USING ENTRUSTABLE PROFESSIONAL ACTIVITIES IN THE DESIGN OF THREE NEW HEALTHCARE UNDERGRADUATE PROGRAMS: BIOMEDICINE, NURSING AND PSYCHOLOGY

Alexandre Sampaio Moura[i],
Renata Toscano Simões,
Suelen Rosa de Oliveira,
Valenir Dias Machado Corrêa da Costa,
Lucimara Alves de Souza,
Tatiana Martins de Paula,
Gabriela Lazarini Prado Meireles,
Bruno Nascimento Moreira,
Rosa Malena Delbone
Faculdade Santa Casa BH,
Av. dos Andradas, 2.688,
Belo Horizonte, Brazil

Abstract:

Entrustable Professional Activities (EPAs) can be defined as a unit of professional practice that can be entrusted to a trainee after they have obtained adequate competency. EPAs integrate multiple competencies from several domains and are very useful in designing competency-based curricula. Using EPAs to design medical curricula has been widely described, but their application to curriculum design of other health-related undergraduate programs is scarce. This manuscript critically assesses an educational planning experience of using EPAs to simultaneously design three healthcare undergraduate programs (nursing, biomedicine and psychology) at Faculdade Santa Casa BH, Minas Gerais, Brazil. We present the EPAs for each program, curricula frameworks, educational strategies, and assessment methods. Expert groups of professors and educational specialists defined the core professional activities that would be directly assessed and entrusted to trainees from the three different programs. The expert group then defined the required knowledge, skills, and attitudes for each EPA and selected the appropriate assessment tools to be used in entrustment decisions. The expected entrustment level for each training phase guided the course's distribution of core and elective courses. The experience of designing a curriculum using EPAs was successful and helped focus on the core activities of each profession. It also provided an opportunity to reflect upon formative and summative assessments throughout the course bringing the challenge of reorienting our teaching practices and assessment approaches.

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[i] Correspondence: email alexandremoura@faculdadesantacasabh.edu.br

Designing undergraduate curricula of health-related professions using EPAs is feasible and might help operationalize competency-based curricula.

Keywords: competency-based education, entrustable professional activities, curriculum, biomedicine, nursing, psychology

1. Introduction

Competency-based education (CBE) has become increasingly used in health professional education in the past 20 years (Carraccio et al., 2002; Frank et al., 2010). Traditional curricula are usually organized around knowledge objectives and tend to emphasize the instructional process; on the other hand, in CBE such processes are secondary, and the curriculum is guided by outcomes. Besides focusing on outcomes, CBE also emphasizes the acquisition of abilities, promotes learner-centeredness and de-emphasize time-based learning.

A great advance of CBE is the understanding that health professional competence is multi-dimensional, dynamic, contextual, and developmental. For each domain of competence, there is a corresponding spectrum of ability from novice to master (Dreyfus, 2004). Competencies have become the unit of health educational planning, mostly in medical education, but they have been successfully used in other health professional courses (e.g., social work, chiropractic, pharmacology) (Frank et al., 2010).

The use of Entrustable Professional Activities (EPAs) in CBE was proposed to overcome barriers and help to operationalize curriculum design and students´ assessment. EPAs can be defined as units of professional practice that correspond to each profession's core. In contrast to competencies, EPAs are not an attribute of the student, being directly related to the work itself. Performing an EPA will require an integration of multiple competencies and thereby multiple skills, attitudes, and knowledge. In a curriculum based on EPAs, students need to be entrusted with critical professional activities to progress (Cate, 2019; Cate & Carraccio, 2019; O'Dowd et al., 2020a). In an EPA-based curriculum, students are expected to complete professional tasks competently with minimal supervision in the workplace at the end of the educational program.

EPAs are commonly integrated within competency frameworks across many healthcare curricula but are less evident in undergraduate programs of other professions such as biomedicine, nursing, and psychology. We present an educational planning experience using a matrix-mapping approach of combining EPAs with competencies to simultaneously design three healthcare undergraduate programs at Faculdade Santa Casa BH, Minas Gerais, Brazil.

2. Case presentation

Faculdade Santa Casa BH (FSCBH), located in Belo Horizonte, MG, Brazil, is part of the Santa Casa BH Group, which holds one of the largest non-profit hospitals fully dedicated to public health care. The hospital was founded more than 120 years ago and currently has around 1,200 beds with almost 40,000 admissions/year. FSCBH was created in 2020, initially offering an undergraduate course in Hospital Management and many postgraduate programs (medical and multidisciplinary residency training programs, multidisciplinary specialization programs in different fields, and a master′s/PhD program in biomedicine and medicine). In 2021, FSCBH decided to implement three new undergraduate programs: Biomedicine, Nursing, and Psychology.

Three groups of experts, each dedicated to a specific educational program, defined the core professional activities that students would be able to perform with reactive (or without) supervision by graduation. The groups were composed of 5-6 experienced professionals and one health education specialist. Instead of starting with the critical question used for developing a CBE curriculum (i.e., ''What abilities are needed of graduates?''), the groups initially defined key professional activities (and their main components) for each profession. The group then reflected on the current professional practice in different contexts, analyzed the national educational guidelines, and considered population health needs to reach a consensus on the EPAs for each program. The core EPAs defined for each course are shown in Figure 1.

Biomedicine
(1) Performing preanalytical laboratory procedures (2) Analyzing biological samples in a clinical laboratory (3) Performing post-analytical laboratory procedures (4) Managing quality processes in a clinical laboratory (5) Conducting scientific research in biomedicine (6) Innovating in biomedicine
Nursing
(1) Providing primary and ambulatory nursing care (2) Providing nursing care in the emergency setting (3) Providing inpatient nursing care (4) Managing nursing care excellence (5) Fostering continuous professional development (6) Conducting scientific research
Psychology
Core EPAs (1) Providing psychological assessment in different settings

(2) Establishing a psychological diagnosis
(3) Conducting individual psychological interventions
(4) Conducting collective psychological interventions
(5) Conducting community and social interventions
(6) Developing scientific thinking in psychology

Specific EPA (according to the emphasis)
(7) Performing healthcare psychology interventions (Health Psychology) or
(8) Performing organizational psychology (Organizational Psychology)

Figure 1: List of core Entrustable Professional Activities (EPAs) defined for the biomedicine, nursing and psychology undergraduate programs at Faculdade Santa Casa BH

After defining the EPAs, the expert groups detailed each EPA component (title, specification/limitation, relevant domains of competence, required experiences, knowledge, skills and attitudes (KSA), assessment information, milestones), using a template proposed by Ten Cate et al. (ten Cate et al., 2015). To assess if all competence domains have been addressed, KSA for each EPA were plotted in a matrix against the six domains (collaborative leadership, communication, social accountability, professionalism, self-regulated learning, and technical expertise) (Figure 2).
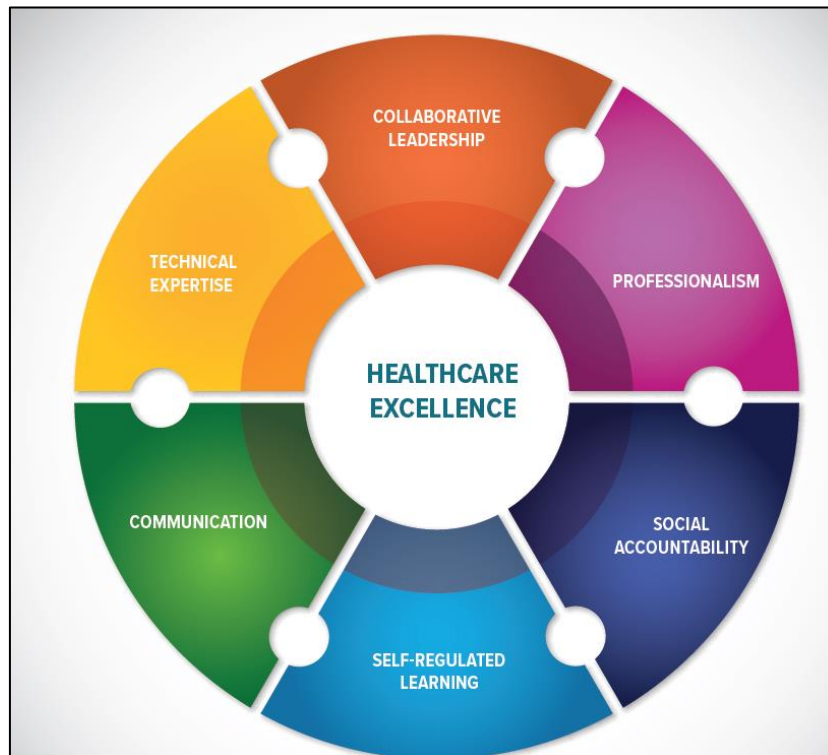

Figure 2: Competence domains used in the curriculum design of the educational programs of Biomedicine, Nursing and Psychology at Faculdade Santa Casa BH

A five-level "assignment and supervision scale" was used to establish students´ milestones throughout the courses (Cate, 2019). The designed curricula required students to be assigned to at least level 3 (i.e., "student is allowed to practice EPA only under reactive supervision or supervisory request") for most EPAs at graduation. The EPA templates were finally adjusted and guided the choice of instructional methods, assessment tools and distribution of core and elective courses.

The expert groups included in the curricula frameworks two vertical axes that will be shared by the three educational programs: interprofessional and innovation/research. A schematic version of the biomedicine curriculum is shown in Figure 3 to illustrate the general framework used by all programs.
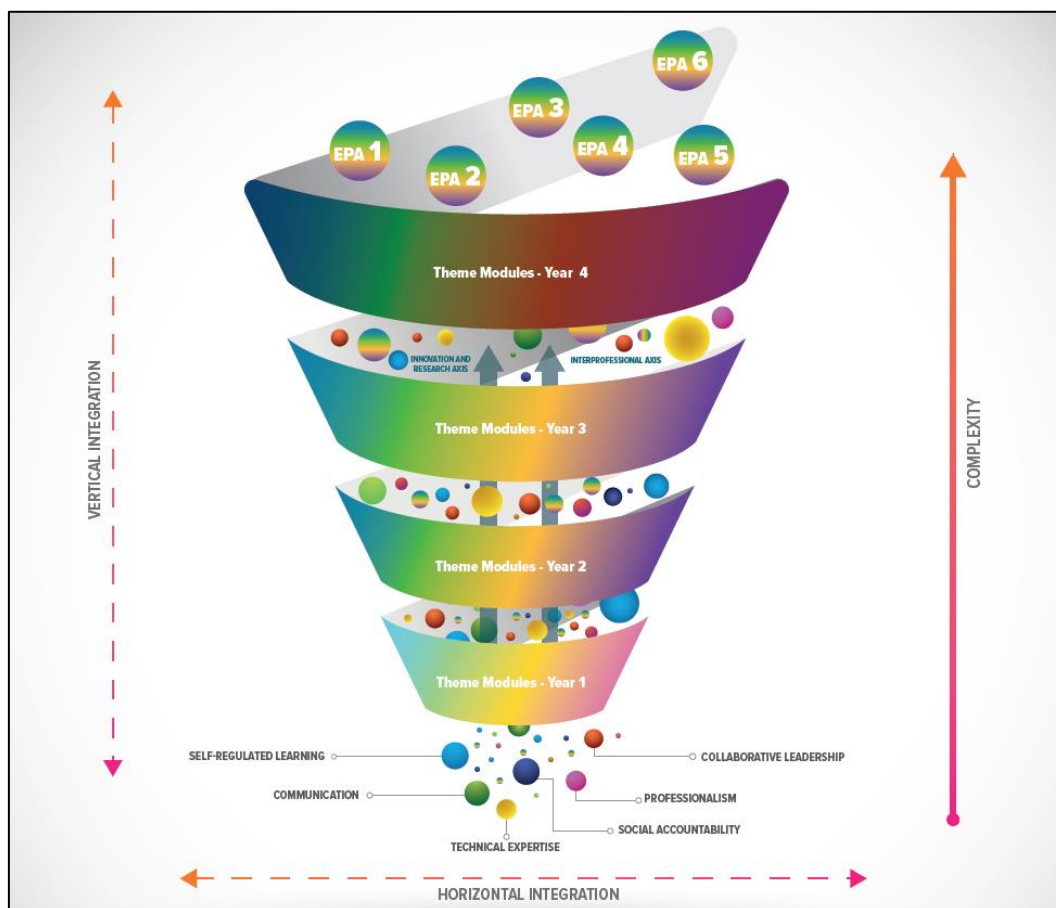

Figure 3: A schematic version of the Biomedicine curriculum at Faculdade Santa Casa BH highlighting the spiral curriculum, the content integration within the thematic modules (both vertical and horizontal) and the vertical axes (interprofessional axis and innovation/research axis)

In the interprofessional vertical axis, students will jointly participate in discussions on contemporary topics of the following areas: environment, sustainable development policy, race and ethnic relations, Afro-Brazilian and indigenous culture, vulnerable populations, human diversity, and human rights.

Given the growing importance of innovation in healthcare, the Innovation vertical axis to foster "innovative thinking" among the students was added. The programs aim to equip students with skills to identify gaps in healthcare and design solutions. The biomedicine program included a specific EPA related to healthcare innovation that required the integration of competencies such as "understanding the key gaps in healthcare", "identifying, discussing, developing and presenting a viable solution to the identified gap", "implementing and validating the proposed solution"; "being creative, conscientious, critical and insightful".

It is important to note that each undergraduate program has its specificity. The biomedicine program, for example, had a stronger emphasis on scientific research, and a dual degree as an optional extended track (Bachelor of Biomedicine/Biomedical Ph.D.) was included. The nursing program focused on allowing early contact of the student with patients in different healthcare settings. In addition, the development of management skills was emphasized, considering the significant role of nurses in coordinating healthcare processes and services. In the undergraduate psychology program, the student would be able to choose one between two different emphases: (1) Health Psychology - focusing on the study of psychological and behavioral processes in health, illness, and healthcare; and (2) Organizational psychology - focusing on human behavior related to the workplace.

The main teaching strategy proposed for the three programs was case-based collaborative learning (CBCL) (Merseth, 1991). According to each course's needs, other strategies such as laboratory practice and supervised practice were included.

Different tools were proposed to allow formative and summative assessments, which are key components of a successful EPA-based curriculum. The main sources of information to support the entrustment decisions will come from direct observation, 360-degree feedback, and portfolio evaluation. These same tools will be used to provide feedback, indicating which skills of the EPA have been mastered by the students and which need improvement. Other assessment tools such as written exams, OSCE (Objective Structured Clinical Examination), case presentations, and critical appraisal of scientific papers will be tailored for each program.

3. Discussion

The experience of designing a curriculum using EPAs was successful and helped focus on the core activities of each profession. In CBE, core competencies are usually the starting point of curriculum design. Adding EPA to this process implies that the definition of core activities precedes and drives the identification of the required competencies. Moreover, the definition of milestones helped guide the distribution of core and elective courses across the curriculum to allow students to be entrusted with more autonomous levels of responsibility (O'Dowd et al., 2020b; ten Cate et al., 2015). The ultimate aim of an undergraduate course is to help develop the required competencies to

perform the core activities with indirect supervision or without supervision (Cate, 2019; Cate & Carraccio, 2019; Meyer et al., 2019; O'Dowd et al., 2020a).

An EPA-based curricula make students more aware of the core tasks and professional responsibilities of a given field and the required competencies to perform such activities (Al-Moteri, 2020). It also helps students to monitor his/her progress in performing core professional activities, allowing corrections, as needed, along the way (Bradley et al., 2022; Lau et al., 2020; Loftus, 2016).

Some promising experiences in the use of EPA in the curriculum design of healthcare-related courses have been published in Nursing (Al-Moteri et al., 2021; Lau et al., 2020), Medicine (Pinilla et al., 2021; ten Cate et al., 2018), Pharmacy (Jarrett et al., 2018) and Sport and Exercise Sciences (Bradley et al., 2022). We could not find similar experiences in biomedicine or psychology.

Adopting an EPA-based curriculum brings the challenge of reorienting instructional design and, consequently, teachers´ roles and responsibilities. One major chosen educational strategy, Case-based Collaborative Learning (CBCL), will provide a student-centered approach to learning by presenting students with realistic cases and asking them to propose solutions with faculty support. CBCL will allow students to apply concepts, argue, and explain to their peers and count on group support to enhance learning (Krain, 2016; Nokes-Malach et al., 2015). Another characteristic of the three curricula we designed is early exposure to the complex and unpredictable workplace setting. Early contact might foster the development of clinical skills and abilities to deal with emotions (Helmich et al., 2011). Moreover, the introduction of an interprofessional vertical axis along the three programs will help students to experience interprofessional collaboration and become aware of the multiple facets of healthcare (Peduzzi et al., 2013). The inclusion of mentoring strategies in a vertical axis of Innovation will help the development of innovative thinking and entrepreneurship that is lacking in traditional health sciences education (Suryavanshi et al., 2020)

Designing EPA-based curricula also provided an opportunity to reflect upon formative and summative assessments throughout the course. Using EPAs as the basis of our curricula means that we needed to define the appropriate strategies to assess students displaying specific practical expertise in an authentic workplace setting. Different methods to directly assess students in practice were proposed, allowing evaluation of the upper tiers of Miller´s pyramid (Miller, 1990).

Faculty development will be critical to the future implementation of the three undergraduate programs. A systematic approach is necessary to prepare faculty to engage in a new paradigm of teaching and assessment (Bray et al., 2021).

4. Conclusion

The simultaneous development of three EPA-based health-related courses, in a collaborative, multidisciplinary, and interprofessional way was innovative. Designing

undergraduate curricula for health-related professions using EPAs is feasible and might help operationalize a competency-based curriculum. Reinforcing the adoption of EPAs as an educational model brings in the challenge of reorienting our teaching practices and assessment approaches.

Conflict of Interest Statement

The authors declare no conflicts of interest

About the Authors

Alexandre Moura has experience in implementing Entrustable Professional Activities in undergraduate and postgraduate educational programs. Alexandre is currently a member of the educational board and Rosa is the director at Faculdade Santa Casa BH (FSCBH). Both authors coordinated the planning of the three programs analyzed in this manuscript.

Renata Simões is a coordinator of the Biomedicine, Nursing and Psychology programs at FSCBH, respectively. They have large experience in teaching and research and coordinated the expert groups that defined the EPAs and the frameworks for each educational program.

Suelen Oliveira is a coordinator of the Biomedicine, Nursing and Psychology programs at FSCBH, respectively. They have large experience in teaching and research and coordinated the expert groups that defined the EPAs and the frameworks for each educational program.

Valenir Costa is a coordinator of the Biomedicine, Nursing and Psychology programs at FSCBH, respectively. They have large experience in teaching and research and coordinated the expert groups that defined the EPAs and the frameworks for each educational program.

Lucimara Souza is an educational specialist at FSCBH. They were members of the expert groups and collaborated on the definition of the framework for the educational programs and helped to tailor the educational strategies and assessment tools for each program.

Tatiana Paula is an educational specialist at FSCBH. They were members of the expert groups and collaborated on the definition of the framework for the educational programs and helped to tailor the educational strategies and assessment tools for each program.

Gabriela Meireles is an educational specialist at FSCBH. They were members of the expert groups and collaborated on the definition of the framework for the educational programs and helped to tailor the educational strategies and assessment tools for each program.

Bruno Moreira is the head of innovation of the Santa Casa BH group and collaborated in the development of the innovation axis in the curricula.

Rosa Malena Delbone has experience in implementing Entrustable Professional Activities in undergraduate and postgraduate educational programs. Alexandre is currently a member of the educational board and Rosa is the director at Faculdade Santa

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