

Modifying Medical Educational Curricula Based on an Interdisciplinary Approach: A Requirement of the Present Era

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Dear Editor,

In recent decades, human knowledge has rapidly progressed, especially in the evolution of new biomedical sciences and techniques, transforming all aspects of social life dramatically. In the new technology era in modern society, novel disciplines, not only theoretically but also from an empirical and practical points of view, have profoundly transformed bureaucratic policies.

Internationally, there is an agreement that the certification obtained at the end of university training no longer indicates sustained quality and the fact that graduates do not have enough skills to perform their professional roles and tasks in the real world.

The large volume of theoretical contents and allocating excessive time to different courses have caused learners to experience fragmented education. The lack of relevance of educational programs to the future work environment has conferred them dryness, dullness, and meaninglessness, delivering traditional discipline-centered training methods unresponsive to the present needs of societies.

Such training, which is offered in the separate disciplines of traditional curricula, is not enough for the current society, which always seeks new knowledge and skills to masterly overcome problems and dive into any conundrum of various sources (1). For this reason, it

seems necessary to develop new educational approaches, including competency-based, interdisciplinary, and multidisciplinary education, during which the delimitation between various fields of knowledge is removed, and learning opportunities are provided in different methods (1).

Competency-based education is a shift in the academic culture, structure, and doctrine, ensuring that all students succeed, and the fundamental deficits of traditional models of learning are resolved. Schools and universities should move towards competency-based education for many reasons, including the achievement of more effective and deep learning and greater equity and the establishment of a continuously improving system, as well as to equip students with sufficient knowledge, psychomotor, communication, and decision-making skills and attitudes to enable them performing best at different actions and jobs. On the other hand, an interdisciplinary curriculum is required to achieve competency-based training.

Interdisciplinary refers to embarking on new areas of knowledge and studying more than one fields of knowledge (2). Interdisciplinary is not a specialty but a method of generating knowledge to manage complexities and discover fundamental facts; in other words, interdisciplinary is a process of answering a complex question that cannot be addressed through one particular

discipline or profession (3).

For the past hundred years, the basis of higher education has been stabilized on academic disciplines. The discipline-centered model has been popular for acquiring specialization in various fields, but today another approach (i.e., the interdisciplinary approach) must be employed to address the modern society's needs and rescue the scientists trapped in solitary cabins. Moreover, this approach can promote technological convergence for the benefit of society (4).

The theoretical base of interdisciplinary curricula can be found in the educational philosophy of progressivism. A progressive movement is an approach towards a training and learning model which emphasizes creativity, activity, natural learning, real-world experiences, and other experiences of this kind (5).

Another new theoretical base of the interdisciplinary approach is the theory of "constructivism." The theory believes that individuals should construct their own facts. One principle of constructivism states that experience is a meaningful key of learning, but of course the experiences that each person gains directly or indirectly and sharing them would be very effective, but not those experiences which have been offered in a textbook (6).

By following Cuba, Iran's medical education system was structurally separated from the body of higher education in the 1960s, proposing a social and community-centered medical theory and insisting on the intertwining of health and treatment with education. This system has important advantages, including no need to import physicians from other countries, appropriate geographical distribution of medical education, and growth of medical activities and research (7).

Amid the Corona pandemic, this integrated system became the strength of treatment and academic research with an independent decision-making power. On the other hand, ample evidence indicates that this system has caused the separation and distance of medical research from some complementary research fields like artificial intelligence and out-of-medical system research centers such as those working on Nanotechnology Biotechnology Information Technology and Cognition (NBIC) areas. At the time that the interdisciplinary approach is growing more than ever, this structural separation can become a weakness of Iran's medical education system.

Interdisciplinary communication seems as an impossible or at least inaccessible goal in Iranian universities. Students in most academic disciplines are trained without any perception of other disciplines and the skills required for interdisciplinary learning and communication (8). Meanwhile, the Corona crisis taught us that we need people who are able to travel the boundaries of knowledge and bring organizations together.

The Corona pandemic and its impacts on the education system have shown us that in order to have a sentence in scientific fields, we need a special culture that forces scientists to learn to speak the language of different scientific disciplines and work together. Many universities

and academic medical centers around the world, although intellectually and theoretically supporting interdisciplinary programs, still scramble within the boundaries of traditional disciplines (8). However, the Corona pandemic has made it clear that interdisciplinary education is not an option but an obligation.

The Ministry of Health, Treatment and Medical Education of Iran, in its report entitled "Achievements, challenges, and agreements ahead of the Islamic Republic of Iran is the health system," recognized the emphasis on separation and specialization, island thinking, lack of horizontal and vertical integration of curricula, and lack of communication as the most important weaknesses of the country's medical education system (9). Hereafter, politicians and managers are obliged to design and implement interdisciplinary programs to train qualified students who can meet the country's current and future health needs.

Accordingly, among the solutions to promote interdisciplinary education are to pay attention to health-centered disciplines such as community medicine and update the curricula of such disciplines in accordance with the interdisciplinary view. The main problem of the current curricula is that they have been written by focusing on current technologies and considering the physician-patient communication model. However, considering the pace of changes and the challenges caused by the Coronavirus pandemic in medical education, current curricula cannot prepare students to face these changes. The hallmark of interdisciplinary education is the integration of notions and guiding principles from multiple disciplines to systematically form a more comprehensive and hopefully coherent analytic framework, offering a richer understanding of the issue under examination. The known boundaries between different fields of knowledge should not be the basis for designing medical education curricula. In fact, these curricula should emphasize on the interdisciplinary subject matter and outcomes and move towards being more and more integrated and effective to face real situations.

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