Using a contextualized competency framework to develop rehabilitation programmes and their curricula

A stepwise guide for programme and curriculum developers

Version for field testing

Rehabilitation COMPETENCY FRAMEWORK

World Health Organization

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KEY TERMS*

Activities	An area of work that encompasses groups of related tasks. Activities are time-limited, trainable and, through the performance of tasks, measurable *(1)*.
Behaviours	Observable conduct towards other people, or activities that express a competency. Behaviours are durable, trainable and measurable *(1)*.
Competencies	The observable ability of a person, integrating knowledge, skills, values and beliefs in their performance of tasks. Competencies are durable, trainable and, through the expression of behaviours, measurable *(1)*.
Course	The discrete units of study addressing specific subject areas. Courses generally increase in the depth of subject matter as learners move through the programme *(2)*. They may be weighted, often using the metric of "units" to indicate the degree to which they contribute to programme completion.
Curriculum	The educational activities and environments that are designed to achieve specific learning objectives. A curriculum encompasses the content and objectives of learning; the learning experiences; teaching methods; and the formats of assessment. It also includes quality improvement and programme evaluation *(3)*.
Curriculum plan	The organization of learning content within a curriculum. A curriculum plan demonstrates how curriculum content is structured and sequenced to enable the progressive attainment of competence, and offers a more detailed description of the learning experiences that students will be offered *(2)*.
Learning objectives	Assessable units of learning which, in aggregate, reflect the attainment of a behaviour or task. This guide distinguishes between programme learning objectives, which capture the units of a behaviour or task, and course learning objectives, which capture the knowledge, skills and attitudes related to the subject matter of the course.
Programme	The totality of courses which provide a specific award or qualification to the learner on successful completion.
Syllabus	A description of the scope and depth of subject matter to be covered in a course, as well as the specific learning experiences, materials and assessments that the course will entail, typically in greater detail than the curriculum plan. A syllabus communicates to learners what they can expect from a course and what it will require of them.
Tasks	Observable units of work as part of an activity, which draw on knowledge, skills, attitudes and behaviours. Tasks are time-limited, trainable and measurable *(1)*.

* Description of terms is specific to this guidance. Interpretation and use of terms vary between contexts.

1. INTRODUCTION

This guide, *Using a contextualized competency framework to develop rehabilitation programmes and their curricula* complements both the *Rehabilitation Competency Framework* (RCF) and *Adapting the WHO Rehabilitation Competency Framework to a specific context*. It proposes a methodology for developing a rehabilitation education and training programme and curriculum that can be used to support competency-based education (see Figure 1). The phases and steps detailed (described in the box below) are relevant to those of any profession or specialization, either developing new rehabilitation programmes, or revising curricula within existing rehabilitation programmes. In addition to outlining the process of programme development, the methodology describes how competencies and activities modelled from the RCF can be used to generate learning objectives, and how these can be positioned in a comprehensive curriculum. It is important to note that whereas "competency-based education" is used in this guide because it is the normative term, the RCF differentiates between competencies and activities, and includes both (see Table 2).

SCOPE OF THE GUIDE

What workforce does this guide relate to?

Rehabilitation programmes include those who provide education and training to health workers who deliver interventions that optimize functioning and reduce disability. The workforce using this guide will typically include those developing, or working in, rehabilitation programmes in the areas of audiology, occupational therapy, prosthetics and orthotics, physiotherapy, and speech and language therapy, as well as those in medical, nursing and psychology rehabilitation specialist programmes. In addition, the guide will be of relevance and use for programmes training rehabilitation assistants, technicians, and community-based rehabilitation workers, or any other health cadre delivering rehabilitation.

What level and type of rehabilitation education and training does this guide relate to?

The process described in this guide relates most directly to comprehensive rehabilitation programmes, such as undergraduate or post-graduate programmes, including those that award a diploma, bachelor's or master's degree. However, the methodology provided can be adapted and scaled for short courses, such as those used in continuous professional development, and to doctoral programmes that include course work.

What stage of rehabilitation programme development does this guide relate to?

This guide can be used in the context of establishing a new rehabilitation programme and its curriculum where one has not previously existed, or revising or renewing an existing programme and curriculum.

Many countries seek to expand their rehabilitation workforce through establishing education and training programmes for professions either not yet in existence in their health system, or only emerging. Establishing a new rehabilitation programme is an involved process, with political, legal, and regulatory facets that call for a systematic, collaborative and coordinated approach. Of utmost importance is ensuring that a programme produces graduates who are equipped to meet population needs, and who function effectively in the health system. While careful planning and cooperation ensure that programme graduates are legally recognized, well regulated, and absorbed into paid posts, the programme's curriculum ensures graduates have the knowledge, skills and attitudes to address the specific needs of the population effectively.

A curriculum is central to any rehabilitation programme, and encompasses the content, structure, learning experiences and assessment methods that will enable graduates to obtain the competence they require to perform their roles safely and effectively *(3–5)*. While traditional curricula development looks retrospectively at the legacy of a profession's knowledge and skills, curricula that support competency-based education are designed according to the required outcomes of the education and training; competency-based education looks ahead to determine what graduates will encounter in terms of population needs, and plans the curricula accordingly so that learners are equipped to meet what is required by the population, associated professionals, employers and regulating bodies (see Table 1) *(6, 7)*.

Figure 1. Progression from the RCF to its application in competency-based education and training

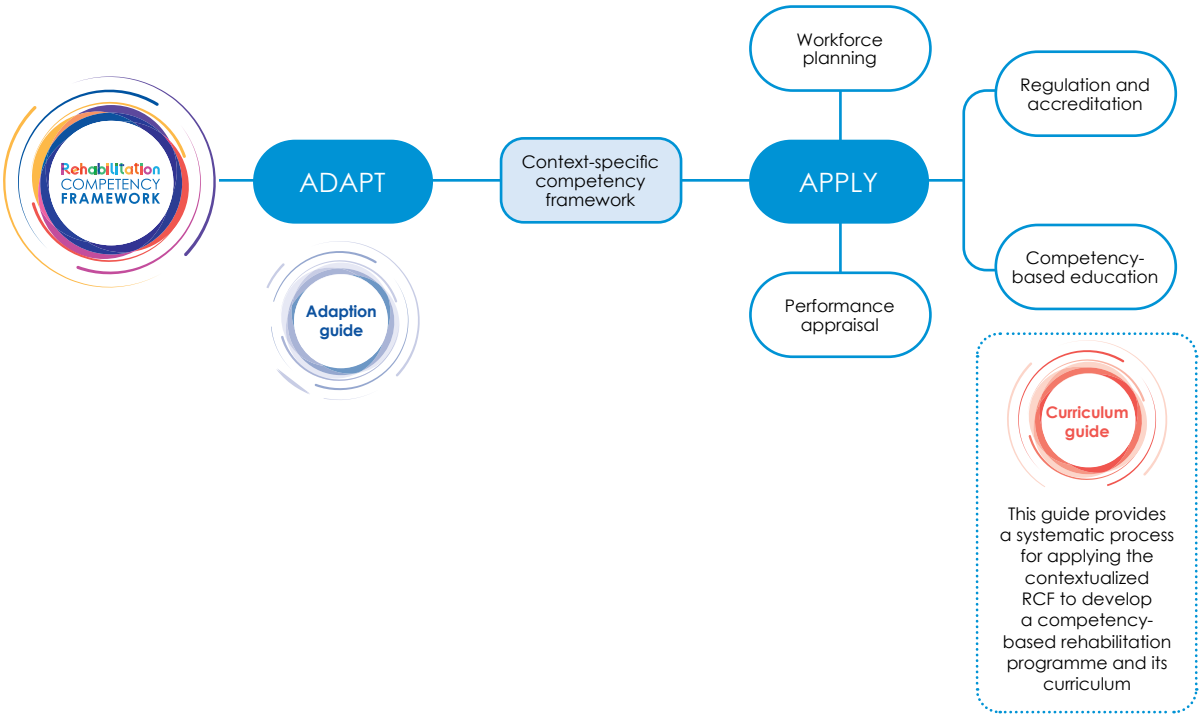
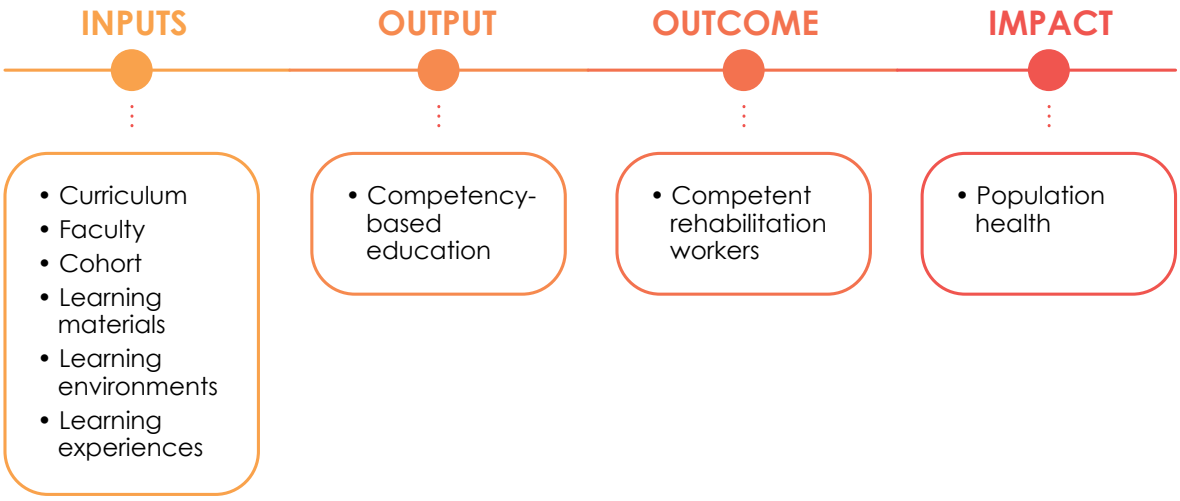


Table 1. The contrasting focus of traditional versus competency-based education *(3, 7)*

Traditional education	Competency-based education
Learning objectives focus on what the learner should know	Learning objectives focus on what the learner should be able to do
Focuses on the process of education	Focuses on the objectives of education
Curriculum largely shaped by what has been taught in the past	Curriculum largely shaped by the competencies needed by the population
Implicitly links the health needs of the population to the content of the curriculum	Explicitly links the health needs of the population to the competencies required of learners

This guide serves to assist those developing or revising rehabilitation programmes and their curricula to apply a competency lens to education and training; it can be applied in the context of pre- or post-service education and training, with outcomes and content scaled accordingly. While it provides a systematic approach for programme and curriculum development, the guide does not define content or specific educational approaches for either. These should be determined by the institution, reflect the learning objectives, and be suitable to the local context and specific needs of the learner. Furthermore, while an appropriately designed programme and curriculum are critical to competency-based education, these are only one aspect of its successful implementation. Implementing the programme and teaching the curriculum require adequate institutional capacity; this includes trained faculty, learning resources, opportunities and environments, and political and regulatory support (Figure 2) *(3)*. Investment in competency-based education is supported by the available evidence and is a powerful mechanism to align education and training with health system priorities *(6, 8, 9)*. Investment holds particular value for resource-limited countries, where the knowledge and skills of rehabilitation workers need to reflect, and accommodate for, not only the population's health profile, but also the strengths and weaknesses (e.g. workforce gaps and maldistributions) of the health system *(6)*.

Figure 2. The competency-based education log frame



Institutions developing programmes or designing curricula are encouraged to look beyond this guidance to the wealth of related evidence and resources, and to partner with experts. Those new to the process of programme development, curriculum design and competency-based education in rehabilitation can use this guide to become more informed and active participants in the development and design process.

2. GOOD PRACTICES WHEN DEVELOPING A CURRICULUM USING A CONTEXTUALIZED REHABILITATION COMPETENCY FRAMEWORK

The guide, *Adapting the Rehabilitation Competency Framework to a specific context* (the "RCF adaptation guide") sets out good practices for developing a competency framework. The same practices apply when using the framework to develop or revise rehabilitation programmes and their curricula; the practices help ensure that a programme and curriculum is acceptable, implementable, and effective in supporting competency-based education, and include the following:

ADOPTING AN INCLUSIVE APPROACH

Including stakeholders in programme and curriculum development is essential to support competency-based education and to develop a workforce that will eventually be absorbed into, and be active and effective contributors to, the health sector. Representatives from government ministries (health, education and labour), service-users, professional associations, employers, and regulatory bodies, as well as key focal points from the institution, should be engaged to some extent in the process of curriculum development, particularly in the planning process (Step 1). Stakeholder input helps not only to shape curriculum content, but also to raise awareness and recognition of the field; it further fosters ownership and support of the programme.

PLANNING IMPLEMENTATION FROM THE OUTSET

Curriculum development is only one component of an effectively implemented competency-based rehabilitation programme. Adequate attention to the political and institutional environments in which the programme will be implemented, and to the institutional capacity and resources required, is essential; careful consideration of these factors from the outset can optimize the value of the programme and curriculum, ensuring that they are context compatible and are capable of equipping learners with knowledge and skills aligned with population needs. Of particular importance is the need to ensure that the qualification achieved will be appropriately recognized, that regulatory mechanisms are in place, and that sufficient paid posts exist for graduates to be absorbed into the health sector.

MONITORING EFFECTIVENESS

Monitoring the effectiveness of a programme and its curriculum can be challenging, since multiple internal and external factors can impact whether learners attain the expected level of competence. Nonetheless, regularly reviewing education and training objectives, and critically reviewing the underlying drivers of learners' performances is an important aspect of programme and curriculum management. A programme and its curriculum should be reviewed periodically and refined according to feedback, assessment results, changing institutional capacity and shifting population needs (Step 12).

3. KEY CONSIDERATIONS WHEN DEVELOPING A PROGRAMME AND CURRICULUM USING A CONTEXTUALIZED REHABILITATION COMPETENCY FRAMEWORK

INSTITUTIONAL READINESS

The state of institutional readiness is of particular importance when a new programme and curriculum are being developed, and remains significant even when the programme and curriculum are being revised, especially when the revision involves shifting from a traditional to a competency-based education approach. As outlined earlier, implementing competency-based education requires the commitment of appropriately-trained faculty; it is associated with a considerable assessment burden, and relies on learners having access to a range of real-world learning experiences. Programme and curriculum developers may need to advocate for competency-based education before securing the approval of the educational institution. Once buy-in is attained, there is a greater chance of the institution making the necessary investment.

RESOURCE AVAILABILITY AND PARTNERSHIPS

The availability of resources, whether human or material, can present a challenge in many countries. In particular, acquiring trained and qualified faculty and practice supervisors can pose a considerable barrier to implementing a curriculum. In situations or contexts where a programme is being introduced for the first time, or where there is scarcity of potential faculty, institutions may need to recruit internationally, and/or partner with institutions where faculty are more readily available. This may be implemented in a phased approach, in a medium- to long-term context towards the institution becoming self-sufficient (Step 11).

Equipment, infrastructure, and learning materials are key to successful implementation of a rehabilitation curriculum. Depending on the programmes already run, some institutions will have much of the material resources required; however, in other situations this will need to be newly sourced.

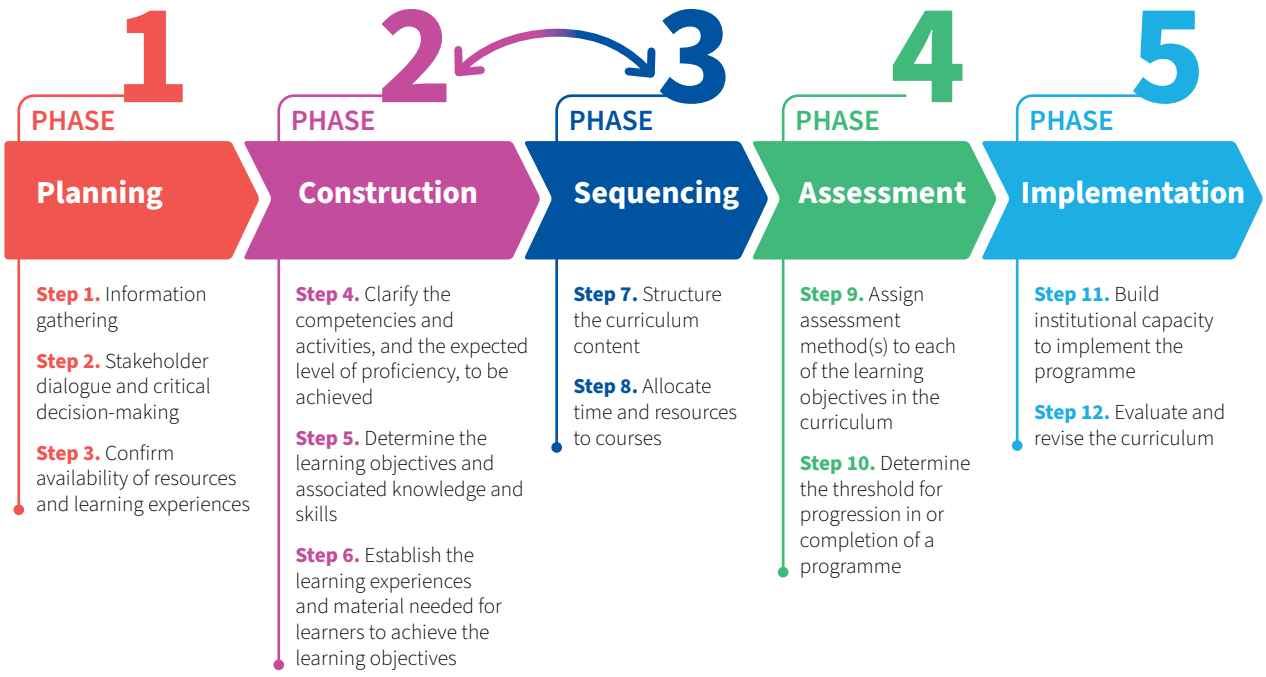
TARGET LEARNERS

The group of learners that the programme and curriculum targets will determine the programme outcomes and curriculum content. For example, implementation as part of pre- or post-service education (e.g. undergraduate or post-graduate audience) will impact what knowledge and skills learners are expected to have when they enter the programme, and to what level the teaching and assessment should be tailored. It is worth considering whether the competencies and activities being developed through the curriculum have been represented by any other profession, and how potential future shifts in scopes of practice will be managed, both practically and legally.

4. THE PROCESS OF DEVELOPING A REHABILITATION PROGRAMME AND ITS CURRICULUM USING A CONTEXTUALIZED COMPETENCY FRAMEWORK

The process of developing a programme and its curriculum using a contextualized rehabilitation competency framework comprises five phases, each with a number of practical steps (Figure 3). Defining the competencies and activities (which constitute the learning outcomes of the programme) is a prerequisite to these phases. The process of using the RCF to identify and contextualize competencies and activities is described in the RCF adaptation guide and, as such, is not covered here. Programme and curriculum developers who do not yet have a competency framework, or have not yet identified the competencies and activities relevant to their programme, are encouraged to refer to the RCF adaptation guide, even if not intending to create a formalized competency framework.

Figure 3. The phases and steps of developing a curriculum to support competency-based education for rehabilitation



PHASE 1. PLANNING

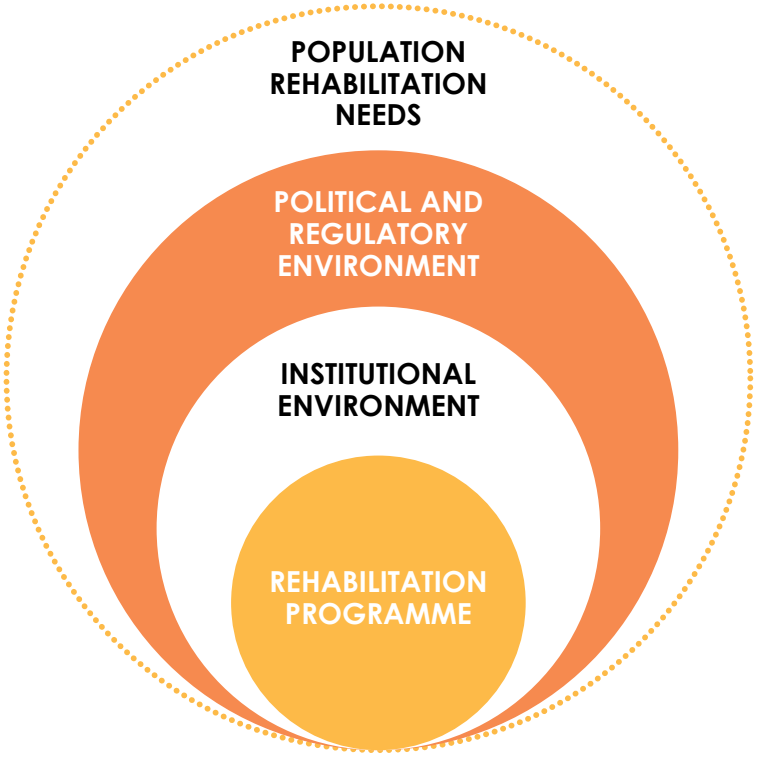
Planning is a pivotal phase of programme and curriculum development and, of all the phases, may require the greatest investment of time. It is not unusual for planning to occur over a period of months, or even years, depending on the situation. Planning lays the foundation for all future phases and steps of the development process and is essential for successful implementation.

The planning process should occur through the coordinated efforts of key stakeholders, typically under the leadership of a designated focal point from the institution or setting within which the curriculum will be implemented, and possibly an external consultant or institutional partner (e.g. individual(s) from a university or college with an established equivalent programme). The stakeholders may operate as a core working group that could comprise the same members as the group responsible for contextualized competency framework development (see Step 4 in the RCF adaptation guide).

STEP 1. INFORMATION GATHERING

Rehabilitation programmes and their curricula are not developed or implemented in a vacuum; they should recognize population needs; particular political and institutional environments; and national or international legal and regulatory frameworks, such as those imposed by professional associations and accreditation bodies (Figure 4).

Figure 4. The ecological context of curriculum development



The first step of programme and curriculum development is a thorough process of information-gathering that informs key considerations, such as those described earlier in section III. Information-gathering may involve key stakeholder interviews, desk reviews, or both. Information should be sought on the following:

- **The health, demographic, and geographic profile of the population**: While these will be reflected in the contextualized competency framework, they will also impact the extent to which specific competencies, behaviours, activities, and tasks are emphasized in the curriculum. For example, if the majority of the population exists in rural areas, the curriculum may devote proportionally more time to knowledge and skills related to working in primary health-care and community-based practice than a curriculum in an urban-dominated setting.
- **Legal and regulatory frameworks relevant to the programme and curriculum**: Do they exist? What content or conditions do they specify? What are the implications of this programme and its curriculum? Are there minimum standards, such as number or qualification level, for faculty numbers? Is programme length stipulated? If necessary, will these be adjusted to meet the needs of the new or revised programme?
- **Institutional investment and capacity**: The level of institutional commitment to the programme and its capacity to support the development and implementation of the curriculum must be investigated.
- **Vision and mission of the institution:** What are the vision and mission, and how might they impact the programme and its curriculum?
- **Existing relevant programmes and curricula, such as from other institutions or rehabilitation professions**: Do they exist? Are they current? Could they serve as valuable reference documents?

STEP 2. STAKEHOLDER DIALOGUE AND CRITICAL DECISION-MAKING

Development of a rehabilitation programme and curriculum sits in the nexus of the domains of ministries of education, labour, and health. As noted by UNESCO, programmes and their curricula are a "joint educational, political and social product cultivated by institutions and actors inside, as well as outside of the education system" *(6)*. Engaging representatives from each of these government sectors, along with the educational institution and accreditation body (where applicable), in the early planning phase is critical in making key decisions. Stakeholder dialogues should consider:

- **The qualification to be awarded:** Will the learners receive a certificate, diploma, bachelor's degree, master's degree, or doctorate on completion of the programme?
- **Accreditation and legal recognition**: Will the programme be recognized by the local accreditation authority, and under health practitioner law? What requirements need to be met and what timelines need to be considered?
- **Recruitment of prospective learners**: What are the programme entrance criteria? How competitive will entry be, compared with equivalent programmes at the institution? Will the learners' fees be subsidized by the government or other organization? How will issues in showing diversity of the learner cohort be addressed? Will international students be accepted, and how will their fees differ from national students? Is the recruitment of international students necessary to help fund the programme, and if so, what impact will this have on how the programme is delivered and on curriculum content (e.g. will the programme be taught in English or another language to accommodate a greater range of students)?
- **Recruitment of prospective programme graduates:** What is the estimated number of paid posts that will be opened to graduates with the qualification being awarded? How will these be distributed across the levels of the health system and between the public and private sector? These questions are important in determining the size of the learner cohort, and how recruitment might expand over time.
- **Modes of education:** Will courses be taught face-to-face, or have online components? Will education be enhanced with technology in any way (Step 6)? What are the infrastructure and resource implications of these decisions?

STEP 3. CONFIRM AVAILABILITY OF RESOURCES AND LEARNING EXPERIENCES

While resource availability should be considered through the course of the planning process, more concrete estimates of resource requirements can be determined once critical decisions have been made. Resource requirements, and associated considerations, relate to, but are not limited to the following:

- **Human resources, including administration and teaching faculty:** Consider what existing human resources are available and what additions may be required. For example, learners may be able to integrate into existing medical and social science courses, although the extra assessment burden additional learners bring should be accounted for, as well as any specific modifications to the courses that may be required. New courses specific to the programme may require new faculty, with specific qualifications and experience, who may not be available locally, and who may need to be trained and/or recruited internationally (see Table 6 for approaches to building the capacity of local/national faculty). Decisions regarding where and how to source faculty will generally be influenced by regulations stipulating the quota of national faculty required for a programme, and qualification requirements.
- **Material resources, including infrastructure and learning materials:** Will implementation of the programme and its curriculum require specific infrastructure, such as a gym, anatomy laboratory, clinical practice space, acoustic laboratory, prosthetics workshop, etc.? Learning materials, such as texts relevant to the local context, and clinical and technical equipment for education and training should also be factored in, especially when they are not readily available. These need to be reviewed and refined as the curriculum develops.
- **Learning experiences:** Practicing competencies and activities in real-world environments is a fundamental characteristic of competency-based education; therefore, opportunities for learners to practice in these settings are essential. Rehabilitation programme and curriculum developers should consider the range of environments and experiences that learners should be exposed to, as well as placement duration in these settings, and what supervisory requirements are needed.

PHASE 2. CONSTRUCTION

Table 2. Differentiating between competencies and activities

Competencies	Activities
Associated with a rehabilitation worker	Associated with a role, its requirements and the scope of practice of the rehabilitation worker
Durable (persist through different activities)	Begin and end
Expressed as behaviours	Encompass tasks

STEP 4. CLARIFY THE COMPETENCIES AND ACTIVITIES, AND THE EXPECTED LEVEL OF PROFICIENCY, TO BE ACHIEVED

As noted earlier, identifying the competencies and activities to be achieved through the programme's curriculum is a prerequisite to undertaking the phases and steps described in this guide. Competencies and activities (see Table 2 for the distinctions between the two), can be extracted and adapted from the RCF through the methodology detailed in the RCF adaptation guide. Even if a competency framework is not deemed necessary, many of the steps described will be useful in identifying and adapting the competencies and activities, which can be documented directly in the curriculum (Step 5).

The level of proficiency at which each competency and activity is expected to be performed (i.e. the expected level of competence to be attained from the programme), should be clear and reflect the requirements of the institution, profession, or specialization *(6, 8)*. Defining proficiency levels helps to determine the threshold for achieving competence, which should be predetermined within the curriculum *(10)*. Proficiency levels may align with those described in the RCF proficiency profiles (levels 1–4) or be modified to suit specific learner expectations.

STEP 5. DETERMINE THE LEARNING OBJECTIVES AND ASSOCIATED KNOWLEDGE AND SKILLS

Translating competencies and activities into a curriculum to support competency-based education programmes involves transforming the behaviours associated with competencies, and the tasks associated with activities, into learning objectives. Learning objectives reflect what the learner will know or do after the learning activities *(3, 5)*. Programme learning objectives allow behaviours or tasks to be broken down into units of learning that can be taught and assessed until the learner is competent in the behaviour or task. Table 3 provides an example of learning objectives for an RCF Practice domain competency (C4) and associated behaviours; and Table 4 for a Practice domain activity (A3) and associated tasks. Both examples are extracted directly from the RCF and expressed as Level 3 of the four proficiency levels. Together, Tables 3 and 4 show how learning objectives can support the development of behaviours (in this case, problem-solving and decision-making, but other behaviours could relate to communication or person-centredness, for example), and the ability to perform tasks (in this case, conducting a rehabilitation assessment, but other tasks could relate to implementing interventions, referring or discharging, for example). When defining learning objectives, the level of performance expected should be clearly described and reflect the time available for attaining the behaviour or task, as well as the demands that the learner will encounter and the level of autonomy they will have after completing the programme.

Table 3. Example programme learning objectives for an RCF Practice domain competency (C4) and associated behaviours

Competency	Behaviours	Programme learning objective* ***On completion of the programme, the learner:***
C4. Adopts a rigorous approach to problem-solving and decision-making	C4.1 Considers personal, environmental, and health factors when conceptualizing problems and identifying solutions	C4.1.1 Describes the International Classification of Functioning, Disability and Health (ICF) model
		C4.1.2 Describes the potential role of personal, environmental and health factors in impacting functioning
		C4.1.3 Compiles a problem list that captures personal, environmental and health factors specific to a person and their family
	C4.2 Integrates information from multiple sources when solving problems and making decisions with the person and their family	C4.2.1 Identifies different sources of information
		C4.2.2 Demonstrates the ability to manage conflicting information from different sources
		C4.2.3 Presents a complete picture of a situation to a person and their family to facilitate their optimal engagement indecision making
	C4.3 Identifies innovative approaches to addressing challenges with a person and their family	C4.3.1 Engages in a joint problem-solving discussion with a person and their family
		C4.3.2 Identifies a range of potential solutions to optimize functioning by addressing relevant personal, environmental and health factors
		C4.3.3 Identifies factors that contribute to selection of the most appropriate approach for a person and their family

* Learning objectives are examples only; they are not applicable to all contexts, nor is the list exhaustive.

Table 4. Example programme learning objectives for an RCF Practice domain activity (A3) and selected associated tasks

Activity	Task	Programme learning objectives* *On completion of the programme, the learner:*
A3. Conducting rehabilitation assessments	A3.1 Obtaining a comprehensive health, environmental and personal history, which reflects an in-depth understanding of the scope and complexity of determinants of health and well-being	A3.1.1 Identifies the type and purpose of information to be collected
		A3.1.2 Conducts a chart review
		A3.1.3 Conducts a logical and organized interview with a person and their family
		A3.1.4 Identifies and uses alternative sources of information when indicated
		A3.1.5 Identifies the presenting problem(s) of a person and their family
		A3.1.6 Identifies significant factors impacting the person and their family's rehabilitation management plan
	A3.2 Assessing whether a person is at a risk of harm to themselves and/or others and implement protection strategies where appropriate	A3.2.1 Identifies indications a person is in need of protection measures
		A3.2.2 Describes the legal obligations and protocols for initiating protection mechanisms
		A3.2.3 Describes the potential barriers to identifying a person at risk of harm
	A3.3 Independently conducting assessments of body structures and functions, adjusting for specific factors, such as age, language, culture or impairment	A3.3.1 Describes the potential assessment tools relevant to a person and their family
		A3.3.2 Manages the environment to provide optimum conditions for the assessment
		A3.3.3 Conducts a cognitive test using a standardized instrument
		A3.3.4 Scores, interprets and reports the results of the assessment

* Learning objectives are examples only; they are not applicable to all contexts, nor is the list exhaustive.

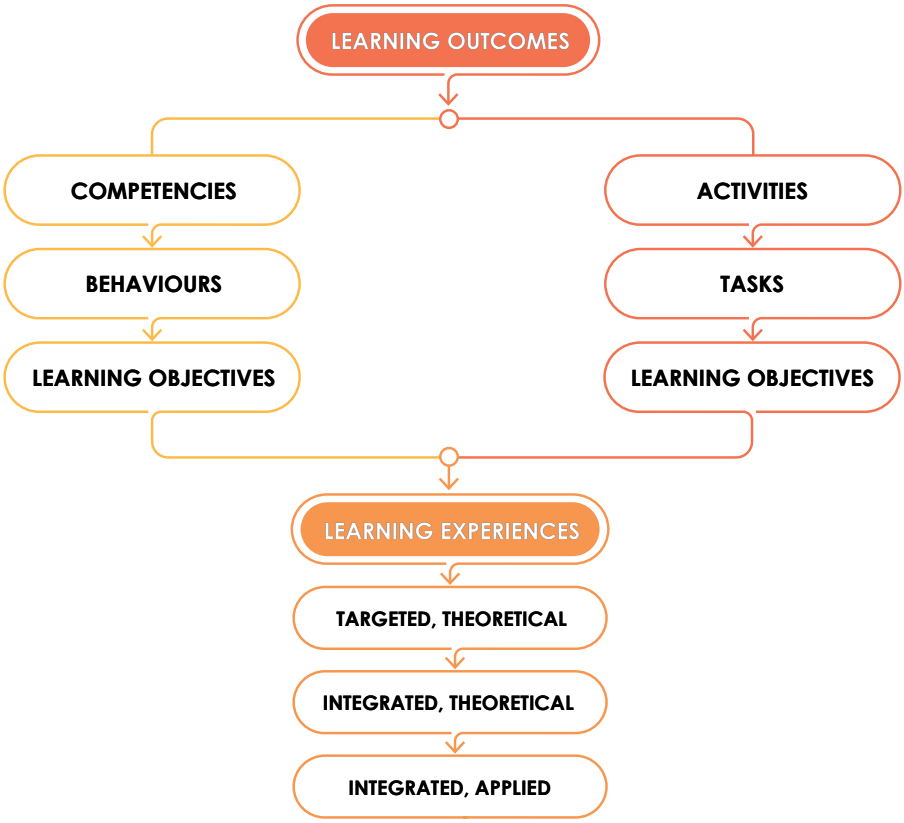
When defining learning objectives, the primary knowledge and skills related to each can be identified, while acknowledging that other more general knowledge and skills may also be required, acquired, or consolidated through the learning activities. Identifying what knowledge and skills underpin learning objectives is important in identifying the appropriate modes of education or learner experiences for knowledge and skill acquisition and assessment. The RCF includes both core and activity-specific knowledge and skills in each domain; these should be contextualized and expanded as needed before being included in the curriculum.

STEP 6. ESTABLISH THE LEARNING EXPERIENCES AND MATERIAL NEEDED FOR LEARNERS TO ACHIEVE THE LEARNING OBJECTIVES

Knowledge and skills are acquired through a range of different learning experiences; while knowledge is generally built on a theoretical foundation, skills tend to require application to be mastered. Building knowledge and skills, especially at an introductory level, may involve targeted learning experiences that isolate, or focus, on a specific subject matter or skill. As learners advance, they begin to integrate knowledge and skills in more practical, realistic scenarios. Figure 5 summarizes learning experiences as i) targeted and theoretical (i.e. experiences consider specific knowledge); ii) integrated and theoretical (experiences consider a range of knowledge); or iii) integrated and applied (experiences consider a range of knowledge which is contextualized in skills) *(3, 5)*. Ultimately, competencies and activities can only be fully developed when integrated and applied, i.e. when the behaviours associated with different competencies are applied in the context of activities. This requires the learner to simultaneously utilize different behaviours while performing different tasks in a range of environments that place varying demands on the learner, honing their proficiency to the required level. For example, in conducting an assessment with a patient and their family, a learner needs to apply competencies associated

with person-centredness, collaboration, communication, and decision-making (in the RCF Practice domain), as well as competencies from other domains, such as Professionalism and Research. Furthermore, a learner cannot be deemed competent in performing activities until they are applied in real-world contexts. These could include environments with limited access to resources; working with people with varying levels of needs, and in situations where there is limited awareness of their role. For this reason, competency-based education in rehabilitation relies on learners being exposed to a range of learning experiences, targeted, integrated, theoretical, and applied.

Figure 5. Targeted and integrated learning experiences required to achieve learning objectives



When selecting a learning experience, availability of resources and access to clinical experiences/placements should be considered and accounted for. For example, some learning experiences are reliant on infrastructure, such as anatomy laboratories with specimens; gait analysis laboratories; prosthetics and orthotics workshops; ready access to computers and internet connection; and facilities with policies and procedures for training and supervising learners. The provision of such training and supervising facilities can be especially challenging when the programme and curriculum concern an emerging profession that does not yet have a substantial presence in the country. In these instances, learners may need to complete placements abroad, and the costs associated with these need to be planned for and managed in a way that includes as many potential learners as possible.

With the rapid evolution of technology, education institutions have a growing range of platforms from which to deliver learning experiences. While rehabilitation programmes have traditionally been delivered in-person, with learners physically attending the settings in which the learning experience is based, many institutions are increasingly making use of online learning platforms. While competency-based education is contingent on learners being exposed to authentic environments, certain courses, or components of courses, may be conducive to online learning, especially those that are theoretical. Indeed, a hybrid of in-person and online learning is increasingly becoming the norm, and offers the advantage of greater flexibility, reducing travel requirements, building digital literacy, and enabling access to a wider range of educators, such as international experts. The advances in education-related technology mean that digital platforms have functionality supporting highly interactive styles of learning. Use of online learning is conditional on learners having access to the necessary infrastructure, including reliable internet connection, which is not available in all contexts. Still another approach is “web-enhanced blended learning”, where learning occurs in-person, but is supported by technology to deliver content and enrich learning activities. This approach requires the educational institution to have a certain degree of digital infrastructure and web connectivity, but this is not required outside the classroom.

PHASE 3. SEQUENCING

Sequencing involves organizing the curriculum content, including the learning objectives and learning experiences, into meaningful components, or courses, within a curriculum plan. The plan documents the pathway that progresses learners towards attaining the required competencies and performing the relevant activities to the required standard *(2)*; it further defines what time is allocated to various components of the curriculum, based on their weight or contribution to attainment of a competency or activity, the level of difficulty, or the time learners are expected to take to reach the anticipated level of mastery. Such decisions are highly context-specific and will inevitably reflect the institution's values and preferences. For this reason, while the general curriculum content for equivalent programmes in different institutions or countries may be similar or based upon the same international standards, their curriculum plans may be diverse.

STEP 7. STRUCTURE THE CURRICULUM CONTENT

Programme organization, or how the curriculum content is structured across the duration of study, is generally presented in the curriculum plan. The plan lists and describes the courses included in the programme, and often indicates which courses are mandatory and which are elective (i.e. can be selected from a range of appropriate options). The plan is an important reference document for faculty, because it indicates where and how learning materials and experiences will be introduced, demonstrating the emphasis on different knowledge and skill areas. The plan is a "road map" documenting development from knowledge and skills to the attainment of learning objectives, and ultimately, to competence *(8)*.

Curriculum content can be structured in multiple ways, the best of which can be informed both by sound principles of pedagogy, and by the experiences of equivalent or similar programmes. Programme organization is also dynamic and should be informed by ongoing learner and faculty feedback (Step 12).

The following questions can help determine how curriculum content is structured within a curriculum plan:

- **What learning should be theoretical, versus applied?**

  There are different schools of thought relating to when a learner should be exposed to the settings in which they will eventually work. Early exposure enables the contextualization of knowledge and early development of skills; later exposure enables a strong theoretical foundation before applied learning. Practical considerations, such as adequate access to supervision in a clinical setting, are also determining factors *(3)*.

- **What depth and scope of subject matter can feasibly be included within a course?**

  The amount of curriculum content that can be included in a course, and the depth at which learners examine this content, should reflect existing or baseline knowledge and skills (i.e. the knowledge and skills the learner has when entering the course, based on entrance criteria and courses completed), and the time allocated to the course.

- **How do knowledge and skills intersect and consolidate in the context of different learning objectives?**

  Programme composition and structure within a curriculum plan should reflect the accumulated knowledge and skills necessary to achieve the learning objectives. As discussed in Step 6, some courses may be targeted at specific areas of knowledge or skill (e.g. medical sciences), while others will require a range of knowledge and skills to be integrated and applied. The former may not aim at achieving a programme learning objective, but rather develop a course learning objective that serves as a foundational building block towards the achievement of programme learning objectives in later courses. Courses should include manageable components of curriculum content commensurate with learning expected, based on where the course is positioned within the programme *(2)*.

In addition to the curriculum plan, content can be organized and described to greater detail in a course syllabus. A syllabus specifies the course learning objectives, which should reflect, or align with, the learning objectives of the relevant programme, and should generally specify the specific knowledge, skills, or values and beliefs that are being targeted in the course. A course syllabus further describes how the learning content will be taught on a lesson-to-lesson, or week-by-week, basis. Course syllabi can be accessed by learners to inform them of what they can expect from the course, and what is required of them. Course syllabi will often have significant input from the educator(s) responsible for the course, although decisions concerning how a syllabus is designed will depend strongly on the educational approaches adopted by the institution.

STEP 8. ALLOCATE TIME AND RESOURCES TO COURSES

An important part of operationalizing a curriculum plan is determining the time and materials required for each course within the programme. The time allocated to courses should reflect the complexity of the subject matter and the weight of its contribution to the attainment of the programme's learning outcomes. Some subject areas may need to be extended over several courses in order for the scope and depth to be adequately captured, while for others, learners may need only a superficial or introductory level of exposure.

Prescribing set amounts of time to different areas of learning is somewhat at odds with the core principles of competency-based education, which advocates a highly flexible approach to learning, whereby a learner's progression through a programme is dictated by their attainment of required behaviours or tasks, rather than completion of courses of study. However, it is important to acknowledge that competence is not static and will continue to develop within and beyond the programme. Reconciling a time-based curriculum with competency-based education is possible, provided that the milestones towards attaining competencies and activities of the curriculum are defined and signal progression between courses *(3)*.

A programme's learning materials can considerably impact the quality of learning experiences and should be appropriate to learning context (i.e. relevant to the country and setting in which the curriculum will be taught and implemented). For example, some materials published in high-income or urbanized settings may need to be complemented with information relevant to low-income or rural settings. Learning materials should also be up-to-date and reflect evidence-based practice. Educational institutions can be important stakeholders in evidence-based guideline and protocol development. The process of identifying learning materials for a programme can highlight gaps and the resources needed to address these.

PHASE 4. ASSESSMENT

A key characteristic of competency-based education is the meaningful assessment of competence, which is also one of the greatest challenges to its implementation *(11)*. Steps 9 and 10 propose a systematic approach to developing assessment strategies and ensuring that assessment aligns with an institution's resource availability.

STEP 9. ASSIGN ASSESSMENT METHOD(S) TO EACH OF THE LEARNING OBJECTIVES IN THE CURRICULUM

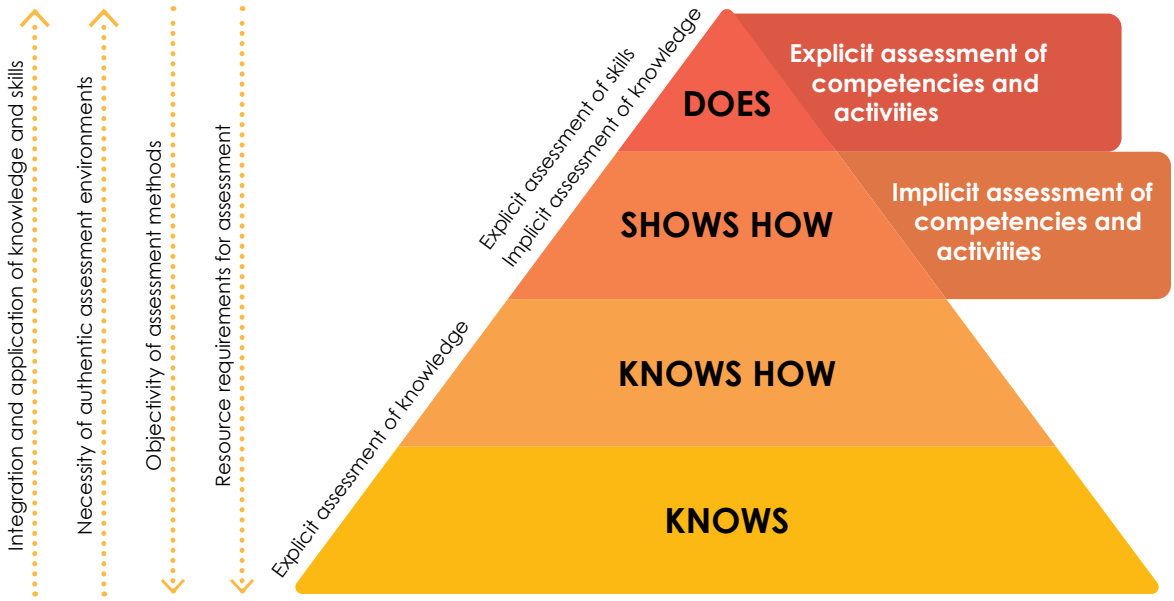
Some of the functions of a curriculum are to delineate the types of assessment methods employed, and to demonstrate the robust assurance of competence, and a required level of proficiency *(2)*. Determining attainment of competencies and mastery of activities should incorporate multiple assessment formats. Interaction of a learner's performance with that of other people, as well as with environmental factors, requires the learner being observed performing activities in a wide range of contexts, and competencies being assessed in the context of multiple different activities *(3, 6, 12)*. Assessment is thus both a complex and a resource-intensive aspect of competency-based education, and requires careful consideration and planning.

Various factors influence the selection of the assessment method:

- **Suitability**: Is the assessment conducive to the learning objective being tested?
- **Reliability**: Does the assessment perform consistently, and is it trustworthy *(3, 13, 14)*?
- **Validity**: Does the assessment measure what it is intended to measure *(3, 13)*?
- **Resource requirements**: Are the required resources (human and material) available *(3)*?
- **Feasibility**: Is implementation possible, when considering the size of the cohort, the time required, and/or the logistical factors *(3)*?

"Miller's Pyramid", shown in the model below, posits that the learning process progresses from "Knows" to "Does" (Figure 6) *(15)*. The model shows how assessment methods reflect this progression, and how progression corresponds with a shift in the objectivity and resource requirements of assessment, as the necessity for authentic assessment environments increases.

Figure 6. The implication for assessment of the progression through the stages of Miller's Pyramid



Competency-based education involves carefully aligning assessment methods with learning objectives *(14)*. Table 5 provides an example using the learning objectives of Tables 3 and 4. The assessment methods included in Table 5 should be interpreted as a demonstration of the diversity of assessment methods that may suit different objectives (acknowledging that they do not present an exhaustive list of potential methods), and how multiple methods can be used for one objective. Assignment of assessment methods as shown in Table 5 should not be construed as the most appropriate per se, since this will depend on how the factors listed earlier apply to a specific curriculum context *(8)*. Multiple learning objectives may be assessed with the same method, and, where appropriate, simultaneously *(6)*.

Table 5. Example of programme learning objectives assigned to different assessment methods

Programme learning objectives	Written essay	Written test	Oral questioning	Case discussion	Oral presentation	Self-assessment	Peer assessment	Observed performance	Report
C4.1.1 Describes the International Classification of Functioning, Disability and Health (ICF) model	X	X							
C4.1.2 Describes the potential role of personal, environmental and health factors in impacting functioning	X		X	X					
C4.1.3 Compiles a problem list that captures personal, environmental and health factors specific to a person and their family		X					X		X
C4.2.1 Identifies different sources of information				X		X		X	
C4.2.2 Demonstrates the ability to manage conflicting information from different sources				X				X	
C4.2.3 Presents a complete picture of a situation to a person and their family to facilitate their optimal engagement in decision-making						X		X	
C4.3.1 Engages in a joint problem-solving discussion with a person and their family						X		X	
C4.3.2 Identifies a range of potential solutions to optimize functioning by addressing relevant personal, environmental and health factors		X	X	X				X	X
C4.3.3 Identifies factors that contribute to selection of the most appropriate approach for a person and their family	X	X	X	X				X	
A3.1.1 Identifies the type and purpose of information to be collected		X						X	
A3.1.2 Conducts a chart review								X	X
A3.1.3 Conducts a logical and organized interview with a person and their family						X		X	
A3.1.4 Identifies and uses alternative sources of information when indicated								X	
A3.1.5 Identifies the chief complaint(s) of a person and their family								X	X
A3.1.6 Identifies significant factors impacting the person and their family's rehabilitation management plan								X	X
A3.2.1 Identifies indications a person is in need of protection measures		X		X					
A3.2.2 Describes the legal obligations and protocols for initiating protection mechanisms		X		X					
A3.2.3 Describes the potential barriers to identifying a person at risk of harm		X		X					
A3.3.1 Describes the potential assessment tools relevant to a person and their family				X	X				
A3.3.2 Manages the environment to provide optimum conditions for the assessment						X		X	
A3.3.3 Conducts a cognitive test using a standardized instrument						X		X	
A3.3.4 Scores, interprets, and reports the results of the assessment						X		X	X

When constructing a curriculum plan, additional assessments will target specific components of the subject matter relevant to each course. Depending on the educational approaches adopted by the institution, assessments in the earlier phases of a programme may target specific knowledge and skills, rather than behaviours or tasks, which begin to emerge once their informational base has been established. Selection of assessment methods requires consideration of the same factors as listed above.

A further important consideration when selecting assessment methods is whether an assessment is formative or summative. When assessment is designed primarily to aid learning (formative), the priority is to provide a learning experience, and an indication of progress against learning objectives that signals learning needs *(11)*. These typically occur more frequently throughout a course and, therefore, assessment methods that are less resource-intensive may be selected. Summative assessment evaluates the learner's achievement of the learning objectives and, ultimately, their attainment of competence. Factors such as reliability and validity hold stronger weight in the context of summative assessment, which may also justify greater investment of resources, given that learner performance in summative assessment indicates their ability to progress through, or complete, the programme.

STEP 10. DETERMINE THE THRESHOLD FOR PROGRESSION IN OR COMPLETION OF A PROGRAMME

Decisions need to be predetermined regarding what a learner needs to achieve before progressing through the programme, or to achieve the programme's award. Such decisions may be guided by a number of factors including:

- the institution's policies;
- factors that indicate readiness to progress in the context of the subject area, or competencies or activities;
- the implications of the decision for practice (i.e. does programme completion qualify the graduate to enter the workforce, or is an additional phase of assessment needed, such as a licencing exam?) *(3, 11)*;
- the conditions under which the learner will be working once they have completed the programme (e.g. the level of supervision and support they will receive) *(3)*; and
- the potential risks of a learner performing below the level of required competence *(3, 11)*

In the context of competency-based education, decisions about progression through, or completion of, a programme should not rest on a single assessment method; rather they should draw on an array of information from multiple summative assessments that indicate the learner's performance of the competencies and activities in a range of contexts *(3, 11, 13)*. When adequate performance of competencies and activities, aligned with population rehabilitation needs, are established through comprehensive summative assessment, the quality and relevance of graduates can be assured *(3)*.

PHASE 5. IMPLEMENTATION

STEP 11. BUILD INSTITUTIONAL CAPACITY TO IMPLEMENT THE PROGRAMME

Ensuring successful implementation of competency-based education requires investment in institutional capacity; this includes strong administrative systems and staff, and equipping faculty to teach and assess the curriculum *(8)*. Where competency-based education is newly implemented, offering faculty the opportunity to visit and learn from well-established institutions can be useful (Table 6 describes various approaches to building the capacity of faculty to deliver competency-based education). Ongoing professional development of faculty is also necessary for ensuring faculty retention and quality education. Institutions need to ensure an appropriate ratio of faculty and clinical educators to learners in order to support programme implementation, noting the heavier assessment burden associated with competency-based education.

Research capacity should also be considered. Institutions should look to develop a strategy that allows expansion in this area over time, including identifying potential funding grants, ethics committees, and building partnerships with national and international research institutions. This is especially important for institutions offering post-graduate courses, but is also valuable in exposing undergraduate learners to research.

Table 6. Approaches to building the capacity of faculty to deliver competency-based education

Approach	Considerations
Learning tours Visits by faculty to educational institutions which have a strong reputation for delivering competency-based education. During these tours, faculty observe and study the approaches in order to better implement these in their own institution. Typically, lessons learned during a tour are shared with other faculty to maximize the benefits of the investment of time and resources.	Sending multiple faculty on learning tours can be resource intensive, in terms of costs both for travel and time; local faculty are diverted from their teaching responsibilities for the duration of their tour, which can disrupt the delivery of the programme. Learning tours are valuable in that they offer an immersive experience which can be difficult to replicate through other approaches. They can also foster positive relationships between institutions, and provide wider and longer-term benefits for the programme.
Faculty mentorship Faculty from educational institutions that have a strong reputation for delivering competency-based education, are brought in to teach and mentor local faculty for a specified time period.	Bringing one or several competency-based education experts to the institution where the new programme or curriculum is being implemented can be more cost-effective than sending local faculty on a study tour, but does not provide the same immersive experience. A benefit of local faculty remaining at their institution is that delivery of the programme is not disrupted. This can be especially important when the number of faculty is very limited.
Continuous professional development courses Faculty are supported to undertake courses in competency-based education, such as those offered by a university or teaching college.	Supporting faculty to undertake professional development courses in competency-based education involves allowing them the required time to participate and meet the demands of the course, as well as potentially covering the cost of the course.

Approach	Considerations
Comprehensive teaching and learning courses	Faculty, or potential faculty, can be supported to attend specific comprehensive courses on teaching and learning, either as an intensive block, or part-time. These courses may be offered by the educational institution in which the faculty will work, or externally. Typically, these courses may include the following topics: • Teaching and learning principles • Syllabus development • Course design • Course goals • Instructional methods • Teaching in the classroom • Assessment of teaching and learning • Development of assessment scoring criteria (rubric development) Comprehensive courses are likely to be more resource-intensive than incremental training, or ad-hoc professional development training; they are also likely to cover a wide range of content to greater depth. Comprehensive courses should be particularly considered for faculty with limited, to no teaching experience, acknowledging that delivering education and training effectively requires specific knowledge and skills, and that well-trained faculty are fundamental to providing quality education.
Comprehensive higher education leadership courses	As described above, faculty, or potential faculty, can be supported to attend specific comprehensive courses on leadership in higher education, either as an intensive block, or part-time. Typically, these courses might include the following topics: • Personal leadership development • Leading others • Leadership in the classroom • Leadership in the clinic/health system • Conflict resolution Faculty who will be supporting other staff, or holding a leadership or managerial role, can benefit from such courses, especially in a new programme where challenges associated with establishing courses call for clear direction and guidance.
Integrate courses on teaching and learning into rehabilitation programmes	Where a rehabilitation profession is still being established in a country, and the pool of faculty is very limited, courses on teaching and learning can be integrated into rehabilitation programmes so that graduates emerge with some capability to take on faculty roles. While faculty should ideally be highly experienced and hold post-graduate qualifications, this option may be suitable as a mechanism of progressive realization.

STEP 12. EVALUATE AND REVISE THE CURRICULUM

Regular evaluation and revision are good practices for all curricula. Evaluation should examine faculty performance, course and programme structure, and learner outcomes, in terms of results and employment. A curriculum evaluation team can comprise representatives from faculty, administration and learners. The team can oversee the evaluation processes, some of which may already be established by the institution, and ensure that the results are thoroughly reviewed and acted upon. Table 6 suggests curriculum evaluation information from a range of groups and in a number of formats.

Table 7. Examples of a curriculum evaluation approach

Evaluation topic	Audience	Format	Example points of enquiry
Course content	Learners	Course evaluation questionnaire	• Content relevance • Educational approach • Learning materials • Learning experiences • Level of difficulty • Learner readiness • Methods and burden of assessment
	Educators	Interview or survey	• Learner readiness • Methods and burden of assessment • Learning materials • Learning experiences • Adequacy of teaching support
Educator/supervisor performance	Learners	Educator/supervisor evaluation questionnaire	• Knowledge of subject area/skills • Preparation • Organization • Teaching/supervisory style • Fairness • Communication • Availability • Approachability
Learner performance	Educators and supervisors	Learner performance evaluation	• Learner/graduate general readiness for practice • Learner/graduate performance in relevant domains (practice, professionalism, learning and development, and research) • Learner/graduate confidence • Learner/graduate values and attitudes
Programme quality	Learners and educators	Programme evaluation questionnaire/focus group	• Achievement of learning objectives • Quality of programme/course organization • Quality of learning materials • Quality of learning experience • Quality of infrastructure/facilities • Quality of faculty • Overall satisfaction
Graduate experiences	Learners	Survey/interview	• Number of students employed (disaggregated by sector and location) • Average time until employed • Readiness for job responsibilities • Alignment of knowledge and skills with population needs
Service user satisfaction	Service users	Service-user survey	• Quality of care • Communication and cultural competence

Evaluation processes should be embedded within the curriculum and performed on an ongoing basis (e.g. course and teacher evaluations at the completion of each course; programme evaluation as each cohort graduates, etc.). Mechanisms should be in place to respond promptly to feedback, for example through modifying learning materials, and teaching styles, and by increasing learner access to educators. Curriculum revision, which encompasses a larger-scale amendment such as eliminating or replacing courses, reordering courses,

or modifying educational approaches, should also occur at set intervals, acknowledging the resources required to perform this revision thoroughly. The regularity of these intervals should also reflect the indications to do so, or lack thereof, based on the feedback derived from evaluation processes.

Avoiding potential pitfalls	
Potential pitfalls:	**Mitigation strategies:**
Neglect of culturally-significant competencies, such as establishing rapport, in favour of competencies related to performance of rehabilitation interventions (i.e. skewing curriculum focus to activities, especially those linked to employment) *(2, 8)*.	• Ensure courses and assessments place weight on learning objectives related to cultural and other "soft" competence. • Ensure evaluation processes review cultural, and other "soft" competencies.
A focus on individual components of performance, often activities, leading to an underemphasis of comprehensive performance (i.e. "checkbox education") *(6, 11)*.	• Ensure ample exposure to authentic learning environments that enable learners to integrate and develop a range of competencies and activities. • Ensure assessment places proportional emphasis on competencies in the context of performance of activities.
A prohibitive assessment burden *(11)*.	• A combination of formative and summative assessment, as well as assessment in authentic environments, is integral to competency-based education. Curricula can explore approaches to economize assessment (such as through use of technology). Institutional capacity needs to accommodate the assessment load.

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ANNEX 1. CHECKLIST FOR COMPETENCY-BASED EDUCATION

The following checklist endeavours to capture the key components of competency-based education, and is based on the competency-based education implementation framework proposed by Melle et al.[1]

- ☐ Competencies and activities are based on rehabilitation needs in the population
- ☐ Competencies and activities to be attained are clearly articulated in the curriculum
- ☐ Competencies and activities and their developmental markers are sequenced progressively in the curriculum plan
- ☐ Learning materials and experiences facilitate the developmental acquisition of competencies and activities
- ☐ Learning takes place in settings that model practice
- ☐ Educational approaches promote the developmental acquisition of competencies and activities
- ☐ Formative and summative assessment supports and documents the developmental acquisition of competencies and activities
- ☐ Programmatic assessment allows for valid and reliable decision-making
- ☐ Learner progression through, and from, the programme is based on multiple points of information, careful interpretation, observation, and feedback
- ☐ Assessment thresholds that determine a learner's progression from the programme reflect the expectations and responsibilities of learners once they graduate

[1] Melle EV, Frank JR, Holmboe ES, Dagnone D, Stockley D, Sherbino J. A core components framework for evaluating implementation of competency-based medical education programs. Academic Medicine. 2019;94(7):1002–9.

ANNEX 2. TEMPLATE FOR COMPETENCY-BASED REHABILITATION PROGRAMME AND CURRICULUM

The following template provides a structure for documenting a rehabilitation programme and its curriculum. The template should be adapted as needed, and amended to suit the requirements of the institution.

1. Introduction
    a. Description and history of the profession
    b. Rehabilitation needs within the population
    c. Overview of the health system
    d. Contribution of the profession to population health
    e. Rational for curriculum development
2. Vision, mission and values
3. Academic qualification awarded
4. Programme duration
5. Requirements for admission
6. Requirements for graduation
7. Governance and management of the programme
8. Faculty requirements, availability, and recruitment
9. Curriculum
    a. Competencies and behaviours of the curriculum
    b. Activities and tasks of the curriculum
    c. Learning objectives, knowledge and skills
    d. Key learning materials
    e. Learning experiences
    f. Educational approaches
    g. Assessment
        i. Assessment strategies
        ii. Remediation policy
    h. Curriculum lifecycle
        i. Evaluation strategies
        ii. Evaluation and review intervals
10. Curriculum plan (see Annex 3)
11. Evaluation forms

ANNEX 3. TEMPLATE FOR COMPETENCY-BASED REHABILITATION CURRICULUM PLAN

The following template provides a structure for a curriculum plan. It should be adapted according to the programme duration, structure of the academic year (number of semesters), and the number of courses included in each semester. The course plan should indicate which courses are core/compulsory and which are elective.

Year	Semester	Course title	Course code	Description	Relevant programme learning objectives	Weight (units)	Learning hours
1	1			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
	2			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			

Year	Semester	Course title	Course code	Description	Relevant programme learning objectives	Weight (units)	Learning hours
2	1			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
	2			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			

Year	Semester	Course title	Course code	Description	Relevant programme learning objectives	Weight (units)	Learning hours
3	1			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
	2			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			

Year	Semester	Course title	Course code	Description	Relevant programme learning objectives	Weight (units)	Learning hours
4	1			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			
	2			Summary			
				Course learning objectives			
				Assessment			
				Summary			
				Course learning objectives			
				Assessment			

World Health Organization