Flexibility in primary medical programs: A scoping review

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Abstract

Introduction: Students and universities increasingly seek flexibility in learning options, however terms such as flexible are not consistently defined in the medical education literature. This review aimed to 1) propose a definition for flexibility in medical education and 2) create a typology of contemporary examples of how flexibility has been operationalised in medical education.

Method: A systematic scoping review of papers published in English since 2009 was undertaken. The focus was on papers reporting initiatives to create flexibility in primary medical programs.

Results: Based on review of 1,641 search returns and 140 full-text articles, two interconnected concepts were identified: flexibility and individualisation. Flexibility describes mechanisms that allow students choice in how they allocate time and resources to meet the requirements of their course, including time-variable progression, acceleration, deceleration, articulated degree entry and exit options, and pedagogical approaches that reduce time required in classrooms. Individualisation describes options that enable student-driven direction, extension or expansion of medical education into special interest areas, including dual degrees, breadth subjects, curriculum tracks, elective service-learning pathways, electives and selectives.

Conclusions: Though not always clearly defined as such, international medical education literature describes a rich variety of flexibility and individualisation initiatives. While the constructs of flexibility and individualisation are interconnected, they can assist curriculum designers to differentiate between the mechanisms that enable flexibility in how students meet course requirements and the mechanisms that enable individual choice in what students study. Flexibility and individualisation initiatives target different needs, including both students' needs and medical workforce needs; they also suggest different institutional and financial implications. Consensus on and consistent use of common terminology about flexibility and individualisation initiatives will improve

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the "searchability" and synthesis of research on such initiatives and their impacts and enablers, as well as encourage further research, publication and synthesis of outcomes of such initiatives.

Keywords: flexibility; medical students; curriculum; time variable; diversity; equity

Introduction

Students and universities increasingly seek flexibility in learning options in primary medical programs (Desy et al., 2017; Slavin et al., 2014). Flexibility has been sought in response to issues such as attempts to increase diversity and equity within the student body, the complexity and specialisation of knowledge required in modern medicine, an increasing emphasis on evidence-based medicine and just-in-time learning, and the expectation that physicians also engage in professional pursuits such as research, medical education and entrepreneurship. In 2020, the COVID-19 pandemic abruptly necessitated and catalysed changes towards increased flexibility in many medical degrees around the world (Menon et al., 2020; Newman & Lattouf, 2020; Whelan et al., 2020).

In the context of worldwide innovation in medical education, widely used terms such as flexibility are not yet consistently defined in the medical education literature. Where research with an explicit focus on flexibility exists, it primarily concerns residency training and continuing professional development (Hoff et al., 2018; Scott et al., 2017). The lack of clarity in what constitutes the operationalisation of flexibility and accompanying terminology means it is difficult to identify a body of literature addressing the advancement of flexibility in primary medical programs. For the purposes of this review, we follow the Australian Medical Council's (AMC) (n.d.) definition of primary medical programs as the primary medical degree at the beginning of the vocational continuum. This qualification permits the holder to seek general registration as a medical practitioner (AMC, n.d.).

Therefore, this review intended to:

- propose a potential definition for flexibility in medical education
- create a catalogue, or typology, of contemporary examples of flexibility in primary medical programs.

A contextual driver for this review was the authors' concurrent engagement in the redesign of the Melbourne MD. One aim of the redesign is to create a more flexible program. From this context of course design arose a further aim:

- to report the findings in a way that assists curriculum designers to identify mechanisms that enable flexibility.

Method

Given the varying methodological approaches within a disparate extant literature on this topic, as well as the broad nature of the research question, we used a scoping review methodology (Thomas et al., 2017). We divided the scoping review into five stages, following the framework developed by Arksey and O'Malley (2005) and advanced by Levac and colleagues (2010). These stages were:

1. *Establishing the research question*

How has the concept of flexibility been operationalised in medical education in the last 10 years, and what typology of initiatives related to flexibility has been described in recent medical education literature?

2. *Identifying relevant studies*

The contents' lists of the two highest-impact medical education journals, *Academic Medicine* and *Medical Education*, were manually searched by the first author (AB) to sensitize the authors to available literature and generate keywords and potential criteria for a database search. On 5 October 2020, AB searched six electronic databases covering education and biomedical literatures for English-language articles published in peer-reviewed journals since 1 January 2009 in consultation with a health sciences librarian (PC). The databases searched were SCOPUS, PubMed, Web of Science MEDLINE, ProQuest, Science Direct and JSTOR. The records from the manual search were later screened using the same criteria as those from the systematic search. The full search strategy is provided in Appendix 1.

We imported all records into an online application, CADIMA, and removed all duplicates. CADIMA is an open-access web tool to facilitate the conduct and documentation of systematic reviews, systematic maps and other literature reviews (Kohl et al., 2018).

3. *Article screening and selection*

We screened the articles in three stages through CADIMA, with the first two stages relating to screening of abstracts. The first was a calibration exercise to ensure validity and reliability in article selection. All authors first conducted an iterative pilot rating process to agree on the selection criteria to be applied to the full list of search results. After each rating 15 articles, the three authors met to discuss inconsistencies in ratings and differences in interpretation of four proposed selection criteria. We then agreed on three criteria to apply that all authors found to be clear and relevant and that were successfully applied in a subsequent pilot rating of 20 titles and abstracts. These were: article is related to primary medical training; article discusses initiatives intended to (or found to) increase flexibility; and article describes a real-world reform or intervention.

A full description of the inclusion criteria can be found in Appendix 2.

In the second stage, AB and a research assistant (EW) screened all titles and abstracts on these criteria, after which we calculated inter-rater reliability (IRR) using Cohen's kappa. The kappa was calculated on the overall result for each record (inclusion or exclusion). The resulting kappa value of 0.78 indicated substantial agreement (McHugh, 2012). We resolved remaining inconsistencies by discussion, then AB screened the full text of all selected records using the same three criteria.

4. *Charting the data*

AB and EK developed and piloted a data collection form on 10 full-text articles. All three authors then reviewed the form. The authors made iterative revisions through discussion and consensus. AB used the final version to extract the data from all included articles. The aim was to summarise intervention types within a large, inclusively screened body of literature.

The following characteristics were extracted from each included article:

- Article demographics
- Description of flexibility initiative described
- Outcomes or recommendations noted

5. *Collating, summarising and reporting the results*

We analysed the descriptions of flexibility initiatives using content analysis. We used open coding to identify basic descriptors and axial coding to describe higher order thematic groups. For the open inductive coding, AB identified descriptors through her initial reading and coding of the identified articles. They were refined in discussion with all authors. The initial basic descriptors included the categories of course structure, delivery methods, well-being/mental health, competency-based medical education, innovative delivery methods, content and social responsibility in medical education. For the axial coding, the initial higher order themes were both inductive and deductive and included the inductively derived "impact on the student experience" theme (e.g., what and how they studied) as well as the deductively derived "course-design mechanisms" theme, reflecting our aim to assist curriculum designers. AB refined the coding to yield 11 descriptive categories for flexibility initiatives in medical education. Agreement was established on the 11 descriptive categories, and the proposed typology was finalised as described below. We have included some case examples from the literature as well as references to some of the preliminary findings. Supplementary information on the intervention types described within the typology was drawn from additional articles that did not meet inclusion criteria but that were sourced from the reference lists of included articles.

Results

The initial search identified 1,870 articles, of which 290 were duplicates. After applying the selection criteria to the remaining 1,580 articles, 140 met the criteria. From these, a typology of 11 descriptive categories of initiatives was identified. We formulated two higher-order descriptive constructs that provide for these 11 categories: interventions that targeted *flexibility* in medical education and interventions that targeted *individualisation*. We propose definitions for these constructs, discuss their interrelatedness and the point of view they reflect, then outline the intervention types under each group, including some illustrative case examples from selected articles.

We propose the use of the term "flexibility" in medical education to describe mechanisms that allow students choice regarding how they allocate time and resources to meet core requirements of their medical education. These interventions may be designed in response to questions such as: "How can students satisfy the core requirements of their medical degree while also meeting the other needs and obligations in their lives?" Interventions we categorised under "flexibility" tended to be characterised by aspects of time variability, for example, in course duration, the pacing of workload within courses and the timing and location of learning activities (for example, asynchronous, out-of-class, self-directed learning).

We propose the use of the term "individualisation" in medical education to describe mechanisms that enable student-driven direction, extension or expansion of medical education into special interest areas. These interventions may be designed in response to questions such as: "What choices do students have regarding the content areas they focus on in their medical degrees and what opportunities will they have to pursue special interests?" Interventions we categorised under "individualisation" tended to enable pursuit of specialised interests within a medical degree and/or enable expansion of study content beyond the medical degree. The availability of individualisation options is often enabled by flexibility in course structure.

While these conceptualisations of flexibility and individualisation may overlap operationally, we have defined them as distinct, as our conceptualisation focuses on students' experience of the curriculum: the construct of flexibility is about *how* students meet course requirements as well as other obligations outside of medicine. Individualisation initiatives enable flexibility in *what* students choose to study, that is, content that reflects their interests, career aspirations and skills. The definitions of these two constructs and their operationalisation are returned to in the Discussion.

Typology and description of initiatives within the flexibility construct

The typology of flexibility initiatives evident in the literature included:

- reduced lecture time
- flipped learning

- time-variable, competency-based (rather than cohort-based, linear) progression
- acceleration
- deceleration
- articulated degree entry and exit options ("on-ramps" and "off-ramps").

Reduced lecture time

Medical school curricula are prone to overloading in response to increasing breadth and complexity of subject matter and changing expectations from regulators and employers regarding students' professionalism and work readiness (Lindberg, 2013; Murdoch-Eaton & Whittle, 2012). Too heavy a reliance on lecture time may adversely affect student outcomes. For example, in a 2009 study of all eight medical schools in the Netherlands, hours of lecture time were negatively related to hours available for self-study, progress made and graduation rate. Conversely, time available for self-study was associated with shorter time to graduate and higher likelihood of graduating (Schmidt et al., 2009).

Several randomised controlled trials (RCTs) have found either superiority or non-inferiority of self-study modalities over lecture-based teaching for medical students (Peine et al., 2016; Raupach et al., 2013). Medical schools have reported on reducing lecture time by 10–15% with either no difference, or improvement, in student outcome variables (Choi-Lundberg et al., 2019; Slavin et al., 2014; Wackett et al., 2016). However, authors note that students require a well-structured and articulated rationale for self-directed learning.

> *Case example*
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> The 5-year undergraduate MBBS program at the University of Tasmania reduced instructional time in the preclinical curriculum by approximately 200 hours (14%) by eliminating non-core and repetitious content and found no significant impact on curriculum coverage, progression rates or assessment outcomes (Choi-Lundberg et al., 2019).

Flipped learning

Flipped learning for the purposes of this review refers to delivery of learning content that allows asynchronous, place-independent study. It includes the flipped classroom approach in which core content is delivered prior to more didactic interactions. Even if this model is applied to all students in a class or session, we argue that it contributes to flexibility for students in choosing when, where and for how long they engage with learning content day-to-day. A meta-analysis of flipped classrooms in health professional education found that students preferred this approach and that flipped classrooms improved student performance more effectively than traditional classrooms (Hew & Lo, 2018). Challenges

may include adapting content to changing course needs and new knowledge; agreeing across individuals, departments and disciplines on what constitutes core content; a sense of loss of purpose for teaching staff; and integrating online delivery with formative feedback and assessment.

Time-variable, competency-based progression

Time-variable, competency-based progression refers here to reports on variable speed of progression through medical education based on individual students' assessed competencies. There are limited reports of successful implementation to date. In the US, for example, despite extensive medical curriculum reform since 2010, Novak and colleagues (2019) reported in 2018 that 96% of the renewed curricula in medical schools surveyed still featured cohort-based, linear pathways. While technological advancements and improved assessments of competency are promising steps towards self-paced medical education, time-variability will place complex demands on medical schools and placement partners, with implications for course registration, timing of standardised examinations and residency-matching processes (Schwinn et al., 2019).

Case example

Education in Pediatrics Across the Curriculum is a US initiative involving four medical schools. Students focus on paediatric aspects during their primarily medical clerkships and electives and are assessed on entrustable professional activities (EPAs) aggregated from faculty, residents and interprofessional team members. Any time during their fourth year that a student is entrusted to perform each of the 13 EPAs, they are able to enter a transition-to-residency phase (Andrews et al., 2018).

Acceleration

Acceleration initiatives are categorised here as part of the flexibility construct, yet they also intersect with that of individualisation. This is because they can enable a curriculum pathway that accommodates how students complete their course from a time-variability perspective as well as what they wish to study. Acceleration refers to programs in which cohorts of students participate together in a compressed, accelerated program, most commonly through 3-year MDs (Leong et al., 2017). Accelerated courses are often tailored for students with a known career preference and can incorporate specialty-relevant longitudinal clinical experiences, earlier clinical clerkships or shadowing experiences. Most are linked with primary care and underserved rural and regional locations. Preliminary findings have shown equivalent or superior performance of 3-year students during and after their degrees (Cangiarella et al., 2017; Lockyer et al., 2009; Raymond et al., 2014). Additional benefits include accelerating pathways to clinical careers and increasing physician numbers in rural or underserved areas and/or underserved specialties. Some have questioned the rationale for recent reintroduction of

3-year MDs in the US given that US history contains two previous waves during which the idea was tried and later abandoned—in part due to student and faculty burnout and lack of contribution of the programs to stated aims, for example, redressing physician shortages (Goldfarb & Morrison, 2013; Schwartz et al., 2018). Pedagogy for successful accelerated programs may entail additional resources to teach parallel curricula. Mentors are recommended as well as partnered residency programs (Leong et al., 2017).

Case example

The Medical College of Wisconsin created two regional campuses dedicated to underserved and rural areas of Wisconsin. A large parallel 3-year medical school program runs on these campuses, complemented by expansion of local residencies in regional health services, with focus on longitudinal integrated clerkships and entry to specialties underserved in the region (Cangiarella et al., 2017).

Deceleration

Voluntary, non-remedial decelerated medical education without additional curricular components may enable students in a range of circumstances to complete some of their medical degree part-time (Stamy et al., 2018). A 2004 report found that nearly one third of US medical schools offered formal options for decelerating or extending a student's curriculum, however these were rarely publicised (McGrath & McQuail, 2004). In that survey, 37% of students participating in decelerated options were from underrepresented minority groups. Some contemporary programs have been designed with social equity in mind to enable minority, non-traditional or disadvantaged students to access and succeed in medical education (Stamy et al., 2018). The benefits of deceleration include the opportunity to graduate students who possess desirable non-cognitive characteristics despite being at academic risk and to avoid the loss of resources invested in students who fail to meet the requirements of a traditional curriculum. Possible disadvantages include stigma and disconnection from the rest of the cohort. Extra support and social contact opportunities may be required for decelerated students. Deceleration may also entail extra financial burden for students, depending on the timing of the extension and whether there are courses that must be repeated (Arvidson et al., 2015).

Case example

Michigan State University College of Human Medicine reported in 2015 on their structured Extended Curriculum Program that allowed students to extend the preclinical curriculum to 3 years or more, as needed. Students could choose to extend at any time during the preclinical curriculum, and the process was the same regardless of the time or the reason (Arvidson et al., 2015; Stamy et al., 2018).

Articulated entry and exit options

Articulated entry and exit options allow students variable "on-ramps" and "off-ramps" in medical education based on their capacity, performance, circumstances and preferences. On-ramps are mechanisms that allow students with prior learning and experience to enter at a tailored stage. This can include credits for prior learning and tailored programs for qualified healthcare professionals to enter medicine.

> *Case example*
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> A new program advertised at the Edinburgh Medical School—the HCP-Med—allows qualified health professionals to work part-time and study online part-time for the first 3 years, with an attachment to a local GP and 3 intensive weeks each year. They then join the main undergraduate cohort full-time for Years 4 and 5 (The University of Edinburgh, 2021).

Off-ramps are options that allow students to exit a medical degree prior to graduation with some certifiable outcome. This can require integration with other courses, departments and institutions to recognise partial completion. Providing off-ramps may improve student wellbeing and reduce the risk of graduating underperforming students. Little documentation of such options is available, however providing students with avenues to leave medical training without compromising self-esteem or incurring unjustified debt has been framed as a moral imperative (Bellini et al., 2019). While off-ramps are not mechanisms to complete the medical course requirements as per our definition of flexibility, they provide insight into curriculum mechanisms to allow medical students taking this option to complete a related course of study.

> *Case example*
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> The Swiss model begins with a 3-year Bachelor of Medicine. After a further 120 credits, graduates achieve a Master of Science in Medicine degree. Those wishing to work with patients can complete the Master of Medicine degree, which contains an additional mandatory year of clinical electives after which they are eligible to be assessed for registration (Hensen, 2010).

Typology and description of initiatives within the individualisation construct

The typology of individualisation initiatives discussed in the literature were:

- elective service-learning pathways
- selectives, electives and concentrations
- curriculum tracks
- dual degrees
- breadth studies.

Elective service-learning pathways

Elective service-learning pathways described in the literature allow students to choose particular learning pathways for their clinical clerkships, often delivered as longitudinal clinical clerkships (LICs) in underserved and rural pathways and primary-care pathways. Students can choose to be embedded into healthcare teams in these contexts and may be entrusted with targeted patient-care responsibilities that add value to their teams as well as their learning experience.

Case example

The University of Washington School of Medicine reported in 2018 on an optional longitudinal extracurricular experience, the Underserved Pathway (UP). Completion of the UP was linked to a significant increase in program graduates matching to an underserved family medicine residency (Kost et al., 2018). The same school developed the Targeted Rural Underserved Track (TRUST), a four-year curriculum centred on an LIC at a single underserved site. Preliminary data showed that 90.9% of graduates entered residencies in needed regional specialties (Stamy et al., 2018).

Selectives, electives and concentrations

Selectives are compulsory core subjects the student must select from a small group. Electives refer to non-compulsory or non-core subjects, a certain number of which must be chosen from a wider group. As core clinical rotations are increasingly completed earlier in medical school, elective advanced clerkships allow students to explore various disciplines before determining their career specialty. Scholarly concentrations and research blocks allow students to select and pursue topics of particular interest and can result in increased scholarly output by participating students (Havnaer et al., 2017).

Curriculum tracks

Curriculum tracks are optional programs in which medical students participate in faculty-designed tailored curriculum across multiple years as a pipeline into a particular role or specialisation. For example, the Memorial University Medical Center and Mercer University School of Medicine (MUSM) offer a 3-year Family Medicine Accelerated Track (FM-ACT), which aims to increase the number of medical students choosing careers in primary care in underserved areas. FM-ACT includes longitudinal clerkship experiences and conditional acceptance to an MUSM residency program in family or internal medicine (Cangiarella et al., 2017). Other types of curriculum tracks include medical leadership tracks (Lawson et al., 2019), global and population health tracks (Williams et al., 2014), health professional education (Chen et al., 2017) and specific technical skill tracks (Dhar et al., 2012).

Dual degrees

Dual degrees include intercalated degrees, which require students to take time off to pursue the second degree full-time, and concurrent degrees, which are integrated into the medical curriculum (Alamri, 2018). Examples of dual degrees include MD/MBA programs (Ackerly et al., 2011; Patel et al., 2014) and combined MD/MPH degrees in topics such as public policy, law, biomedical engineering, arts, bioethics, public health and epidemiology (Alamri, 2018). The majority of graduates of joint medical degree programs reportedly enters the clinical workforce upon graduation (Brass et al., 2010; Jeffe & Andriole, 2011; Patel et al., 2014; Sullivan et al., 2017).

Many US combined programs offer a Bachelor of Arts or Bachelor of Science along with an MD. This is achieved largely by compressing the baccalaureate component by granting course credit for medical school course work or using summer session courses (Eaglen et al., 2012; Green et al., 2016).

A 2010 US review found that approximately 95% of MD/PhD graduates went on to undertake residency. Ultimately, 80% were employed full-time in academic centres or research institutes. US MD/PhD programs typically recruit and train bench scientists, however graduates undertook an unexpected diversity of translational and clinical research (Brass et al., 2010). Successful MD/PhD programs may need to foster cognitive ability to transfer knowledge between clinical and research training and professional identity as a physician-scientist (Ng et al., 2019).

Breadth studies

Breadth studies are course-design elements that allow time for activities and subjects that expand the student's knowledge outside of medical study but do not lead to a second qualification. Example breadth areas reported on include business, foreign languages, literature, engineering, clinical genetics/genomics, bioinformatics, biophysics, nanoscience, regenerative medicine, biomaterials and clinical informatics (Schwinn et al., 2019). These can take the form of faculty subjects, subjects in other departments, experiential programs or initiatives organised by medical students.

Discussion

This scoping review aimed to create a catalogue of contemporary examples of flexibility in medical education in the form of a typology of initiatives under the higher-order construct of flexibility. Our findings suggest that there are two higher-order descriptive constructs within flexibility, which we put forward for discussion as potential common descriptors for future discourse, research and evaluation of medical education course-design initiatives: namely, *flexibility* in medical education, within which six types of intervention were defined and described, and *individualisation* in medical education, within which a further five types of intervention were defined and described.

Our definitions of the constructs of flexibility and individualisation as distinct but interconnected reflect differences in point of departure. A curriculum planner might seek to distinguish between mechanisms that enable a student to complete course requirements while managing external obligations and those that allow the student to individualise course content. For a student, flexibility and individualisation are likely to be seen as two sides of one coin, as a flexible medical program is likely to be one that allows students to individualise both how (e.g., when, where, for how long) and what (e.g., medicine and law) they study. A medical school could offer both flexible and individualisation initiatives.

We propose that consensus on and consistent use of common terminology about flexibility and individualisation initiatives in medical education will improve the searchability and synthesis of research on such initiatives and their impacts, outcomes and enablers as well as encourage further research, publication and synthesis of outcomes of such initiatives. We considered the higher-order constructs of flexibility and individualisation to be conceptually distinct, targeting different needs of both students and the medical workforce and suggesting different institutional and financial implications. Our experiences of using these two higher-order constructs in the initial phases of redesigning a more flexible MD at the University of Melbourne suggest the usefulness of distinguishing between these two constructs. These experiences also highlighted that it is far harder to operationalise flexibility for how students choose to study than it is to operationalise individualisation initiatives for what students wish to study. Further application of these constructs to curriculum planning is needed for their validation and development.

Flexibility initiatives have particular implications for student wellbeing as well as diversity and equity in the medical student body if students from diverse backgrounds can choose how, when and for how long they engage with core medical education while balancing other life priorities (for example, income generation, parenting and other caregiving obligations).

Increasing individualisation of medical education may reflect and be necessitated by changes in the complexity and specialisation of contemporary medical knowledge and in the diversity and overlap between the multiple professional roles and characteristics expected of today's medical workforce. Globally, there are some significant mismatches between the competencies of health professionals and the needs and priorities of their communities. This manifests in workforce shortages, maldistributed workforces and inappropriate skill set balances (Frenk et al., 2010; Prideaux, 2019). An emerging theme in the literature we categorised as related to individualisation in medical education was the need for accompanying education and guidelines on global and local skill priorities as well as relevant and motivating clinical experiences to ensure that uptake of individualised medical education options is well aligned with the healthcare needs and priorities of communities (Prideaux, 2019; Reeve et al., 2017).

Limitations of this review are an over-representation of US and other Western, high-income country examples in the literature available and insufficient scope to synthesise current findings on the outcomes of the curricular elements described or to critically examine these initiatives and their reported impact. As well as adopting more standardised terminology to refer to these types of curriculum innovations, future research should investigate the impact of these innovations on medical students, for example, student and graduate well-being, development of adaptive expertise and preparation for future learning and career pathways as well as their impact on education institutions, patients, communities and other stakeholders.

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Appendix 1

Search Strategy

Six electronic databases covering education and biomedical literatures were searched: SCOPUS, PubMed, Web of Science MEDLINE, ProQuest, Science Direct, JSTOR. The following terms were searched for in titles and abstracts: (*"medical education" OR "medical school*" OR "medical student*" OR "medical curricul*")* AND *(flexible OR flexibility OR flexibly).* Eligible papers were limited to English-language articles published in peer-reviewed journals from 1st January 2009 to 5th October 2020.

Appendix 2

Inclusion Criteria

Criterion 1: Article concerns pre-registration medical training

Includes:

- Pre-registration medical degrees, basic sciences in undergraduate medicine, pre-registration clinical placements and pre-medical education (USA)

Excludes:

- Articles describing interventions or course-design components solely designed for other disciplines (including other healthcare disciplines)
- Articles solely concerning selection and recruitment of students
- Articles related solely to residency training or continuing professional development

Criterion 2: Article describes initiatives intended to (or found to) increase course flexibility

Includes:

- Articles describing interventions or reforms that were intended to increase course flexibility
- Articles describing interventions that were found to increase course flexibility, regardless of whether flexibility was an intended or primary focus of the reform

Excludes:

- Articles describing interventions or reforms aimed at improving learning quality only, without consideration of flexibility
- Articles describing interventions aimed at introducing or emphasising certain curricular content, without any element of flexibility, electability or similar (e.g., school-wide introduction of new content on palliative care)
- Assessments or evaluations of different pedagogical approaches without significant aspects related to flexibility of course design (e.g., comparison of the learning outcomes of problem-based learning versus traditional curriculum)
- Articles that report only on techniques of assessment or definition of competencies and milestones
- Articles that report only on technological developments and processes related to implementing interventions but do not report on relevant outcomes

Criterion 3: Article reports on a real-world reform or intervention

Includes:

- Articles reporting on preliminary, interim or final outcomes of interventions
- Articles reporting on qualitative or quantitative outcomes
- Articles reporting based on information from primary, secondary or tertiary sources

Excludes:

- Articles containing only commentary, without descriptions of real-world examples