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## Short Communication

# Introducing Competency-Based Education Based on the Roles that Physiotherapists Fulfil

### Abstract

**Introduction:** Although there has been a shift towards competency-based medical education in the past decade, little literature is available about the specific use of competency-based education in physiotherapy education. The purpose of this article is firstly to describe the development of a competency-based educational program for physiotherapy and secondly to present the results of the evaluation of the competency-based program by an independent panel of stakeholders.

**Method:** A role-based competency framework was gradually developed and implemented in a 5-year university-based physiotherapy education program leading to a Master of Science degree. A stakeholder panel was asked to which degree they agreed that the specified roles and competencies were important for physiotherapists.

**Results:** Competencies were defined for the roles of clinician, scientist and professional and linked to behavioural indicators, carefully checking that the model covered all Dublin descriptors. Although a vast majority of the stakeholder panel considered the proposed roles (92,8%) and competencies (100%) as a strong characteristic of the program, scientific competencies were generally considered less important than clinical or professional competencies.

**Conclusions:** Competencies of a role-based educational program for physiotherapy should be aligned with competencies expected in the professional field paying special attention to scientific competencies needed for evidence-based clinical practise and innovation of physiotherapy.

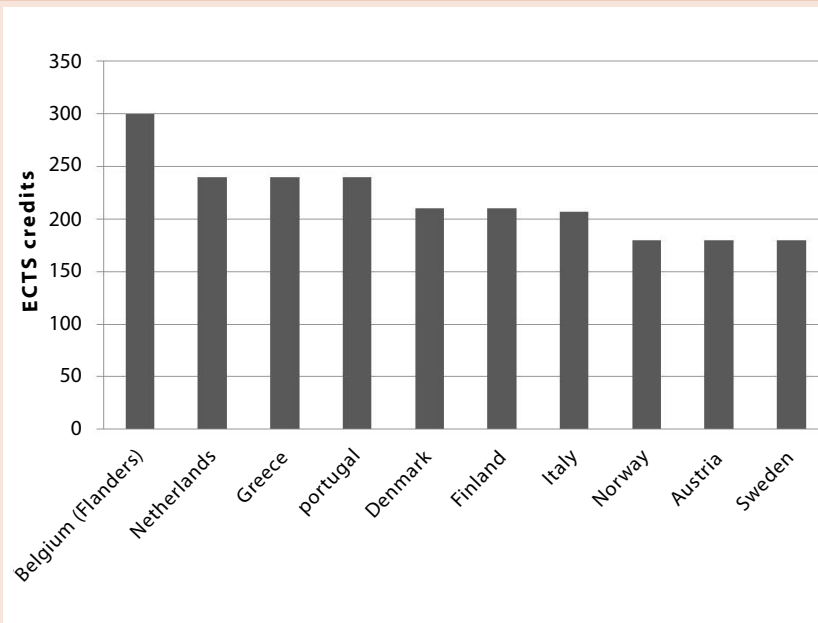
## Introduction

Competency-based education (CBE) is focused on outcomes (competencies) that are linked to workforce needs, as defined by employers and the profession. Therefore, it is focused on skills, knowledge and attitudes of graduates, rather than solely what goes into the curriculum. With a competency-based approach, firstly, the competencies that need to be attained by the students are identified and secondly, the content to support student attainment of those competencies is selected. Such an approach needs to be accompanied by a robust and multifaceted assessment system [1]. There seems to be a need for the development of appropriate steps to promote dialogue, critique and innovation within and among professions about relevant competencies when introducing a competency-based educational program [2]. Competency-based approaches to interprofessional education have been developed in parallel to competency-based approaches within the health professions [3].

The challenge seems to be to engage all stakeholders in this dialogue [4]. Meeting the challenges of a competency-based framework and supporting these educational innovations require a robust faculty development program [5,6]. Although core competencies that are important for physiotherapists seem to be available [7-9] and the use

of CBE in medical education seems to be well described [10], there exists, to the best of our knowledge, little literature about the specific use of CBE in physiotherapy education. With a steady push towards education of evidence-based practise, there seems to be an increasing interest in physical therapy PhD programs, both in Europe and the United States. In Europe there is a lot of difference in the diploma and the credits needed to start working as a physiotherapist (Figure 1). In Flanders, the Dutch-speaking part of Belgium, physiotherapists graduate as a Master of Science in rehabilitation sciences and physiotherapy. They enrol in a 5-year educational program of the second cycle, as described in the Bergen conference of European ministers responsible for higher education [11] that consists of a 3-year bachelor program (180 ECTS Credits) and a 2-year master program (120 ECTS Credits).

In 2006, CBE was introduced in the physiotherapy educational program of the University of Antwerp. The goal of this paper is to describe the development and stepwise introduction of competency-based physiotherapy education that is based on the roles a physiotherapist fulfils and to report on how the proposed competencies were perceived by representatives of the profession and stakeholders.



**Figure 1:** Overview of the number of credits of diplomas physiotherapy in various European countries. ECTS denotes European Credit Transfer System.

## Design, Setting and Method

The development and stepwise implementation of the CBE was designed by a committee on curriculum and educational innovation composed by representatives of the different research and education groups of the department of rehabilitation sciences and physiotherapy of the University of Antwerp. In the results section an overview of their working process towards CBE is described. The national and international models that served as the foundation for the renewed curriculum are explained.

A panel of stakeholders ( $n=17$ ) were asked (by questionnaire) to which degree they agreed that the proposed roles and competencies of the renewed CBE were important for physiotherapists. This panel of stakeholders included practising physiotherapists, employers, health insurance companies, professional associations, external academics and representatives of the government. The panel consisted of 5.9% students, 5.9% alumni, 52.9% representatives of the profession, 17.5% educational experts, 35.3% policy makers (multiple answers were possible). For each competency within each role a 4-point ordinal scale had to be filled in ranking from not important to very important.

## Results

The committee on curriculum and educational renewal of the physiotherapy education proposed a framework, based on roles and competencies, to rebuild the curriculum. This proposition was discussed and approved in the educational board. The roles were based on the CanMEDS roles [12-14] and turned out to be congruent to the roles proposed by the Belgian National Council for Physiotherapy in 2010 (Figure 2).

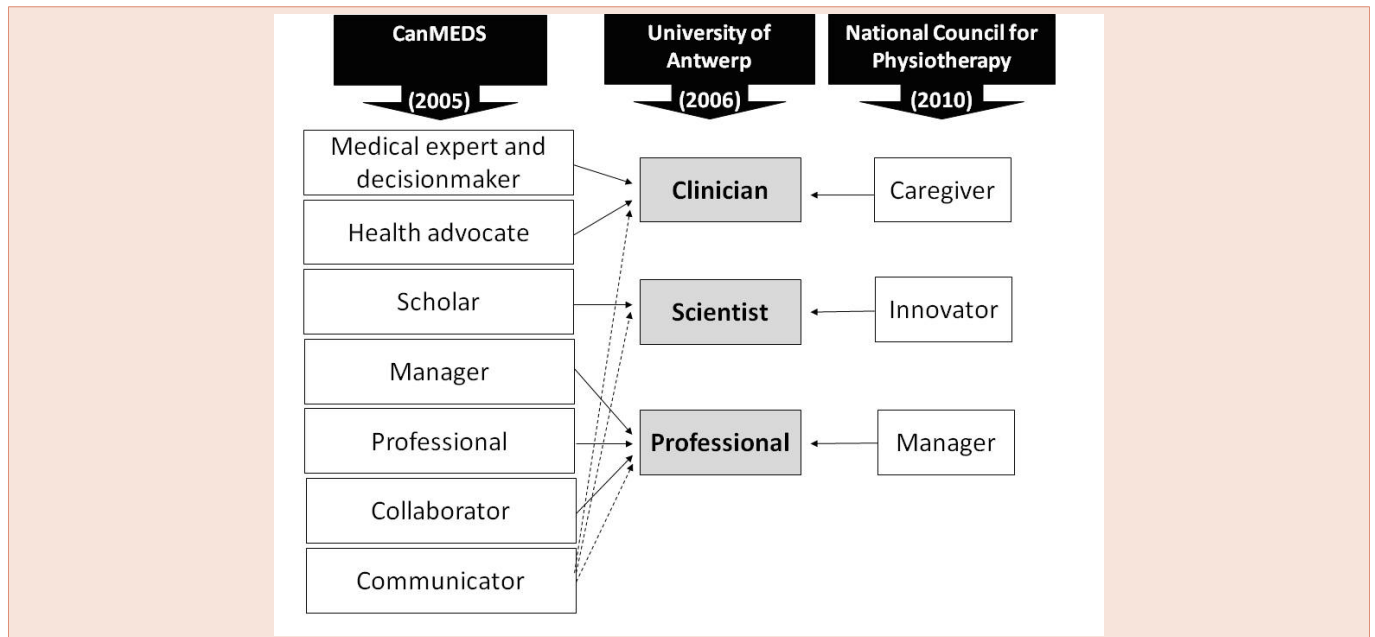
Within each role, competencies were defined (Tables 1 and 2). All competencies were cross-checked with the Dublin descriptors as

described in the Bologna framework [15,16]. The Dublin descriptors offer generic statements of typical expectations of achievements and abilities associated with qualifications that represent the end of each of the Bologna cycle and refer to the following five dimensions: 'knowledge and understanding', 'applying knowledge and understanding', 'making judgements', 'communication' and 'learning skills'.

For every competency, behavioural indicators were formulated, allowing assessment of the competencies attained by a student. The curriculum was redesigned and optimized so that students can acquire and develop all of the specified competencies, using a covering matrix (competencies x courses). The curriculum was built around central themes per year (Figure 3).

Evaluation and assessment were based on competencies and corresponding behavioural indicators. For every course an assessment matrix was developed, indicating clearly what competencies will be assessed based on which behavioural indicators and what the relative weight of each competency is. The introduction of this CBE was a stepwise process, spread over 5 consecutive years, which began in the first year of the curriculum. Every year there were teacher study days, where workshops were given on specific topics such as: how to re-write your course information using competencies and behavioural indicators, competency-based assessment and making an assessment matrix. By introducing new concepts gradually and repeating the established concepts, but also by providing hands-on workshops, there was a good overall support for the use of CBE.

In 2011 the roles, competencies and curriculum were presented to a broad group of stakeholders including representatives of the profession, employers, academic and educational representatives and representatives of health insurance companies. We asked them



**Figure 2:** Roles for a physiotherapist as defined by the University of Antwerp were based on the roles described in the CanMEDS and turned out to be congruent with the roles as defined by the Belgian National Council for Physiotherapy.

**Table 1:** Roles and competencies of the Bachelor of Science in Rehabilitation Sciences and Physiotherapy with scores, expressed as percentages, of the panel of stakeholders (n=17).

Bachelor of Science in Rehabilitation Sciences and Physiotherapy					
Roles	Competencies	Not important	Somewhat important	Important	Very important
Clinician	The student has knowledge and comprehension of the functioning of humans	0.0	0.0	29.4	70.6
	The student has comprehension of physical activity	0.0	0.0	37.5	62.5
	The student applies physiotherapeutic techniques	0.0	6.3	12.5	81.3
	The student knows and fulfils his role as physiotherapist in the health care system	0.0	6.3	43.8	50.0
	The student applies correct clinical reasoning	0.0	0.0	29.4	70.6
	The student adjusts his physiotherapeutic methods to specific goals and context	0.0	11.8	23.5	64.7
	The student communicates in a correct and relevant way	0.0	0.0	23.5	76.5
	The student reflects on his role as a clinician	0.0	5.9	35.3	58.8
Scientist	The student has knowledge and comprehension of research methodology	0.0	13.3	53.3	33.3
	The student performs a literature study	0.0	25.0	50.0	25.0
	The student collects, analyzes and interprets data	0.0	26.7	46.7	26.7
	The student chooses the appropriate scientific research methodology	0.0	6.3	62.5	31.3
	The student formulates research question that are relevant for health care	0.0	20.0	60.0	20.0
	The student interprets experimental data from literature and makes the link with concepts discussed during classes	0.0	12.5	62.5	25.0
	The student reports about scientific research	0.0	37.5	37.5	25.0
	The student takes the initiative to look up specific scientific literature	0.0	17.6	29.4	52.9
	The student reflects on his role as scientist	0.0	28.6	50.0	21.4

Professional	The student uses his social skills	0.0	6.3	43.8	50.0
	The student does things as agreed upon	0.0	5.9	23.5	70.6
	The student is efficient and accurate	0.0	0.0	31.3	68.8
	The student acts in a deontological correct way	0.0	11.8	17.6	70.6
	The student communicates appropriate	0.0	0.0	41.2	58.8
	The student plans his learning trajectories	0.0	11.8	41.2	47.1
	The student reflects on his role as professional	0.0	6.3	37.5	56.3

**Table 2:** Roles and competencies of the Master of Science in Rehabilitation Sciences and Physiotherapy with scores, expressed as percentages, of the panel of stakeholders (n=17).

Master of Science in Rehabilitation Sciences and Physiotherapy					
Roles	Competencies	Not important	Somewhat important	Important	Very important
Clinician	The student inventarizes the complaints of the patient	0.0	0.0	12.5	87.5
	The student performs a physiotherapeutic examination	0.0	0.0	12.5	87.5
	The student applies correct clinical reasoning	0.0	0.0	12.5	87.5
	The student formulates correct and relevant therapeutic goal	0.0	0.0	31.3	68.8
	The student proposes a correct and relevant physiotherapeutic treatment	0.0	0.0	18.8	81.3
	The student applies physiotherapeutic techniques	0.0	0.0	12.5	87.5
	The student adjusts his physiotherapeutic methods to specific goals and context	0.0	0.0	18.8	81.3
	The student evaluates the result of the treatment and adjusts if necessary	0.0	0.0	12.5	87.5
	The student communicates in a correct and relevant way	0.0	0.0	18.8	81.3
	The student reflects on his role as a clinician	0.0	6.3	25.0	68.8
Scientist	The student performs a systematic analysis of scientific sources	0.0	18.8	31.3	50.0
	The student performs a systematic literature review	0.0	20.0	40.0	40.0
	The student formulates research questions	0.0	20.0	26.7	53.3
	The student performs scientific research	0.0	25.0	18.8	56.3
	The student interprets scientific data	0.0	12.5	18.8	68.8
	The student disseminates the scientific research	0.0	12.5	37.5	50.0
	The student reflects on his role as scientist	0.0	18.8	25.0	56.3
Professional	The student promotes a healthy lifestyle	0.0	6.7	46.7	46.7
	The student coaches a patient	0.0	0.0	18.8	81.3
	The student uses his social skills	0.0	6.3	18.8	75.0
	The student does things as agreed upon	0.0	0.0	18.8	81.3
	The student is efficient and accurate	0.0	0.0	12.5	87.5
	The student formulates didactical goals	6.3	6.3	37.5	50.0
	The student acts in didactical and methodical	0.0	6.7	46.7	46.7
	The student coaches the learning process	6.7	6.7	40.0	46.7
	The student uses his management skills	0.0	13.3	46.7	40.0
	The student is well organized	0.0	0.0	50.0	50.0
	The student communicates appropriate	0.0	0.0	31.3	68.8
	The student makes an assessment	0.0	0.0	31.3	68.8
	The student shows a problem-solving attitude	0.0	0.0	26.7	73.3
	The student acquires an attitude towards lifelong learning	0.0	6.7	33.3	60.0
	The student is critical and creative towards the quality of his profession	0.0	0.0	37.5	62.5
	The student reflects on his role as professional	0.0	13.3	20.0	66.7

to evaluate both bachelor and master program separately. Although many competencies of the bachelor program are further developed in the master program (same roles), the master program focuses on scientific research and the application of existing knowledge and skills in more complex contexts (Figure 3). In the final (second) year of the master program the students choose a specialisation such as musculoskeletal physiotherapy (incl. manual therapy or sports physiotherapy), physiotherapy in internal or neurological disorders and geriatric or pediatric physiotherapy.

In general the roles and competencies were perceived as a strong characteristic of the educational concept. In the bachelor of science in rehabilitation sciences and physiotherapy the roles were mostly scored as strong (41.2%) and very strong (47.1%), out of 5 possibilities ranging from very weak to very strong. The competencies of the bachelor program were scored as strong (60%) and very strong (40%). Also in the master of science in rehabilitation sciences and physiotherapy the roles and competencies were mostly scored strong (37.5%, resp. 47.1%) and very strong (56.5%, resp. 52.9%).

A detailed overview of the scores of the individual competencies is given in tables 1 and 2. The scientific competencies were generally considered less important than the clinical or professional competencies.

## Discussion

The educational concept of the physiotherapy program of the University of Antwerp is based on competencies and knowledge. This duality is underlined in an effort to narrow the possible gap between theory and practise [17]. One of the possible pitfalls of CBE could be, in our opinion, to accentuate the attainment of skills and attitudes and to diminish the importance of gained knowledge. There are some other possible drawbacks to CBE. It can be a time-consuming model that can weigh heavily on organizational and financial resources [18]. Working with competency-based frameworks can seem rather theoretical and disconnected from clinical activities

to clinicians [19]. However, despite of the criticism and challenges that remain, the past decade has seen a movement away from time-based training to a competency-based medical education model that focuses on observable and measurable outcomes [20]. This is mainly due to the need for educational institutions to meet the needs of employers in the health care field and the increasing importance for health professionals of working interdisciplinary on the one hand and demonstrating a unique role in health care on the other hand [21]. In this paper we described a framework for competency-based physiotherapy education based on roles that physiotherapists fulfil and demonstrated that a gradual implementation of CBE is feasible. Although we acknowledge that the relative small number of participants in the group of stakeholders is a limitation of this study, we feel that the fact that this independent panel evaluated the proposed roles and competencies can be regarded as strength of this study. In general the proposed roles and competencies were evaluated as a strong characteristic. The scores of the individual competencies however, demonstrated that the scientific competencies are perceived somewhat less important than clinical and professional competencies. This can be regarded as a signal to increase communication and discussion with the profession on the role of scientist that a physiotherapist could fulfil. In the first place because there clearly is a need for scientific evidence in order to practise evidence-based physiotherapy [22]. Physiotherapists should be the driving forces for innovation of the profession and should therefore acquire the needed scientific competencies. Also when it comes to health insurance, it is important that a request for reimbursement of physiotherapy can be made based on available scientific evidence.

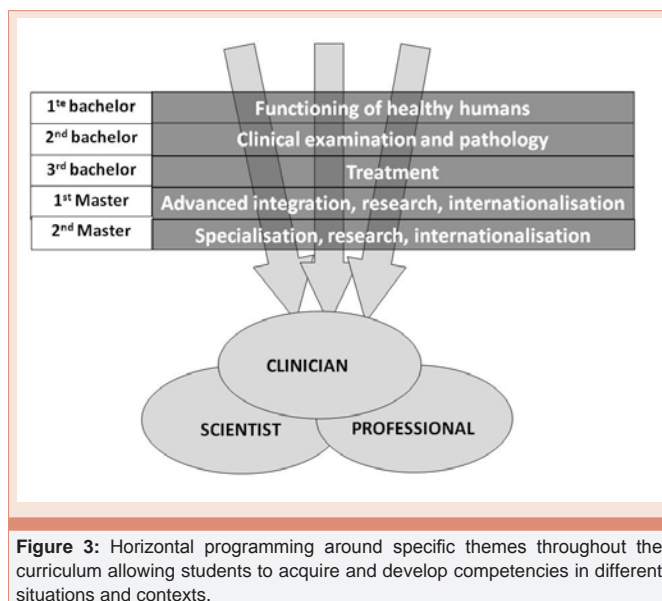
An international position stand on key competencies for physiotherapists would be welcomed and could contribute to a more comparable level of physiotherapy education, ensuring graduates meet entry-level standards of physiotherapy throughout the world. Physiotherapy diplomas in Europe for example, now vary from bachelor over bachelor of science to master of science.

## Conclusion

Introducing a competency-based educational program for physiotherapy is feasible. However, it should be taken into account that this is a gradual process that takes time and has to be accompanied by a competency-based way of assessment and will probably result in a redesigned curriculum since the program is subservient to the competencies that the student has to acquire and develop. Universities and colleges should involve representatives of the profession and other stakeholders to align competencies of the educational program and competencies expected in the professional field paying special attention for dialogue about the necessity of scientific competencies needed for evidence-based clinical practise and innovation of the profession.

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