

An Integrated Competency-based Curriculum for Undergraduate Medical Education Programme in Bhutan

Tenzin, K.¹, Dorji, T.², Sherub, K.³, Chhezom, K.¹, Dorji, G.¹, Tshering, K.¹, Choden, R. S.¹, Mukhia, S.³, Choeda, T.¹, Galey, K.¹, Gyamtsho, S.³, Tshering, P.¹, Siebeck, M.⁴, Jayasinghe, S.⁵, Dhakal, G.P.^{1,3}

Abstract

Introduction: Training of health human resources is an integral component of strengthening health systems. In Bhutan, the postgraduate training programme commenced in 2014 and the undergraduate programme is scheduled to begin in 2024.

Methods: The curriculum was drafted by a team of experts and reviewed over multiple rounds with medical educators, health administrators and field experts from within and outside the country. The curriculum was validated by a team of experts from the university and the medical council. The curriculum for the Bhutan Medicine Programme adopted an integrated approach for teaching-learning and assessments.

Results: Core competencies have been defined to meet the needs of a graduate that is prepared to face the challenges of the present and the future. Learning objectives are constructively aligned with teaching-learning and assessment tools. The five-year programme includes the Foundation of Medicine, Early Clinical Exposure, System integration through module-based learning, Clinical rotations including professorial attachments and internship. Community medicine, behavioural sciences and medical humanities are incorporated through the first to fourth years. We foresee a challenge in the acceptance of an integrated curriculum from sections of senior clinicians and teachers who have been trained in a traditional curriculum. A series of faculty development programmes have been conducted to discuss advantages of an integrated approach.

Conclusion: Implementation of an integrated curriculum requires adequate faculty together with faculty development. Faculty recruitment is ongoing at the time of publication.

Keywords: Constructive alignment; Clinical case discussion; Competency-based curriculum

Introduction

The Khesar Gyalpo University of Medical Sciences of Bhutan is the only medical university in Bhutan.

¹Faculty of Undergraduate Medicine, Khesar Gyalpo University of Medical Sciences of Bhutan, Bhutan

²Central Regional Referral Hospital, Bhutan

³Jigme Dorji Wangchuck National Referral Hospital, Thimphu, Bhutan

⁴Institute of Medical Education, University Hospital, Munich, Germany

⁵Freelance Consultant, Colombo, Sri Lanka

Corresponding author: Dr. Karma Tenzin

Email: karmatenzin9@gmail.com

Bhutan is a small country and offers universal healthcare to a population of approximately 770,000 citizens. The Khesar Gyalpo University of Medical Sciences of Bhutan was established in 2012 under an act of parliament with the primary objective of establishing an undergraduate medical school.

Despite many attempts, an undergraduate MBBS (Bachelor of Medicine and Bachelor of Surgery) programme could not be established within the proposed timeline. The Faculty of Postgraduate Medicine was established with MD (doctor of medicine) programmes in General Surgery, Paediatrics Ophthalmology,



© SEAJME. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Anaesthesiology, and Obstetrics-Gynaecology in 2014, Internal Medicine in 2015, Orthopaedic Surgery and General Practice in 2017, Psychiatry and Emergency Medicine in 2018, Ear-Nose-Throat Surgery in 2019, and Dermatology in 2022. The curricula for the postgraduate programmes were developed by experts within the country to meet the standards of the regulatory council.

The shortage of doctors continues to be major problem for Bhutan and COVID-19 pandemic worsened the situation. The government re-initiated the process to start an undergraduate medicine programme in 2024 with a curriculum that is relevant to the needs of the future. Historically, medical education curricula predominantly emphasized on the cognitive domain, placing excessive emphasis on whether students and trainees passed the exams with minimal emphasis on their

performance as clinicians and competency building. There was an opportunity to formulate the curriculum with a framework of clearly defined objectives for the cognitive, psychomotor and affective domains of learning that is aligned with an appropriate assessment method (Amin et al., 2006).

A curriculum provides the framework to deliver knowledge, skills and professionalism to students to meet the defined core competencies. Apart from the intended curriculum, educators must be aware of the factors that influence supported, enacted, assessed and attained curriculums (Figure 1). For the overall efficiency of the curriculum to produce a graduate with the desired capabilities and qualities, there needs to be careful and conscious effort in an inclusive approach in constructing a curriculum.

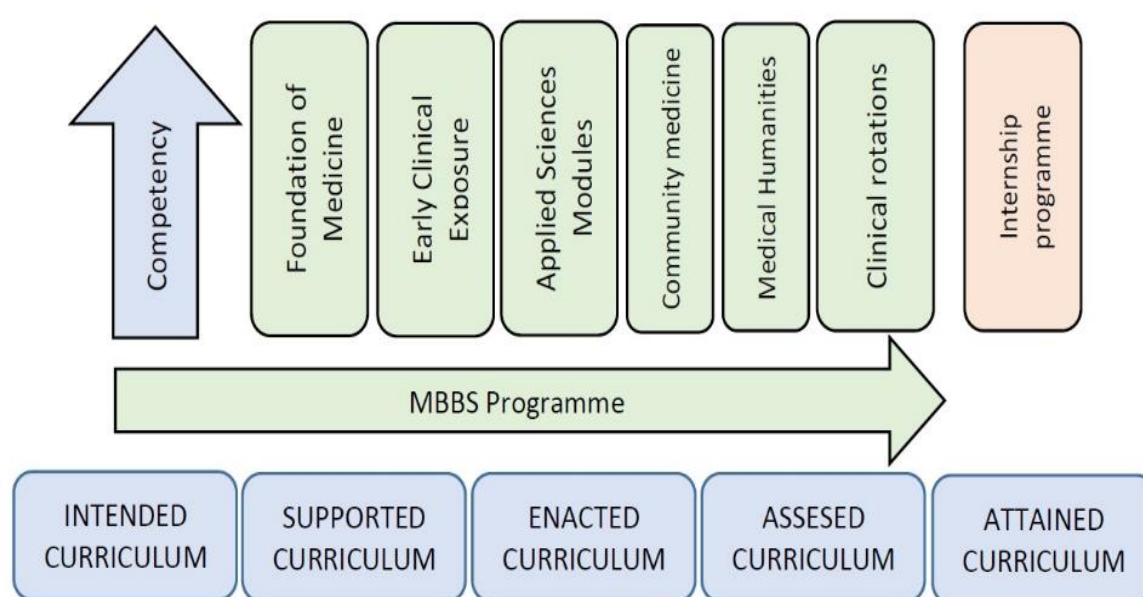


Figure 1: An overview of various frameworks of curriculum for the Bhutan MBBS Programme, 2023

The Khesar Gyalpo University of Medical Sciences of Bhutan appointed a Technical Working Group (TWG) to draft the curriculum for the undergraduate MBBS programme. This paper summarizes the process that took place through December 2022 to December 2023 to develop the curriculum taking into the context the needs of the country and the changing context of medical education.

Development of Bhutan MBBS Curriculum

Step 1: Curriculum Committee

The University's Governing Council initiated the process of starting the MBBS programme in consultation with the regulatory body, the Bhutan Professional Qualification and Certification Authority. A Curriculum Committee (TWG) was appointed consisting of medical education experts, faculty members, clinicians and other relevant stakeholders. One of the first

tasks of the TWG was to review the draft MBBS curriculum developed in 2011 that was designed for a competency-based education. With a vision to design a curriculum that adopts the recent developments in the field of medical education, we reached a consensus to abandon the old draft and develop an integrated curriculum (Brauer & Ferguson, 2015; Malik & Malik, 2011). In an integrated curriculum, anatomy, physiology and biochemistry are no longer taught as separate subjects but as a part of medical learning with the involvement of clinical sciences.

Step 2: Consultation with medical education experts

Various competency frameworks were discussed with medical educators and curriculum experts in India, Nepal, Sri Lanka and Germany between January and March 2023. Bhutanese stakeholders included executives in the health system, health workers in the districts/fields and medical educators in the university and teaching hospitals.

Step 3: Development of an integrated curriculum

The TWG members conducted an extensive desk review of the literature on the undergraduate curricula and practices across developed countries with a detailed review of countries in South Asia. The TWG has three broad sub-groups that reviewed sections: basic and para-clinical sciences, medical sciences and surgical sciences. The curriculum was based on identifying core competencies with a constructive alignment of learning objectives, teaching-learning methods and assessments. The members of the TWG received training on faculty development, curriculum development, teaching-learning methods and assessment tools. In addition to the curriculum, the TWG also developed a curriculum implementation plan to aid the newly established Faculty of Undergraduate Medicine.

Step 4: Internal review

Faculty members from various clinical departments from the teaching hospitals were involved in reviewing the respective specialty competencies in the curriculum. The clinical faculty members were also trained on faculty

development and aspects of an integrated curriculum. This process was conducted with a medical education expert from Germany.

Step 5: National-level review

The content coverage of the curriculum was reviewed by a group consisting of 18 specialists. This group comprised individuals who had been educated with various forms of integrated curricula in countries in the region. The review team was also provided with training on faculty development, curriculum development and teaching-learning and assessment methods.

Step 6: Validation of the advanced version

The advanced version of the curriculum was reviewed by an independent group of team members comprising medical educators, technical experts and members from the regulatory body. After every round of review, the TWG convened a meeting and revised the draft curriculum.

Bhutan MBBS Programme

Bhutan adopted an integrated curriculum for the MBBS programme that will be delivered over a period of five years. The curriculum has six segments:

- Foundation of Medicine
- Early Clinical Exposure
- Applied Sciences Modules
- Clinical Rotations
- Community Medicine
- Medical Humanities

Foundation of Medicine and Early Clinical Exposure

Unlike in a traditional curriculum, a genuine effort was made to deliver the critical aspects of the basic and para-clinical sciences of the curriculum in the first two years of the programme. We adopted a system-based teaching-learning approach over subject-based didactics. To overcome disengaged learning of basic and para-clinical sciences, more emphasis was given to Interactive, Constructive, Active, and Passive of modes cognitive engagement on the applications of basic sciences over purely academic learning (Lim *et al.*, 2019; Malik & Malik, 2011). Early

Clinical Exposure is introduced to help students assimilate the learnings of the basic sciences and integrate them with clinical applications (Tayade & Latti, 2021).

System integration and module-based learning

18 modules will be delivered over two years. All relevant specialties were involved in the development of each module. For instance, the development of the Cardiovascular System Module was led by a cardiologist but components of the module were also developed with the involvement of an anatomist, physiologist, pharmacologist, and internist among others. The primary goal of such an effort was to ensure all aspects of competencies would be delivered through both horizontal and vertical integration (Baig et al., 2022; Brauer & Ferguson, 2015).

The module-based teaching covers the Cardiovascular system, Respiratory system, Endocrinology and metabolism, Gastrointestinal system, Nutrition, growth and development module, Blood and lymphoreticular system, Nephro-urology, Infectious diseases, Special senses module (ear, nose, and throat surgery, dermatology and ophthalmology), Radio-diagnosis and imaging module, Nervous system module, Mental health module, Musculoskeletal system module, Trauma module, Reproductive health module, Forensic medicine and toxicology module, Emergency medicine module and Clinical epidemiology and research module.. These will be delivered through classroom-based teaching in the afternoons.

Clinical clerkship

Clinical exposure begins with the Early Clinical Exposure component in the second year. Students will undergo supervised rotations in clinical departments across various departments in the third and fourth years. Students in the fifth year will undergo professorial rotations in the five major departments of Internal Medicine, General Surgery, Paediatrics, Obstetrics and Gynaecology and Psychiatry where they will be

provided in-depth exposure to clinical management.

Community medicine, behavioural sciences and medical humanities

Components of community medicine and public health will be delivered through a structured programme including placement in communities and primary health centres in the first four years. Components of behavioural sciences, medical ethics and communications skills will be delivered through a dedicated curriculum with a conscious focus on the Bhutanese context that influences patient care in the country.

Doctors in the 21st century need to appreciate both the explicit and implicit roles of a medical doctor and as a global citizen. An attempt was made to ensure community-based learning through the placement in primary health centres to provide experience of a doctor's role in public health (Amalba et al., 2020). It is also imperative for graduates to understand the influence of cultural sensitivities in patient management and communication with patient carers. The components of medical humanities will help orient students to the specifics of medical ethics and professionalism (Petrou et al., 2021).

Achieving constructive alignment

We identified the following five core competencies that will provide overall guidance in framing the learning objectives and the selection of the appropriate teaching-learning and assessment methods: Medical knowledge and patient care, Interpersonal and communication skills, Professionalism and ethics, Practice-based learning and improvement; and System-based practice. To ensure a competency-based delivery of the curriculum, the SMART learning objectives were grouped into broad domains of competencies and then aligned with the teaching-learning methods and assessment tools to achieve constructive alignment (Biggs, 2012) (Figure 2).

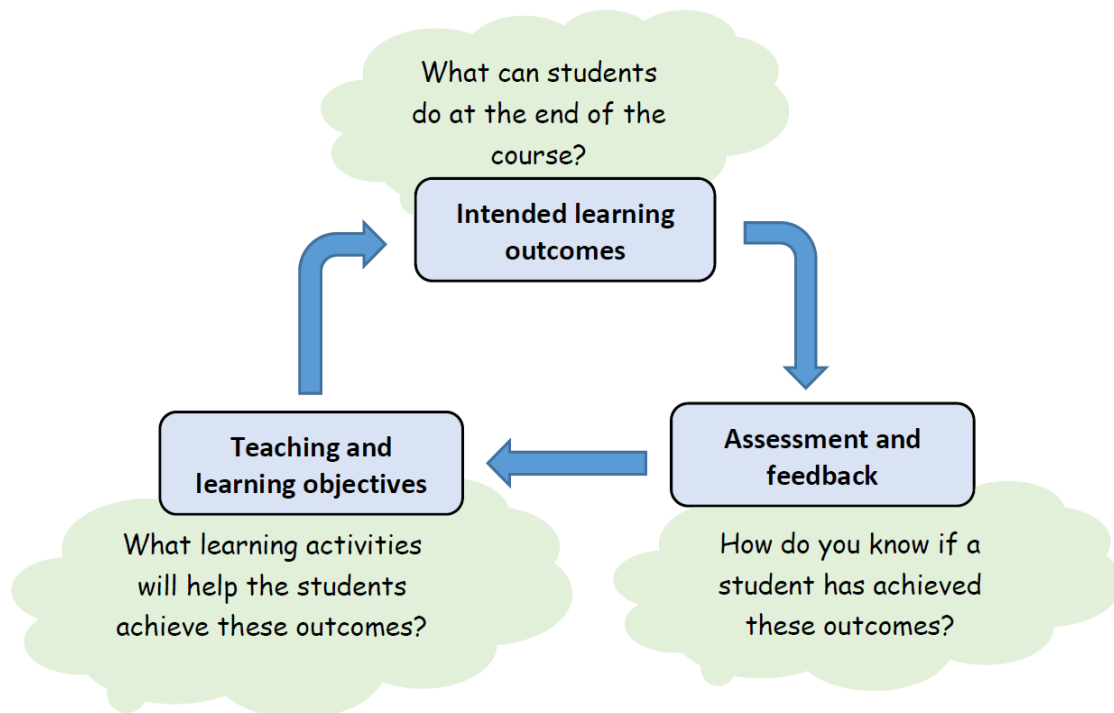


Figure 2: Components of constructive alignment of curriculum

In a competency-based curriculum, teaching-learning is student-oriented and student engagement is given much emphasis. The student-oriented learning and assessment are reported to have multiple benefits such as motivated students and satisfaction, student engagement, empowerment, deeper learning and better clinical reasoning skills among many others. Flipped classroom, case-based learning, team-based learning, community-based learning, inquiry-based learning and simulation-based learning methods of applied knowledge were included (Alinier & Oriot, 2022; George *et al.*, 2020). For clinical teaching-learning, four steps clinical teaching, bedside teaching such as one-minute preceptor, workplace-based assessment tools were adopted to ensure the right competencies are developed in the students (Norcini, 2003). The curriculum has a strong feature of integrated learning over subject-based learning.

The current trends in medical education focus on developing the right competencies and observation of behaviour in the real-life setting by an experienced assessor. There is a growing adoption of integrated assessment such as

workplace-based methods of collecting information about student's performance and providing feedback based on Miller's pyramid for assessment of clinical competence (Norcini, 2003) (Figure 3). In our curriculum, we have provided space for reflection and feedback on various learning and assessment methods.

Roadblocks in the implementation of integrated curriculum

The concept of an integrated curriculum and integrated assessment is new in Bhutan with the majority of current clinicians and teachers having been trained in the traditional curriculum. The adoption of an integrated curriculum was a mindful attempt to bring in the best practices in medical education that have been implemented in India, Sri Lanka, Malaysia and Thailand. The first step involved a series of communication strategies to garner the support of senior clinicians and educators to appreciate the benefits of an integrated curriculum, especially in the context of preparing the graduate to face the growing complexities surrounding medical practices.



Figure 3: Advantages of frequent assessment accompanied by feedback in academic growth

The university initiated a series of faculty development programmes with training on newer concepts of medical education to increase teacher self-efficacy and productivity of medical educators. Some strategies that have already been adopted in the university include case-based learning, self-directed learning, the use of information communication technology, clinical audits and research to translate the learning objectives and competency domains. The university has developed plans to train all faculty members involved in the delivery of this curriculum.

The biggest roadblock is the lack of an adequate number of faculty members to implement this curriculum. All means and resources are required to designate dedicated faculty members as the students join the programme.

Conclusion

The establishment of an undergraduate medicine programme in Bhutan is a historic step in building health human resources and strengthening the health system. We took the opportunity to develop an integrated curriculum, adopting the best practices emerging in medical education. This curriculum is aimed at helping the students achieve the desired core competencies through an efficient delivery of a curriculum that is constructively aligned. Our

hope is that our graduates will be job-ready and future-ready and serve humanity in Bhutan and beyond.

Acknowledgement

We express our deepest gratitude to the Office of the President, Khesar Gyalpo University of Medical Sciences of Bhutan and the faculty members for their support and contribution in drafting the curriculum. We thank Dr. A Supe and Dr Brian Jack for all the pivotal roles they played in shaping the curriculum.

References

- Alinier, G., & Oriot, D. (2022). Simulation-based education: deceiving learners with good intent. *Advances in Simulation*, 7(1), 8. <https://doi.org/10.1186/s41077-022-00206-3>.
- Amalba, A., Abantanga, F. A., Scherpier, A. J. J. A., & van Mook, W. N. K. A. (2020). The Role of Community-Based Education and Service (COBES) in Undergraduate Medical Education in Reducing the Mal-Distribution of Medical Doctors in Rural Areas in Africa: A Systematic Review. *Health Professions Education*, 6(1), 9–18. <https://doi.org/https://doi.org/10.1016/j.hpe.2019.09.003>.
- Amin, Z., Seng, C. Y., & Eng, K. H. (2006). Practical Guide to Medical Student Assessment. WORLD SCIENTIFIC. <https://doi.org/10.1142/6109>.

- Baig, N., Siddiqui, F., Baig, M. A. M., Khurshed, I., & Meah, K. M. S. (2022). Level of integration in current undergraduate curricula of two private-sector medical colleges in Karachi. *Canadian Medical Education Journal*, 13(3), 84–90. <https://doi.org/10.36834/cmej.73910>.
- Biggs, J. (2012). Enhancing Learning through Constructive Alignment. In J. R. Kirby & M. J. E. Lawson (Eds.), *Enhancing the Quality of Learning: Dispositions, Instruction, and Learning Processes* (pp. 117–136). Cambridge University Press. <https://doi.org/10.1017/CBO9781139048224.009>.
- Brauer, D. G., & Ferguson, K. J. (2015). The integrated curriculum in medical education: AMEE Guide No. 96. *Medical Teacher*, 37(4), 312–322. <https://doi.org/10.3109/0142159X.2014.970998>.
- George, T., Carey, R. A. B., Abraham, O. C., Sebastian, T., & Faith, M. F. (2020). Trainee doctors in medicine prefer case-based learning compared to didactic teaching. *Journal of Family Medicine and Primary Care*, 9(2), 580–584. https://doi.org/10.4103/jfmpc.jfmpc_1093_19.
- Lim, J., Ko, H., Yang, J. W., Kim, S., Lee, S., Chun, M.-S., Ihm, J., & Park, J. (2019). Active learning through discussion: ICAP framework for education in health professions. *BMC Medical Education*, 19(1), 477. <https://doi.org/10.1186/s12909-019-1901-7>.
- Malik, A. S., & Malik, R. H. (2011). Twelve tips for developing an integrated curriculum. *Medical Teacher*, 33(2), 99–104. <https://doi.org/10.3109/0142159X.2010.507711>.
- Norcini, J. J. (2003). Work based assessment. *BMJ (Clinical Research Ed.)*, 326(7392), 753–755. <https://doi.org/10.1136/bmj.326.7392.753>.
- Petrou, L., Mittelman, E., Osibona, O., Panahi, M., Harvey, J. M., Patrick, Y. A. A., & Leedham-Green, K. E. (2021). The role of humanities in the medical curriculum: medical students' perspectives. *BMC Medical Education*, 21(1), 179. <https://doi.org/10.1186/s12909-021-02555-5>.
- Tayade, M. C., & Latti, R. G. (2021). Effectiveness of early clinical exposure in medical education: Settings and scientific theories - Review. *Journal of Education and Health Promotion*, 10, 117. https://doi.org/10.4103/jehp.jehp_988_20.