SIMULATION-BASED LEARNING IN OCCUPATIONAL THERAPY
(SIMBA)

Competency Framework and Implementation Guidelines for Simulation-Based Learning in Occupational Therapy Education

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COMPETENCY FRAMEWORK AND IMPLEMENTATION GUIDELINES FOR SIMULATION-BASED LEARNING IN OCCUPATIONAL THERAPY EDUCATION

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BRIEF CONTENTS

PREFACE

This book is the result of work carried out in the Erasmus+ funded SIMBA project (Simulation-based learning in occupational therapy, project no. 2022-1-BE02-KA220-HED-000088974), which aims to develop and integrate simulation-based learning (SBL) and assessment methods in the occupational therapy (OT) programs of five partner institutions in Belgium, Austria, Finland, Turkey, and Croatia. In the long-term, the SIMBA project aims to create and disseminate evidence-based, theoretically driven and practical resources for the implementation of SBL in occupational therapy education. These resources, including this book, a Teacher's manual for simulation design and delivery, a set of 30 hands-on and digital simulation scenarios, and a standardized assessment tool for evaluation of occupational therapy competencies in SBL, will be available to educators, practitioners and students on the SIMBA project website: https://simba.turkuamk.fi/.

This book is the result of two systematic narrative literature reviews and two focus group studies that aimed to examine existing theoretical, empirical, professional and practical knowledge about the application of a simulation-based learning methodology for the acquisition and evaluation of professional competencies in occupational therapy education. This book focuses on an overview of the information collected, reviewed and analysed in these studies and presents a framework and guidelines informed by the insights gained from these research findings. Full details of the methodology of the literature review and focus group studies are available on the SIMBA project website.

This book is made up of two parts. In Part One, the SIMBA Framework of the key professional occupational therapy competencies for design and implementation of SBL in OT education is presented. The aim of this Framework is to provide a synthesis of existing competency frameworks, classifications and standards defining occupational therapy competencies. It offers a starting point from which to determine the professional competencies most suitable for application of SBL methodologies in OT education, define competency-based learning outcomes and objectives for simulation-based learning and assessment, and consider how the gradual acquisition of competencies across different levels of education can be accounted for in simulation design.

In Part Two, the SIMBA Guidelines for the implementation of SBL in OT education present a practical overview of theoretical, empirical, methodological, and contextual knowledge about the application of a simulation paradigm to the acquisition and assessment of professional competencies in occupational therapy education. Drawing from this accumulated knowledge, the Guidelines presents the OT-SIMBA Frame as a comprehensive

framework for describing, informing and guiding the conception, development, implementation, and evaluation of simulation-based learning (SBL) in undergraduate occupational therapy educational programmes.

Together, the SIMBA Framework and Guidelines are complementary tools designed to be used by both educators and students to enhance simulation-based learning in OT education. The Framework identifies key competencies and parameters for identifying competency-based learning objectives for simulation-based learning and supporting competency development across educational levels. The Guidelines provide a clear and comprehensive structure for implementing SBL with the aim to facilitate development of professional competencies and enrichen learning experiences in OT education. A brief overview of the extensive content covered in this book is available in a series of short webinars available on the SIMBA website: https://simba.turkuamk.fi/results/. By using the Framework and Guidelines together, educators will acquire knowledge necessary for integrating SBL into their own programs and fostering active student participation so that students are both competent and feel confident in their transition to the occupational therapy field. In the long term, this approach aspires to improve the quality, safety, and effectiveness of client care, ensuring OT graduates are ready to meet modern healthcare demands and societal needs.

Abbreviations

The following table presents a list of key abbreviations used in this publication.

Abbreviation	Full term	Description
SIMBA	Simulation-based learning and assessment in occupational therapy education	Abbreviation used when referring to the project as a whole.
SBL	Simulation-based learning	*An array of structured activities that represent actual or potential situations in education and practice. These activities allow participants to develop or enhance their knowledge, skills, and attitudes, or to analyse and respond to realistic situations in a simulated environment* (definition from Guidelines retrieved from Sim Dictionary).
SimOT	Simulation-based learning in occupational therapy	From the Guidelines, used whenever referring to SBL in OT and used to develop the SimOT approach.
CBSP	Context-based Simulation Practice	CBSP is an element in the SimOT approach. CBSP refers to immersing students in authentic, safe learning environments that mirror the diverse and complex practice contexts faced by occupational therapists.
OBSP	Occupation-based Simulation Practice	OBSP is an element in the SimOT approach of the Guidelines. OBSP is a purposeful, safe, and real-life simulated learning approach dedicated to equipping students with the necessary competencies for fulfilment of the professional OT role.
PCSP	Person-centred Simulation Practice	PCSP is an element in the SimOT approach. PCSP refers to immersing students in safe, real-life, learner-centred simulations that embrace a humane and holistic approach of occupational therapy practice and education.
OSPE	Occupational Simulation Performance and Engagement	OSPE is an element of the SimOT approach. OSPE refers to the integrated and active demonstration of occupational therapy knowledge, skills, and attitudes within the context of safe, real-life simulation scenarios, guiding students towards a more integrated understanding of the dynamic interaction between individual factors, environmental influences, and the nature of the occupation itself.

PART ONE:
A FRAMEWORK OF OCCUPATIONAL THERAPY COMPETENCIES FOR SIMULATION-BASED LEARNING

Andreja Bartolac, Claire Sangster Jokić, Ivana Klepo & Laurence Magerat

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Introduction

This document presents a framework of the key professional occupational therapy competencies for the design and implementation of simulation-based learning (SBL) in occupational therapy (OT) education. It has been prepared as part of the Erasmus+ funded SIMBA project (Simulation-based learning in occupational therapy, project no. 2022-1-BE02-KA220-HED-000088974) and is the result of a systematic narrative literature review examining occupational therapy competencies and two focus group studies examining the perspectives of stakeholders (OT educators, practitioners, and students) and international experts in simulation-based learning in occupational therapy education. In this Framework, competencies are defined as a combination of knowledge and understanding, interpersonal and practical skills, ethical values and attitudes, and occupational therapy responsibilities that are required for competent occupational therapy practice (1,2). They are distinguished from the notion of *competence*, which refers to the level (novice-expert or beginner-advanced) at which an individual demonstrates given competency or competencies. The competencies defined here are intended to describe those expected of a novice occupational therapy practitioner, defined as an individual who has successfully completed a pre-registration (undergraduate) education programme in occupational therapy and is deemed eligible to practice as an occupational therapist.

In the context of the European Qualification Framework (EQF) (3), the focus of this Framework is on competencies acquired in the first cycle of education that correspond to learning outcomes for EQF Level 6 (knowledge, skills, autonomy and responsibility). The purpose of this Framework is not to offer a new or alternative framework of occupational therapy (OT) competencies, but rather to provide a synthesis of existing competency frameworks, standards and classifications that define professional OT competencies, including national and international competency frameworks and research examining questions related to OT competencies and competency development. Although this document strongly relies on and takes into account global (WFOT Minimum Standards for the Education of Occupational Therapist) (4) and European (CALOHEE-ENOTHE Tuning Educational Structures in Europe) (2) recommendations for defining occupational therapy competencies at different levels of education, it primarily focuses on specific competencies appropriate in the application of simulation methodology as a teaching and learning medium and represents the results of a wider review of literature that included other frameworks of professional OT competencies as well as empirical research examining competency development using a simulation methodology and two focus group studies that further examined stakeholder and expert perspectives on SBL in OT

education for supporting acquisition of occupational therapy competencies.

This synthesis offers a starting point from which to consider two key questions relevant to the design and delivery of SBL in OT education:

- For which professional competencies is the application of SBL methodologies in occupational therapy education most suitable?
- In the first cycle of occupational therapy education, how is the progression of professional competencies over time formulated?

Furthermore, while this Framework focuses specifically on the specific competencies for proficient occupational therapy practice, it recognizes that other wider and more generic competencies (leadership, entrepreneurship, autonomy and responsibility, research skills, environmental and social sustainability etc.) not exclusively specific to OT education or the profession itself are also acquired and applied in competent OT practice. Indeed, the manner in which many generic competencies are applied in acquiring and performing profession-specific competencies is evident in the knowledge, skills and attitudes defined in this Framework. A full list of works included in the narrative review of the literature used to prepare this Framework is provided in Appendices A and B.

Classification of professional competencies

Existing national and international frameworks for defining and describing the professional competencies of occupational therapists typically present competencies within a structure of key competency domains, thus allowing for a basic classification of the types of knowledge, skills and attitudes required for competent occupational therapy practice[1]. Thematic content analysis of the literature included in the review from which this framework was derived (Appendix A) enabled a cross-framework comparison of these classifications and the clustering of similar competency domains to arrive at a unified classification of competencies.

Using the results of the literature review and focus group studies, professional competencies of the novice occupational therapy practitioner have been classified in this framework within six key competency domains. Figure 1 presents and briefly defines these competency domains.

1 While this framework has applied competency descriptor labels of knowledge, skills and attitudes to describe competencies, the *autonomy and responsibility* competency domain named in the EQF (3) and applied in the Tuning framework (2) is also visible within this framework in Domains D and E and in part in Domain B3 (ethical practice).

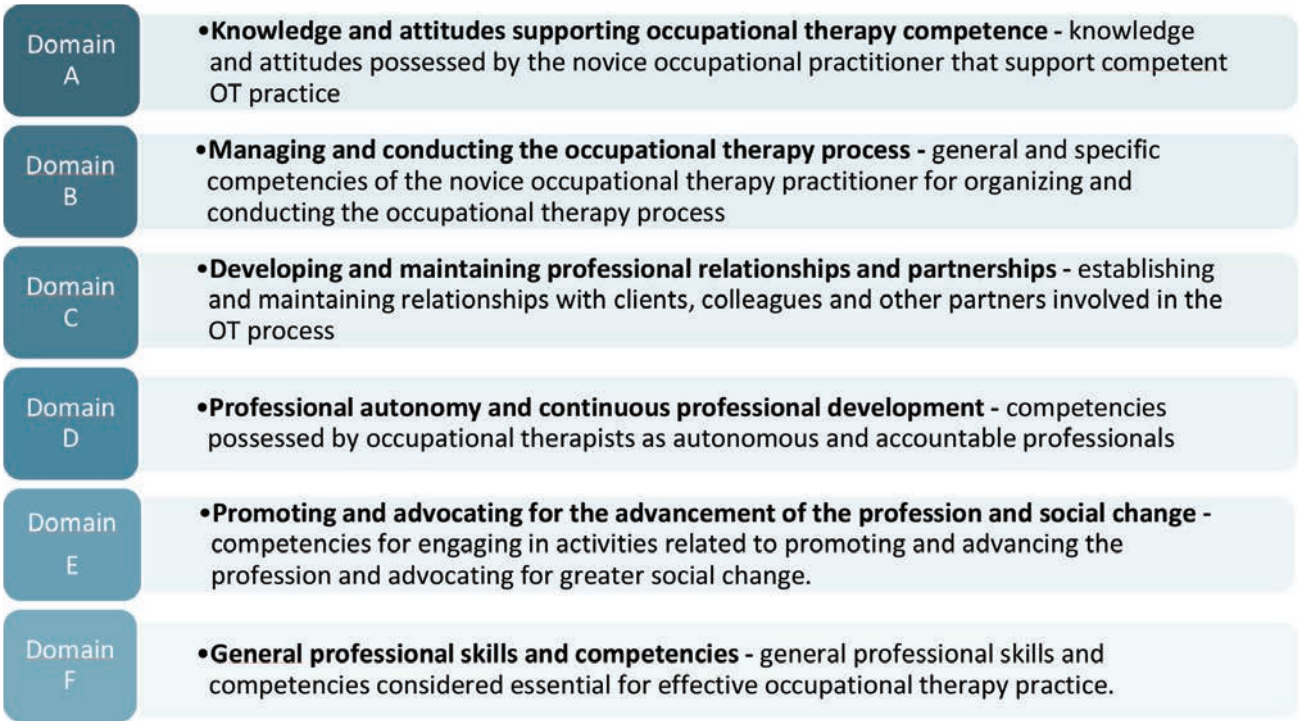

Figure 1: Classification of occupational therapy competency domains

In the following section, the competencies (knowledge, skills, and attitudes) of a novice OT practitioner are defined in full for each domain. Because this classification represents a synthesis of competency standards from numerous frameworks, there is an inherent overlap with the domains presented here and those in other frameworks. However, this classification is not identical to any single framework and therefore does not aim to capture all aspects of any one framework nor re-define competency domains. Instead, the intention of this classification is to provide a structure in which to present a comprehensive overview of already-defined occupational therapy competencies and a foundation from which to consider the competencies that are (or might be) most appropriately and effectively addressed using SBL methodologies in OT education.

Essential professional competencies of the novice occupational therapy practitioner

As previously mentioned, the results of the literature review and focus group studies enabled the creation of a detailed catalogue of occupational therapy competencies within each domain described above. These competencies are presented in Table 1.

Table 1. Six competency domains of the SIMBA Framework

DOMAIN A. Knowledge and attitudes supporting occupational therapy competence

This domain describes the knowledge and attitudes possessed by the novice occupational practitioner that support competent OT practice.

A.1. Occupational therapists possess knowledge about occupation and humans as occupational beings:

- Humans as occupational beings: meaning and subjective experience of human occupation
- Nature of occupation (forms, types, and domains of occupation)
- Relationship between occupation and: health, well-being, participation, occupational and social justice within complex contexts
- Occupations in context: Relationships between person, environment (and other contextual factors), occupation and occupational performance, participation, occupational and social justice
- Theories, concepts and approaches for understanding human occupation
- Effect of an individuals' health, development, needs, and function (physical, social, psychological) on occupational performance and participation
- Effect of diverse physical, social, cultural, political, economic, and institutional environments on occupational performance and participation
- Occupational identity and occupational roles
- Occupational rights and occupational justice

A.2. Occupational therapists possess knowledge about occupational therapy:

- Theoretical and philosophical foundations of profession
- Occupation as a means and an outcome
- Therapeutic use of occupation
- How changes to function, health, development, or environments alter participation in occupation
- How limitations or changes to participation in occupation affect health
- Domains of occupational therapy expertise – person, occupation, and context
- Client-centred, occupation-based, and outcome-oriented occupational therapy practice
- Process of occupational therapy (occupational therapy assessments; goal-setting approaches; intervention strategies, methods and equipment targeting person, occupation and/or environment; outcome evaluation; documentation)

A.3. Occupational therapists possess knowledge and skills for contributing to research and development in occupational therapy and occupational science.

A.3.1. Occupational therapists possess ***knowledge*** *about research and development in occupational therapy and occupational science:*

- Searching, integrating, and applying evidence, literature, and data from occupational sciences in occupational therapy practice
- Understanding the scientific process, research paradigms and methodologies, research governance and ethics procedures
- Conducting the scientific process, data analysis and synthesis, and academic writing

A.3.2. Occupational therapists possess ***skills*** *to advance knowledge through research and development in occupational therapy and science. They:*

- Identify gaps in current evidence in occupational therapy and occupational science that consider complex contexts to promote health, well-being and social transformation
- Conduct a search and review of literature in health, social and occupational sciences
- Critically appraise research outputs (evaluate relevance and trustworthiness of information; understand limitations of research evidence)
- Apply and justify appropriate research methods in alignment with research ethics
- Systematically collect, interpret, and synthesize data using various research methods (quantitative, qualitative, mixed methods)
- Participate in inter- and intra-professional research teams or projects to contribute to the profession's knowledge and evidence base
- Conduct research according to ethical research and practices
- Disseminate results of research through participation in conferences, workshops, scientific publication
- Apply research results to support practice

A.4. Occupational therapists possess attitudes about:

- The value of every person and people's ability to adapt and change
- The environment in which people choose to live
- Factors that present barriers to participation
- Individual and cultural differences in beliefs about causes of health, occupation, and occupational practices
- Rights of people to receive needed services and participate in health enhancing occupations
- Team members and other partners that promote effective working relationships
- Conducting the OT process in a professional manner based on one's own experience
- Ensuring quality and evidence-based service through the application of theory and research findings
- The value and necessity of ethical practice
- The need for continuous professional development (lifelong learning and reflective practice)
- Managing the professional performance of oneself and others

A.5. Occupational therapists possess general professional knowledge about health and social care:

- Human anatomy and function of the human body
- Human development (physical, psychological, social)
- The nature and range of health conditions
- The social model of disability
- Health promotion and prevention
- Legislative and regulatory frameworks supporting occupational therapy practice
- Structure and function of private, public and third sector service providers
- Expertise and practice areas of different professional groups
- Interprofessional collaboration, therapeutic relationships, group dynamics and communication processes
- Personal professional competence and therapeutic use of self
- Reflective practice
- Processes for quality assurance, leadership, professional management, and promotion
- Evidence from social, behavioural, and biological sciences

DOMAIN B: Managing and conducting the occupational therapy process

This domain describes the general and specific competencies of the novice occupational therapy practitioner for organizing and conducting the occupational therapy process.

B.1. Occupational therapists demonstrate competencies in professional reasoning during the occupational therapy process. They:

- Identify the need and appropriateness of occupational therapy for a client (individuals, organizations, or communities)
- Evaluate and apply theories, approaches, and evidence-informed knowledge to inform, prioritize and guide the client-centred and occupation-based therapy process
- Apply reflexive professional reasoning, practice-based and evidence-based approaches throughout the occupational therapy process
- Plan and implement practice within constraints of the 'real world' context (i.e., reconcile the gap between theory and practice, manage differences between medical and social practice models, negotiate service systems and work within economic constraints)
- Apply skills in professional reasoning, problem solving, flexibility, creativity and critical thinking for reflecting on their own practice and making informed decisions throughout the OT process
- Re-evaluate previous assumptions and revise decisions to incorporate new evidence, research findings, and outcome data
- Conduct occupational therapy services in direct contact with clients using a variety of service delivery approaches (in-person meetings, group sessions and virtual health service delivery

B.2. Occupational therapists demonstrate competencies in managing and conducting the occupational therapy process.

- Effectively apply occupational therapy conceptual and process models in a collaborative, ethical manner with respect to diversity throughout the whole occupational therapy process

*B.2.1. Occupational therapists **assess occupational participation** in all areas of human occupation (e.g. personal care, daily living, work/study/school, play, leisure and rest). They:*

- Gather client information from available documentation and other formal resources
- Conduct an occupational therapy interview to understand the client's occupational narrative and establish a relationship with the client
- Assess subjective personal factors (i.e., client's beliefs about occupation, occupational goals, strengths, skills, limitations; satisfaction with participation) that affect occupational performance or participation
- Construct an occupational profile based on occupational history, identity, and experience
- Select appropriate client-centred and evidence-based (standardized and/or structured) assessment tools and methods
- Measure objective personal factors that affect (i.e., support, hinder, prevent or pose risk to) occupational performance or participation
- Assess physical, social, attitudinal, cultural, and legislative contextual factors that affect (support, hinder, prevent, or pose risk to) occupational performance or participation
- Skilfully conduct activity and occupational analysis (i.e., break down activity into their fundamental components; analyse connections between skills, preferences, and abilities, the sequence and timing of the activity and the physical/social environment)
- Analyse, interpret, and clearly communicate assessment findings
- Prepare an accurate and occupation-oriented report based on assessment

*B.2.2. Occupational therapists jointly set **goals and intervention plans** with the client. They:*

- Jointly negotiate and set objective, achievable and reasonable (SMART) goals with the client
- Develop occupation-focused intervention plans (timeline, outcomes, resources, contingency plans, and responsibilities) based on assessment findings, client goals, best available evidence, and professional reasoning

B.2.3. Occupational therapists demonstrate competencies for implementing, monitoring, evaluating, adjusting, and concluding occupational therapy ***interventions.*** *They:*

- Implement intervention plans, which might include:
  - Using therapeutic skills to facilitate clients' occupational participation, health, and well-being (in the institution, home and/or community)
  - Facilitating clients' use of their strengths and resources to sustain occupational participation
  - Using occupation therapeutically for purposes of prevention, maintenance or restoration of function or adaptation
  - Creating opportunities for creative self-expression or purposeful engagement in leisure activities
  - Observing and analysing occupational performance (occupational analysis and synthesis) throughout the occupational therapy process
  - Grading and adapting occupation
  - Modifying aspects of social and physical environments in home, school, work, and other settings to promote safe and effective occupational participation
  - Selecting, applying, designing, or informing clients about assistive technology and equipment to support occupational performance or participation
  - Supporting clients to achieve occupational balance (strategies for adapting activity patterns, routines, habits, and roles)
  - Assisting clients to access support networks and resources
  - Offering counselling, teaching and training to support acquisition of new competencies, strategies, and perspectives for occupational participation
  - Performing and providing training on safe and efficient mobility, handling, and body transfer techniques
  - Advocating for equal and accessible opportunities for occupational participation
- Continuously review and evaluate the effectiveness and progress (outcomes) of the intervention plan with the client, and modify plans, goals, and intervention when necessary
- Complete, interpret, synthesize, and document final evaluation of intervention outcomes with the client and others involved in the plan
- Prepare and implement a safe and effective plan for concluding/discontinuing OT services (when identified goals are achieved, client has reached maximum benefit or does not wish to continue services), providing ongoing services, or facilitating transition to other services in collaboration with the client, family members, significant others, other professionals, and community resources
- Maintain and store clear, accurate and timely documentation of occupational therapy referral, assessment, intervention, and outcomes
- Prepare an accurate and occupation-oriented client report based on intervention results

B.3. Occupational therapists demonstrate competencies in conducting ethical and safe practice. They:

- Demonstrate professional ethics, integrity, and responsibility to ensure safe occupational therapy practice
- Ensure clients are informed about the range of possible interventions, likely outcomes, and potential risks
- Obtain client's informed consent for all procedures performed during the occupational therapy process
- Provide equitable, ethical, and respectful practice and is mindful of biases, stereotyping and prejudices
- Respect client's occupational rights
- Recognize, clarify, and resolve ethical issues and dilemmas that arise within professional relationships or within the OT process using reflection based on ethical frameworks (Code of ethics, Standards of practice, laws, and regulations)
- Integrate varying perspectives in the ethics of clinical practice, occupational justice, and professional actions
- Respond to and reports unprofessional, unethical, or oppressive behaviour when observed in practice
- Maintain data confidentiality, security, and integrity in the sharing, transmission, storage, and management of the client's personal information
- Maintain professional boundaries in all client and professional relationships
- Recognise and manage conflicts of interest in all client and professional relationships
- Use and promote ethical/moral reasoning and behaviour
- Ethically report on applied services and outcomes to service payers, relevant local, regional, and national databases, and registries
- Monitor safety and evaluate and reduce risks throughout the occupational therapy process and service delivery and during supervision, mentoring, teaching, and advising activities
- Monitor and preserve one's own and other's health using safety measures and equipment within an inclusive, supportive practice setting

B.4. Occupational therapists demonstrate competencies in conducting culturally sensitive practice. They:

- Recognize, understand, and respect cultural differences and diversity
- Recognize and analyse the social, cultural, political, and ecological determinants of health, well-being, and occupational possibilities
- Analyse and challenge the effects of biases, social structures, and systemic and historical factors on people, groups, and their occupational possibilities
- Identify and manage the influence of one's own values and culture on practice and act to minimize personal bias and inequitable practice based on social position and power
- Practice in an inclusive, culturally responsive, and culturally safe manner using culturally sensitive communication tools and strategies
- Demonstrate cultural humility and act to integrate client's understanding of health, well-being, and occupation into the service plan

DOMAIN C: Developing and maintaining professional relationships and partnerships

This domain describes the competencies possessed by occupational therapists for establishing and maintaining relationships with clients, colleagues and other partners involved in the OT process.

C.1. Occupational therapists demonstrate competencies in engaging in effective professional communication. They:

- Communicate in a respectful, appropriate, and effective manner with clients, families, significant others, colleagues/team members, supervisors, agencies, school, work, community and public
- Use active listening skills
- Use situational awareness, emotional intelligence, and empathy
- Demonstrate effective, appropriate, and inclusive communication skills in a variety of mediums (verbal, non-verbal, written, digital) adjusted according to abilities, personal factors, learning styles, needs
- Recognize and adjust power imbalances that affect relationships and communication
- Use respectful and effective communication to professionally initiate and end the client-therapist relationship, seek and respond to feedback, conduct an interview or provide counselling
- Effectively apply a wide range of communication skills to professional and non-professional audiences with consideration of diversity and complex contexts

C.2. Occupational therapists demonstrate competencies in establishing trusted professional relationships and partnerships.

C.2.1. Occupational therapists establish and maintain relationships and partnerships ***with clients****. They:*

- Understand and respects the unique nature of individuals, view the client holistically in a broader context and appreciates diversity
- Nurture a shared understanding and agreement about: clients' values and needs, scope and nature of services, benefits and risks, expectations and priorities, rationale for decisions, power balance
- Support clients in making informed decisions about their involvement in occupational therapy procedures, process, and services
- Collaborate and partner with clients, families, and significant others to attain optimal and person-centred occupational outcomes
- Make therapeutic use of self (creating a meaningful relationship between the therapist and the client)

C.2.2. Occupational therapists establish & maintain relationships and partnerships ***with colleagues****. They:*

- Define, understand and present the professional role and contribution of OT within a team, health setting, and society
- Develop and maintain mutually supportive interprofessional and trans-professional team relationships and engage in networking
- Respect and negotiate shared and overlapping roles and responsibilities
- Engage in conflict management, problem solving or resolution finding in a respective manner
- Participate actively, respectfully, and inclusively, in collaborative and evidence-based decision making
- Inform team members about the scope of occupational therapy services provided to the client in a confidential and objective manner
- Collaborate in inter-professional service provision, education, and research
- Build professional support networks (with assistants, students, support staff, volunteers, team members, associations)

C.2.3. Occupational therapists establish and maintain relationships and partnerships ***with other agencies and stakeholders****. They:*

- Advocate for the client's intervention goals and necessary accommodation or to facilitate social and occupational participation
- Collaborate with societal systems, civil organizations (NGOs) and community agencies
- Provide consultation and advice related to occupational performance and occupational justice

DOMAIN D: Professional autonomy and continuous professional development
This domain describes the competencies possessed by occupational therapists as autonomous and accountable professionals.

D.1. Occupational therapists demonstrate competencies in professional autonomy and accountability. They:

- Work with a high degree of autonomy based on professional knowledge, skills, attitudes, responsibility, critical self-reflection, continual professional improvement, and quality assurance
- Develop work life skills (respecting working hours, commitment to work, responsibility for own work, appreciation of work, independent work attitude)
- Practice in accordance with national and international polices, regulations, procedures, and codes of ethics for occupational therapists
- Establish, maintain, advance, and update professional performance, knowledge, and skills
- Are responsible and accountable for all aspects of the occupational therapy process and safe and effective service delivery
- Practice within limits of own level of competence and expertise and refer to a supervisor, team members or other professionals when required
- Re-examine previous assumptions during decision making and revise decisions to incorporate new evidence, research findings and outcome data
- Apply evidence-informed practice in an ethical and appropriate manner
- Are knowledgeable and respectful of current legislative, societal, and cultural norms, and behave accordingly
- Use resources in a sustainable manner: economically, socially, and ecologically
- Respect professional boundaries and competencies, scope of practice and area of expertise

D.2. Occupational therapists demonstrate competencies in the management of oneself and one's practice, service, and workplace. They:

- Manage and coordinate the development and implementation of occupational therapy services within budgetary and legislative constraints
- Manage and maintain spaces, equipment and other resources used in the provision of services
- Effectively manage work resources, equipment, time, workload and demands within the constraints/limitations of work setting
- Manage self and others in both planned and uncertain work situations, using problem-solving skills
- Manage caseloads and prioritize services as necessary
- Manage the assignment of services to other team members who have competencies to deliver the service (staff management)
- Establish, evaluate, and maintain OT services (including recognizing and responding to business needs, developing and writing a business plan, articulating economic benefits of the service/cost effectiveness, marketing, consumer satisfaction)
- Implement project management strategies (planning, implementation of, reporting on and evaluating a project)
- Apply skills in leadership, management and entrepreneurship, innovative and sustainable practice
- Demonstrate creativity, innovation, and adaptability to change in response to the occupational needs of persons, groups, populations, and communities
- Support initiatives and contribute to development and quality improvement of services
- Professionally and proactively accept and address issues or failures in own management
- Manage and maintain their own physical and mental health

D.3. Occupational therapists demonstrate competencies in continuous professional development (CPD). They:

- Demonstrate knowledge of national requirements and standards for continuous professional development
- Demonstrate autonomy and responsibility in engaging the process of life-long learning and professional development
- Identify own development needs and seek/utilize learning opportunities
- Develop a continuous professional development plan, especially when moving to a new area of practice or returning to practice after a period of absence
- Improve practice though self-assessment (based on performance and quality indicators), self-reflection and feedback
- Keep up to date with research, guidelines, protocols, and evidence-based practices
- Develop skills and adjust to new/emerging areas (e.g., major accidents and disasters, crises, and catastrophic situations)
- Integrate knowledge and skills acquired in continuous professional development (CPD) into practice
- Facilitate and lead CPD activities and education for others
- Are mindful and proactive in managing one's own occupational balance and well being
- Nurture and develop personal traits and qualities for self and professional practice (e.g., humanity, compassion, adaptability, flexibility, responsibility, objectiveness, timeliness, confidence, respectably presented, organization, psychological resilience)

DOMAIN E: Promoting and advocating for the advancement of the profession and social change

This domain describes the competencies possessed by occupational therapists for engaging in activities related to promoting and advancing the profession and advocating for greater social change.

E.1. Occupational therapists demonstrate competencies in promoting the profession of occupational therapy. They:

- Articulate, promote, and share information about the role, knowledge and value of OT in health/social care settings and the wider community
- Contribute to programme planning/development, quality assurance and improvement activities, including collecting/analysing quality assurance data
- Contribute to the development of the occupational therapy profession and body of occupational therapy knowledge
- Collaborate with colleagues to ensure progress towards workplace values, vision, and goals

E.2. Occupational therapists demonstrate competencies in providing training, mentorship, and education to others. They:

- Supervise OT students, assistants, volunteers, and others involved in the OT process
- Contribute to entry-to-practice education (e.g., fieldwork mentorship)
- Act as a professional mentor or coach to peers or students
- Monitor the safety and effectiveness of others' performance through supervision, mentoring, teaching, and coaching

E.3. Occupational therapists demonstrate competencies in advancing and advocating for social change through occupation and inclusive practices. They:

- Apply advocacy approaches to promote the occupational rights of persons, groups, populations, and communities
- Promote and advocate for the value of occupation as a determinant of health and well-being
- Recognize and respond to the effects of social, political, structural, and ecological factors on health, well-being, and participation
- Raise awareness of the needs and rights of individuals, groups, populations for everyday occupations and contribute to mitigation of societal challenges
- Apply and promote principles of social and occupational justice to empower clients to seek and obtain resources that support health, well-being, and occupational participation and to influence social change (e.g., health services, work conditions, education…)
- Engage and consult with community partners and participate in professional and community development activities that support participation, health promotion and/or social change
- Advocate for factors (OT standards and practices, environments, organizational/political/social policies, and practices) that promote health, well-being, and occupations
- Prioritize and promote equitable access to OT services related to clients' occupational needs
- Implement strategies to promote provision of OT services that respond to local health and social challenges
- Demonstrate professional courage and take an active role in advocating for social change through occupation and inclusive practices

DOMAIN F: General professional skills and competencies
This domain describes the general professional skills and competencies possessed by occupational therapists. While these competencies are not necessarily skills specific to the occupational therapy profession alone, they are considered essential skills for effective occupational therapy practice.

F.1. Occupational therapists demonstrate general professional competencies important for fulfilling responsibilities. They:

- Understand and responsibly use computing skills and digital systems, tools, services, and technologies to enhance their professional profile and practice (communication, seeking and interpreting information, service provision, reporting)
- Contribute to the development of digital systems and services of relevance to the profession and raise awareness of limitations and bias in data, information, and systems
- Have a working knowledge of English to keep up to date with the professions' body of knowledge
- Recognize and adapt to new situations driven by policy, social change and client/population need and are creative in finding the best solutions
- Reflect on and apply basic knowledge
- Demonstrate good problem-solving skills
- Understand and perform own role as a team member and seek support from team when appropriate (e.g., problem resolution, service coordination)
- Recognize and cultivate opportunities; understand and assess risk

F.2. Occupational therapists demonstrate competencies for understanding and working within the local and national context and legislation. They:

- Possess knowledge of local and national health, social, education and disability systems and relevant health, social, consumer, disability, and workplace legislation
- Recognize national health needs, priorities, and goals
- Understand and comply with rules, procedures and policies in the workplace/organization and act if these conflict with professional standards, client values or evidence
- Follow regulatory guidance for accepting, initiating, assigning, and supervising service
- Recognize and address social, political, and other contextual factors that might affect occupational participation (e.g., aging population, policy directives, health and disability legislation, financial resources…) and act as key driver of occupational therapy services
- Consider social, economic, and ecological costs of care
- Respect laws, codes of ethics, rules and regulations that govern occupational therapy
- Conduct all aspects of the OT process (screening, assessment, planning, intervention, evaluation, documentation, information storage) in accordance with national/local laws, regulatory requirements, and standards

What occupational therapy competencies might be effectively addressed using SBL methodology?

To examine what occupational therapy competencies might be effectively addressed using simulation methodology, data extracted from a review of the literature on simulation and simulation-based learning (SBL) in OT education (Appendix B) and the results of two focus groups were used to identify the specific OT competencies and learning outcomes currently being targeted through the application of simulation methods. Here, *simulation* is defined as a teaching, learning and assessment methodology that recreates all or part of a clinical or professional experience in which a learner gains experience in performing one or more professional competencies under varying levels of support or guidance. SBL methodologies in healthcare education have been linked to numerous potential benefits and impacts in the literature, as summarized according to Lateef (5) in Figure 2.

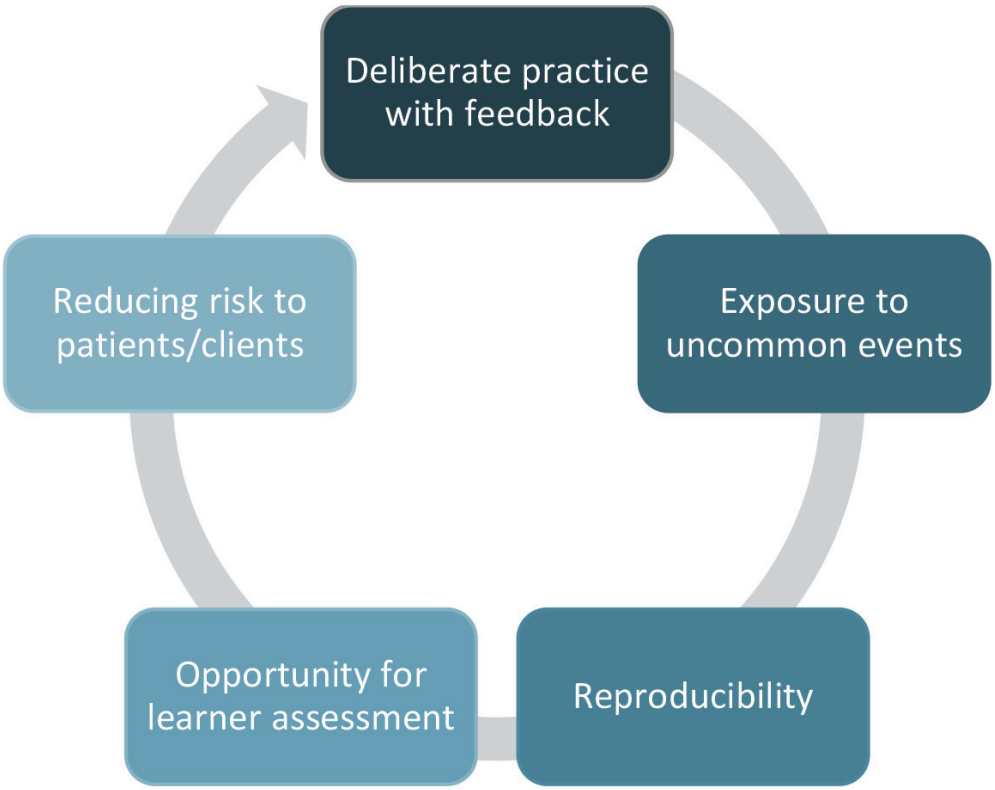

Figure 2. The educational benefits of simulation in healthcare education (Adapted from: Lateef, 2010) (5)

For the purposes of this analysis, the six domain headings of the Framework were used to identify and categorize the competencies commonly addressed using simulation methodology. Figure 3 presents an overview of the most commonly reported competencies currently addressed or deemed most suitable for application of an SBL methodology, as reported in current literature and by stakeholders and experts participating in the focus groups.

Results of this analysis indicated that by far the most common competency domain addressed in current applications of simulation in OT education is *Conducting the OT process and professional reasoning (Domain B).* This included more general competencies in **professional reasoning** such as clinical decision making or problem-solving, as well as specific competencies for applying professional reasoning skills when performing various aspects of the occupational therapy process. Specific technical competencies related to conducting the **occupational therapy process** with a client were also commonly identified as target learning objectives (Figure 3).

In addition to being the most commonly addressed competency domain in existing literature examining simulation in OT education, occupational competencies from Domain B were identified as those that might be most effectively addressed using an SBL methodology. In a focus group study, OT education stakeholders and experts in the application of simulation in OT education agreed that SBL methods are potentially valuable and effective for acquiring competency for conducting various aspects of the **occupational therapy process**, emphasizing competencies related to conducting an interview, client assessment, activity/occupational analysis and various technical skills and techniques used in intervention (e.g., facilitation and transfer methods, feeding therapy, making/applying orthoses or assistive devices). Similarly, SBL was deemed a potentially valuable method for facilitating the development of other Domain B competencies important for successfully engaging in the OT process, such as **problem-solving, clinical reasoning, and decision-making**.

The second most identified competency area identified in the review of the literature and focus group data was *Communication and professional relationships (Domain C)*. Here, simulation was discussed as a method for the assessment and facilitation of student competency in performing various skills related to **communication and establishing rapport** with a client or team member/colleagues. In many instances, these competencies were linked to other competencies in conducting the OT process (e.g., conducting an interview, therapeutic use of self), suggesting that these two competency domains are often targeted in parallel in a single simulation experience. Once again, opinions and perspectives expressed in stakeholder and expert focus groups supported this finding, where competencies related to effective **communication and teamwork** (e.g., counselling and education of clients, interdisciplinary collaboration, verbal and non-verbal communication skills, and written communication such as OT documentation/reports) were identified as those that can be effectively addressed using SBL methodology.

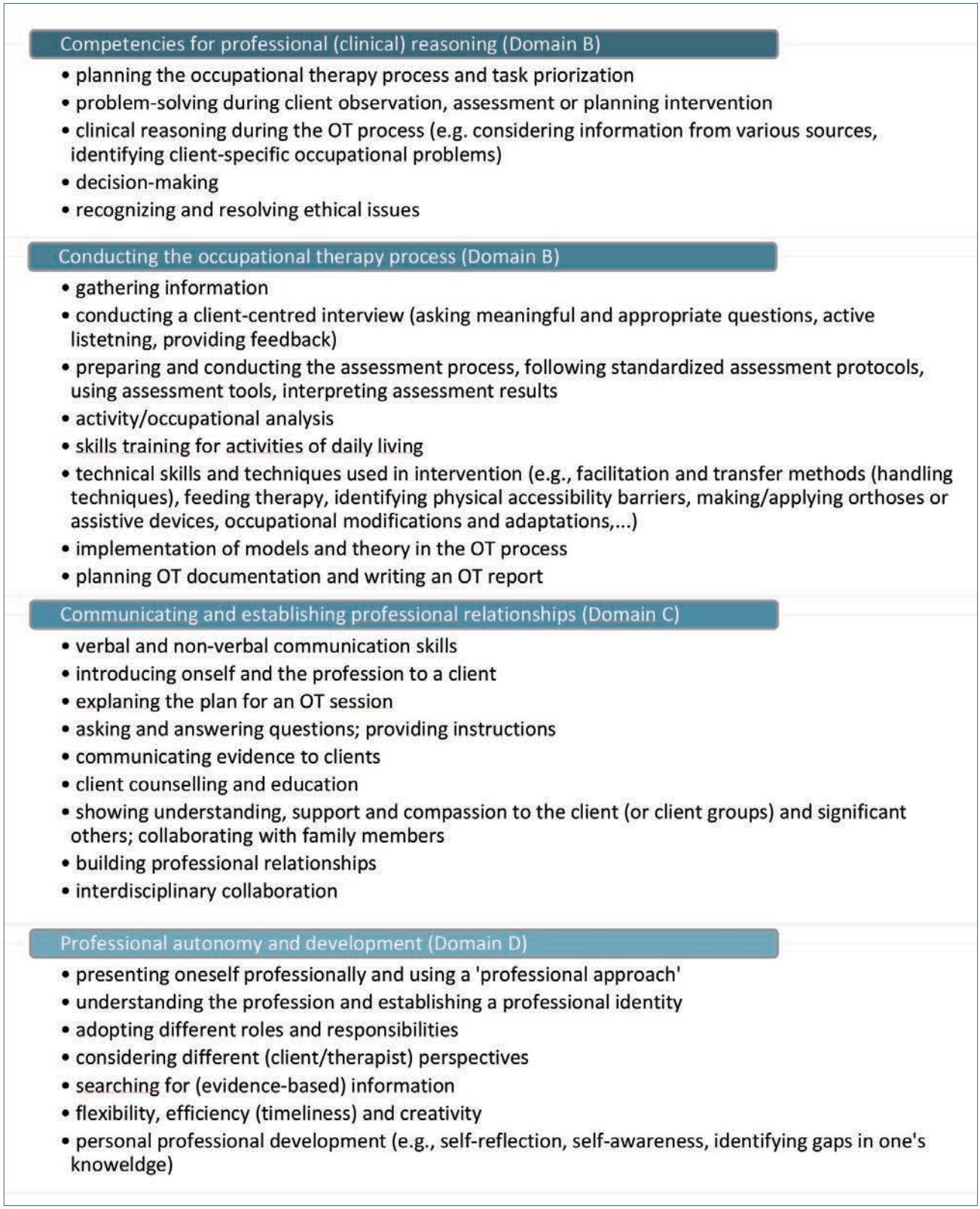

Figure 3. Professional OT competencies most commonly addressed using SBL methodology

Competencies in *Domain D - Professional autonomy and development* and *Domain F - General skills* were less evident in current applications of simulation methodology in OT education. Identified target competencies from Domain D were predominantly in the form of generally defined learning outcomes related to **professionalism** and **professional development,** such as exhibiting professional behaviours and establishing a professional identity, or other gen-

eral competencies related to personal development. Perspectives of stakeholders and experts in focus groups also highlighted the potential of SBL for supporting the development of soft skills, such as competency in self-reflection, adopting different roles and responsibilities, considering different (client/therapist) perspectives, and searching for (evidence-based) information, as well as other more general competencies such as flexibility, efficiency (timeliness) and creativity.

Although not always identified as a direct learning target in the application of simulation methods in OT education, *Professional knowledge and attitudes (Domain A)* were occasionally mentioned in reference to other competencies involved in conducting the OT process. In these instances, performance of these competencies was assumed to rely on the application of relevant theoretical, clinical, and practical knowledge during professional reasoning and decision-making processes. As such, it is important in the development of simulation methods that, along with the identification of target outcomes and competencies to be acquired or performed by the learner, the **prerequisite knowledge** necessary for demonstrating these competencies in a practice situation is also defined. In a few instances, acquisition of knowledge in a specific practice area or topic (e.g., inter-professional knowledge, knowledge about trauma-informed care) or the development of **attitudes** deemed important when working with specific client groups, such as the development of understanding and empathy towards persons with mental health problems or acquiring insight into the lived experience of a client with a physical disability, was identified as a direct aim of a simulation experience. Similarly evident in some of the described applications of simulation were general competencies related to acquiring confidence and self-efficacy in conducting the OT process and working with specific client populations or practice areas. While there was no information in the literature about competencies that are difficult to address using simulation methodologies, expert focus group participants identified competencies and practice situations for working with children as more difficult to simulate in the non-clinical environment.

On the whole, this analysis indicates that SBL methods have to date been predominantly applied for facilitating and assessing the acquisition of competencies for professional (clinical) reasoning, conducting the occupational therapy process and communicating and establishing relationships with clients and other stakeholders. In contrast, profession-specific and general knowledge and attitudes, while not often directly defined as a target learning outcome, are often implicitly assumed to be prerequisite competencies of the learner for demonstrating 'practical' competencies directly targeted in simulated learning and assessment situations. As such, it would be ben-

eficial in the development of a simulation-based methodology to clearly define the knowledge the learner will have to have acquired to demonstrate the skills or competencies identified as target outcomes in the simulation programme.

How do professional competencies develop?

While existing frameworks of professional occupational therapy competencies tend to define competencies as the 'final outcomes' exhibited by a novice practitioner ready to enter practice, it is inherently recognized that such outcomes are the result of a prolonged process of education, practice, and training during which specific knowledge, skills and attitudes are acquired over time and through learning experiences. Simulation methodologies offer one means through which competencies can be practiced, acquired, and evaluated during formal occupational therapy education. As such, implementation of SBL for the purpose of competency acquisition and evaluation must consider the nature through which such competencies develop over time; how specific simulation methods can account for this process; and how SBL can be used to meet learning objectives and address learning needs at novice, intermediate and expert levels. Elements in the design and delivery of SBL that support the graded and progressive acquisition of competencies over time are summarized in Figure 4 and discussed in detail in the *SIMBA Guidelines for the implementation of SBL in OT education*.

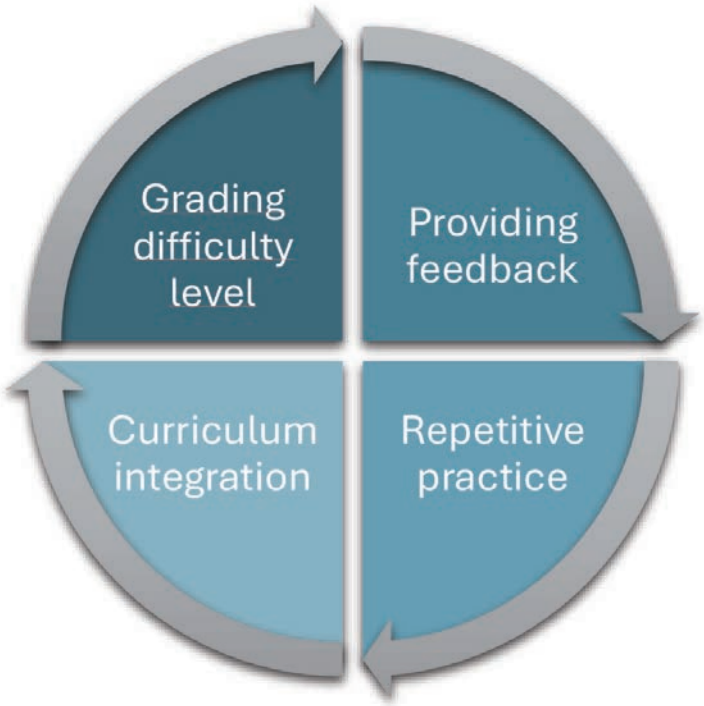

Figure 4. Features of simulation which best facilitate learning
(Adapted from: Lateef, 2010) (5)

To begin, consideration of competency development in higher education in the European context is informed by the descriptors defined in the European Qualifications Framework (3) and applied in the TUNING Guidelines and Reference Points for the Design and Delivery of Degree Programmes in Occupational Therapy.(2) Here, the process of learning is described as one that encompasses aspects of knowledge/understanding, skills/application and autonomy/responsibility and that occurs as a progression from acquisition knowledge, through knowledge application and skill performance to the mastery of higher-level autonomy and responsibility (or 'authority') in a given area or field (2,3). This progression is similarly reflected in other models for describing and measuring competency development identified in the wider literature on the development of occupational therapy competencies during formal education. Analysis of the literature included in the review conducted within the SIMBA project revealed three frameworks used for this purpose, each of which will be briefly described here.

The first model is commonly referred to as Miller's (6) pyramid of clinical competence and was originally developed for defining and assessing competencies in health-care education settings. Miller's model (Figure 5) illustrates the expected progression of competency development (defined as the acquisition of knowledge, skills, and attitudes) from novice (bottom of pyramid) to expert (top). In early learning phases, it is expected that learners will first demonstrate competency for recalling and identifying factual information ('knows' level). Later, learners will be able to interpret, analyse, synthesize, and apply information to build an argument and make decisions in a practical situation ('knows how') and eventually demonstrate and perform required knowledge, skills, and attitudes in controlled/simulated or authentic practice settings ('shows' and 'does'). In this way, Miller's model depicts the progression from theoretical and conceptual knowledge acquisition to competency in the practical application of knowledge and performance of professional skills in practice and argues that approaches to methods of instruction and assessment must be defined and applied to ensure appropriate learning opportunities at each level of a learner's development.(6)

Also present in the literature on occupational therapy competency development is Bloom's taxonomy (7), originally developed in 1956 and revised in 2001. This well-known framework describes a classification for defining learning processes and outcomes within a hierarchical structure of knowledge and skill acquisition, analysis, synthesis, and application that moves from simple to complex, concrete to abstract. The structural and conceptual similarities between Bloom's taxonomy and Miller's pyramid can be observed in Figure 5, where both models are briefly presented. As in Mill-

er's hierarchy, Bloom's model recognizes that knowledge and skill acquisition (i.e., competency development) occurs along a continuum, starting at the lower levels of the taxonomy (acquiring and recalling knowledge), through middle levels of competency development (explaining and applying new knowledge) and later progressing to higher levels of competency for increasingly complex analytical, evaluative, and creative processes.

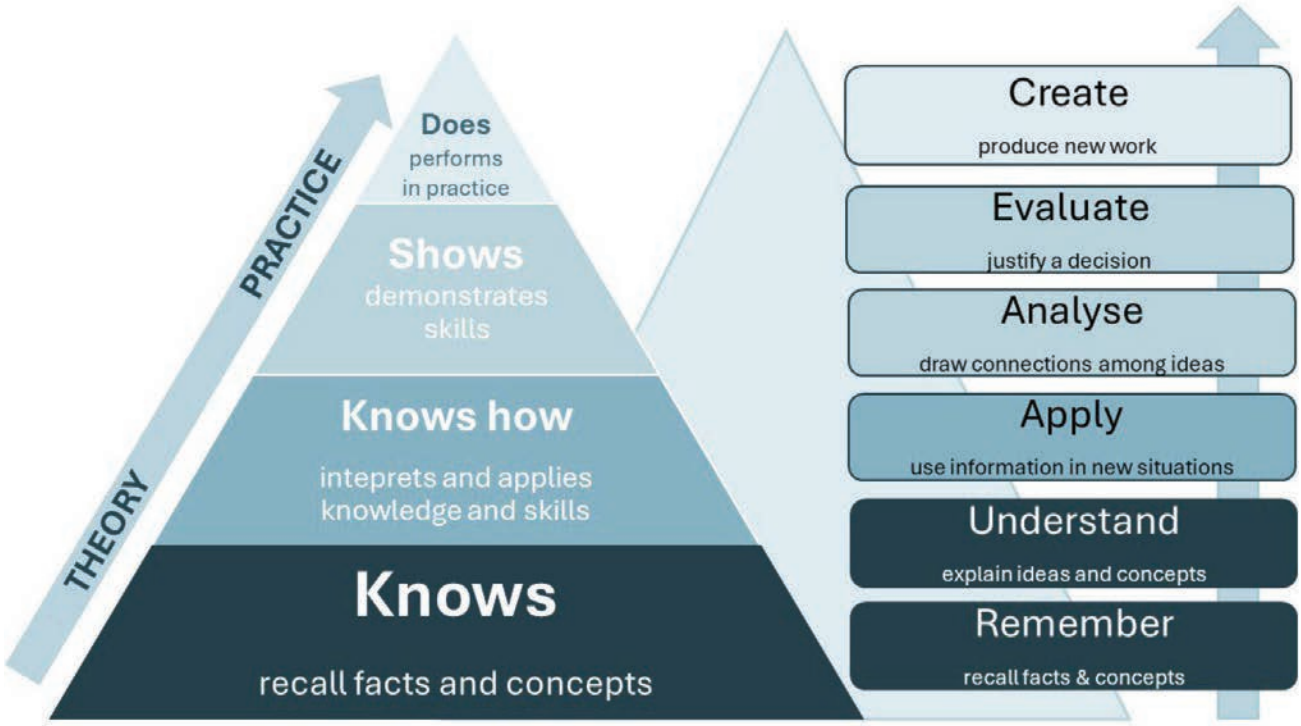

Figure 5: Comparison of Miller's pyramid and Bloom's Taxonomy (Adapted from: Miller, 1990 & Anderson & Krathwohl, 2001) (6,7)

In the context of occupational therapy education, Bloom's taxonomy has been applied in defining learning outcomes and goals based on target competencies, designing curriculum, and evaluating outcomes. For example, learning objectives in occupational therapy curricula have been created and defined according to Bloom's taxonomy so that objectives in initial phases of an educational programme reflect goals that target lower levels of the taxonomy (e.g., obtaining, identifying, defining or classifying topic-specific information and later explaining and applying this information in a practical situation), while objectives in later learning phases build upon earlier objectives and reflect higher levels of Bloom's taxonomy (e.g., critically analysing and comparing multiple sources of information to make a clinical decision; planning and conducting assessment or intervention based on the application, evaluation and synthesis of information; evaluating and explaining the outcomes of an intervention). This method of mapping learning objectives and target outcomes onto a graduated taxonomy of competency development is a means through which occupational therapy education

programmes can ensure that the progression of competency development is appropriately graded and reflects the stepwise course of knowledge and skill acquisition through which a learner progresses over time.

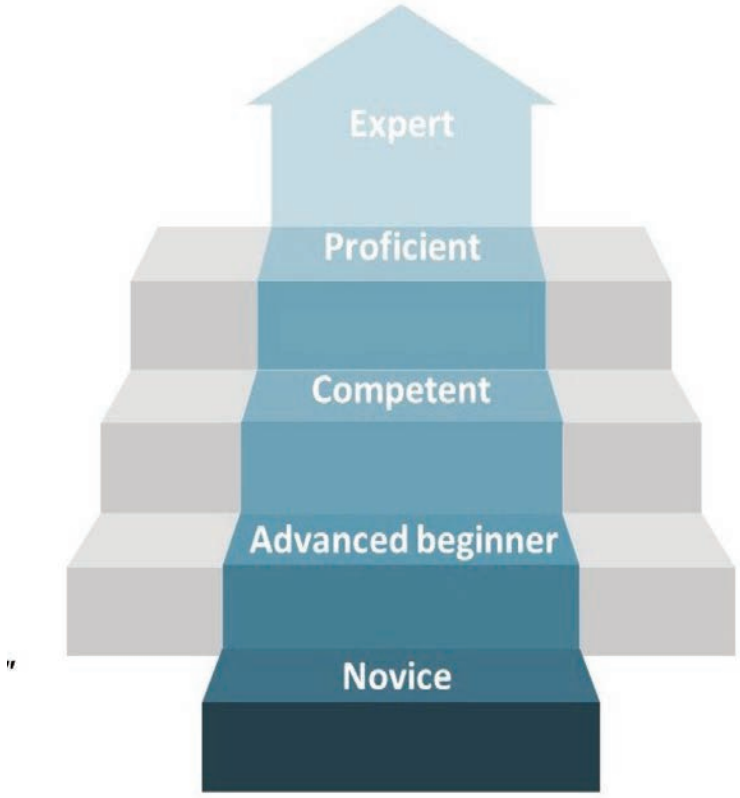

Figure 6: Dreyfus model of skill acquisition (Adapted from: 8,9)

Finally, a review of the literature revealed that some authors refer to Dreyfus' (8,9) model of skill acquisition to describe and evaluate competency development in occupational therapy and other health professions education. According to this model, learners progress through five stages of skill level that move from novice to expert. Each stage is differentiated by the elements of a learning situation that a learner can perceive and address, the ability of the learner to decide how to act in a given situation, and the emotional commitment of the learner to the situation. A *novice (first stage)* learner is an individual in the early phases of the learning process, who can recognize and understand factual information and use pre-determined rules for making decisions and determining actions in a performance situation, but with limited capacity for managing varying contextual factors that might arise. As such, skill performance at this level is described as context-free and analytic (rule-based) and the learner benefits from a controlled performance environment in which contextual variance is minimized. In the *second, advanced beginner stage*, learners gain better understanding of relevant aspects of the performance context through experience in coping with real situations, but continue to perform skills using an analytic, rule-based

approach. With more experience, the learner can recognize an increasing number of relevant contextual elements and performance procedures and eventually learns to devise a plan for determining which elements are relevant to performance (i.e., which information requires attention) and make purposeful decisions during skill performance. According to Dreyfus (8), these are attributes of a *competent learner (Stage 3)*. As learners progresses to the *fourth (proficient)* and *fifth (expert) stages* of skill acquisition, they become increasingly skilled at recognizing and understanding a large repertoire of contextual, situational, and task variables that influence performance and use this information to make deliberate decisions regarding action or skill performance to achieve a desired goal.

When considered together, these models can be used define, describe, and measure the process of competency development across a number of fields, domains and skill areas. In general, this process is described as one that progresses from a stage in which the learner acquires and understands specific theoretical, scientific, and procedural knowledge, through stages in which they become increasingly skilful in analysing, synthesizing and applying knowledge to situations in which skills are performed in varying contexts to a final stage of competence where complex skills are proficiently performed as the result of a dynamic process of information analysis, decision making and action planning.

The application of models and taxonomies of skill acquisition and competency development for describing and measuring occupational therapy competencies is well illustrated in Bossers et al.'s (10) Competency Based Fieldwork Evaluation (CBFE). Here, students' competency across seven core domains is represented along a continuum that progresses through three stages of competency development from when students first enter an occupational therapy education programme to when they complete the programme and are considered eligible for entry to practice. Here, this progression is defined as one that moves from a stage of basic knowledge application (Level 1) through a transition phase (Level 2) to final consolidation (Level 3). Similar to Dreyfus' (8) model, the CBFE (10) describes the level of competency development demonstrated by learners at each stage. For example, in Level 1, students possess and demonstrate understanding of knowledge relevant for occupational therapy practice (e.g., body structure and (dys)function, occupational frames of reference, assessment methods, ethical practice standards…) and will begin to use this knowledge to make decisions and perform basic skills involved in the OT process. At this level, it is expected that a significant degree of guidance and instruction will be beneficial in supporting the student to perform specific competencies. At Level 2, students will become increasingly independent and competent in

performing aspects of the OT process (e.g., conducting assessment, formulating an intervention plan based on collected information) and interact with clients and colleagues as they gain experience in classroom and practical learning situations that offer moderate levels of support. The knowledge, skills and attitudes acquired at the first two levels is consolidated in Level 3, where students are approaching competent performance of numerous complex aspects of practice (e.g., carrying out an intervention plan, providing education to clients and others, evaluating outcomes of intervention, and making appropriate decisions regarding ongoing care) with minimal or no support.(10)

These models and theories of competency development should also be applied in the design and delivery of simulation-based learning methodologies to account for the dynamic progression of the learning process. This means ensuring that SBL learning objectives align with the learning needs and competency levels of the learner at early, intermediate, or late stages of learning but also that simulation experiences are carefully graded to an appropriate level of complexity and competency so that it presents a learning opportunity in which the learner possesses the necessary prerequisite knowledge or skill but is sufficiently challenged to perform just beyond current competency level, thus supporting new learning.

Based on the models reviewed above, Figure 7 provides an overview of the manner in which simulation design might be aligned with different stages of competency development. As students move from novice, through intermediate and finally towards proficient competency levels, simulation experiences should progress from simple, controlled practice situations in which the student is required to demonstrate knowledge and perform basic competencies towards increasingly complex and varied practice situations in which higher-level competencies involved in professional decision-making and reasoning are required. Furthermore, the sequence of graded simulation experiences should be planned in such a way that it offers students repeated opportunities for practice in continuous learning cycles as they progress through the education programme, to engage in simulation experience that are relevant and appropriate to their current competency level and to gradually acquire specific competencies at increasingly higher levels as they progress through the study programme. For example, in the first year of study when students have limited exposure to theoretical learning and no prior clinical experience, simulation-based learning focuses on preparing students for first fieldwork practice or placement. Here, the emphasis is on providing opportunities to demonstrate and apply newly-acquired knowledge or perform basic skills involved in the occupational therapy process (e.g., introducing oneself to a client, establishing a therapeutic rela-

tionship with the client, organizing and conducting an interview). In later stages of study, when students have gained practical experience in clinical placement, simulation experiences are focused on more advanced competencies in clinical reasoning and skill performance and include more complex scenarios. The SIMBA *Guidelines for the implementation of simulation-based learning in occupational therapy education* offer a clear and detailed framework for the design and delivery of simulation experiences that take into account the graded, repetitive and scaffolded nature of SBL in accordance with learning needs, curriculum objectives and competency levels.

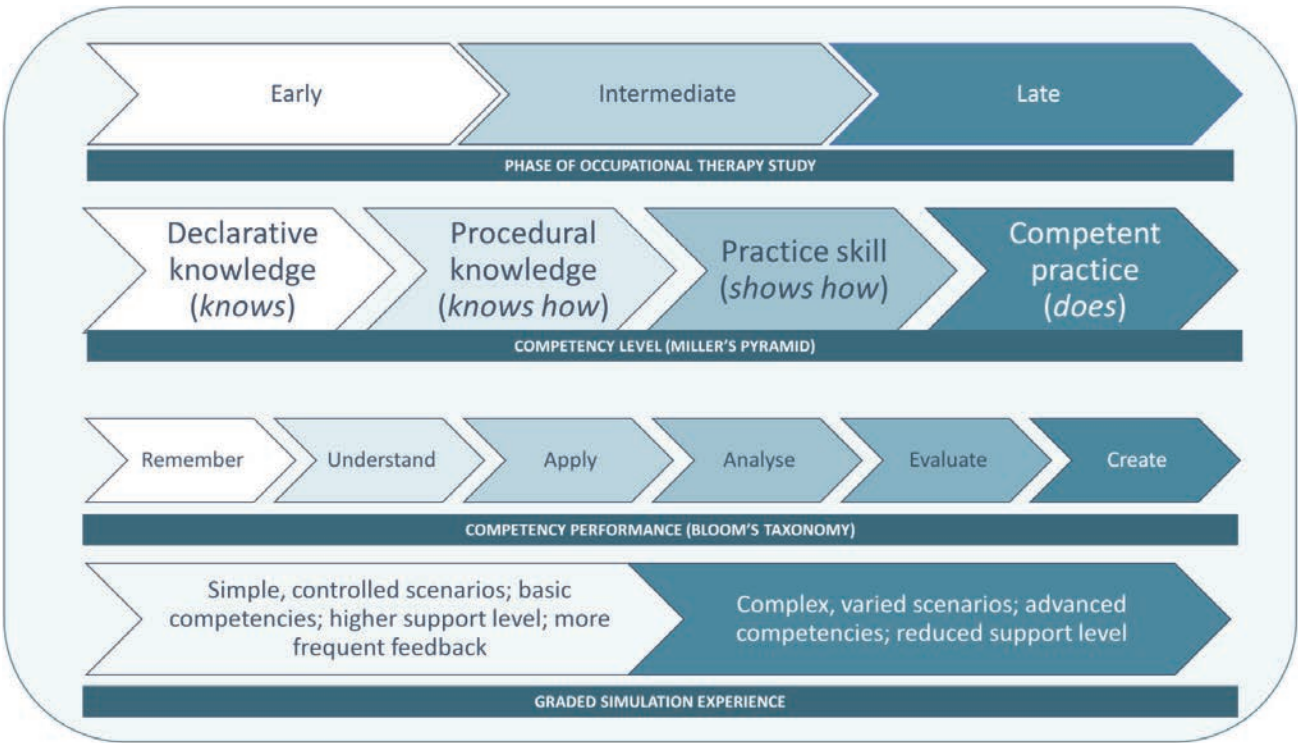

Figure 7: Alignment of simulation with stages of occupational therapy competency development

Conclusion

This Framework presents a comprehensive synthesis of the essential professional competencies (knowledge, skills, and attitudes) of a novice occupational therapy practitioner. It also presents an analysis of the professional competency domains most suitable for the application of simulation methodology in occupational therapy education, as supported by current evidence, practice knowledge and educational experience. Finally, it considers the manner in which the development of these professional competencies is conceptualized in existing models of learning and skill acquisition and identifies several key principles of this process consistent across models. Together with the SIMBA *Guidelines for the implementation of SBL in OT education*, we hope that this Framework will serve as a resource during the design and delivery of simulation-based learning in occupational therapy education aimed at the acquisition and mastery of professional competencies. Furthermore, we hope that it offers a platform from which to construct simulation experiences that allow for graduated, repeated, and graded learning opportunities throughout the course of the development of occupational therapy competencies for practice.

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PART TWO:
GUIDELINES FOR THE IMPLEMENTATION OF SIMULATION-BASED LEARNING IN OCCUPATIONAL THERAPY EDUCATION

**Laurence Magerat, Ivana Klepo,
Andreja Bartolac & Claire Sangster Jokić**

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Introduction

1. Purpose of the Guidelines

These Guidelines are the result of work conducted within the Erasmus+ funded Simulation-based learning in occupational therapy (SIMBA) project (2022-1-BE02-KA220-HED-000088974), which aims to develop and integrate simulation-based learning and assessment methods in the occupational therapy programs of five partner institutions in Belgium, Austria, Finland, Turkey, and Croatia. In occupational therapy, simulation-based learning is a pedagogical approach that recreates realistic practice situations, allowing learners to enhance their knowledge, skills, and attitudes through guided simulations. The purpose of the Guidelines, as one of the first main outcomes of this project, is to provide a practical overview of theoretical, empirical, methodological, and contextual knowledge about the application of a simulation paradigm to the acquisition and assessment of professional competencies in occupational therapy education. It presents a framework for informing the conception, development, implementation, and evaluation of ***simulation-based learning (SBL) in undergraduate occupational therapy educational programmes***, hereinafter referred to in these Guidelines as **SimOT**.

The Guidelines have been used in the SIMBA project as a foundational resource for informing other activities and outcomes, including the development of simulation scenarios, an assessment tool, and a teacher manual for implementation of SBL across all levels of OT education in the partner programmes. Figure 1 presents an overview of the process through which the Guidelines were constructed in parallel to the development of the *SIMBA Framework of occupational therapy competencies for simulation-based learning,* an adjunct document that supports these Guidelines in the design and delivery of SBL in OT education.

Construction of the Guidelines was based on a structured narrative review of the literature examining SBL in occupational therapy (OT) education and a post-hoc comparative analysis of literature review results with key papers examining SBL in other allied health professions. Further consultation and validation of the Guidelines was carried out within two focus group studies, in which input and perspectives of stakeholders (OT educators, practitioners, and students) from the five partner countries on the project and international experts in SBL in occupational therapy education were collected, analysed, and applied to Guidelines development. Finally, these Guidelines were additionally informed by general literature in simulation, occupational therapy, and OT education. In the long term, it is hoped that these Guidelines will serve as a valuable and practical resource for supporting and guiding the development and implementation of SBL methodologies in the wider context of OT education programmes across Europe.

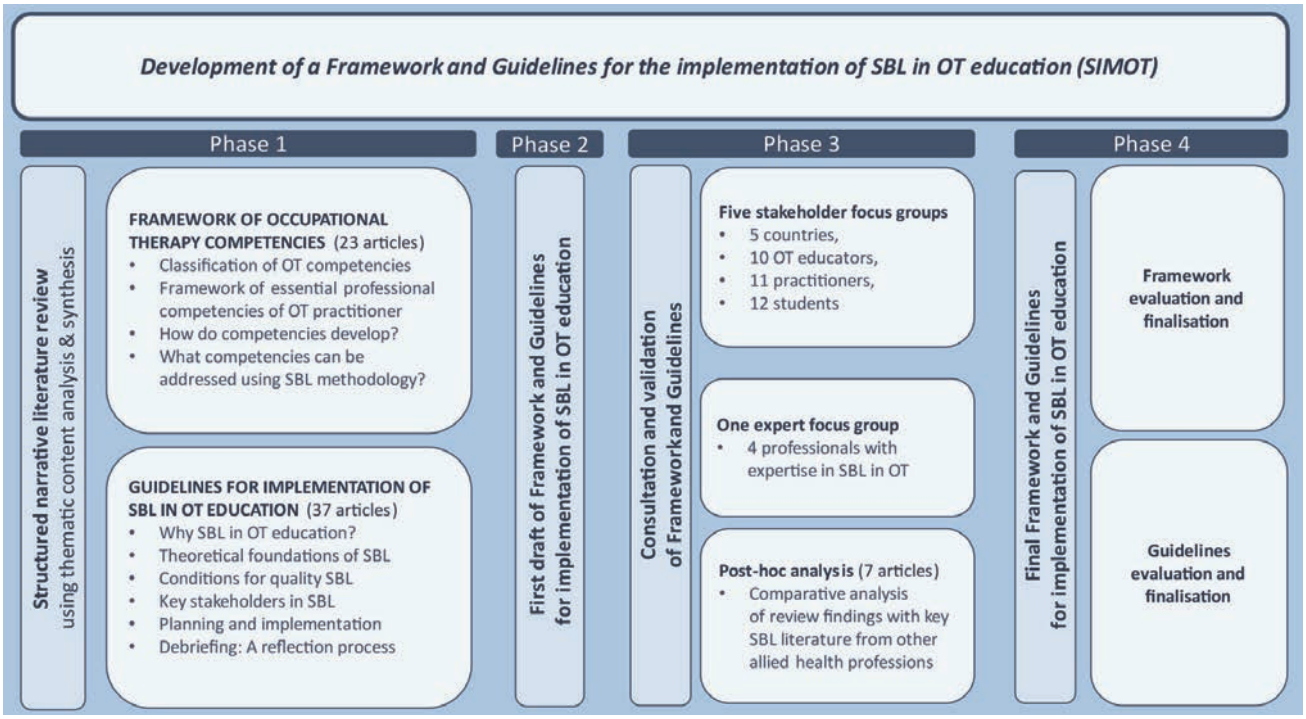


Figure 1: Construction of the SIMBA Framework and Guidelines

2. The importance of SIMBA

In our globally connected world, the present knowledge explosion requires a paradigm shift in student learning. Fostering self-direction, creativity, communication skills and critical thinking is necessary to navigate this complex, changing landscape. However, research indicates that occupational therapist graduates do not feel well prepared for the transition to professional practice, especially with regard to soft skills, clinical reasoning skills and the implementation (application) of evidence-based practice.(1)

A primary aim of any occupational therapy education programme is to enable students to acquire the professional competencies necessary to fulfil the role of qualified occupational therapy practitioner. The development of occupational therapy competencies involves the acquisition, integration, and application of diverse range of knowledge, skills and attitudes involved in professional practice. (2) According to Miller's (3) pyramid of competency development, classroom-based teaching and learning methods in educational programmes permit the acquisition and assessment of a learner's theoretical and practical knowledge (Miller levels 'knows' and 'knows how'), while fieldwork and practice experiences expect learners to perform competencies in actual practice situations (Miller level 'does), often without having had prior opportunities to integrate and apply this knowledge in a more controlled and supportive learning environment (Miller's level 'shows how'). Arguably, such educational practice gives rise to an inherent gap between knowledge acquisition and skill performance.(4)

Simulation-based learning (SBL) is an educational approach where students put their theoretical knowledge into practice in a replicated real-life environment.

SBL enables the integration of knowledge from theoretical learning situations with practical skills by creating an experiential learning situation in an authentic environment.(5–7) Here, students are required to perform tasks and interact with 'clients' in a similar manner as they would in real-world practice and adapt performance in accordance to changing situational demands, while also benefiting from the support, guidance, and feedback of the simulation instructor.(6) In this way, engaging in realistic and practical situations in a safe, authentic simulation-based learning (SBL) environment provides students the opportunity to develop and demonstrate professional competencies at Miller's 'shows how' level. As such, SBL is thought to act as a 'bridge' between classroom and worksite learning (4) and has been argued to enable better preparation for fieldwork and first contact with clients than is the case in more traditional theoretical teaching alone. This notion is reflected in the following quote from a SIMBA focus group participant:

I think theory is always a foundation. If you have to make a pyramid...you need theory. Otherwise, you are in darkness. And I think you can concretise and strengthen your theory by simulating it. With that backpack, you can leave for the field ...

More specifically, simulation experiences allow for the provision of more practical and engaging learning activities in a meaningful environment while at the same time offering appropriate support to ensure that the simulation environment is a 'safe' one in which there is no risk to clients and where students can make mistakes, receive feedback and correct errors as they develop competencies and prepare for fieldwork under controlled conditions. (5,7–10) In the words of two other stakeholder focus group participants:

I'm also thinking very much about the hands-on techniques or hands-on therapies, i.e. positions and mobilizations. That you've actually tried them out before...it's something completely different when you actually do it. And then you have at least tried it once in a safe space.

And what I would also like to mention is learning from mistakes. I think you learn quite well when you do something wrong. <In practice> you're not allowed to do that...then I have a problem if I've done it wrong. But to put it quite banally, if something goes wrong <in simulation>, if I've simply made a mistake somewhere and reflect on it. I think you learn a lot from that.

Methods and principles inherent in the SBL paradigm, such as structured opportunities to observe and practice specific tasks and skills with peers; guided inquiry, experimentation, and self-reflection; active and immersed learner engagement; scaffolded learning experiences; and the application of diverse learning opportunities through various modalities make it a more engaging, active, and inclusive teaching and learning methodology. Such inclusive and authentic methodologies have numerous potential impacts and outcomes, as identified in theoretical literature and demonstrated in existing empirical evidence examining the real and potential outcomes of SimOT. Figure 2 presents an overview of these outcomes, as identified in the theoretical and empirical literature included in the literature review examining the real and potential outcomes of SimOT.

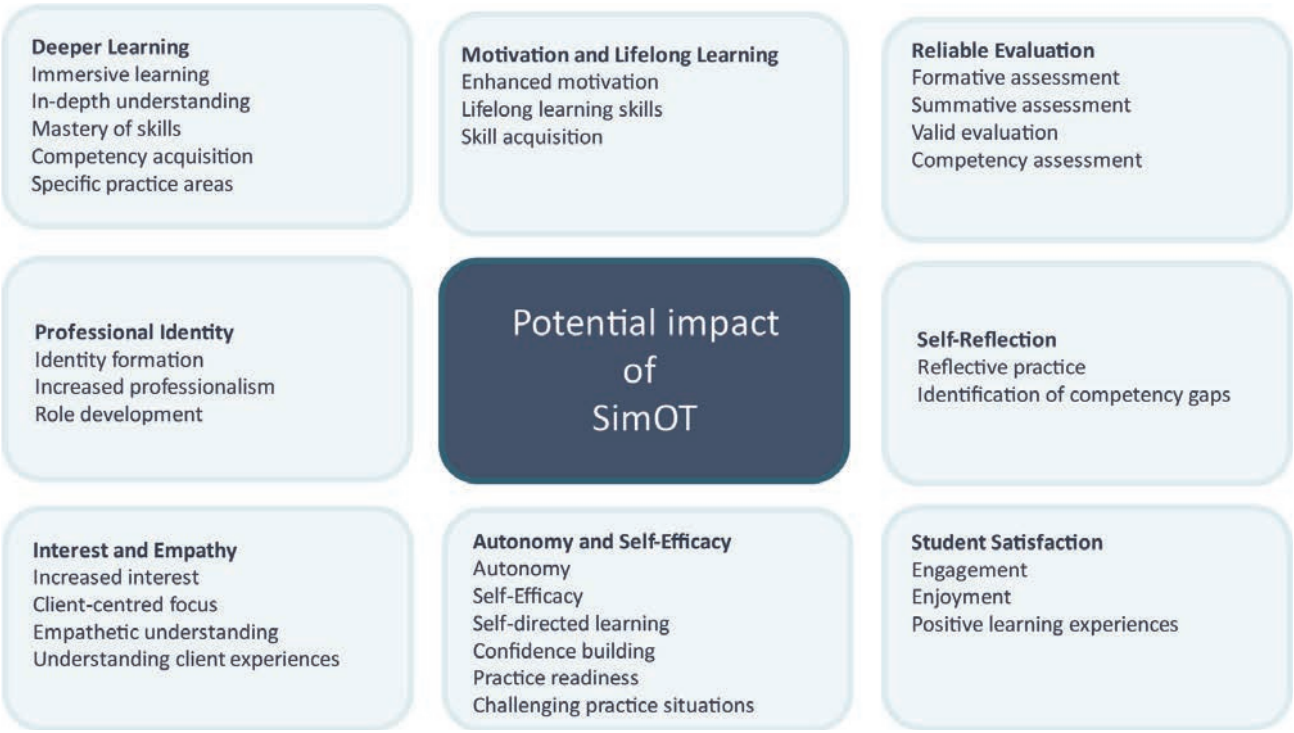


Figure 2: Impact and outcomes of simulation-based learning in OT education (5–33)

While SBL is commonly used by professional education programmes in other health professions such as medicine and nursing, the use of SBL in occupational therapy (OT) education is only emerging and, until recently, only limited evidence for SBL design and delivery within OT education has been available.(5,6,34) While simulation experiences in other health profession programmes have predominantly tended to focus on performance of technical and medical skills and procedures, SBL in OT education or SimOT must be able to provide learning opportunities specific to the profession and its' central focus on occupation and person-centred care, holistic interventions and the interpersonal dynamic between the therapist and client. Furthermore, while there is emerging evidence to suggest that SBL has a

strong potential to contribute to numerous positive outcomes in OT education and promote development in numerous competency domains, there is still a need for ongoing investigation regarding the long-term utility and impact of SBL compared to other methods and other specific questions relevant to design and delivery of SBL in OT education.(5,6,9)

Addressing these issues requires a clear set of recommendations and strategies for enabling systematic, innovative and evidence informed SBL design and implementation in OT educational programmes. As such, a primary aim of SIMBA was to develop an evidence-based framework grounded in current practical, empirical, and theoretical knowledge for the development and implementation of SBL in OT education (SimOT) to support acquisition and assessment of professional competencies in an authentic, supportive, and safe simulated learning context. In doing so, implementation of simulation can bridge the gap between theoretical understanding and practical application. The key components of this project are reflected in the SIMBA logo, where Miller's pyramid is housed under a ladder that represents simulation-based learning, which serves to 'bridge the gap' in the pyramid between acquisition of knowledge through classroom-based teaching (Miller levels 'knows' and 'knows how') and competent professional practice (Miller level 'does') by offering a safe and immersive learning environment in which to acquire and master performance based-competencies for practice (Miller level 'shows how'). This process is conducted within the context of occupational therapy education and practice and is therefore shaped by the foundational philosophies, paradigms, and theories of contemporary OT practice. By implementing authentic SBL elements into existing programme curricula, SIMBA aims to contribute to the active participation and increased motivation of students in the learning process, improved professional competencies, increased confidence and skills for lifelong learning, and better preparation for the transition into professional practice.(6,10,12–14,23–26,31–33) In the long term, it is believed that these outcomes will contribute to an increase in the quality, safety, and effectiveness of OT service delivery through the promotion of professional competency development using authentic, inclusive, and innovative methodologies. 6,19,20,23) In the words of participants in stakeholder focus groups:

But above all, I believe that many of us would go into practice with more courage and more self-confidence. Obviously this has already changed in recent years, but it was always the case that the fear of the internships increased again, in the direction of "I don't dare", "I'm afraid that I can't think of anything." And that you can then simply go into practice with more self-confidence.

What is simulation-based learning?

3. Defining simulation-based learning

A review of the existing literature examining SBL in OT education (SimOT) reveals varying definitions and terminology to discuss the application of simulation and simulation-based learning in occupational therapy education. For the purposes of clarity and consistency, these Guidelines apply terminology defined in the Healthcare Simulation Dictionary. (35) Here, **simulation** is defined as:

„A technique that creates a situation or environment to allow persons to experience a representation of a real event for the purpose of practice, learning, evaluation, testing, or to gain understanding of systems or human actions" (p. 46).

This definition of simulation is complemented by further descriptive reference to a definition from the International Nursing Association for Clinical Simulation and Learning Simulation (36):

„A pedagogy using one or more typologies to promote, improve, or validate a participant's progression from novice to expert" (p. 46).

To define a **simulated-based learning (SBL) or simulation experience**, the Healthcare Simulation Dictionary (35) refers to a definition derived by Pilcher and colleagues (37):

"An array of structured activities that represent actual or potential situations in education and practice. These activities allow participants to develop or enhance their knowledge, skills, and attitudes, or to analyse and respond to realistic situations in a simulated environment" (p. 45).

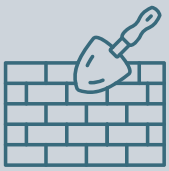
Implementation of a simulation experience in practice is typically carried out using a **simulation scenario**, defined in the Healthcare Simulation Dictionary (35) according to Alinier (38) as follows:

"A description of a simulation that includes the goals, objectives, debriefing points, narrative description of the clinical simulation, staff requirements, simulation room set up, simulators, props, simulator operation, and instructions for standardized patients." (p. 41).

In essence, in the context of occupational therapy education, simulation-based learning might be defined as a pedagogical approach in which simulation is applied as a key pedagogical methodology, where simulation refers to a teaching, learning and assessment methodology that recreates a clinical or professional experience (entirely or in part) in which a learner gains experience in performing one or more professional competencies under varying levels of support or guidance. It may apply a variety of modalities and methods, ranging from virtual and computer-systems that reproduce practice situations, simulated or standardized patients, role play and case study, whereby competencies applied in fulfilling a professional role with clients are practiced and acquired. In these Guidelines, all references to SBL or the simulation experience apply these definitions to understand and describe the simulation paradigm. While the term simulated patient is most commonly used in the simulation literature to refer to an individual trained to portray an actual patient and simulate a set of symptoms or problems in a simulation scenario, the term simulated *client* will be used in these Guidelines when referring to individuals engaged in simulation experiences in this manner so as to align with terminology most commonly used in occupational therapy practice.

4. Theoretical foundations informing SimOT

Simulation and SBL as an educational methodology is based on a rich theoretical foundation that adopts and applies constructs, models, ideas and principles from disciplines examining learning from diverse perspectives, including behaviourist, constructivist and cognitive paradigms. (39,40) While a detailed examination of various theoretical approaches and models that have been applied in simulation design and delivery is beyond the scope of these Guidelines, a thorough understanding of learning theories helps the simulation designer understand how, when, and where learning occurs and is therefore imperative when embarking on the development of a simulation experience. Based on the results of an analysis and synthesis of literature examining SBL in occupational therapy and other health professions (described above), the theories below form the basis for simulation design decisions and ensure that simulation experiences align with learning objectives and outcomes, where specific methods, techniques and principles are based on theoretical foundations (Figure 3).



Throughout the guidelines, instances in which a particular theoretical principle or model can be applied to inform aspect(s) of simulation design or delivery are signposted with this icon and a short list of relevant theories or principles. While not intended to be exhaustive lists of theories informing simulation design, they offer suggestions to the interested reader for where to find further information about the theoretical underpinnings of simulation-based learning.

Foundational theories informing SimOT

Experiential learning theory, proposed by David Kolb (41), emphasizes the importance of learning through students' direct personal experiences in the learning process, which aligns with the occupational therapy profession's focus on occupation-based learning. According to Kolb's model, learning involves a continuous cycle of four stages: concrete experience (doing), reflective observation (observing), abstract conceptualization (thinking), and active experimentation (planning). Through this process, learners engage in dynamic, integrated, spiral elements, repeatedly capturing and transforming experiences (42), aligning theory with real-world applications and preparing students for diverse occupational practice challenges.

Bandura's social cognitive theory (43) represents another important conceptual foundation of the simulation paradigm in which the main premise is that learning occurs in a social context through the dynamic interaction of cognitive, behavioural and environmental factors.

The concept of *self-efficacy* (44) is one of the main components of Bandura's social cognitive theory, where self-efficacy relates to personal belief in one's capabilities to perform required actions. Learners' level of motivation and learning is determined by their perception of self-efficacy. Improving self-confidence and self-efficacy is one of the desirable learning outcomes of the simulation experience.(42) An opportunity to repeatedly practice skills, engage in reflection and receive feedback in a safe, low-risk environment contributes to the development of competence, confidence, and self-efficacy (8) by engaging cognitive (thinking and self-reflection), behavioural (performing the simulation) and environmental (simulation context) elements.

Observational learning (43) is another important component of social cognitive theory where learning and adopting behaviour occurs by observing others and by modelling. Through collaboration and engagement in small groups or pairs during the simulation experience, students benefit from

learning through both participation and observation.(8) Observational learning requires attention, retention, motor reproduction and motivation.(42)

Andragogy: Self- directed learning

Adult Learning Theory (45) is based on the assumption that adults have a desire and intrinsic motivation to learn and control their learning. It is a theory that belongs to andragogy, the concept that deals with the methodology of teaching adults whose learning differs from the way children learn. Simulation-based experiences can serve as a model for promoting self-directed and self-regulated learning and taking an active role in the learning process while also ensuring that experiences are tailored and that learning opportunities remain timely, relevant, goal and task-oriented.(16) Adults learn from their experience, which is a resource for upgrading their future knowledge, and as such their learning is task-oriented and problem-oriented.(40)

Theories and taxonomies of learning and competency-based education

Vygotsky's zone of proximal development (ZPD) (46) is a concept that emphasizes the social context of learning in which the learner progresses gradually with the help of a teacher or a more experienced peer. ZPD is defined as 'the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more knowledgeable other' (p. 86).(46) The *scaffolding* technique arose from the ZPD concept and can be applied to simulation design in order to enhance learning through a step-by-step process (47) in a safe and collaborative environment.

Alongside the previously mentioned Miller (3) pyramid, **Bloom's taxonomy** (48) is a useful framework that provides a structure for determining learning outcomes and describing the progression of competency-based learning during a simulation experience. The taxonomy classifies three domains of learning: cognitive (knowledge), psychomotor (skills) and affective (attitudes). The revised taxonomy contains 6 hierarchy levels, where learning progresses from lower level (remember, understand) to higher-level objectives (apply, analyse, evaluate, and create).

One form of competency-based education is **mastery learning** in which the time frame for the acquisition of predetermined skills and knowledge is not limited, and each learner learns at his own pace.(39) Mastery learning should contain standardized outcomes of education using validated tools.(49,50) Together with mastery learning, simulation- based education involves **deliberate practice**, which refers to repetitive rehearsal aimed to develop skills and knowledge.(49–51)

Figure 3: Theoretical models, concepts and principles informing simulation-based learning in occupational therapy (5–17,19–29,31–33,42,47,49–67)

In addition to providing the general conceptual foundations from which the simulation paradigm arose, these learning theories have given rise to numerous concepts and principles that inform the manner in which we understand, promote and evaluate learning, including constructs such as problem-based and goal-oriented learning, the manner in which form and frequency of practice shapes learning, the role of feedback in learning, and the transfer and generalization of learning (Figure 3). Together, these theories and concepts are used to justify simulation as a method to promote learning and to inform numerous decisions made in simulation design. In this way, the methods, techniques, processes, and strategies used throughout the simulation process are grounded in a theoretical understanding of learning from diverse perspectives and ensure that a given SBL experience will reach given learning objectives and outcomes.

5. Simulation-based learning in occupational therapy

While the basic definitions of simulation and simulation-based learning (SBL) are universal and can be applied to the design and delivery of SBL in occupational therapy, unique to simulation-based learning in occupational therapy education (SimOT) is its roots in the specific paradigms and principles of occupational therapy practice. In line with the World Federation of Occupational Therapists' (WFOT) definition of occupational therapy (68), SimOT is based on a person-centred approach emphasizing the therapeutic use of occupations to promote health and well-being. Moreover, SimOT emphasises the holistic nature of the occupational therapy profession, where treatment is

not only focused on the needs of individuals, groups, and populations, but also takes into account the context and activities that individuals and/or communities want, need or are expected to do in their environment to better support occupational engagement. This notion is reflected in the following quotes from SimOT experts who participated in a SIMBA focus group:

> ***...It's about what they call human factors in simulation...that's perhaps a difference to some other health professionals.***

> ***...because OT is conversation-based, and about observation as well and about how the person interacts with the environment and the occupation...in simulation, it's actually bringing all of those elements together...***

The Person-Environment-Occupation (PEO) model (69) - which emphasizes occupational performance as shaped by the interaction between person, environment, and occupation - provides a framework that closely aligns with the occupational therapy approach within simulation-based learning and therefore provides a useful means for considering the alignment of SimOT with fundamental occupational principles. In the SimOT approach (Figure 4), the PEO-model serves as the foundational perspective for considering simulation in OT education.

Consistent with the PEO-model (69), the SimOT approach consists of individual, contextual and occupational components in a dynamic interaction and emphasizes performance and engagement in a simulation experience as the result of this interaction. As such, it is informed by this and other existing theories, concepts, and paradigms of the OT profession.

- **Context-based Simulation Practice (CBSP)** immerses students in authentic, safe learning environments that mirror the diverse and complex practice contexts faced by occupational therapists. Simulations include micro, meso, and macro contexts and refer to the environmental and personal factors that can affect an individual's participation in occupations. This includes the physical, social, cultural, personal, temporal, and virtual aspects of the environment in which the individual engages in activities. CBSP promotes an understanding of the impact of context on identity, health, well-being, and engagement in daily activities for individuals, groups and populations and the role of context in informing and shaping simulation-based learning outcomes and objectives.(70)

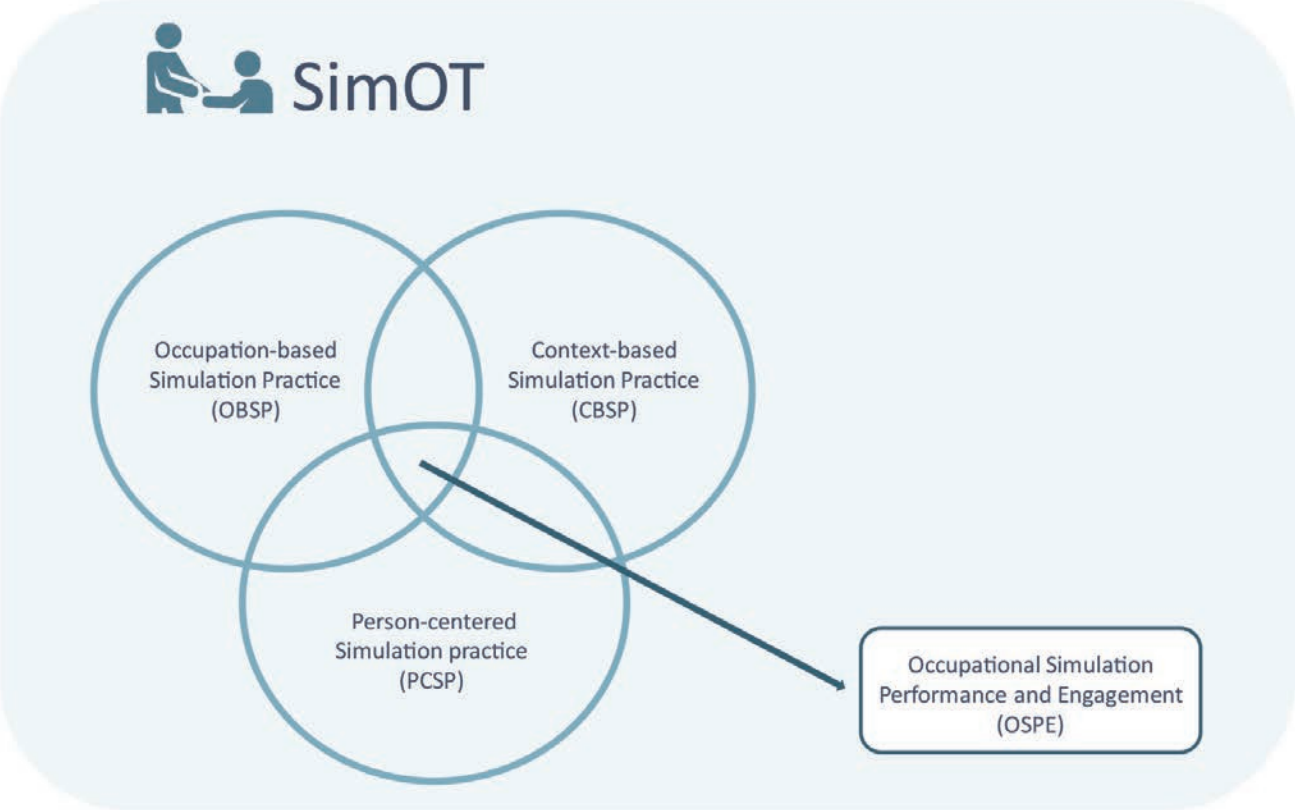


Figure 4: The SimOT approach (Simulation-based education in Occupational Therapy education) informed by the PEO-model (69)

- **Occupation-based Simulation Practice (OBSP)** is a purposeful, safe, and real-life simulated learning approach dedicated to equipping students with necessary competencies for fulfillment of the professional OT role. As such, it embraces occupational therapy's core values of promoting occupational performance and engagement by enabling people to participate in meaningful activities of everyday life and recognizing self-care, productivity and leisure as essential dimensions of human activity and equips students with the knowledge, skills and attitudes needed to understand and facilitate meaningful and purposeful engagement in activities and occupations of daily living.(71–73)
- **Person-centered Simulation Practice (PCSP)** immerses students in safe, real-life, learner-centered simulations that embrace a humane and holistic approach of occupational therapy practice and education. It recognizes individuals, groups and populations as dynamic entities with unique needs, preferences, values, and life-experiences that shape daily occupations. Grounded in person-centered care, it emphasizes collaboration, empowerment, and respect during the learning process and in performance of the OT role, fostering students' awareness of social positions. PCSP equips learners to navigate diverse therapeutic contexts, promoting health, well-being, equity, and justice. (68,70,74,75)

- **Occupational Simulation Performance and Engagement (OSPE)** refers to the integrated and active demonstration of occupational therapy knowledge, skills, and attitudes within the context of safe, real-life simulation scenarios, guiding students towards a more integrated understanding of the dynamic interaction between individual factors, environmental influences, and the nature of the occupation itself.

The SimOT approach is a key component that informs the design and delivery of simulation-based learning in occupational therapy education by ensuring that this process is grounded in an occupational therapy paradigm and supports Occupational simulation performance and engagement. As such, it is an integral element of the OT SIMBA-Frame, a comprehensive model developed for the purposes of these Guidelines to inform and guide this process. The OT SIMBA-Frame is described in full in the following section.

OT SIMBA-Frame: Planning, design, and implementation of SBL in OT

The OT SIMBA-Frame (Figure 5) is a framework intended to visually portray the numerous inter-connected elements involved in planning, design, and implementation of simulation-based learning in occupational therapy education (SimOT).

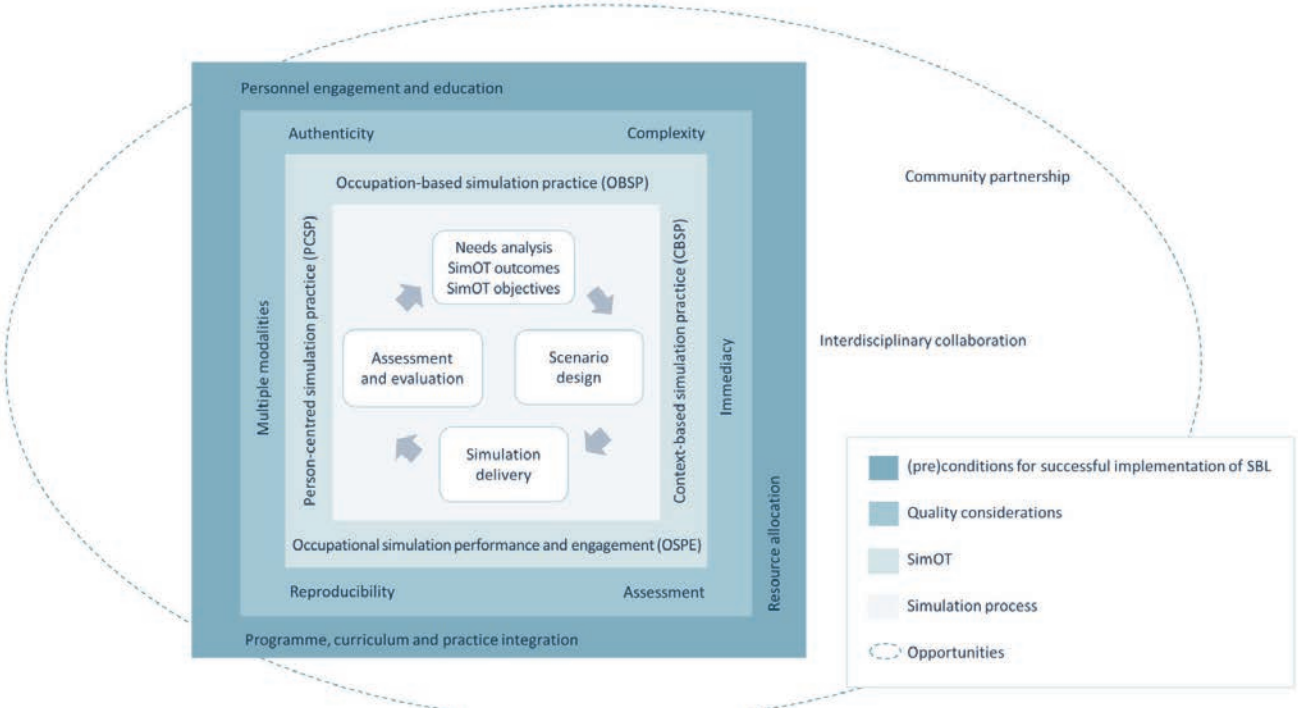


Figure 5: The OT SIMBA-Frame

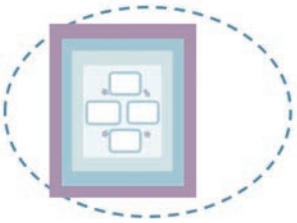
Here, the process of simulation design and delivery is housed within multiple 'frames' that represent relevant theoretical, empirical, and practical knowledge in simulation and occupational therapy education. First, this process is grounded in the occupational simulation performance and engagement (OSPE) process described above and is therefore informed by the person-centred, occupation-based, and context-based perspectives of the occupational therapy paradigm. Second, a number of key quality principles are considered throughout the simulation process. Third, this process is informed by various considerations related to securing the necessary preconditions for successful and sustainable implementation and quality in SimOT. Finally, behind the entire framework lies a number of more far-reaching opportunities associated with the application of SimOT, including the potential for forging new community partnerships, advancing interprofessional collaboration and integrating innovative technologies in occupational therapy education.

Within these nested frames, the simulation process includes four components that unfold in a sequential and iterative manner:

- needs analysis and identification of learning outcomes and objectives,
- scenario design,
- simulation delivery,
- assessment and evaluation.

Each element of the OT SIMBA-Frame is described in detail in the following sections.

6. Preconditions



The decision to develop and implement SimOT in an educational programme should be informed by a careful weighing of the potential impact and outcomes against requisite costs and resources. When doing so, several key elements should be considered as critical (pre)conditions for the successful implementation of a high-quality SBL programme that ensures student engagement and achievement of target objectives. (5,8–10,19,22) These elements can be summarized within three domains, as presented in Figure 6.

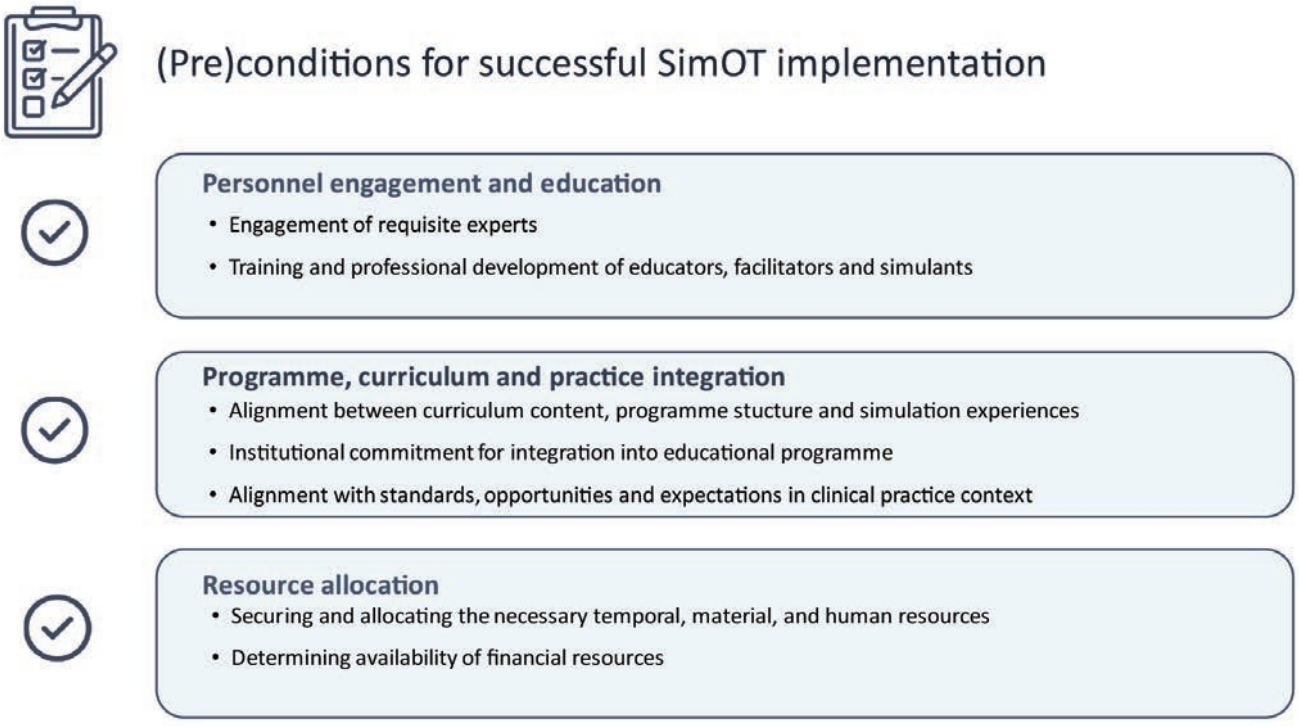


Figure 6: Preconditions for successful implementation of SimOT

6.1. Personnel engagement and education

Ensuring engagement and adequate training of relevant personnel in the design, development, implementation, and evaluation of SimOT is an imperative prerequisite. In the first instance, the engagement of experts with relevant knowledge, skills, and experience is critical in developing simulation scenarios; training simulated clients and other educators involved in implementing the simulation; addressing organizational, administrative, and technical tasks during implementation; and monitoring and evaluating SBL outcomes.(5,7–10,17,18,22,29,31,32,50,67) This includes the engagement of:

- **simulation-based learning experts** that specialize in the design, development, and implementation of realistic and immersive scenarios that replicate authentic occupational therapy settings and practice. (7,10,17,50)
- **occupational therapy education and programme compliance experts** with expertise in occupational therapy curriculum development (including target competencies and/or learning outcomes) and ethical and accessibility standards in education. These experts ensure the alignment of SimOT with the objectives, needs and standards of the educational programme and curriculum and the development of safe, inclusive and supportive learning environments for all SimOT participants.(7,11–13,20,23,24,31,50,61,67)
- **content and subject-matter experts** with in-depth knowledge and/or expertise in specific areas of OT practice and occupational experience. This includes OT practitioners with relevant practice experience and expertise as well as persons with lived experience relevant to OT practice (e.g., persons with a disability) that bring real-world insight into simulation design. These experts contribute to preparing authentic scenarios that involve clients from different population groups and practice areas and target a wide range of assessments and interventions.(22,67)
- **technology experts** who can offer specialized support in preparation and application of audio, video, virtual reality (VR), augmented reality (AR), and other simulation technologies.(17,19,22,25,30,63)
- **educational researchers** in the field of SimOT with expertise in evaluating the impact of simulation-based learning on student outcome, refining simulation designs for optimal educational outcomes and contributing to evidence-based practices.(50,55)

The inclusion of these expert groups ensures successful planning and implementation of SimOT and strengthens the learning experience for stu-

dents through expert-informed facilitation, task demonstration and feedback provision. Another key role of experts is ensuring adequate *education*, training and support for all other personnel involved in the SimOT implementation, including other OT educators and practice mentors as well as students and simulated/actual clients involved in the SBL experiences. (17,18,50,55,65) This includes familiarization with the nature and aim of the simulation experience; instruction and training in the implementation of all elements of SBL including (self)assessment protocols and methods and techniques for providing feedback and facilitating discussion following the simulation experience; providing a clear outline of expectations; and training of (simulated) clients. Prior to and throughout implementation of the simulation experience, educators and simulation facilitators must be provided with thorough training and support to:

- gain knowledge and understanding of the overall aim, context and principles of the SBL paradigm;
- become familiar with the simulation scenarios, cases, methods and materials to be used;
- acquire and refine skills in applying simulation methods, materials, and technology for learning and assessment purposes, embed and integrate simulation experiences into existing course content, and support active engagement of students in the simulation environment.

Careful planning and implementation of education and training activities prior to simulation is critical to ensure adequate qualification and preparedness of those delivering, facilitating, monitoring, and evaluating simulation experiences and should ideally include a combination of methods to ensure adequate preparation for the application of SBL methods and scenarios. This can include:

- direct instruction in small group workshops,
- a teaching manual,
- guidelines and checklist for student observation and evaluation during simulation,
- audio-visual and digital resources (e.g., video case studies, supplementary materials).

6.2. Programme, curriculum, and practice integration

To successfully implement SimOT into an educational programme, the simulation experiences must be able to readily integrate into the *programme curriculum* or course content across all levels.(5,7–11,18,29,31,32,65) To do so, the simulation experience must have clearly stated learning objectives and outcome measures that align with the learning outcomes/objectives and evaluation methods that already exist within the academic programme.

Furthermore, the time, resources and personnel needed to implement SBL experiences must be visible and formally designated within the *educational programme plan* at the institutional level to ensure that implementation is integrated and feasible within the capacities of faculty workloads, schedules, and resource allocations.(5,8) Persons responsible for the actual implementation of simulation experiences should be included in the initial planning and design stages to most effectively determine where simulation experiences might be integrated into the programme, whether learning objectives are in tune with the existing curriculum, and the feasibility of assessment protocols as well as to enable a deeper understanding and readiness to implement simulation in practice.

Finally, simulation experiences should offer learning opportunities in simulated scenarios that reflect actual *OT practice* and the opportunities and competencies expected of an occupational therapist in the context in which it is being implemented. (5,10) Engaging OT practitioners and fieldwork mentors in the design and delivery of simulation scenarios and applying existing national and international frameworks of professional occupational therapy competencies are important measures in ensuring that a simulation experience will allow for the acquisition of competencies relevant for future practice in a specific context. The *SIMBA Framework of occupational therapy competencies for simulation-based learning* offers a useful resource to align SimOT learning objectives with existing occupational therapy competency standards.

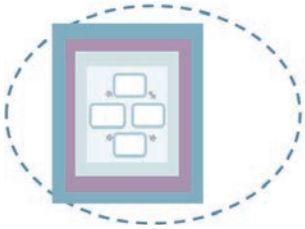
6.3. Resource allocation

Inherent in ensuring effective programme integration and securing sufficiently knowledgeable and trained personnel is the allocation of numerous resources considered essential for planning and implementing SimOT into an academic programme. Firstly, *time* is a key resource for planning, developing, coordinating, scheduling, and implementing SBL into a programme and must be considered when making the decision to embark on such an endeavour. This requires a commitment at both individual and institutional levels to devote the required time to all phases of the simulation process,

both within the workloads of educators involved in simulation development and delivery and within the programme schedule.

Similarly, numerous *physical, material and personnel* resources are required to create and conduct high-quality and authentic simulation experiences, ranging from appropriate spaces, equipment, devices, and software necessary for constructing the simulation environment to logistical and technical support from qualified staff persons.(5,7,8,10–12,17–19,22,26,27,29–33,64) Precise allocation of personnel hours and curriculum content to simulation experiences within the programme plan and appropriate supervision, facilitation, and evaluation by educators and/or clinical practice mentors is also an important consideration when ensuring adequate resources are available. Another important resource are the individuals involved in scenarios as simulated/actual clients, who might be engaged as volunteers or university employees under contract and reimbursed for their services. The acquisition of all resources (as well as resource maintenance and ongoing personnel reimbursement) requires financial commitment from the organizing institution, which also must be carefully considered in advance of SimOT implementation to ensure the feasibility and sustainability of the programme.

7. Quality considerations



The preconditions for successful SimOT implementation described above are critical for ensuring that the simulation experience will meet target learning objectives while also being feasible and sustainable. Furthermore, careful consideration and integration of the frameworks, principles and preconditions described in these Guidelines during all phases of the simulation process will directly contribute to the quality of the SimOT approach. In the first instance, high-quality simulation is that which is grounded in sound *theories and frameworks* of learning and skill acquisition (described in Section 4 of the Guidelines) and readily integrated with existing elements of the *curriculum* (and practice education in particular). Moreover, quality simulation uses clear and precise *learning objectives* and *authentic, complex simulation experiences*. The numerous principles and methods for achieving high quality simulation are discussed in detail in Section 9.1. As mentioned previously, simulation programmes should be developed and implemented with input from individuals with relevant *expertise* and ensure provision of adequate *training and support* for all SBL stakeholders.(10,15,17,26,27,30,32,63) Finally, an important quality assurance measure is the inclusion of a *formal evaluation* of the simulation experience with all stakeholders.(8,14,18) This evaluation process is discussed further in Section 9.4.

A more detailed consideration of quality in simulation design is offered by Rodger and colleagues (76), who identified six key criteria for assessing quality of simulation in their examination of the potential of SBL in occupational therapy education (Figure 7).

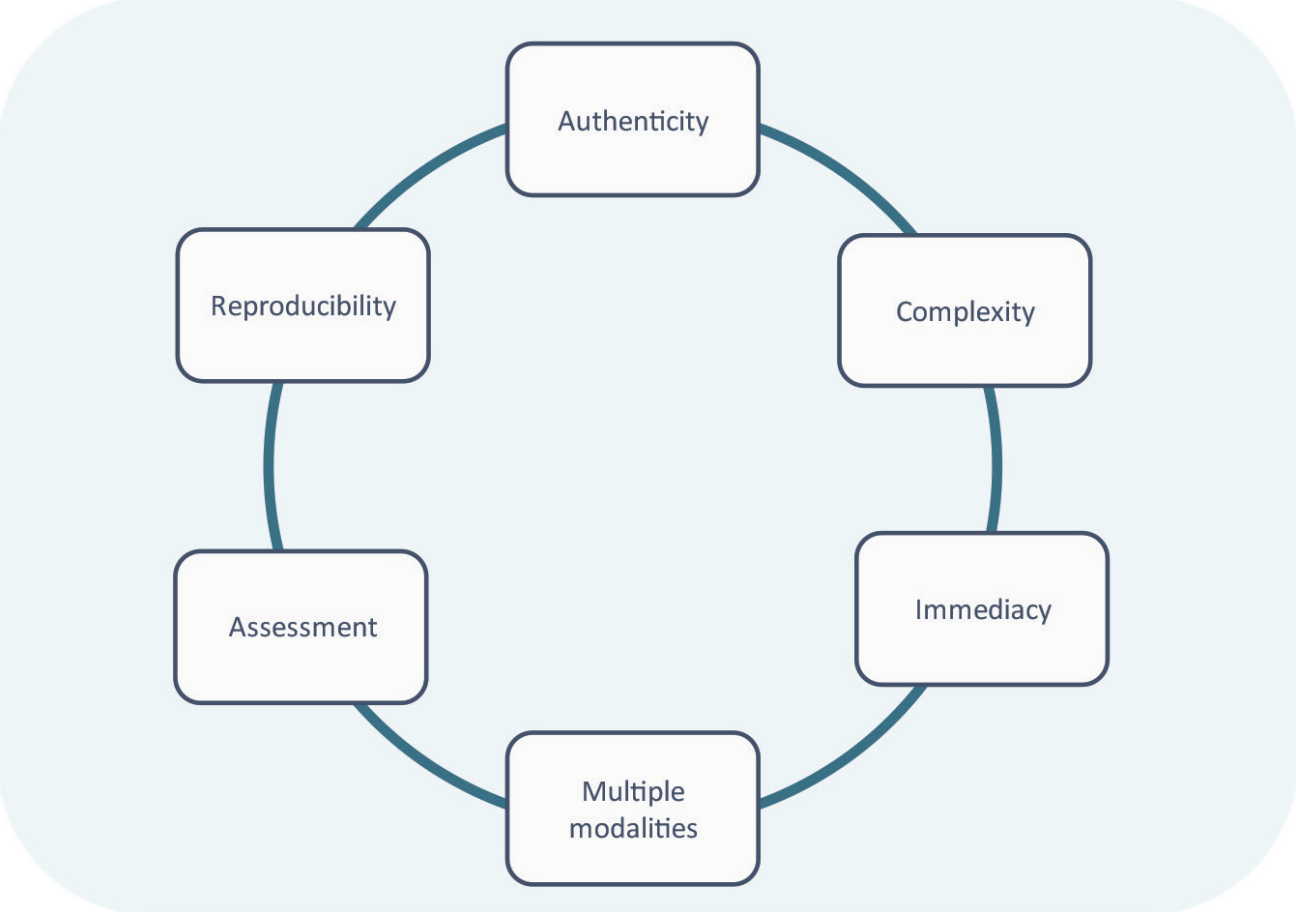


Figure 7: Criteria for achieving quality in simulation-based learning (Adapted from: Rodger et al., 2010).

Firstly, simulation experiences should offer a sufficient level of *complexity* that allows for modification to meet the specific objectives and elements of a given course or curriculum and for the grading of simulation experiences over time.(5,6,10,17,29,61,63) Such complexity and modifiability ensures that specific simulation experiences can be implemented in a way that requires active student engagement and interaction (i.e., provides a 'just right challenge' that prompts students to practice skills and apply knowledge slightly beyond their current competency level) and allows for the scaffolded progression of simulation expectations over the course of an educational programme.

Furthermore, high-quality simulation design should offer *immediacy* to actual practice, or be readily linked to anticipated or actual experiences and performance expectations in real-world practice situations. In addition, the simulation should employ *mixed modalities* to ensure a rich and authentic learning experience.(5,7,8,12,15,17,22,27,33,64) Fourthly, simulation expe-

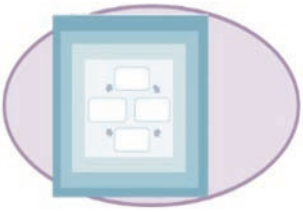
riences should include a detailed protocol for the *assessment* of student performance according to clearly defined criteria and/or learning objectives. To ensure that the implementation of SBL will be sustainable over time, simulation design must also consider *reproducibility*, in which high-quality simulation experiences are those that can be readily integrated into the curriculum and that contain reproducible, accessible, and standardized learning experiences.(5,7,8,10,17,18,31)

Finally, high quality simulation experiences must reach sufficient *authenticity* for occupational therapy practice. In simulation, authenticity can be defined as the feeling of 'realness' achieved within the simulation and is a measure of the degree to which the learner experiences reality (or the perception of a real-world practice situation) as they participate in the simulation. Achieving authenticity in simulation design is considered a key indicator of quality because it ensures several key objectives inherent in this paradigm. Namely, it allows for the:

- elicitation of realistic responses from the learner,
- 'risk-free' practice of target skills and development of competencies relevant for practice,
- development of specific attitudes such as empathy,
- emergence of a professional identity.

Authenticity in simulation design is discussed further in section 9.2. of the Guidelines.

8. Opportunities



The previous sections have examined the three components that scaffold the design and delivery of SimOT within the OT SIMBA-Frame. These 'frames' integrate numerous professional, contextual, theoretical, and empirical principles, knowledge and requisites for effective, occupation-centred, and high-quality simulation in OT education (SimOT). They represent essential and integral considerations that inform the processes, methods, and decisions involved in the simulation process, from initial conceptualization and design, planning, and implementation through to evaluation.

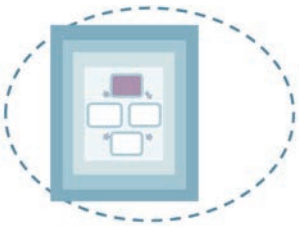
Figure 8: Opportunities in SimOT

At a wider contextual level, the potential of SimOT can be considered from the perspective of more far-reaching opportunities related to continuous development and advancement of educational programmes in occupational therapy. Specifically, SimOT might be considered as a platform from which to consider and engage in opportunities and achieve programme aims related to partnership and collaboration within educational institutions, across various disciplines and within the larger community as well as the advancement of the programme through the integration of novel and innovative technologies in the teaching and learning process (Figure 8). By informing simulation design, such opportunities ensure real-life relevance, increase authenticity in simulation, and promote active participation of numerous stakeholders in the simulation process. As such, they represent the wider potential of SimOT to promote development of professional and inter-professional competencies, but also to advance the quality of an educational programme and its partnership with the wider community for improving the quality and relevance of occupational therapy. By embracing opportunities for innovative technology integration, community partnerships, and interdisciplinary collaboration in the development and delivery of SimOT, occupational therapy educators can create a more comprehensive and enriching simulation-based learning environment.

9. The simulation process

The process of simulation design, delivery and evaluation takes place within the three previously described frames of the OT SIMBA-Frame. In other words, the simulation process is informed by and inseparable from these factors throughout four distinct phases. Each phase is discussed in detail in the following sections.

9.1. SimOT learning outcomes and learning objectives



The first step in the design and delivery of a simulation experience involves the development of learning outcomes and objectives grounded within the conceptual underpinnings of SimOT. Specifically, **SimOT learning outcomes and objectives** conform to the theoretical paradigm of occupational therapy and are therefore person-centred, occupation-based and context-oriented. Identification of clearly stated and operationally defined outcomes and objectives is completed on the basis of a **needs analysis** (47,50,60) that considers input from numerous stakeholders and is aligned with evidence-based occupational therapy practice (Figure 9).

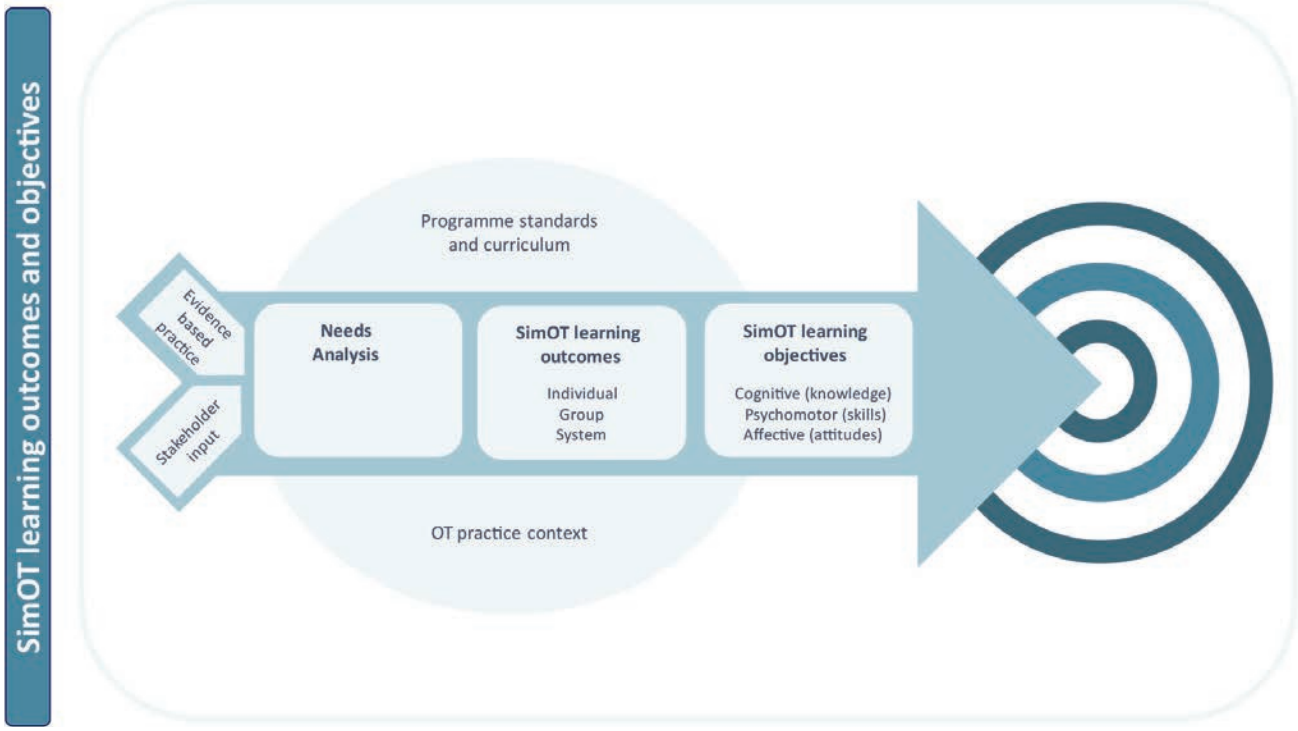
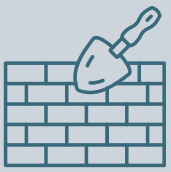


Figure 9: Developing occupation-based simulation learning outcomes and objectives

Specifically, SimOT learning outcomes and objectives should be informed by the specific needs and aims of the **programme standards and curriculum** in which the simulation will be implemented.(47,50,60) They should also conform to nationally accepted standardized occupational therapy practice protocols and frameworks. This requires careful consideration of existing curriculum content and learning outcomes; expertise, learning levels and learning needs of target participants (educators and students); and local, national, and international standards and requirements for educational and professional accreditation. Furthermore, outcomes and objectives should be developed in line with the needs of contemporary, evidence-based **occupational therapy practice** in the local context (i.e., they should be in line

with the occupation-focused competencies and outcomes required of an occupational therapy practitioner in real-world practice and the occupational needs of service users in the context in which the programme is being delivered).(5,10,31,63,67)

In addition to the specific aims and needs identified through needs analysis, the development of learning outcomes and objectives can be supported by existing theoretical models and frameworks of learning, skill acquisition and competency development:



Foundations for SimOT learning outcomes and objectives

- ***The S.M.A.R.T framework***
- ***Zone of proximal development (Vygotsky & Cole, 1981)***
- ***Bloom's taxonomy (Anderson & Krathwohl, 2001)***
- ***Miller's pyramid (Miller, 1990)***

Using needs analysis and theoretical frameworks as a starting point, the identification of SimOT **learning outcomes** involves the definition of the broader target outcomes of SimOT. Outcomes can be defined with respect to simulation participants – learner (student) and end user (client) – and at a systems level. For the learner, outcomes will most often be framed in terms of the acquisition of general and specific professional competencies (knowledge, skills, and attitudes) but might also refer to other outcomes such as increased self-confidence in one's own professional competence or greater satisfaction with the learning experience. For the end user, a potential outcome might be promoting excellence in OT service delivery or increasing safety or quality in client care. Systems-level SimOT outcomes identify potential long-term outcomes at a broader level, such as improvements to cost-effectiveness of OT service delivery and better health outcomes.

SimOT **learning objectives** reflect the operationalization of desired outcomes through the precise statement of the specific competencies the learner is expected to acquire through participation in the simulation experience (5,7,10,12,17,61), where competency refers to a combination of acquired knowledge (cognitive), applied skill (psychomotor) and attitudes (affective). Development of competency-based outcomes and objectives should be informed by existing frameworks that define and describe professional competencies in OT education. The *SIMBA Framework of occupational therapy competencies for simulation-based learning* offers a useful resource in this regard.

Needs-based and theory-informed development of learning outcomes and objectives ensures that several important conditions are met, which are described further in the following paragraphs.

SimOT learning outcomes and objectives:

- **Are readily integrated into an existing programme and across all programme levels.**

Ensuring that SimOT outcomes and objectives align with the needs and objectives of the curriculum and educational programme enables integration of the simulation into the programme.(5,7–9,11,18,29,31,32,65)

- **Are meaningful, practice-oriented, and occupation-focused.**

Aligning objectives with existing frameworks and standards of professional competencies and the roles of OT practitioners in real-world practice will ensure that learning outcomes and objectives are *meaningful and relevant* at a larger systems level and firmly grounded in the occupational paradigm that is at the centre of the profession. (10,29,31,63,67)

- **Reflect specific, measurable, and concise statements of expected outcomes.**

Formulating SimOT outcomes and objectives using existing goal-setting frameworks such as S.M.A.R.T. will ensure that they are *clearly and concisely* formulated, *specific a*nd m*easurable.*(7,8,12,17,32)

- **Are attuned with student learning levels and needs**

Because the experience of students at differing stages of OT education varies, learning outcomes and objectives must be attuned to *learner level, knowledge, skills, and experience*. In the first instance, the *prerequisite knowledge and skills* necessary to actively engage in the simulation experience should be clearly defined.

Careful planning for how students will acquire this knowledge and thus be adequately prepared for the simulation experience is also important, where placement of the simulation experience must align with *a-priori* opportunities for the acquisition of the requisite knowledge and skill through formal instruction (presentations, lectures) or other methods (e.g., practical demonstrations, use of digital media and video case studies, independent reading and research, role-playing, observation, reflection and feedback).

In addition to knowledge and skill related to specific occupational therapy competencies, it is important to ensure that students have sufficient experience, competence, and access for engaging with the various pedagogical methods and media used in the simulation experience. This is especially important when applying digital, online, or virtual methodologies. (7,9,10,12,13,17,61)

- **Can be graded over time to offer challenging but achievable learning experiences**

Expected performance and target learning outcomes and objectives should be *graded over time* to increase complexity, where the learning cycle can evolve in a dynamic, upwards, spiral manner. The aim of grading is to support individualized learning by offering small adaptive challenges and integrating feedback mechanisms that promote skill progression with each simulation experience.(5,8,11,14,17–19,30,32) This can be achieved by matching simulation experiences with appropriate points in the curriculum in a way that accounts for the progression of competency development. Identification of clear, measurable, and appropriate learning outcomes can be supported using frameworks and models such as Miller's model (3) Bloom's taxonomy. (48) The *SIMBA Framework of occupational therapy competencies for simulation-based learning* further discusses the means through which competency-based learning objectives can be graded to reflect gradual acquisition of knowledge and skill.

Scaffolding, a related concept, emphasises a variety of instructional techniques used to move students progressively towards better understanding and, ultimately, greater independence in their learning process. (17,47,51) Scaffolded simulation experiences that are graded according to level of complexity, amount of support, and target competency or learning objective might be offered to students across numerous time points to engage students in a learning environment appropriate to their present skill level and integrate progressively challenging simulations throughout the educational programme. Arguably, exposing students to simulation earlier and in a gradual fashion is useful in offering a more diversified experience and supports a more equitable and inclusive learning experience. (5,8,10,11,17,19,28,29,61)

The relevance of graded practice with scaffolded support in supporting the learning process is reflected in the following quote from an occupational therapy student who participated in the stakeholder focus groups:

> ***Then, I think simulation is important precisely because it allows you to build in complexity gradually.... Because you can practice at your own level, you can practice with each other, you can practice with a teacher, you can practice with VR ... there are so many possibilities to kind of break down that complexity into manageable pieces and then at the top, create a complex situation. You can really start at the basics.***

- **Consider issues of equity, inclusivity, and diversity**

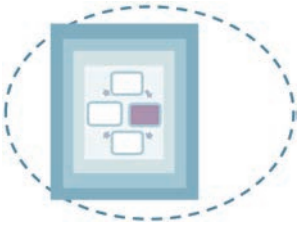
SimOT outcomes and objectives should enable sufficient flexibility for accommodating diverse learning needs and levels. When determining target outcomes, it is important to recognize that students with differing competency levels will approach the simulation experience with differing learning needs and goals and that outcomes of this experience are therefore unique and not always limited only to those formally identified in the simulation process.

As such, while clear and concise definition of learning outcomes and objectives is universally recognized as an important prerequisite for successful simulation, it is equally important to recognize diverse learning needs and readiness levels and to allow for a certain degree of flexibility in the development of appropriate learning outcomes and objectives as a means for achieving inclusive, supportive, and accessible simulation experiences. This notion is reflected in the quotes from SimOT experts presented below. A more detailed consideration of inclusivity in simulation design is discussed in the following section.

A simulation experience has...lots of different learning outcomes that might come out. And it might be different for different students in the same simulation... (who) may actually be focusing on different types of learning.

There is a bit of a risk saying 'here is the learning outcome that the simulation is designed for'. I recognize that you have to have that, but there is a risk in actually locking it down a little bit too far. And perhaps not enabling students and staff to recognize that for some individuals this learning will go in a very slightly different direction and this is what happens in practice and...that's fine.

9.2. Scenario design



Scenario design in the OT SIMBA-Frame (Figure 5) is a purposeful and systematically structured process aimed at creating authentic, contextually relevant simulated situations reflecting the challenges encountered in occupational therapy practice. It leans on and is guided by the initial step in the simulation process focused on articulating needs, outcomes, and objectives of the simulation experience in a specific context (see Section 9.1. of the Guidelines). The overarching goal is to immerse students in experiences mirroring authentic occupational therapy

(OT) situations. This approach aims to refine clinical skills, foster critical thinking, and enhance effective problem-solving within a controlled and supportive learning environment.

The 5-step process of scenario design in the OT SIMBA-Frame was systematically shaped by the extensive review of the literature and input from focus group studies (see Figure 1) and also adhere with the INACSL Standard for Simulation Design as outlined by Watts and colleagues (66).

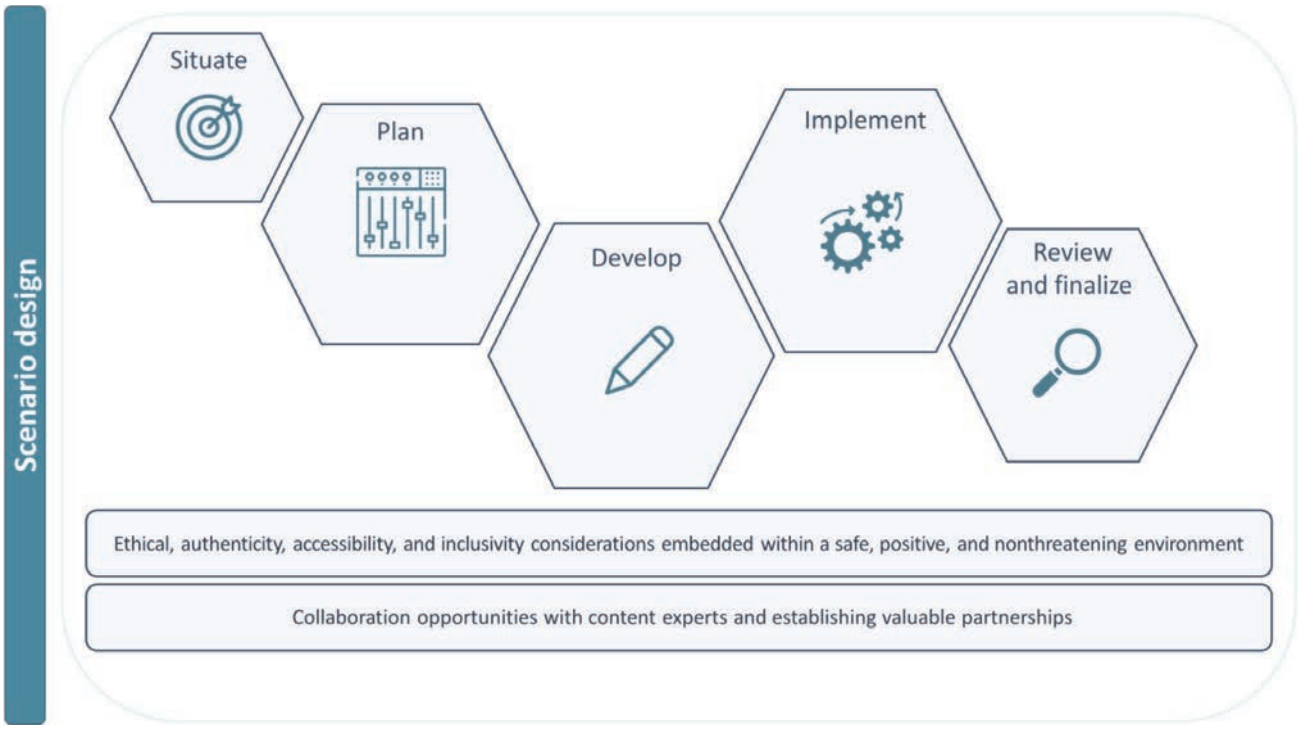


Figure 10: Blueprint for effective scenario design

Figure 10 serves as a guide for developing simulated OT scenarios aligned with specific educational objectives and informed by best practices from the behavioral, cognitive, and constructivist learning theories and principles introduced in Section 4:

Foundations for scenario design

- ***Kolb's experiential learning theory (Kolb, 1984)***
- ***Bandura's social cognitive theory (Bandura, 1986)***
- ***Knowles adult learning theory (Knowles, 1984)***
- ***Competency based education***

The systematic, but flexible approach to OT scenario design is grounded in five basic steps: Situate, Plan, Develop, Implement, and Review & finalize. Additionally, two critical elements span and shape the entire process:

1. *Ethical and safety considerations, authenticity, accessibility, inclusivity* (5–10,14,16–18,20,22–27,32,42,49,51,60,64,67,77)
   - In SimOT, it is essential to respect the *ethical* and *safety standards* of both educational and practice contexts, which form the basis for responsible and safe learning practices. Integrating *authenticity* into scenarios enhances the learning process, allowing students to bridge the theory-practice gap in a safe and realistic simulated learning context and develop essential occupational therapy skills. A *supportive environment* promotes student growth, improving the overall educational experience in SimOT. Additionally, a commitment to *accessibility* and *inclusivity* ensures that scenarios meet the diverse needs of students. By prioritizing accessibility, scenarios meet a variety of needs, promoting equal opportunities for all students throughout their learning journey. Inclusivity promotes a learning environment that embraces the inherent diversity of student backgrounds, experiences, and perspectives in occupational therapy education.
2. *Collaboration with content and subject-matter experts and partners* (10,31,50,63,66,67)
   - By collaborating with content and subject-matter experts and partners, SimOT integrates authentic perspectives from occupational therapy (OT) practice into simulation scenarios. This collaboration not only bridges academic and professional OT expertise, but also increases the relevance and effectiveness of scenario-based learning in SimOT. Moreover, partnerships can help integrate and apply recent trends and developments so that students are well prepared for the complex and evolving landscape of OT practice.

Moreover, these considerations and the five basic steps of OT scenario design should be contemplated within the overarching OT SIMBA-Frame (Figure 5), which provides a holistic perspective on the development and implementation of the SimOT process.

9.2.1. Situate

The 'Situate' step delineates the starting point for the creation of a simulated OT learning experience. Informed by the SimOT learning outcomes and objectives identified in the first phase of the simulation process, situating the simulation experience requires consideration of who, what and where questions to clearly delineate the person, task, and environment features of the simulation experience.

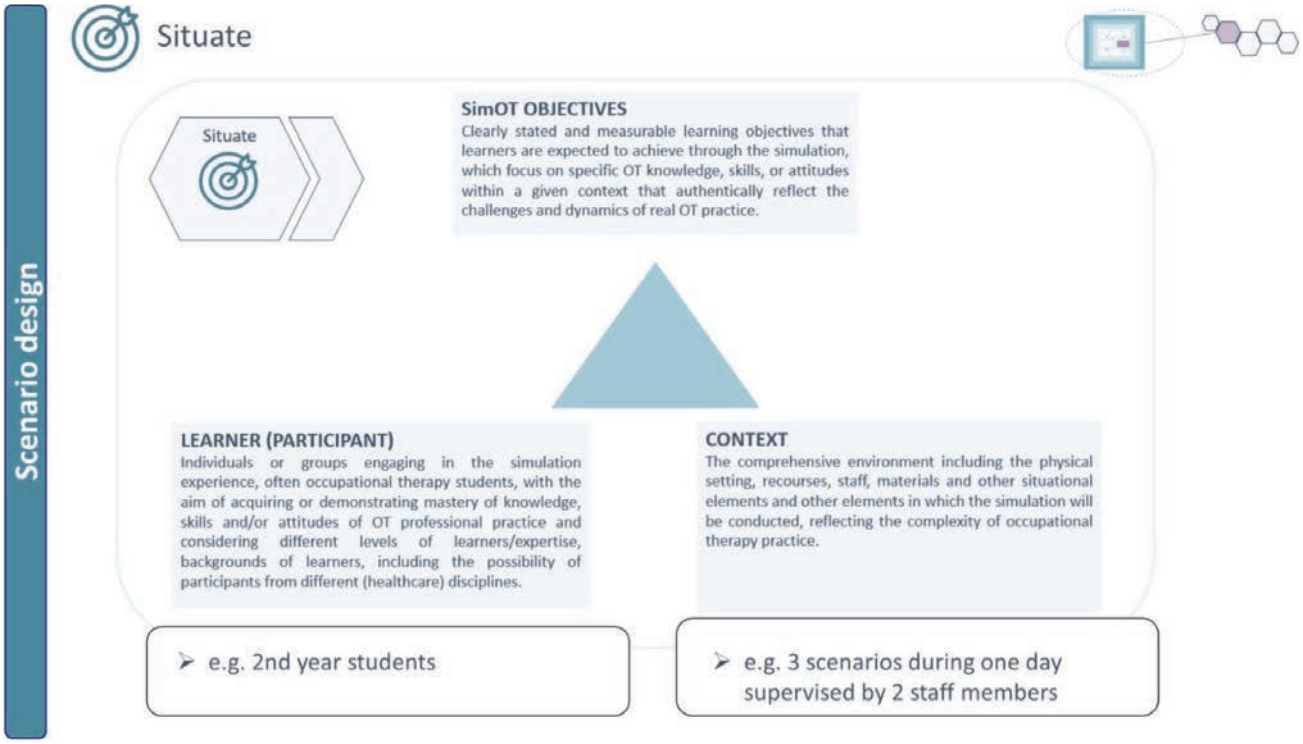


Figure 11: The 'Situate' step in scenario design

These elements are depicted in Figure 11 and are used to delineate an initial blueprint of the simulation experience. Specifically, the design of the simulation experience focuses on the learner (individuals or groups), with the aim of acquiring and demonstrating mastery of professional competencies. Clearly defined and measurable learning objectives focus on purposive and meaningful OT knowledge, skills, or attitudes, while the carefully designed context, which includes the physical environment and situational elements, lays the foundation for an immersive simulation experience.

9.2.2. Plan

The 'Plan' step in scenario design involves detailed planning and decision-making regarding critical aspects of the simulation experience. This step is pivotal to ensuring seamless alignment with other steps in scenario design, as well as adherence to educational learning objectives, the learner's proficiency level, and integration of the simulation experience into the overall educational programme. The ultimate goal is to deliver a safe, meaningful, and authentic learning experience. The key activities involved in the 'Plan' step are listed in Figure 12, followed by a detailed description of each step.

Determining the simulated OT practice situation

To fully immerse OT students in realistic scenarios reflective of the diverse and complex challenges encountered by occupational therapists, it

is imperative to ensure precision in defining and depicting a simulated OT practice situation. The simulated practice situation involves immersive scenarios in OT education, aligning with diverse cases, populations, and settings for purposeful learning experiences in SimOT.(10) The specific elements within the scenario, such as the practice setting or the specific stage of the client's medical or treatment trajectory, must closely align with the stated learning/curriculum objectives and the students' learning level.(5,7–11,17,18,29,31,32,47,50,60,64,77) Moreover, the delineation of the simulated OT practice situation should adhere with the SimOT approach (Figure 4) presented in Section 5 of these Guidelines, and align with personal, occupational and contextual elements of simulated OT practice. The delineation of the simulated OT practice situation should encompass physical, mental and social client factors, where clients might be individuals, groups and populations. Specific attention to client needs, preferences, values, and daily experiences, along with contextual elements, contributes significantly to the authenticity and educational value of the simulation. To elevate authenticity and augment the learning impact, collaboration with other stakeholders including OT practitioners, experts, and/or client groups is imperative.

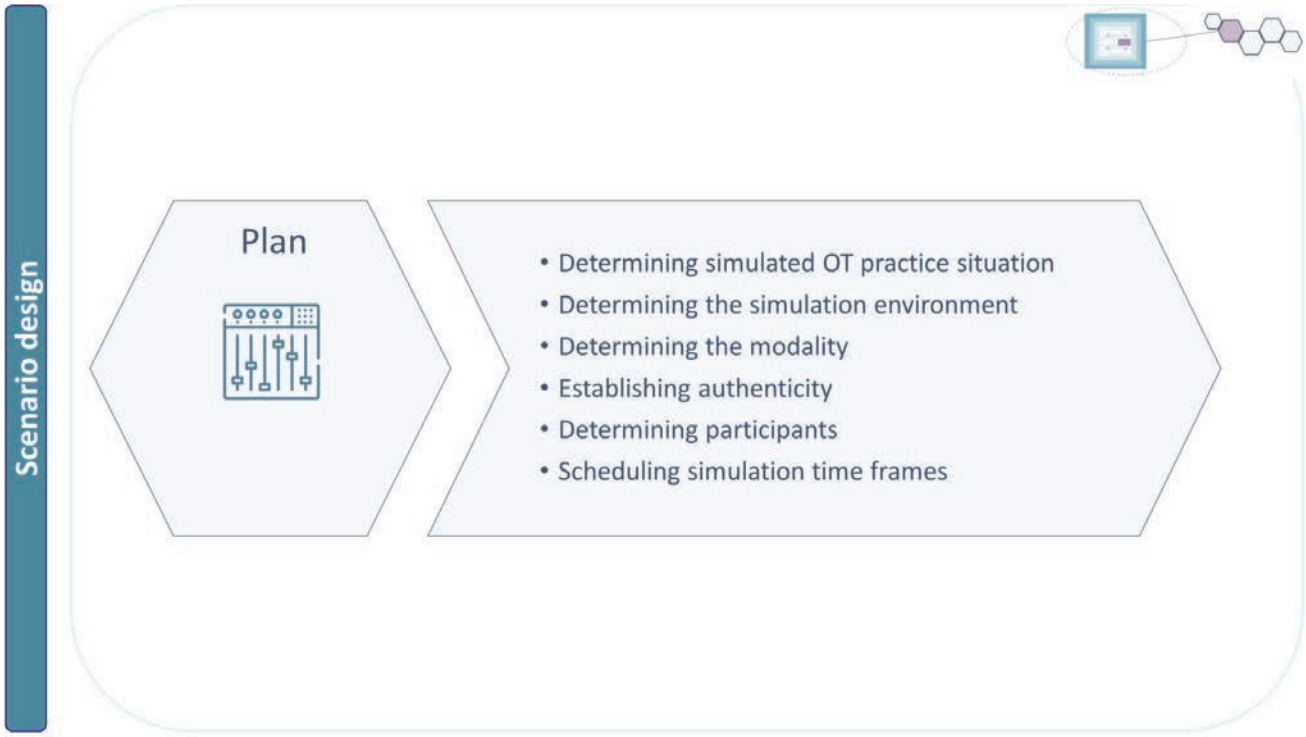


Figure 12: The 'Plan' step in scenario design

When defining the simulated OT practice situation, consideration of the following aspects is essential:

- *Scenario types*: Clearly define the types of scenarios and the elements of practice that the scenario involves. For example, will the focus be on history taking, client assessment, home intervention, er-

gonomic advice, interprofessional collaboration, ...? Delineation of the scenario type is informed by the identified learning objectives and ensures targeted and effective learning experiences.(5–9,11–17,19–25,28–33,53,61,63,64,67)

- *OT cases and populations:* Simulated OT practice situations should explore diverse client cases and populations, reflecting the multifaceted nature of OT practice across micro-, meso-, and macro-levels. For example, a simulated OT practice situation might be oriented towards developing competencies for working with clients with complex conditions, persons of older age or children/youth, or clients with mental, social and/or physical health issues.(7,10,12,17,20–25,28,29,31–33,62–64)
- *OT Settings:* Simulation-based learning in OT education can provide opportunities for simulated OT practice in diverse settings, such as clinical environments (acute care hospital rooms, clinical treatment rooms, emergency care, intensive care, hospital wards), community settings, home environments, outpatient settings, pediatric rehabilitation, physical rehabilitation, psychiatric rehabilitation, emergency rooms, school-based settings, and vocational rehabilitation/testing centres. Clear delineation of the practice setting in a simulation experience is shaped by the SimOT learning outcomes and objectives. (5,7,9,10,12,13,15,17,20–22,24,25,30–32,62,63,65,67)

Determining the simulation environment

To ensure an effective simulation-based learning experience, the physical setting should represent an authentic, safe, environment, with careful consideration given to ethical, accessibility, and inclusivity aspects. The physical setting should enable learners to be active participants in an environment that closely mirrors the reality of an OT practice situation.

The simulation experience can unfold in various settings, such as *on-campus*, in a *digital (home) environment*, or through *In Situ Simulation (ISS)* conducted in the actual OT practice setting.(5,7,10,14,19–22,25,27,30,50,58,64,65) Authenticity extends beyond spatial layout to encompass availability of equipment, materials and objects and the overall ambiance shaped by human, psychological, sociocultural, and temporal factors, all of which contribute to a heightened real-life immersive experience. These elements are discussed further in the upcoming section on achieving authenticity in simulation design.

While the prevailing literature often emphasizes a controlled, reproducible environment for simulation-based learning in OT education (5), there is also recognition of participatory simulation design involving both learners and teachers.(20) This distinction is illustrated in Figure 13.

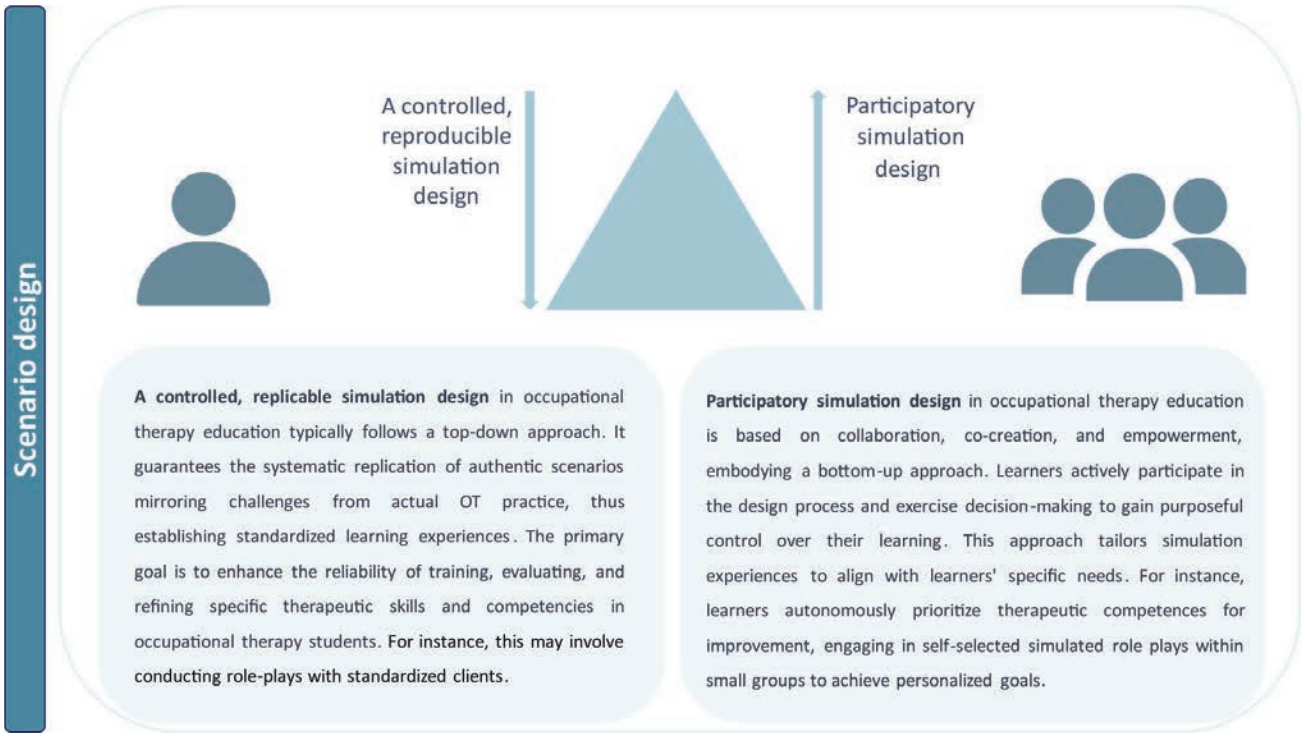


Figure 13: Controlled, reproducible environment and participatory simulation design

Simulation activities are frequently organized into *learning stations*, where students, either individually, in pairs, or small groups, sequentially navigate through different stations. These dynamic simulation activities are interconnected to collectively form a comprehensive simulation experience aligned with predetermined learning objectives and the students' skill learner levels.(18,20,21,23,32,33,64,67) Figure 14 offers a representation of possible learning station topics.

Determining modality

After clearly defining learning objectives and needs, a crucial aspect in planning simulation is the selection of an appropriate modality (or modalities). Incorporating multiple or mixed simulation modalities within a single activity enhances the overall experience by making it richer and more realistic and in turn, increasing participant engagement. This approach aligns with principles of *blended learning and hybrid learning.* (10,16,17,51,66,77)

A diverse **range of modalities** have been employed in occupational therapy education and can be considered when designing the simulation experi-

ence. Table 1 details the description, key features, applications, and evaluations for each modality in SimOT.

Figure 14: Representation of possible learning station topics

While *disability simulation (impairment simulation)* is not included in Table 1, it is a role-play method frequently employed in occupational therapy training. In disability simulation, participants engage in activities like manoeuvring a wheelchair or completing daily tasks with impaired senses. (21,33,58) Sometimes specific techniques are used to enhance the authenticity of this type of simulation, such as:

- *Voice simulation tapes*, studied by Merryman (21), immerse participants in authentic auditory experiences during various activities like puzzle-solving, purchasing coffee, and comprehension tests. This method integrates real-world tasks with auditory simulations, enhancing overall engagement and learning effectiveness.
- *Mediated role-play activities*, as explored in a study by Marchetti (20), leverage the playful learning paradigm. Occupational therapy students, working in small groups, engage in tasks simulating various medical conditions, such as swallowing difficulties or orthopaedic challenges. These simulations incorporate illustrated videos and slides accessible on students' phones or laptops, thus enriching the learning experience.

Table 1: Modalities used in SimOT

Modality	Description	Key Features	Applications and evaluations
Case Studies or Case Scenarios (16,19,22–24,29,32,61,62,65,67)	Paper or video-based scenarios outlining a client's current situation, including health conditions, occupations, social/ family context, assessment results, and therapist's notes.	**Authenticity, contextual richness:** Video-based cases, offer contextual richness and are proven to be more effective in evoking empathy and enhancing the overall learning experience.	**Interactivity:** Written cases can be transformed into interactive role-playing scenarios to deepen the impact of the simulation.
High or Low Authenticity Mannequin or Part-Task Trainer (7,12,25)	A Human-like healthcare simulator portraying a client's full body, contrasting with a part-task trainer representing specific body parts in simulations.	**Physical dimension:** Adds a physical dimension to learning.	**Diverse scenarios:** Allows simulation of various scenarios and procedures, e.g., blood pressure or heart sounds or specific procedures such as CPR; **Limited adoption in OT:** Limited use in OT education compared to medical and nursing education.
Role Play (7,20,23,24,26,27,29)	Learners immerse themselves in various roles (therapists, clients, caregivers) within a simulation.	**Cost-effective:** Often chosen in settings with organizational and budgetary constraints. **Perspectives:** Enables learners to adopt diverse perspectives, actions, and discourses fostering a deeper understanding of different points of view.	**Negative evaluations:** Tends to be less popular due to perceived authenticity, especially when individual is already familiar to students (i.e. teacher, peer). Live simulated cases are evaluated more positively.
Simulated Client (5–7,10,13,14,16,19,23,24,27,28,64)	Individuals (trained or actual) with specific conditions, representing OT clients in simulated or actual interactions.	**Client interaction:** Involves interaction with simulated or actual clients. Setting: Traditionally occur in a face-to-face setting, but virtual experiences and Interaction in a community setting are also mentioned	**Positive evaluations:** Live simulated cases are preferred by occupational therapy students. **Meticulous planning/training:** Success relies on planning, communication, and thorough training. Clients undergo training for simulation methodology and scenarios. Manuals/ Instructional Videos are integral tools for simulant guidance.
Standardized Client (5,7,9,10,13,14,16,17,23,25,27,29,30,33,53,64,65)	Individuals trained to portray a client with a specific condition in a realistic, standardized, and repeatable way.		
Computer-Based Simulation (12,15,19–21,26–28,30,31,53,62,63)	Participants are involved in activities such as virtual client tasks, immersive virtual reality experiences, or performing tasks using part-task trainers.	**IT expertise:** Requires appropriate IT expertise and technology. **Supplementary practice** enhances clinical reasoning for novice students. **Authenticity matters:** Effectiveness correlates with the authenticity of the experience. **Potential:** Complements learners' clinical reasoning, offering supplementary practice opportunities for diverse client groups. Integration with other learning methods enhances learning.	**Various applications:** To date, computer-based simulation has been used in a range of applications for practice areas, including: a computer model for elderly care simulations; interactive video client simulations; online role-play simulations in psychosocial OT education; virtual reality for clinical interviews, Simucase™ for Level I OT fieldwork simulations; and Unity-built home visit OT simulations.

Previous research has highlighted various positive outcomes of disability simulation, including increased understanding and empathy among occupational therapy students (21) and opportunities to teach students about experiences of daily living and adaptations.(33) However, despite its' potential use in simulated learning experiences, *disability simulation* is criticized for not authentically replicating the lived experiences of persons with disabilities and therefore being potentially harmful and disrespectful.(58) To be useful, disability simulations should complement other pedagogical methods in SBL, be carefully planned and well-structured and include supervised exposure to effective methods of performing daily tasks for persons with various physical, mental, or social challenges.

To select an appropriate modality (or modalities), several considerations come into play. Figure 15 provides a comprehensive, but non-exhaustive list to assist OT educators in choosing modalities that align with learning objectives, foster realism, promote active engagement, and uphold ethical and safe practices. These elements collectively contribute to the heightened effectiveness of SimOT.

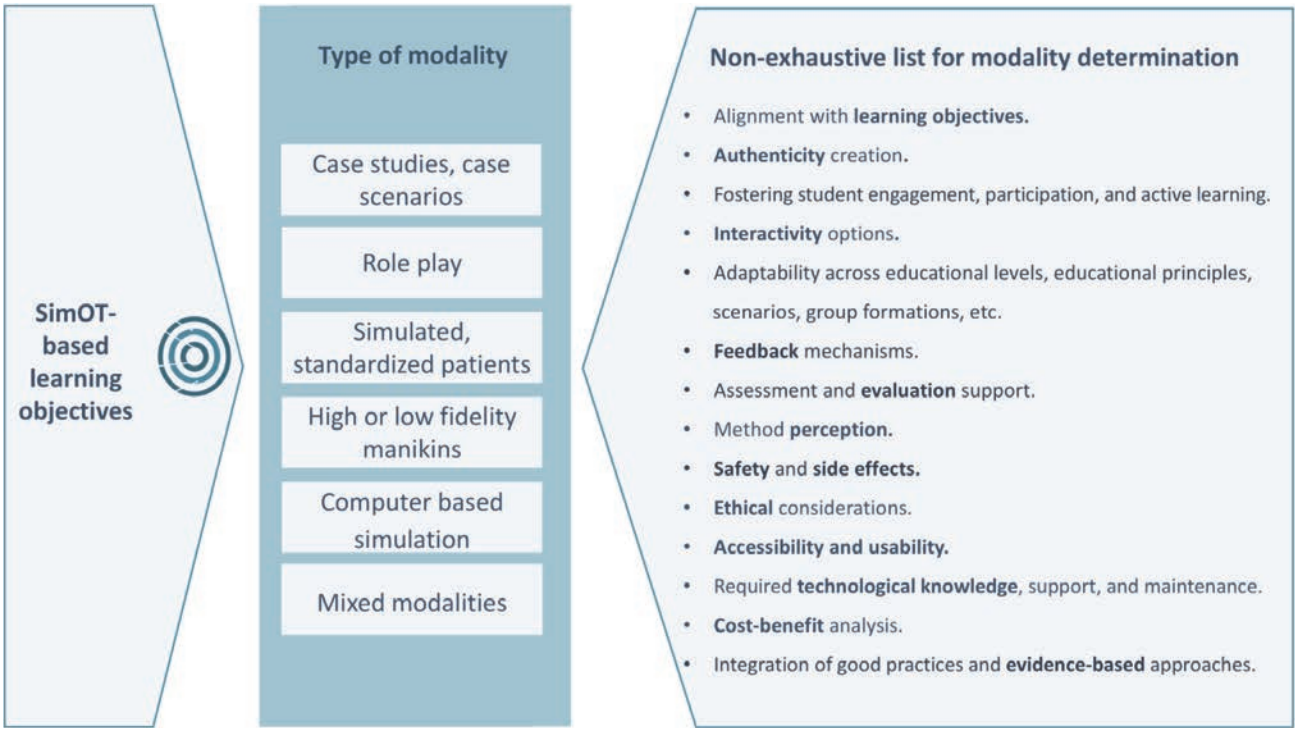


Figure 15: Types of modalities and modality determination (5–7,9,10,12–31,33,49,53,60–67)

Establishing authenticity

The theoretical rationale and empirical evidence for SimOT supports the argument that a high level of **authenticity** is required for effective simulation (5–10,12,17,18,20,22–26,32,64,67), where authenticity refers to the degree to which a simulation experience achieves a feeling of 'realness' in

which the learner achieves a sense of being immersed in a real-world practice situation. An authentic simulation experience enables the learner to fully immerse themselves in the situation and behave as if they would in an actual practice situation while still feeling supported within a safe learning environment, as reflected in the following quote from a stakeholder focus group participant:

> ***The point of nervousness and uncertainty disappears. I think with simulation there would be less nervousness, but I think it's still relatively similar <to a real practice situation>. If you have an actor in front of you now or a real person - for me personally there wouldn't be much difference.***

In general, authenticity can be considered and evaluated across seven dimensions (Figure 16).

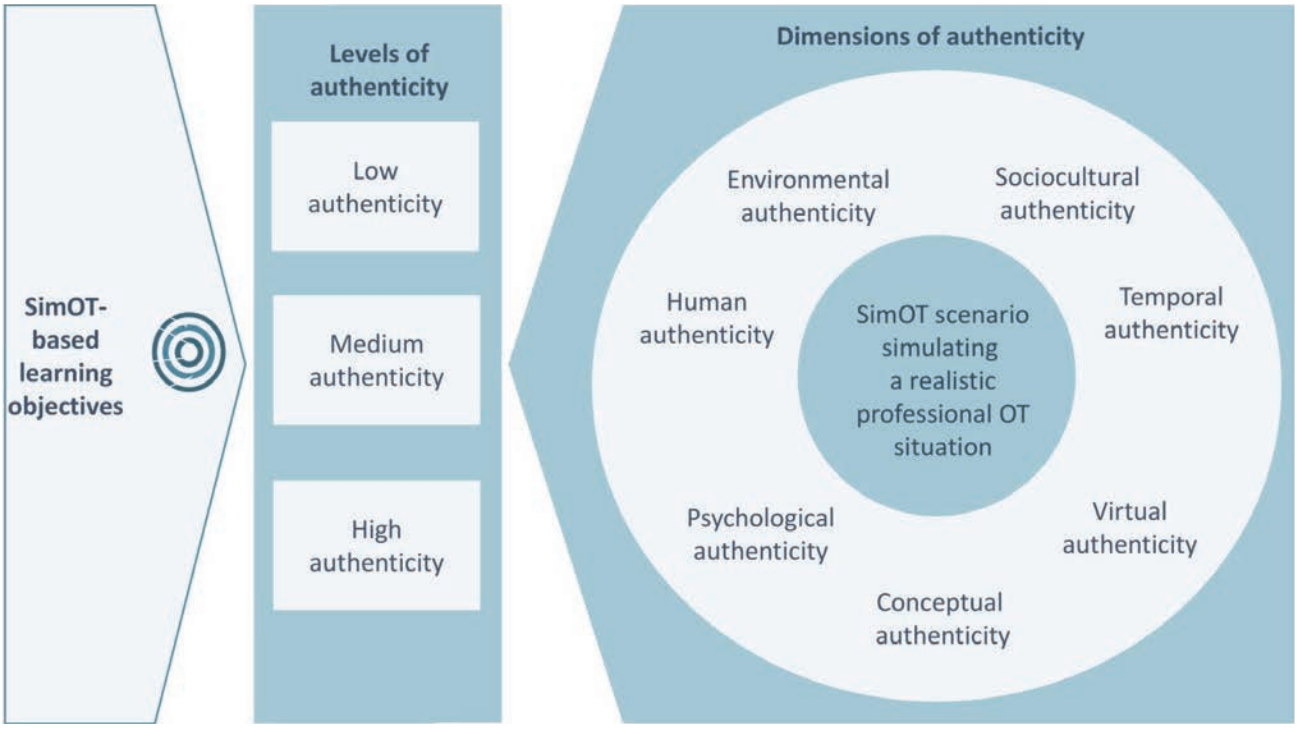


Figure 16: Levels and dimensions of authenticity in simulation design (6,7,10–13,15,17,18,22,24,27,29,31,63,64,66)

Here, the achievement of moderate to high levels of authenticity over multiple dimensions determines the overall level of authenticity (low-medium-high) achieved in a given simulation experience. Authenticity decisions regarding the simulation experience and scenario are informed by the SimOT learning outcomes and objectives. The dimensions of authenticity are defined and described in Table 2.

Table 2: Authenticity dimensions in simulation design

Dimension	Description	
Environmental authenticity (6,10,12,17,22,27)	*Definition*	Creating a simulated environment that mirrors real-world settings in OT practice, utilizing authentic facilities and equipment.
	Relevance	Fosters realistic skill transfer, reflects spontaneity of therapy encounter. Enhances learner adaptability and familiarity with practice settings.
	Application	Creating authentic spaces (e.g., hospital ward, living room, kitchen with realistic equipment/props); wearing a uniform and using OT practice tools/instruments; planning scenario in accordance with practice standards and protocols.
Human authenticity (7,11,13,18,22,24,27,29,31,64)	*Definition*	Degree to which persons with whom the student interacts during a simulation are perceived to represent actual clients or other stakeholders. Focuses on the realism and authenticity of human interactions within the simulation, including behaviours, responses, and communication.
	Relevance	Cultivates interpersonal skills and empathy, fostering professional behaviour. Offers a safe environment for skill acquisition.
	Application	Engaging a person unfamiliar to students as actual client; engaging experience specialist to provide authentic insight based on lived experience.
Psychological authenticity (6,11,64)	*Definition*	Degree to which learner experiences emotions, psychological reactions (e.g., anxiety, self-confidence) as in an actual practice situation.
	Relevance	Helps determine students' preparedness for performing targeted competencies under psychological conditions of an actual practice situation.
	Application	Psychological authenticity can be heightened when the physical, social, and contextual elements of the simulation reach high authenticity.
Temporal authenticity (11,22)	*Definition*	Degree to which a simulation experience is carried out in 'real time' or as it would be in an actual practice situation.
	Relevance	Promotes acquisition of skills in time management, task prioritization and adaptability in a realistic practice context.
	Application	Require student to act and make decisions on basis of incoming/evolving information. Use spontaneous, unpredictable elements in scenario.
Socio-cultural authenticity (10)	*Definition*	Degree to which a simulation experience replicates specific socio-cultural contexts and practice processes. Involves ensuring inclusiveness in simulation design by accurately and appropriately representing diversity of a given context.
	Relevance	Ensures the simulation experience supports students to acquire competencies necessary for working with clients in their own contexts (beyond simple replication professional tasks); better prepares students to appropriately recognize and respond to diversity in practice.
	Application	Scenarios that require consideration of specific social, cultural, and institutional factors that inform practice in given context or client needs.

Virtual authenticity (15,22,63)	*Definition*	Degree to which virtual or digital environments reach or contribute to authenticity along all other dimensions.
	Relevance	Ensures immersive learning where learner practices skills, interacts with client, behaves and responds as they would in actual practice situation.
	Application	Dependent on technical and digital expertise in design of simulation environments using high quality video/audio production. Supplementary materials (e.g., digital client records, audio recordings of a conversation with family member, etc.) can also be used as a tool.
Conceptual authenticity (66)	*Definition*	Accuracy with which the concepts, principles, and theories of OT practice are represented in the simulation.
	Relevance	Ensures that the learning experience aligns with OT paradigms; facilitates the transfer of theory into practice so that the client makes sense as a whole to the learner(s) (e.g., vital signs are consistent with the diagnosis.
	Application	All elements of the scenario (e.g., client diagnosis, occupational perforamnce issues, OT assessment method or approach) should realistically relate to each other To maximize conceptual authenticity, cases or scenarios should be reviewed by content expert(s).

Taken together, achieving authenticity requires a holistic approach that considers physical, psychological, socio-cultural, human, temporal, and virtual aspects of the simulation context and that strives for simulation experiences that present situations and tasks that an occupational therapy would encounter in actual practice. Effective and high-quality simulation design must ensure that this context reflects the complexity inherent in the holistic, dynamic, and interconnected activities and processes of **holistic occupational therapy practice** by considering methods for improving authenticity across multiple dimensions.(10) This, in turn, offers an opportunity in which students engage in immersive, exploratory, and experiential learning for supporting the acquisition of the knowledge, skills and attitudes necessary for competent practice.

Determining participants

Careful consideration and identification of all SimOT participants is an important part of scenario design as each of them has a unique role in the simulation process. Therefore, it is important to address the diversity of students and their learning needs, and to ensure they possess the required knowledge and skills to successfully participate in the simulation experience. The availability of competent staff is also important for the successful achievement of the desired learning objectives and outcomes. Successful delivery of a simulation experience requires the involvement of various stakeholder profiles. A summary of the roles, requirements and attributes of the primary participants is presented in Table 3.

Table 3: Primary participants in SimOT(5–17,19–29,31–33,42,47,49–67)

SimOT Participant	Learner	Educator	Facilitator	Simulant
Definition	OT students engaging in SimOT, or other allied health care professional.	A professional involved in the design, implementation and/or delivery of SimOT; provides the learner with the knowledge and skills required to successfully participate in simulation experience.	An individual involved in the design, implementation and/or delivery of SimOT who supports and directly facilitates the achievement of a desired learning outcome in simulation experience.	Individual, group or organisation who is qualified or trained to fulfil the client role with specific characteristics related to learning outcomes. Can also refer to computer- or technology-based simulators.
Background	Undergraduate OT students engaging in SBL experience, or other allied health care professional.	OT faculty member, OT practitioner, allied health professional, experience specialist.	Can be OT faculty member or practice mentor, other allied health professional, or an individual with specific knowledge/experience relevant to the simulation scenario.	Actor, OT client or service user, standardized or simulated client, experience specialist (e.g., person with disability), organisation or computer-based simulator.
Attributes	Works in small groups (up to 6), pairs or individually; is motivated to engage in SimOT and demonstrates a positive attitude towards SBL and sufficient prerequisite knowledge and skills.	Competent, professionals with relevant clinical, empirical and pedagogical knowledge and skills.	Competent, professional with skills for supporting learner participation in all phases of simulation.	Possesses authentic experience and knowledge to accurately depict client role; demographic data depends on the role and learning objectives.
Role	Active participant, peer observer, provider of peer feedback, role player.	Teacher, instructor, demonstrator, role-player, supervisor, facilitator, evaluator.	Teacher, instructor, demonstrator, supervisor, facilitator, evaluator.	Actor, educator, feedback provider.
Responsibility/ prerequisites	Active participation, collaboration, observation, reflection, professional and ethical behaviour.	Design, implementation and evaluation; determining and monitoring the environment, demonstrating skills, observing and providing feedback, training/ preparing standardized clients, ensuring professionalism, ethics and safety for clients and students.	Supporting skill development; delivering cues; facilitating self-reflection, providing constructive feedback and evaluation; training/preparing standardized clients training/preparing standardized clients, ensuring professionalism, ethics and safety for clients/students.	Fulfilling client role according to the script/scenario, portraying a client in a realistic manner, providing feedback.
Training requirements	Knowledge about OT theory and practice; specific health conditions; familiarization with SBL methods and expectations for the simulation experience; communication and interviewing skills; technology use.	Skills and knowledge in simulation pedagogy; knowledge and skill in applying theoretical principles and methods of learning and SBL.	Skills and knowledge in simulation pedagogy; facilitation, pre-briefing and debriefing skills, skill for applying learning principles and methods.	Familiarization with simulation methodology, scenario and the role to be played; training in the provision of feedback to learners.

Scheduling simulation time frames

Defining a clear and precise time frame is an important part of the simulation plan, as it structures the progression of the simulation experience in alignment with learning objectives and ensures integration of the simulation experience into existing programme plans and schedules at a timepoint that aligns with students' learning levels/needs.(7,9,10,12,13,17,19,61) Careful scheduling ensures timely conduction of important aspects of the simulation experience (e.g., briefing and assessment), thus fostering skill development and contributing to achievement of learning outcomes. Several factors come into play when it comes to *scheduling* simulation activities, including the *duration* and *frequency* of the simulation, its *intensity* (i.e., the number of simulation activities or learning stations within a specified time span), and the provision of opportunities for repeated practice, often organized in a rhythmic cycle.(7,8,11,12,14,17,20–24,31–33,64,67) Building opportunities for repetition into simulation schedules enables students to engage in trial-and-error type of practice in a safe environment where they can make mistakes, receive feedback and then repeat the simulation. Attending to these considerations will increase the opportunities for a well-organized and impactful simulation-based learning experience that can be feasibly integrated into existing educational programme and align with target learning outcomes.(66)

9.2.3. Develop

Within the 'Develop' step of the SimOT process, a purposeful and structured process is essential for enhancing the efficacy of OT simulation experiences. As illustrated in Figure 17, this encompasses the creation of authentic scenarios and scripts, meticulous planning of the briefing process (prebriefing, debriefing), thoughtful planning of evaluations, participant role assignments, and further determination of material, environment, and planning requirements. This systematic and iterative approach guarantees that simulation experiences align seamlessly with learning objectives, program standards and curriculum, and occupational therapy practice, thus fostering a safe, authentic, and effective simulated learning experience.

Scenario development and script writing

A well-developed case *scenario* is an essential element to any simulation activity as it shapes the student learning experience. The simulation scenario is detailed in a **script** - a structured, written narrative that serves as a blueprint for simulated experiences.(5,7,14,18,22–25,63) The script outlines the scenario activities, including role-play, event sequences, potential

challenges and contextual factors of a simulated experience. It facilitates realistic, standardized, repeatable goal-oriented practice aligned with the learning objectives.(66)

Figure 17: The 'Develop' step in scenario design

The script offers comprehensive instructions for all participants (including human actors, programmed simulators and/or computer-based simulators) that guide the progression of interactions, responses, and scenario complexity. *Time frames* for specific elements of the scenario are strategically planned to guide the scenario's progression, ensuring a reasonable duration for achieving objectives.(66) This intentional progression is guided by **cues** *and prompts* allowing students to develop skills gradually. Cues, planned or unplanned, are linked to *performance measures*, and help to evaluate and refocus learners when deviating from intended objectives. Cues serve dual purposes: those providing instructional support (*conceptual cues)* and those aiding learners in interpreting simulated reality (*reality cues)*. (49,78) Learners can receive cues in multiple ways, including verbal, visual, tactile, environmental, task-related, client-related, and equipment-generated cues.

In the creation of simulated OT scenarios, it is important to ensure a safe, non-threatening and supportive environment for learners with varying levels of confidence, competence, and readiness, as well as differing comfort levels with specific situations, such as physical touch. This requires careful planning of facilitation and feedback protocols and flexibility in facilitation, feedback, student preparation, and individual follow-up.

It's important to recognize that, just because the simulation might be the same, the student learning isn't going to be the same or the student experience isn't going to be the same.

The ultimate goal of scenario development is to provide an authentic, safe, controlled and supportive environment where participants can apply theoretical knowledge to practical simulated situations, so that they will have the professional competencies and confidence needed to provide safe and effective care in OT practice.(6,10,12–14,23–26,31–33)

Planning the briefing process: Prebriefing and debriefing

The simulation experience depends on a carefully planned and facilitated briefing process grounded in theoretical frameworks and evidence-based concepts. Prebriefing readies learners for the simulated activity, while debriefing fosters perspective-sharing and feedback. It enhances insights into occupational therapy performance, cultivates professional competencies, and facilitates learning transfer, fostering self-confidence, self-awareness, and self-efficacy.(54,56)

Prebriefing

Prebriefing serves as the foundation of a successful simulation experience, offering participants valuable insights and preparations. Before engaging in the simulation activity, instructors, educators, or facilitators guide students through a comprehensive orientation, elucidating the simulation process, learning objectives, and expectations. This stage ensures that participants are well-informed about their roles, necessary materials, and the relevant knowledge and skills to be practiced. In addition to orientation, educators may provide direct instruction on specific techniques or knowledge required for the simulation. This phase also involves the clarification of the planned simulation activities, such as *length, course,* and *location*, as well as *learning objectives* and *skills or competencies* that students will be expected to acquire. Some programs even afford students the opportunity to explore simulation stations or review case studies in advance, fostering familiarity with the scenario, equipment, materials, and the simulated environment. Prebriefing sessions are typically conducted in *groups*, either through *live on-campus* or *online sessions*, but may also involve independent preparation through manuals or videos. Additionally, prebriefing should include sufficient education and preparation of students for giving and receiving feedback during the simulation experience, which in turn will enable

learners to make better use of feedback during debriefing, self-reflection and self-assessment phases as well as in later practice situations.(7,11–14,17–20,24,25,27,30,32,33,35,50,56,60)

...it's about setting the tone...you <student> need to know who is going to do what in the session, how you're going to work in the peer group, how you're going to support each other

Debriefing

Debriefing stands as a pivotal element in any effective simulation experience that involves a formal and collaborative process of reflection between all participants. Debriefing contributes significantly to the development and integration of knowledge, skills, and attitudes into professional OT practice.(5,7,11,12,14,17,21,23,24,27,30–32,64,67)

The distinction between debriefing, reflection, and feedback is nuanced, with debriefing encompassing both reflection and feedback:

- *Reflection* is a scheduled post-simulation activity that involves collaborative and guided discussions between learners and educators, focusing on sharing perspectives, personal development, and therapeutic approaches.(35,50,54)
- *Feedback* focuses on communicating information about learners' performance and self-confidence.(35,50,54)

Various **sources** contribute to the debriefing process, including *educators, facilitators, peers, and simulated clients*, who can provide feedback through various methods, such as real-time communication during simulations, checklist-based assessments, video recordings, rating forms and questionnaires prepared in advance of the simulation activity.(5–7,10,12–15,18–20,24,27,30,31,64) While facilitators and peers typically provide feedback specific to learning objectives or competency performance, feedback from simulated clients is focused on their experiences as a client (how they would have felt had they been an actual client in a practice situation) and thus offers added value to the simulation experience.(10,50,54) Incorporating the expectation for giving and receiving peer feedback prompts group collaboration and can support the 'realness' of the simulation experience and make use of the power of the group for deepening learning. Technology can also add value to debriefing, for example in computer-based simulations that provide immediate feedback.(19,30,31,62) Complementing information from these different feedback sources provides valuable insights that can enrich the debriefing process. Learners incorporate this multifaceted feedback into their self-assessment and reflection on learning and

skill acquisition by using tools such as written assignments, feedback sheets, checklists, self-monitoring via instructional videos on phones/laptops and self-assessment using video recordings.(5–7,10,12–15,18–20,24,27,30,31,64) The goal-directed, dynamic and interactive nature of the debriefing process, as depicted in Figure 18, underscores its capacity to foster active participation among the educator/facilitator, learner, peers, and simulated client, creating a collaborative environment where all individuals, alongside the integration of technology, contribute to the exchange of feedback and engage in reflective discussions.

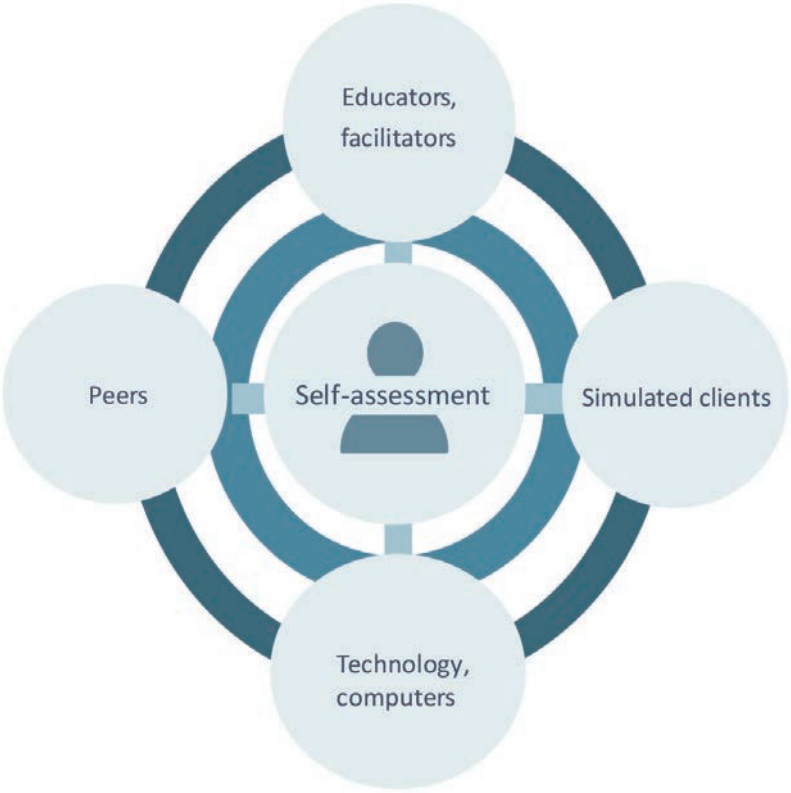


Figure 18: The goal directed, dynamic and interactive nature of the debriefing process (5–7,10,12–15,18–20,24,27,30,31,64)

This dynamic process of self-reflection and receiving feedback during and following simulation is reflected in the following quote from a SimOT stakeholder:

...but, if you get the opportunity to make mistakes, I think, if I make that mistake, during <simulation> practicals, then I'm less likely to make that mistake on internship. The fact that I'm allowed to make that mistake or the fact that a person <referring to simulation patient> reacts like that, is going to remind me, like aaah OK, I should definitely be careful next time with a patient in that situation.

Effective debriefing requires thoughtful planning and intentional structuring. To maximize learning and apply newly acquired knowledge, skills, and attitudes in practice, it is recommended to use one or more debriefing models based on established theories, frameworks, and evidence-based practices. The box below highlights key debriefing models. While these models share similarities and often follow similar phases, each focuses on different areas and employs distinct strategies.

Foundations for debriefing

- ***Promoting Excellence and Reflective Learning in Simulation (PEARLS) framework (Eppich & Cheng, 2015)***
- ***3D Model of debriefing (Zigmont et al., 2011)***
- ***Additional resources can be found in INACSL Standards of Best Practice: The Debriefing Process (Decker et al., 2021)***

The "Healthcare Simulation Standards of Best Practice™: The Debriefing Process" (54) delineates a **structured approach to debriefing sessions**, comprising distinct phases: the description phase, where participants revisit simulation objectives and debriefing purposes; the reaction/defuse phase, during which learners delve into their emotional responses to the experience; the analysis/discovery phase, where facilitators guide learners in exploring their experiences; and the summary/application phase, providing an opportunity to recap the experience, unearth insights, and contemplate the transferability of gained knowledge, skills, and attitudes into real practice.(54,79)

In the planning and preparation process of debriefing, careful consideration must be given to various elements, such as environment, forms, duration, frequency and timing. First, regardless of whether debriefing occurs *live, on campus or online*, effective debriefing requires an **environment** (10,15) that is not only supportive, safe, inclusive and confidential, but is also a space that encourages open communication. Second, debriefing can take different **forms** ranging from *formal* (structured and planned) to *informal* (unplanned), and can be delivered in *verbal, written or digital* formats that address *individuals or groups*. *Formative feedback* helps learners reflect on their progress, experience and confidence in acquiring and performing new simulated skills; while *summative feedback* explains ratings of a completed simulated performance in relation to normative standards. (5,7,11,12,14,17,21,23–25,27,30–32,64,67)

Regarding the **duration, frequency and timing** of debriefing (7,10,11,13–15,21,24,30,31,33,64,67), the following considerations may apply:

- *Post-simulation* debriefing involves planned discussions following the simulation experience, allowing a more reflective and in-depth exploration.
- *Real-time debriefing, direct debriefing, and just-in-time debriefing* are closely related terms, and involve continuous evaluation, encouragement, and guidance of the learner immediately (or just before) feedback is required during the simulation activity.
- *Time-out* signifies a temporary pause in simulation action, providing opportunities for active involvement by student observers and perceived as valuable by educators, especially in cases when students experienced feelings that undermine self-confidence.(11)

Preparing for learner assessment and simulation evaluation

Rigorous planning of assessment and evaluation is required to optimise the effectiveness of the simulation, deliver meaningful learning experiences, and ensure a means for measuring achievement of learning outcomes and objectives. It is important that a specific protocol for how this evaluation will be conducted and how and to whom feedback will be provided is clearly defined during planning stages.

In general, planning assessment and evaluation includes the following key steps (8,15,18,50,57):

- aligning evaluation with participants' learning objectives and experience levels;
- defining assessment criteria;
- selecting appropriate assessment types and methods, including technology-enhanced approaches;
- establishing a timeline for assessment activities;
- paying attention to authenticity and safety measures;
- ensuring alignment with debriefing mechanisms;
- ensuring adequate training for assessors.

Furthermore, in order to ensure continuity of competency development and allow students to become familiar with expectations in clinical placements, the competency domains, assessment methods and evaluation criteria applied during assessment in simulation should align with those used in clinical fieldwork experiences. Assessment and evaluation methods used in simulation are discussed further in Section 9.4.

Participant role assignment

This part of simulation design planning involves clearly and thoroughly defining the roles of all participants involved in the simulation experience. Written instructions can be helpful for understanding and following the defined tasks that are part of the role assignments of all participants.

As a central figure in the simulation experience, learners should be provided with clear instructions on what is expected from them and what assignments they have to complete as a part of the scenario. For the most part, simulation experiences are conducted in small groups (8,11,20,23,29,30,61,67), in pairs (7,20,67) or individually.(19,29,67) The learner role during the simulation experience might be rotated and can be generally described as either active learner or observer.(7,11,23,24,27) Group simulation sessions typically involve up to 6 students (23,30,61,67) and can be completed in a rotating manner when several tasks or activity stations are involved.(21) Simulation experiences conducted in student *pairs* often involve a role play in which one student acts as the client and the other as the therapist. When planned as *individual* learning tasks, the learner has the opportunity to independently carry out a simulation task. The role of peer observation can be directly built into the simulation experience, where one student group observes another while conducting an assignment, after which a formal feedback session and the subsequent reversal of roles can follow.(11)

The person who portrays the simulant must also be provided with precise instructions and completely be familiar with her/his role and the conditions that must be presented as authentically as possible. If a part of the scenario, special attention should be paid to a way of providing feedback to learners.

The facilitators' role is particularly important throughout the simulation experience as their knowledge and facilitation skills directly contribute to the achievement of defined learning outcomes. (59) Therefore, how to prepare students for the simulation activity during prebriefing, what specific knowledge and skills should be observed during student performance, and how to deliver cues during the simulation activity in order to support the learning process should all be clearly defined. Finally, methods and strategies for conducting self-reflection and giving feedback should be clearly defined and communicated in the process of role assignment.

Elaborate material, environmental, planning and cost requirements

When designing a simulation scenario, a critical step lies in the identification of required materials for scenario implementation. This entails creating a comprehensive list of required spaces, equipment, devices, and supplementary materials that will be used during the scenario (either directly by participants or indirectly in simulation implementation and for the purposes of authenticity, where each item contributes to the immersive nature of the simulation). This might encompass: (i) a clinical or living space with appropriate furniture, objects and equipment relevant to the scenario such as a chair, bed, sink, eating utensils or hygiene tools, wheelchair, etc.; (ii) therapeutic tools including assessment instruments or thermoplastic materials, and (iii) multimedia components such as audio recording devices or digital materials.(5,7,8,12,15,17,22,27,33,64) A strategic approach to identifying the material requirements of the scenario and accurate cost estimation ensures that the simulation unfolds seamlessly, creating a rich and authentic learning experience for participants.

In a recent study, Puzziferro and colleagues (30) refer to the use of *at-home lab kits* or virtual lab kits, which contain the equipment/materials needed to carry out hands-on simulation activities at home and a supplementary list of materials to be provided by students. This innovative approach ensures the seamless execution of simulation scenarios, even in decentralized settings.

9.2.4. Implement

Successful implementation and integration of a simulation experience into an educational programme requires considerable planning. As illustrated in Figure 19, in the 'Implement' step of the simulation process, consideration must be given to the availability of simulation equipment or standardized clients, the authenticity of the required simulation, time schedules, access to suitable simulation environments, the required staff, and costs.

Informing the standardized clients

For simulation experiences that will involve interaction with a standardized client, identification and recruitment of individuals to fill this role must be carried out well in advance of the planned experience. Standardized clients might be paid actors, volunteers (e.g., higher-level OT students, former/current OT practitioners) or persons with direct experience as an OT service user. In all cases, the terms and conditions of their engagement in the simulation experience (time commitment, simulation schedules, renumeration (when applicable) should be clearly and formally negotiated with

all parties. In addition, familiarizing standardized clients with the simulation methodology and the scenario is an important component of the implementation process. Adequate training, support and guidance must be provided to standardized clients involved in simulation scenarios. This should involve in-person or written/digital education about the simulation experience/case in which they will be participating, the activities or tasks in which they will be engaging, how to portray essential behaviours, and methods for providing feedback to students (if applicable). In the case of simulated clients, the training protocol should include a clear description of health conditions, impairments, and contextual factors of the client they will be simulating and an emphasis on the importance of remaining in the client role. Again, such training will be most effective when offered across a variety of modalities. Support for clients should also be provided throughout simulation implementation from a key expert involved in the development of the simulation protocol and scenarios.

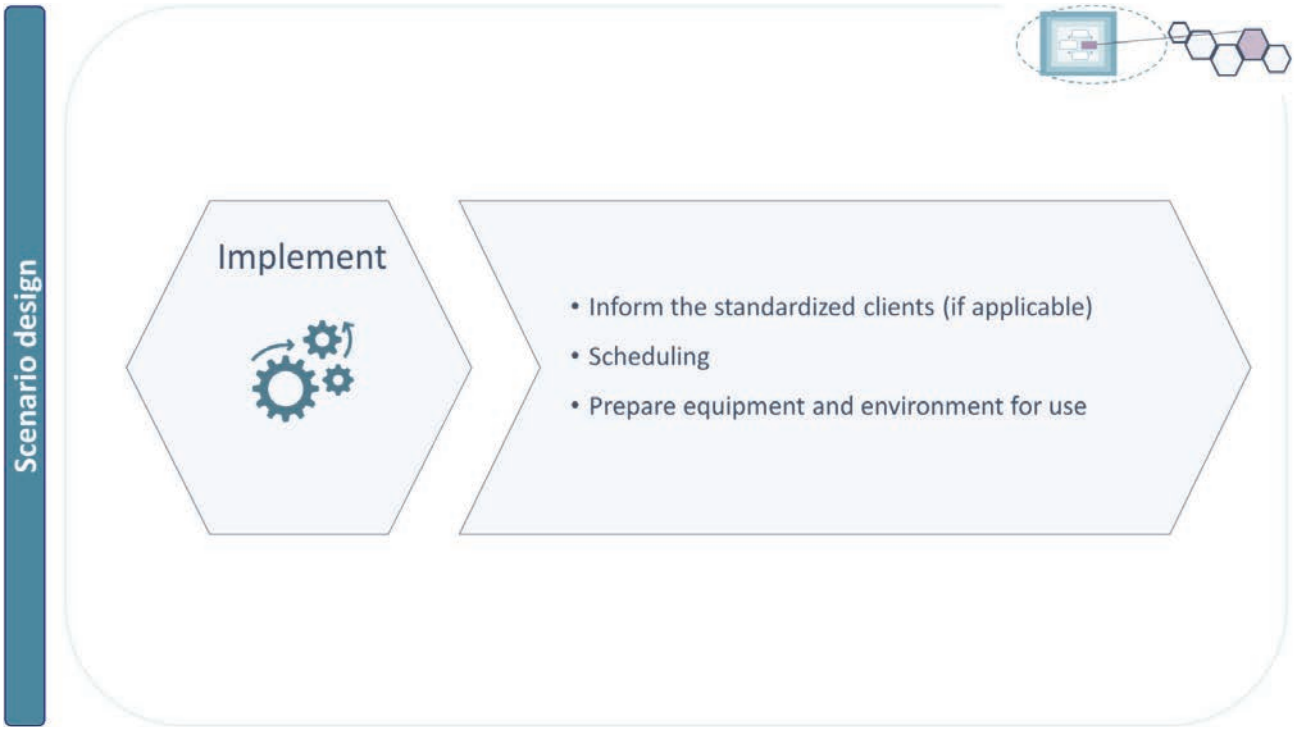


Figure 19: The 'Implement' step in scenario design

Scheduling and preparing the simulation experience

Prior to the realization of the simulation experience in practice, educators and facilitators must allocate time for ensuring conditions are in place for successful implementation. In the first instance, this involves confirming simulation schedules within the course programme and in accordance with timelines for programme planning as well as informing all participants (students, facilitators, simulants) of the time(s) and location(s) of scheduled sessions. In advance of a scheduled simulation experience, educators and facilitators must also allocate time to preparing the simulation envi-

ronment and equipment for use. Specifically, this involves securing access to the simulation environment according to the predetermined schedule, setting up the environment and all relevant equipment in accordance with the planned scenario and ensuring that any other consumable materials that will be used during the simulation experience (e.g., therapy materials, foods, or beverages) are available.

9.2.5. Review and finalize

The 'Review and finalize' step (Figure 20) involves conducting a pilot test, fine-tuning the simulation scenario, and addressing any identified issues through problem-solving.

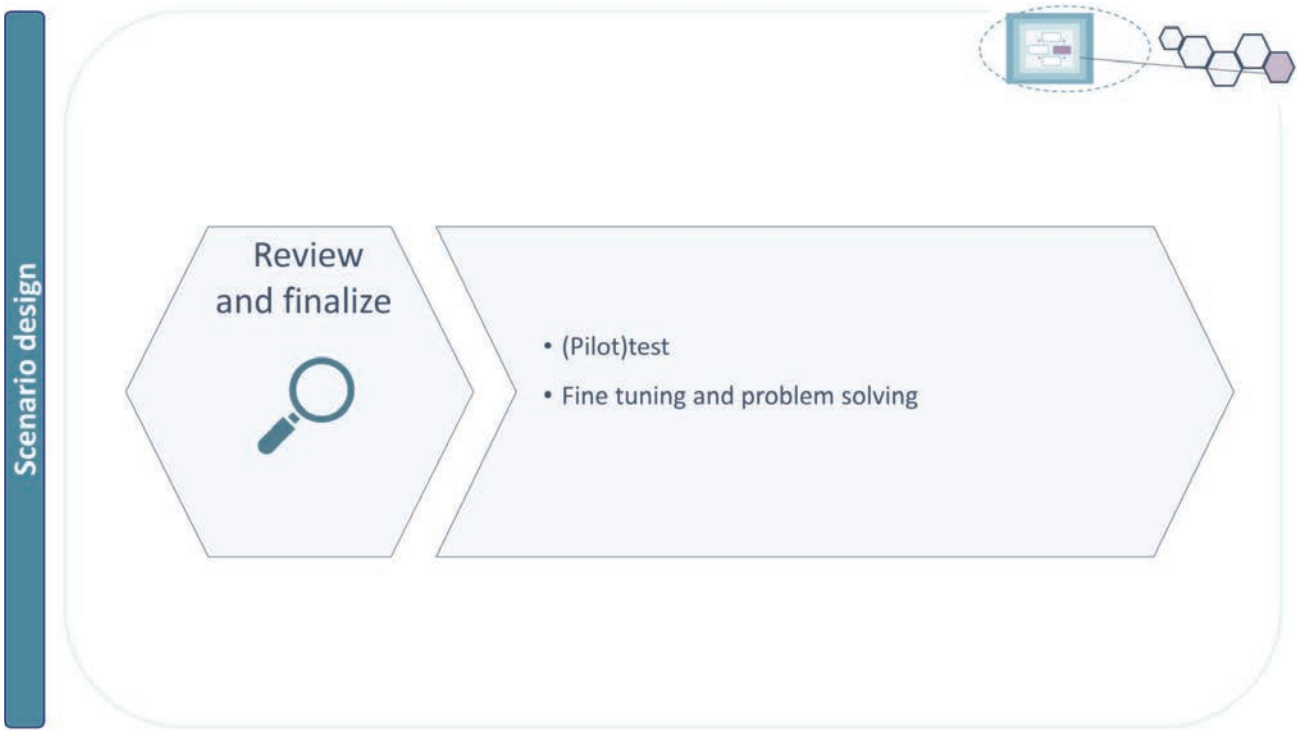
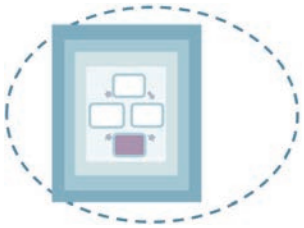


Figure 20: The 'Review and finalize' step in scenario design

Based on INACSL Standard (66), a "pilot test or prototype" in SimOT consists of creating an initial version of a simulated scenario or training programme before it is fully implemented. After completion of the design, a comprehensive pilot test assesses the effectiveness of the simulation to ensure that it matches the intended objectives and proves effective for students. This includes selecting participant(s) similar to the intended target group and possibly using instruments to assess validity and reliability. During the pilot implementation, elements such as clarity, completeness and possible improvements are identified. As resources are limited, pilot testing does not always precede a simulation activity. When appropriate and feasible, refinement based on feedback from the pilot test improves the simulation-based experience before full implementation, ensuring optimal educational outcomes for OT students.(66)

9.3. Simulation delivery



Simulation delivery in SimOT is the pivotal phase where theory effectively transforms into practice. Following needs assessment, goal setting, meticulous simulation planning, and development, this hands-on stage is designed to immerse students at an appropriate learning level in purposeful, safe, and realistic scenarios. Ethical, authenticity, accessibility, and inclusivity considerations are embedded within a safe, positive, and nonthreatening environment, as outlined in Section 9.2. of these Guidelines.

Simulation delivery in SimOT comprises three integral components: prebriefing, simulation activity, and debriefing, in which each plays a crucial role in generating a dynamic and effective learning experience. (77,80) Figure 21 illustrates the key components and flow of simulation delivery in OT education.

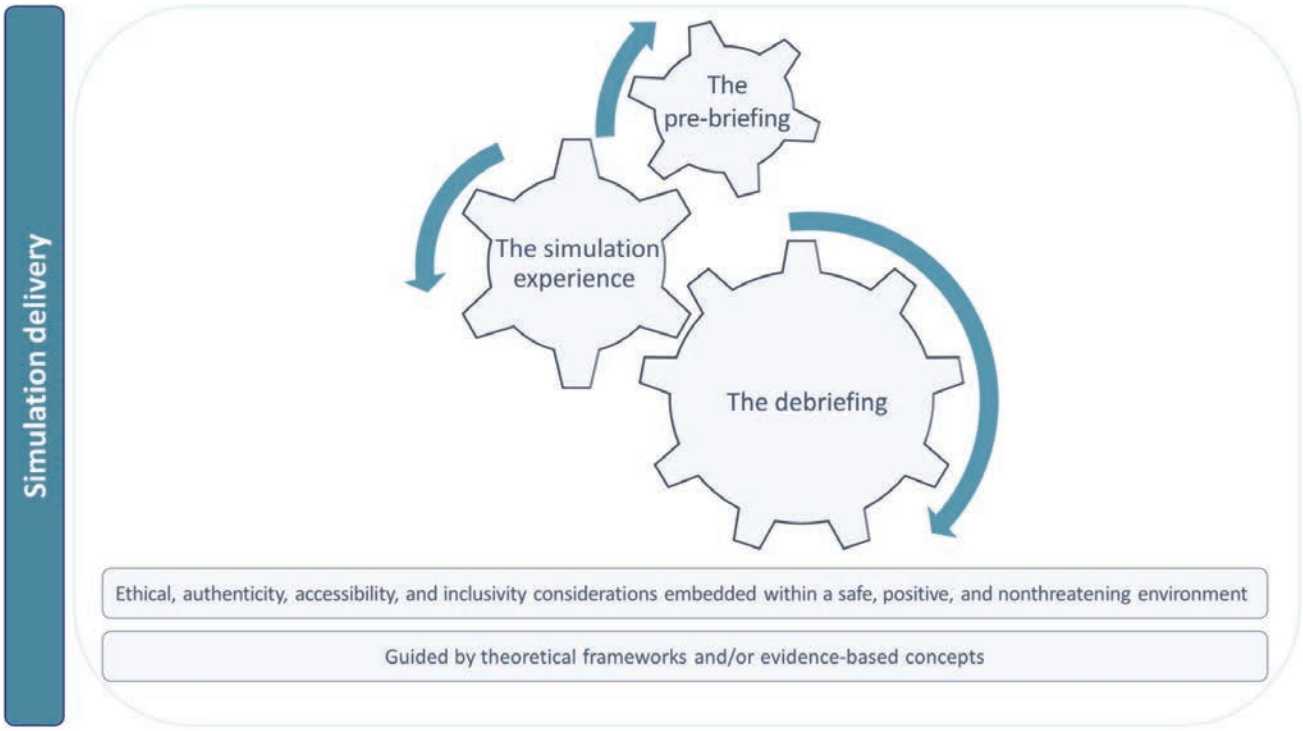


Figure 21: Simulation delivery

To set the stage, the *prebriefing* introduces the simulation context and roles. It establishes the foundation for the simulation activity, allowing participants to apply theoretical knowledge in a controlled environment and promotes psychological safety for the simulation-based learning experience by ensuring adequate preparedness of all participants.(56) (For further insight, consult the discussion on prebriefing in Section 9.2.3. in these Guidelines).

The *simulation activity* is a central and dynamic component where learners actively engage in hands-on scenarios. It is an immersive experience in a supportive environment, where educators seamlessly transition into the role of facilitators.(59,60) Through careful observation, educators closely monitor participants' actions and interactions in real-time, ensuring performance aligns with predefined objectives.(59) Facilitators adopt a learner-centred "guide on the side" approach, emphasizing mutual trust and providing guidance that encourages critical thinking, problem-solving, and clinical reasoning. This approach also considers emotional aspects such as stress and anxiety.(49,59,60) The facilitator's responsibility extends to structuring the simulation activity and delivering cues, both predetermined and unplanned, to assist participants in achieving expected outcomes.(59) Effective facilitation requires skill in evaluating when and to what degree support should be offered and when it is more appropriate to allow the learner to solve a problem or address a challenge independently. Attributes such as age, experience, and clinical expertise contribute to effective facilitation, emphasizing the need for comprehensive training in simulation facilitation.(60) Facilitation methods, influenced by theory and research, adapt to participant levels, simulation objectives, and contextual factors, and embrace cultural and individual differences to enrich the overall learning experience.(59)

Facilitating *debriefing* both during and after the simulation aims to guide participants toward achieving expected outcomes.(59) Following simulation, debriefing initiates reflective dialogue and feedback, linking SimOT actions to learning objectives, thereby enhancing critical thinking. Debriefing should be student-centred, aligning with the competency and learning levels of the student and encouraging active reflection about experiences, performance and decisions made during the simulation. All scenario-based simulation and formative assessments should purposefully incorporate a planned and structured debriefing session, guided by theoretical frameworks and/or evidence-based concepts, to optimize participant reflection and promote learning.(54) It is widely accepted as the most important component of simulation-based education and therefore allocating sufficient post-simulation time in educational settings is crucial for maximum learning benefit.(49,50) The facilitator, possessing proficiency in the debriefing process, assumes a central role. Research underscores the direct correlation between the debriefer's facilitation skills and the overall quality of the simulation experience.(50,60) For a more detailed discussion, consult the discussion on debriefing in these Guidelines in Section 9.2.3.

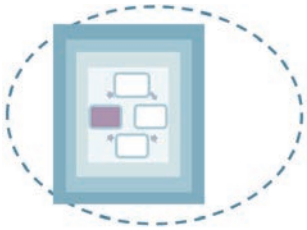
Debriefing and feedback are also recognized as an important medium through which to acquire competency in self-reflection, self-evaluation and

receiving and providing feedback, which in turn allows students to make better use of later practice fieldwork because they possess a greater readiness for receiving and reflecting on feedback and applying this feedback to modify practice. This notion is reflected in the following quotes from SimOT experts participating in the focus groups:

> ***...students actually learned how to use the supervision from simulation and they learn how to really respond to feedback and how to engage in a formal action that allowed them to develop.***

> ***We don't just give feedback to the students, we then talk to them about what they're going to do with that and... I suppose, prompt them to make an action plan...why are you getting that feedback and what does that mean and what are you going to do in your next steps.***

9.4. Assessment and evaluation



Following simulation delivery, assessment and evaluation should align with the intended learning outcomes and OT curriculum, thus ensuring relevance to real-world occupational therapy practice and promoting a comprehensive understanding of OT client-centred care. In addition, assessments should be tailored to the participants' level of experience and emphasise robust and realistic learning objectives. Prioritising psychological safety during the assessment process is crucial so that participants receive appropriate support (50) and can effectively use feedback and assessment results to advance learning and competency development further.

When defining **assessment**, The Healthcare Simulation Dictionary (35) refers to a definition derived from the International Nursing Association for Clinical Simulation and Learning Simulation (36) and Scheckel (81):

> ***"Assessment refers to processes that provide information about or feedback about individual participants, groups, or programs. Specifically, assessment refers to observations of progress related to knowledge, skills, and attitudes (KSA). Findings of assessment are used to improve future outcomes." (pp.S39-40)***

As mentioned in the definition above and shown in Figure 22, assessment includes **multiple perspectives**. *Individual assessments* focus on the learner's performance, while *group assessments* encourage collaborative learning and/or interprofessional communication. *Organizational or program assessments* consider the overall impact of SBL on curriculum outcomes and institutional goals. The *client or stakeholder perspective* is also essential for ensuring that SBL aligns with the expectations and needs of those receiving occupational therapy services.(50,57,60)

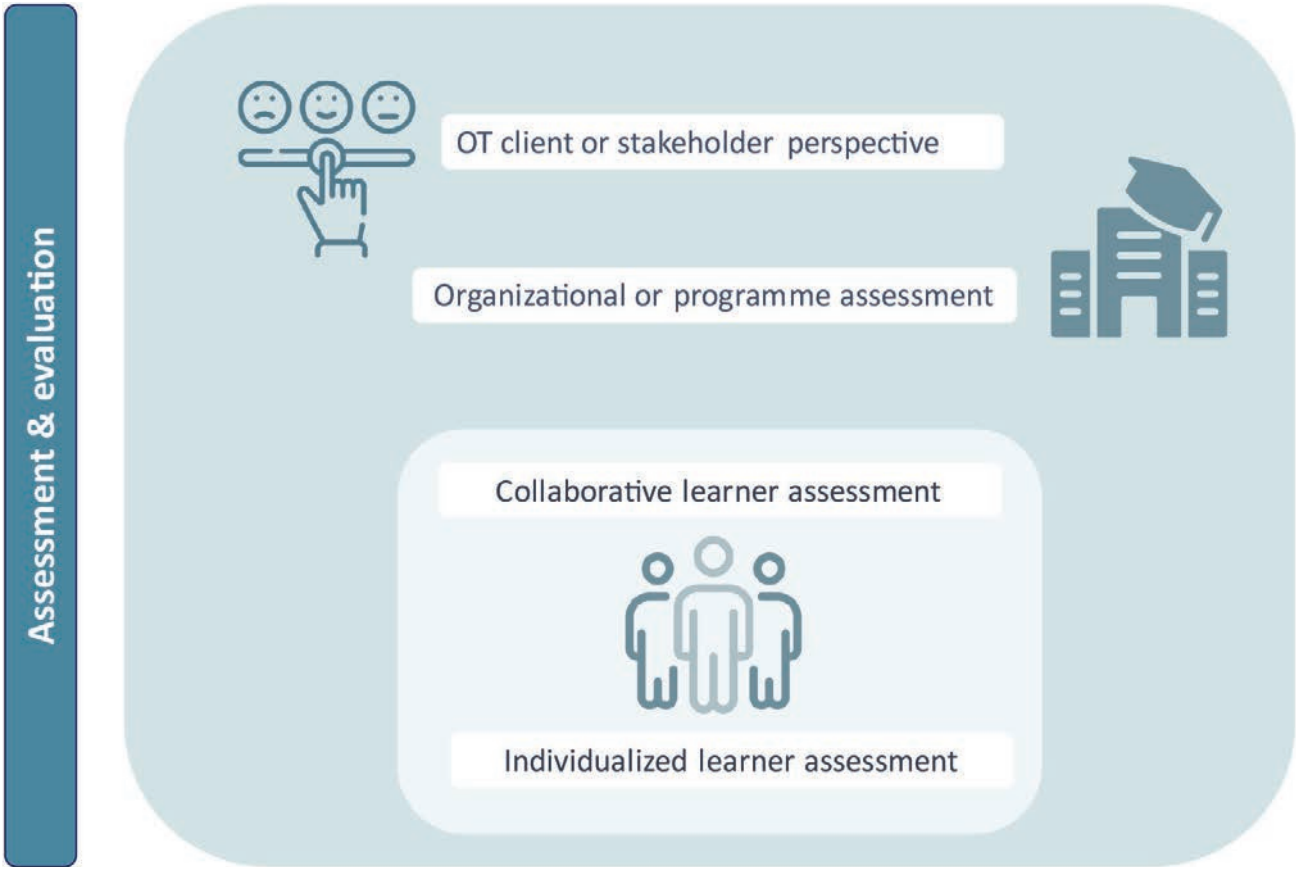


Figure 22: Assessment and evaluation (50,57,60)

Depending on the nature and aim of the assessment and the level (individual, group, programme/institution), numerous **assessment types** might be considered.

In the assessment of students' performance and acquisition of target competencies, *formative assessments* offer ongoing feedback on learners' progress, experience, and confidence during skill acquisition in simulations. *Summative assessments*, on the other hand, evaluate overall performance in relation to a normative score at the end of a simulation, possibly with *high-stakes* implications. (7,14,18,22,24,30–32,57) *Programmatic assessments* evaluate the overall quality and impact of the occupational therapy simulation program. Furthermore, different **assessment methods** can be applied, including (i) *performance evaluations*, such as direct observation by educators, peers, and standardized clients, as well as video reviews and Objective Structured Clinical Examination (OSCE); (ii) *self-assessment and evaluation methods,* including checklists, rating forms, questionnaires, reflective journals, and surveys; (iii) w*ritten assessments*, like quizzes and knowledge-based examinations; and (iv) *technology-assisted evaluations*, such as software-assisted assessments. The incorporation of both formative and summative assessments ensures a thorough understanding of students' progress and their preparedness for professional occupational therapy practice.(5–17,19–29,31–33,53,58,61–65,67)

To evaluate the transfer of learning outcomes and the effectiveness of a simulation-based learning programme, **Kirkpatrick's evaluation model** (82) is recommended. This model provides a systematic framework to assess participant engagement, knowledge acquisition, skill application, and the overall impact on client outcomes. Specifically, the New World Kirkpatrick Model outlines four sequential levels of evaluation: (1) participants reactions, (2) learning outcomes, (3) behavioural changes, and (4) the results or ultimate impact on client outcomes. This structured approach ensures a comprehensive evaluation, guiding the refinement of simulation design for optimal educational effectiveness and alignment with learning objectives. (50)

At the institutional level, evaluation involves a structured and systematic assessment of the outcomes of simulation experience(s) within an educational programme. It involves gathering information from students and educators/facilitators about their experiences and perspectives regarding the effectiveness, satisfaction and value of the simulation experience, specific teaching or evaluation methods, and perceived outcomes or impact. Evaluation might also involve a post-simulation discussion with (simulated) clients regarding their own experiences of the simulation, challenges experienced

during the learning session, the effectiveness and ease of use of scripts, scenarios and other materials, and the identification of areas for improvement or modification. Again, various methods might be used to collect this information, including post-simulation reflection and discussion or evaluation questionnaires.

This evaluation should be planned in the initial design phases and consider *what* will be evaluated, *how* the simulation will be evaluated (i.e., which evaluation methods) and *when* the evaluation will be conducted. Depending on the needs and aims of the educational programme, this evaluation might consider the following elements:

What will be evaluated?

- Student achievement of target competencies (i.e., demonstrates SimOT learning objectives)
- Subjective experiences of simulation participants (students, simulants, facilitators)
  - perceived effectiveness or value of the simulation
  - satisfaction regarding simulation experience
  - perceived outcomes and impact
  - reflections on specific teaching/learning methods

How will the evaluation be conducted?

- Formal assessment of student performance (e.g., OSCE)
- Oral or written self-reflection tasks
- Questionnaires

When will the evaluation be conducted?

- Once every academic year or with a single student cohort
- Periodically during the academic schedule
- Embedded within the simulation experience (e.g., during debriefing, self-reflection)

Finally, evaluation might include an assessment of the adherence of simulation experience(s) to the recommendations and principles included in these Guidelines, which were developed on the basis of an in-depth review, analysis and synthesis of current theoretical, empirical, and practical knowledge and evidence for implementation of simulation-based learning in OT education. For this purpose, Table 4 provides a brief fidelity checklist that educators might use during simulation design and delivery to monitor and evaluate their simulation programme against the theory-grounded, practice-informed, and evidence-based simulation practices described in the Guidelines.

Table 4: Fidelity checklist for evaluating the adherence of a simulation experience to Guidelines

The simulation experience should:	✓
Be grounded in an occupational paradigm: it is person-centred, occupation-based, and context-oriented.	
Clearly state learning objectives that align with the programme curriculum and target competency level.	
Use standardized and straightforward protocols, scripts, and instructions to ease implementation.	
Ensure appropriate and sufficient preparation and training of all participants.	
Incorporate a range of populations, practice areas and methods in simulation scenarios.	
Be planned in accordance with nationally accepted practice standards and protocols.	
Ensure a safe and authentic simulation environment.	
Enable active and immersive participation of the learner in a context of exploratory and experiential learning.	
Include a clear and structured protocol for providing feedback, supporting self-reflection, and leading the debriefing process.	
Allow for grading of simulation experience in accordance with learning needs/objectives.	
Enable opportunities for valid and reliable assessment (summative & formative).	
Consider ethical, safety, and accessibility aspects to ensure a supportive and inclusive learning space for all participants (student, facilitator, simulant).	
Be supported by current evidence and best practices.	
Be feasible, sustainable, and cost-effective in regard to available resources (time, equipment, facilities, personnel).	

Conclusion

The aim of these Guidelines is to provide a clear set of evidence-based, theory-driven, and practice-oriented principles, recommendations, and standards to inform the development, design, planning, implementation, and evaluation of simulation and SBL in occupational therapy education (SimOT). Based on a structured, narrative review of the literature examining SBL in OT education and other allied health professions and a series of stakeholder and expert focus groups, it provides a detailed account of current knowledge arising from existing experience and research in this field.

Within the SIMBA project, the Guidelines have served as a foundation from which to develop, pilot and evaluate materials and resources for the implementation of SBL in the occupational therapy programmes of each partner institution, including an online education module, a set of 30 validated simulation scenarios (digital and hands-on), a standard scenario template and a teacher manual. In publishing the Guidelines and other resources on the SIMBA web platform, we hope that they will also serve as a starting point for the development of evidence-based and theory-driven simulation-based learning methodologies in other programmes.

In the long term, we hope that the Guidelines and other resources developed within the SIMBA project will support more widespread application of SimOT and thus contribute to active participation and increased motivation of students in the learning process, improved professional competencies, increased confidence and skills for lifelong learning, better preparation for the transition into professional practice and, ultimately, an increase in the quality, safety, and effectiveness of OT service delivery through the promotion of professional competency development using authentic, inclusive, and innovative methodologies.

In addition, we hope that the Guidelines and other outcomes of the SIMBA project will stimulate ongoing development and research into potential future applications and opportunities for SimOT, such as:

- integration of digital and virtual technologies into OT educational programmes.
- application of SimOT in meso- and macro-contexts for promoting competency development in emerging areas of OT practice (e.g., working with populations and communities; work in advocacy, health promotion and occupational justice; cultural competence, diversity, and inclusion).
- inter-disciplinary and international education and collaboration among educators and students in occupational therapy and other allied disciplines across national, regional, and global contexts.

- creation of partnerships between educational programmes and other communities, institutions, and organizations for enhancing the competency and relevance of occupational therapists for addressing health and social needs in local, national, and international contexts.

By supporting the evidence-based and theory-driven development of SBL in OT education, these Guidelines also hope to stimulate ongoing research into the use, effectiveness, and impact of SimOT. Indeed, the research and consultation conducted in developing these Guidelines highlighted several areas for further research, including ongoing examination of:

- the impact of SimOT on students' acquisition of professional competencies;
- the influence of SimOT on improving client outcomes;
- the potential for transfer of learning from simulation experiences to practice and the maintenance of acquired skills over time;
- the potential of SBL across different competency domains;
- the potential of SimOT to address and evaluate competency across all levels of education.

Research exploring the potential impact and outcome of SimOT should employ a variety of methods, moving beyond self-reports of students and simulation participants to the valid and precise measurement of learning outcomes and skill acquisition. Such research should examine the impact of simulated learning experiences during or immediately following the implementation of this methodology but also over time to determine the sustainability and long-term utility of SBL methods. Together, such research will contribute to a clearer understanding of the potential of SimOT and allow for a precise consideration of cost-benefit balance.

In addressing these and other questions and topics during ongoing activities of the SIMBA project, these Guidelines aim to provide a template and resource for enabling innovation in simulation design using traditional, contemporary, and digital practices and technologies in a way that promotes the successful implementation of evidence-based, theory-driven, sustainable, and inclusive SBL programmes in occupational therapy education.

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