

Revision of a nationwide competency framework for undergraduate medical education in Switzerland: PROFILES 2

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Summary

For more than 20 years, Switzerland has had a national binding set of learning objectives to guide medical education at universities. The learning expectations, compiled in the *Principal Relevant Objectives and Framework for Integrative Learning and Education in Switzerland* (PROFILES), were revised in 2023. The purpose of this article is to describe the revision process and highlight the changes and updates in PROFILES 2. The new document consists of three interrelated and interdependent chapters: the *Competencies and Roles* (CRs), the *Entrustable Professional Activities* (EPAs) and the *Situations as Starting Points* (SSPs). The CRs are based on the CanMEDS roles, which describe the personal attributes and competencies of the graduate. EPAs define what activities the graduate is expected to perform on the first day of residency. SSPs represent situations in which the professional activities are expected to be performed. In terms of content, three new areas of focus have been added: planetary health; diversity, equity and inclusion (DEI); and digitalisation. The revised PROFILES reflects current best practice in medical education and will help to ensure that the needs of future generations of doctors and society are met.

Introduction

In 2000, the Joint Commission of the Swiss Medical Schools (SMIFK/CIMS) decided to develop a national cat-

alogue of learning objectives in response to various changes in educational policy (accreditation, bilateral negotiations between Switzerland and the EU). This first Swiss Catalogue of Learning Objectives for Undergraduate Medical Training (SCLO) was published two years later [1, 2]. The SCLO marked an important advance in medical education, because for the first time the content and aims of medical training were widely discussed. Criticism arose however, as the document was essentially a long list of “discipline-related objectives” (a list of diagnoses and factual knowledge) and “problems as starting points” (a symptom, sign or test result of a patient with which the physician may be confronted). The SCLO did not adequately address social, attitudinal and ethical issues [3].

This feedback was taken into account when the catalogue was revised. In the second edition of the SCLO, published in 2008 [3], a specific chapter on *General Objectives* based on the CanMEDS 2005 Framework [4] was integrated into the document. The CanMEDS framework was originally developed by the Royal College of Physicians and Surgeons of Canada with the goal to “identify the core competencies generic to all specialists to meet the needs of society” [5]. With the integration of CanMEDS, the general objectives of the different roles of a physician became tangible. This was a first step towards a reference document based on competences, defined as a set of cognitive learning objectives, skills, attitudes and values.

In light of developments in medicine and medical education, the SMIFK/CIMS decided to undertake a complete revision of the SCLO in the mid-2010s [6]. The guiding principle in revising the document was to adopt the notion of competency-based education and to promote an integrative approach to medicine. In 2017 the *Principal Relevant Objectives and Framework for Integrative Learning and Education in Switzerland* (PROFILES) document was published [6]. PROFILES provided a generic description of outcome-based competencies that cover the field of medicine without focusing on specific disciplines. Consequently, the “discipline-related objectives” were dropped

ABBREVIATIONS

EPAs	Entrustable Professional Activities
PROFILES	Principal Relevant Objectives and Framework for Integrative Learning and Education in Switzerland
SCLO	Swiss Catalogue of Learning Objectives for Undergraduate Medical Training
SMIFK/CIMS	Joint Commission of the Swiss Medical Schools
SSP	Situations as Starting Points

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and a chapter was added presenting a set of *Entrustable Professional Activities* (EPAs) reflecting the main medical tasks that a physician must be able to perform autonomously on the first day of residency [7]. PROFILES also provided an important reference for the development and orientation of existing curricula, and was especially relevant for the newly created medical degree programmes (Universities of Fribourg, Lucerne and St Gallen, and the Swiss Federal Institute of Technology Zurich [ETH]). At ETH, the new bachelor's degree in medicine was built from scratch by using PROFILES for curriculum development by mapping PROFILES items to each new module to guide the definition of its content [8, 9]. It also served as a reference for the Federal Licensing Examination that every graduate must pass to begin postgraduate training. The content of the federal examination in human medicine is determined by PROFILES. This national examination is held simultaneously and identically in the respective universities. The examination consists of two parts: a written examination with 240 multiple-choice questions and a practical clinical skills examination with 12 Objective Structured Clinical Examination (OSCE) stations. In this sense, PROFILES supports the link between undergraduate and postgraduate medical education in Switzerland.

Now that PROFILES has been in use for several years, the SMIFK/CIMS has decided to review and update the document to reflect social and global developments in medical education and to adapt its three chapters to best support its ongoing widespread implementation. This article describes the approach and methods used to review and revise PROFILES. It aims to make the process as transparent as possible and to serve as a reference for stakeholders that are planning to undertake a similar exercise.

Process

A working group, composed of experts from multiple medical education fields: clinicians, deans, medical education experts, faculty staff and student representatives, was mandated by the SMIFK/CIMS in 2021 to carry out the review. Details on the WG members can be found in the appendix in table S1. The review was structured in the following phases: *inquiry*, *analysis* and *validation*.

Inquiry of needs

In November 2021, a targeted needs assessment was initiated. The invitation to submit proposals for changes to PROFILES was sent to the deaneries of all Swiss faculties of medicine, the university hospitals, the Institute for Medical Education (Institut für Medizinische Lehre, IML), the Association of Swiss Assistant and Senior Physicians (Verband Schweizerischer Assistenz- und Oberärztinnen und -ärzte VSAO), the Swiss Medical Students' Association (SWIMSA), the Joint Commission of the Swiss Medical Schools (SMIFK/CIMS), the Swiss Institute for Postgraduate and Continuous Education (SIWF), the Swiss Medical Association (Foederatio Medicorum Helveticorum, FMH), the Federal Office of Public Health and the Swiss Armed Forces.

Analysis of needs

As a first step, each member of the working group individually assessed each proposed change and decided whether to support or reject the proposal. In a second step, iterative rounds of revision and review took place in hybrid meetings of the entire working group. A nominal group technique for reflection on the formal structure and content was used for these meetings [10]. During this process, literature was consulted to relate the proposed innovations to international trends. After three meetings, consensus was reached and no further revisions were requested by the group members.

Validation of goals and objectives

A two-strategy approach was adopted to validate the proposed changes to the PROFILES document. Regular reports and discussions were held at SMIFK/CIMS meetings on the ongoing revision process. SMIFK/CIMS members already include deans and vice-deans from all faculties and training centres, but in addition, feedback on the preliminary draft of PROFILES 2 was specifically sought from the deaneries of all faculties of medicine in Switzerland. The revised and updated document was well received, and no significant requests were made to change or add to the document. Based on this feedback and the discussions at the SMIFK/CIMS meetings, the document was finalised and presented at a SMIFK/CIMS meeting in June 2023, where it was unanimously adopted.

Outcomes

In total, 128 proposals were submitted by the contacted stakeholders. Most of the proposals were submitted by the medical faculties and the associated university hospitals (92%), followed by the student association (6%) and other stakeholders (2%). The proposals fell into three categories: implementation of main innovations; structural adaptations affecting the understanding of the three PROFILES chapters and their interrelation; and editorial adaptations concerning rewording or elimination of duplicates of clinical issues in EPAs or SSPs.

An overview of the evolution of the national learning objectives catalogue in Switzerland from SCLO 1 to PROFILES 2 is presented in figure 1, which delineates the number of items related to the corresponding chapter.

Main innovations

Approximately one third of proposals related to content changes, focusing on three topics: planetary health; diversity, equity and inclusion (DEI); and digitalisation. The importance of these three themes is well supported by international literature on medical education and is, in terms of content, the most significant development of the PROFILES 2 document.

Planetary health

Based on the concept of planetary boundaries [11], which was first defined in 2009, and the comprehension that human health depends on the environmental state, the concept of planetary health was defined [12]. The concept of planetary health looks at the material, biological, social

and cultural aspects of public health and accepts that human health and the state of the environment are irreversibly intertwined [13]. There is overwhelming scientific evidence on the adverse effects of environmental changes on human health. Examples are numerous: heat waves increase the number of cardiovascular diseases [14], air pollution leads to respiratory diseases [15], while the loss of biodiversity leads to increasing prevalences of allergies and chronic inflammatory diseases [16, 17]. Additionally, the human health sector itself has an impact on the environment: in OECD countries, China and India, the healthcare sector accounts for 5% of the national carbon footprint of these countries [18]. The “AMEE Consensus Statement 2021 on planetary health and education for sustainable healthcare” highlights the importance of preparing health professionals to address the upcoming challenges through medical education [19].

Diversity, equity and inclusion

The necessity of implementing diversity, equity and inclusion in medical education arose in response to the increasing visibility and awareness given to diversity in patients and students. Counteracting discrimination and striving for equity is also documented in the Swiss Federal Constitution (Art. 8) and Swiss Criminal Code (Art. 261) [25, 26]. By implementing diversity, equity and inclusion in medical curricula, the quality of healthcare (by inclusion of marginalised and vulnerable populations) can be improved and the comfort and success of students from underrepresented groups at faculties of medicine can be enhanced [20]. Most frequently, diversity, equity and inclusion is discussed in medical education concerning the following dimensions: age, gender, ethnicity, physical impairment, sexual orientation and religion [21]. The need for such standards is evident in the numerous publications concerning insufficient healthcare for minorities such as transgender [22–25], for patients from diverse cultural backgrounds [26] or the inclusion of students with disabilities into medical training [27]. An evaluation of sex- and gender-specific medicine

in German curricula showed that the implementation of diversity, equity and inclusion in medical curricula varies greatly between medical faculties [28]. To address this heterogeneity, it is recommended that aspects of the diversity, equity and inclusion should be included in documents that guide undergraduate medical education [21].

Digitalisation

The importance of implementing digital skills into medical education is evident when looking at the speed at which new technologies are developed and introduced into clinical practice and the healthcare system. Applications of digital technology in medicine are diverse, ranging from AI-based cancer detection [39–41], to the use of AI in computational psychiatry [43]. An overview of the digital competencies in medical education in Switzerland from 2020 revealed that digital competencies are very heterogeneously taught at the different faculties [29]. Traditionally, new content is only integrated into a medical curriculum when it becomes part of the generally accepted body of knowledge [30, 31]. However, for digital competencies this procedure would be fatal as future developments have to be anticipated in order to help shape the future of (digitalisation in) medicine [30].

Elements of planetary health, diversity, equity and inclusion and digitisation were mentioned in PROFILES 1, but the revision has given them increased weight and visibility. Tables S2, S3 and S4 in the appendix illustrate the evolution of items from PROFILES 1 to PROFILES 2.

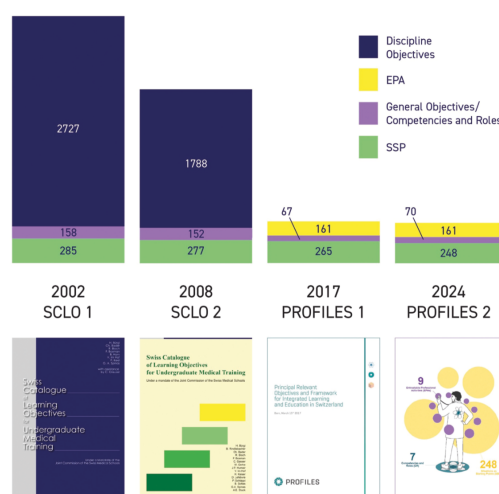
Structural adaptations

First, *Competencies and Roles* replaced the term *General Objectives* to reflect the competency-based approach. Second, based on the experience of implementing PROFILES 1 and the feedback received, it has become clear that many users struggled with how to distinguish and use the three PROFILES chapters. Thus, great care has been taken to ensure that the reader of the new document realises that the three main chapters of PROFILES cover three inseparable dimensions of medical practice: *Competencies and Roles* (CR) represent the personal attributes and competencies of the graduate, *Entrustable Professional Activities* (EPAs) describe what the graduate is expected to perform (by using the competencies), and *Situations as Starting Points for Learning* (SSPs) list the situations in which these professional activities are expected to be performed. An illustration has been made to highlight the complex relationship between the three chapters (see figure 2).

Editorial adaptations

Around half of the proposals concerned the specification of the detailed wording or the removal of duplicates in the EPA and SSP chapters. In the SSP chapter, the number of items decreased from 265 to 248 (see figure 1). In this category, the clinical expertise of the working group was of great importance to find the right formulations while keeping the level of complexity in line with the level of expertise the medical students should reach by the end of their studies for the federal licensing exam.

Figure 1: Evolution of the learning expectations (in terms of number of items related to discipline-related objectives, Entrustable Professional Activities [EPAs], General Objectives/Competencies and Roles, and Situations as Starting Point [SSP] from the first national catalogue SCLO 1 in 2002 to PROFILES 2 in 2024).



Outlook

The basic structure of the PROFILES document, with its competency-based approach to undergraduate medical education, has not been adapted and thus proven its worth. In this sense, the updated PROFILES 2 document does not represent a revolution, but rather an evolution. Retaining the tripartite structure (SSP originating from SCLO 1, CanMEDS roles from SCLO 2 and EPA from PROFILES 1), the current version provides continuity with the previous edition but integrates the global trends that will shape healthcare in the future. PROFILES 2 comes into force for the 2025/26 semester and the document will be the basis for the Federal Licensing Examination 2028.

The process of implementing PROFILES 2 by translating the expectations into teaching and assessment in different medical schools has only just begun. For successful implementation, it is particularly important to align the competence-based outcome parameter described in PROFILES 2 with the curriculum design and the assessment system [32]. Equally important to success is a well-qualified teaching staff who place their teaching within a global vision of the concepts that underpin PROFILES 2. If the full potential of competency-based education is to be implemented, it is essential that the development of this approach in both undergraduate and postgraduate medical education is coordinated and that there is a seamless and coherent transition between the two stages of education [6, 33].

For future revisions, the needs assessment might be supported by technical tools that facilitate reporting by all stakeholders, as has already been done in Germany for the revision of the NKLM catalogue (equivalent to PROFILES) [34, 35]. In the present revision, the involvement of patient representatives or other civil representation was left at the faculties' discretion, so this occurred inhomogeneously. In a forthcoming revision of this document, it

seems even more important to consider the systematic involvement of representatives of civil society [36]. The CanMEDS project has pioneered this approach by advocating a competence framework that takes into account societal needs. Such an approach would be in line with the WHO's call to strengthen public accountability in health systems and policy setting [37].

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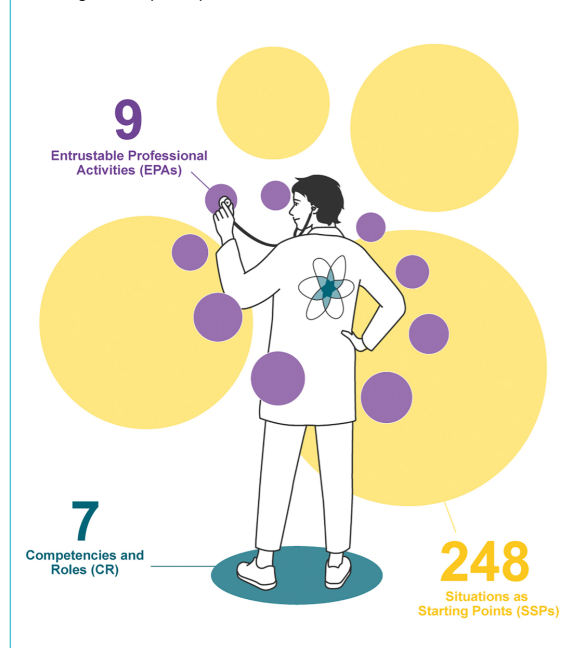
Potential competing interests

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflict of interest related to the content of this manuscript was disclosed.

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Figure 2: Illustration showing the interplay between the three chapters of the PROFILES document: Competencies and Roles (CR), Entrustable Professional Activities (EPAs) and Situations as Starting Points (SSPs).



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Appendix

The composition of the working group (WG) concerning their function and institution is displayed in Table 1.

Table 1: Institution and function of the participants of the working group for the PROFILES revision in Switzerland.

Institution	Function
University of Geneva	chair, vice-dean undergraduate training & clinician
University of Fribourg	vice-dean medical education
University of St. Gallen	program quality & clinician
ETH Zurich	curriculum mapping specialist & study director
Università della Svizzera italiana, USI	vice-dean education & clinician
University of Bern	assessment and evaluation
University of Basel	vice-dean education
University of Zurich	curriculum development coordinator
University of Lucerne	head of dean's office
University Hospital Lausanne	head of the Department of Family Medicine
SIWF	vice-president
SMIFK/CIMS	president & vice-president
SWIMSA	two student representatives
Initial PROFILES working group (WG)	former chair working group PROFILES 1

Tables 2-4 illustrate the evolution of PROFILES items from PROFILES 1 to PROFILES 2 concerning environmental topics (table 2), digitalization (table 3) and diversity, equity and inclusion (table 4).

The content that has been deleted is strikethrough and all that is red and bold has been added in PROFILES 2. The presence of the topic in the PROFILES item is marked with an "x" in the columns of the PROFILES version.

Table 2: List of environmentally relevant PROFILES items in PROFILES 1 and 2.

		PROFILES 1	PROFILES 2
GO 1.08	integrate the foundations of basic medical sciences into their clinical reasoning and the selection of relevant procedures and investigations, <i>respecting the principles of sustainable healthcare and environment</i>		x
GO 1.09	establish a patient-centred, shared management plan and deliver high-quality, cost-effective, <i>and sustainable</i> preventive and curative care, <i>especially including</i> when dealing with a patient who is vulnerable and/or polymorbid (elderly) or who suffers from a terminal illness		x
GO 1.10	demonstrate safe <i>and environmentally responsible</i> prescribing		x
GO 1.24	take into account the economic, social, cultural, <i>and ecological</i> aspects of health maintenance prevention and care at individual and community levels		x
GO 1.27	<i>Integrate sustainable health care into practice (management, procedures and investigations) and recognize the relationship between environment and individual or population health</i>		x (NEW)
GO 4.03	recognize and respond to <i>be aware of the complexity of</i> disease outbreaks, epidemics, pandemics, <i>and mass casualties; recognize and respond to climate-induced events.</i>		x
GO 4.05	address the psychosocial, insurance, financial and environmental aspects of handicap and chronic diseases	x	x
GO 4.08	identify and engage in opportunities for continuous improvement of the healthcare system, based on a critical understanding of the continuous transformation of medicine, society, <i>and environment</i>		x
GO 5.02	incorporate health surveillance activities into interactions with individual patients (discussing lifestyles, counselling). Such activities include, <i>but are not limited to</i> screening, immunization and disease prevention, risk and harm reduction measures, <i>including from environmental hazards</i> , and health promotion		x
GO 5.03	work with a community or population to identify the determinants of health that affect them, how to address them and promote system-level change in a socially <i>and environmentally</i> accountable manner		x
GO 5.5	<i>inform the population on the risks of climate change and biodiversity loss on health. Advocate for systemic actions to mitigate these impacts on health and adapt to global changes</i>		x (NEW)
EPA 1.08	Review the patient's health behaviour, and lifestyle, <i>and environmental risk exposure</i> as part of a routine check-up, or as far as possible, and assess the patient's opinions, representations and expectations		x

		PROFILES 1	PROFILES 2
EPA 4.02	Justify an informed, evidence-based rationale for ordering tests (when appropriate, based on integration of basic medical disciplines as they relate to the clinical condition); take into account cost-effectiveness <i>and environmental impact</i> of ordering		x
EPA 9.08	Assess age-specific environmental risks and propose safety measures <i>(i.e. fall risk in elderly, self-medication)</i>	x	x
EPA 9.07	Contribute to the literacy of patients and oneself regarding environmental and ecological safety	x	x
SSP 245	environmental and psychosocial aspects of chronic condition	x	x
SSP 244	dietary counselling <i>including a healthy and sustainable nutrition</i>		x

Table 3: List of relevant PROFILES items in PROFILES 1 and 2 concerning digitalization.

		PROFILES 1	PROFILES 2
GO 1.26	demonstrate appropriate use of modern technology and artificial intelligence for diagnosis, decision making, management, communication, and patient guidance		X (NEW)
GO 2.09	improve patient's and family's health literacy by using and assisting them to identify, access, and make use of information and communication technologies to support their health care and the adoption of healthy lifestyles	X	X
GO 3.01	optimize health care delivery in identifying and understanding the roles and responsibilities of individuals such as physicians from other disciplines, nurses, pharmacists, physiotherapists, psychologists, dieticians, social workers, religious ministers, technology experts, medical engineers, data managers and, when appropriate, the patient him/herself		X
GO 6.03	demonstrate the critical use of information technology to access accurate and reliable (online) medical information, taking into account the levels of evidence provided by the medical literature, and integrating it into patient care	X	X
GO 6.06	adapt to new technological advances, e.g. big data, new imaging techniques and tools to monitor a patient's state of health and disease stage clinical decision support systems, artificial intelligence, and options for remote patient monitoring	X	X
EPA 9.01	Identify actual and potential ("near miss") errors in care; speak up in the face of real or potential errors or risk of error, and use error reporting systems if available a patient encounter and report them using an error reporting systems (CIRS). Show adequate accountability	X	X

Table 4: List of relevant PROFILES items in PROFILES 1 and 2 concerning diversity, equity and inclusion.

		PROFILES 1	PROFILES 2
GO 1.17	develop a critical awareness of common stereotypes in all areas of diversity that might bias clinical activities, related to factors such as age, gender, ethnicity, culture, level of education, political orientation, handicaps , and representations	x	x
GO 1.18	identify the impact on health of sex (i.e. biological difference related to sexual determination), and gender (cultural and social differences between men and women across the spectrum of gender in terms of roles and expectations). Address these issues in medical activities	x	x
GO 2.04	deal effectively with diverse groups of patients such as children, adolescents, and adults of all ages and seniors ; men, women and people with other gender identities (e.g. non binary transgender); and patients with different languages and different cultural and religious backgrounds and languages	x	x
GO 4.05	address the psychosocial, insurance, financial and environmental aspects of handicaps persons with disabilities and chronic diseases	x	x
GO 7.04	show awareness of individual factors (e.g. cultural, societal, and spiritual/religious issues) that impact on the health and delivery of care of individuals and of the community	x	x
GO 7.08	act with respect towards colleagues and other healthcare professionals ; recognize and respond appropriately to unprofessional and unethical behaviour by physicians and other health care professionals, such as sexism, sexual harassment, racism, or any other forms of discrimination	x	x
EPA 2.03	Perform a physical examination in difficult situations such as obesity, intrusive procedure, non-cooperative patients, reduced consciousness, cognitive impairment, disabled patients , and persons who do not speak the local language or are of different ethnicity	x	x
EPA 2 y.	Examination of male external genitals (all sexes)		x
EPA 2 z.	Rectal examination in male and female (anus, rectum, prostate gland, sacrum, vagina, uterus, parametria)		x
EPA 9.08	Assess patient age -specific environmental risks and propose safety measures (i.e. fall risk in elderly, self-medication)		x
SSP 132	Physiological, post-surgical or after mutilation, hormonal, and pathological variations in abnormal external genitalia (female, male, including intersex and transgender individuals)		x
SSP 195	well-baby, and well-child visit, and well-adolescent visit	x	x
SSP 237	issues regarding diversity of affective and sexual orientation and gender identity	x	x