LETTER TO EDITOR

Bologna Model of Education—MD/PhD Program: Observation of PhD students in Bosnia and Herzegovina

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The reform of the higher education system and the introduction of the Bologna Process throughout the University of Bosnia and Herzegovina, the PhD study became the next step in education after the completion of an integrated study of medicine. Bosnia and Herzegovina officially accepted the principles of the Bologna Process in the field of education in 2003 (1). In Bosnia and Herzegovina, at all public universities (Sarajevo since 2013, Mostar since 2011, Tuzla since 2013, Banja Luka since 2015, East Sarajevo (Foca) since 2015), PhD study is implemented as a three-year program in the biomedical field, and is finalized by writing doctoral thesis. Previously, the old system of study was organized through the undergraduate and postgraduate studies (along with the writing of master's dissertation), and then writing a doctoral dissertation with subject and a mentor in the field of the work of the healthcare worker. At the first private Faculty of Medicine, Sarajevo School of Science and Technology, the PhD program will begin with the academic year 2018/2019. The fact is that the reform of the education system enabled quick movement through the academic hierarchy, and fast possibility of starting the study, but that also led to many problems for the students, who are often not able to fulfill what is expected of them. The requirement for defending the PhD dissertation is to publish an article that covers the part of the PhD dissertation (data from the dissertation should be the core of the

article) in the Web of Science (WoS) or Current Contents (CC) or in the reference index database (without specifying which one). This is added in order to avoid the experience from the region, when in the race to meet the criteria, the student does not publish article that is directly related with the topic in journals with high impact factor (2). Inadequate criteria for defending the PhD dissertation, contribute to the emergence of qualitatively uneven dissertations, and thus a minimal increase in knowledge from a certain field at the local and the world level. The purpose of the PhD dissertation should essentially be the candidate's contribution to the development of certain medical area from which the dissertation is written, and it should provide new knowledge that can improve clinical practice. Such dissertation can certainly find a place in the most high impact journals. Aspiration of some Universities towards science excellence is highly justified and substantiated, and it should be essentially the same for all Universities that award the same degree after the completion of the studies. The desire for academic action in Bosnia and Herzegovina does not go away, regardless of the unfavorable economic, political or global situation, which is an exceptionally good thing but is a little surprising.

Roach and Sauermann pointed out that 40% of PhD students are not interested in pursuing an academic career (3) which is significantly different from the situation in Bosnia and

Herzegovina (4-9). The interest in B&H is high, and the lists for enrollment from year to year are getting bigger. Through a year or two of the PhD studies (with obligatory modules which are in one or even in all four semesters, depending on the University and elective modules that are basically always the same), the student is trained on the methodology of scientific work, with the basic statistical methods. The third year or the last year is left for writing of the dissertation itself. The lectures are essentially confined to the theoretical preparation of the candidates. After the first year of the studies, most of the universities in B&H do not organize workshops (which are included in the PhD studies plan and program) where student can acquire practical knowledge and skills in the development of PhD dissertation. The term of continuing medical education is something what is not established. The choice of a mentor for the writing of the PhD dissertation is left to the student without a clear plan for all students (it should be emphasized that these are general studies without specialization in certain field). Criteria for the selection of mentors led to the fact that very small group of individuals can have that role. The conditions for mentoring at some universities are the status of full professor and publications in CC index base. The aforementioned conditions reduce the possibility of selecting a mentor, or it can happen that a student cannot write a PhD dissertation from the field in which he is working, because there is no professor who satisfies the mentioned conditions. Some very wide areas (like cardiology) at some universities are tied to only one person, who cannot accept all interested candidates. The occupation of highly profiled mentors by day-to-day work is another problem. An administrative problem when selecting a mentor from the University from abroad or the problem with an institution where a student works, when the institution sometimes is not willing to collaborate is a part of everyday PhD student life, who is essentially helpless in that situation.

The average salary of a healthcare worker in Bosnia and Herzegovina is miserable, planned funds for scientific research work in health institutions are not present or are minor, open calls for the development of science in the territory of Bosnia and Herzegovina, if present, are financially insufficient. The phenomenon of individuals involved in international projects and collaborations is rare, the emergence of those directly involved in projects supported by the European Union are even rarer, the laboratory equipment of healthcare institutions is rather modest and inadequate, genetic processing is rarity or basic (again depending on equipment) and that are only parts of the daily life in Bosnia and Herzegovina. The screening program does not exist in essence, there is no register of certain pathology or illnesses, with the gap between colleagues who have studied under the old system of education (undergraduate, postgraduate, doctoral studies) and colleagues who are much younger, but with experience far from them, makes it difficult to write the dissertation it-

self. In the end it comes to the fact that at those universities that have set the criteria of scientific excellence, there are no individuals who complete the study successfully, or if they exist, they are sporadic, in other words, they are exceptions that do not confirm the rule. Unfortunately, public data is not available.

PhD position is a full time job. In B&H it is not treated even as a part-time job, but more like personal interest. Aside from the funding deficit, time spent for the research itself or possibility to partially conduct research abroad is often dictated/limited by the employers, consequently forcing PhD students to prolong or change thesis.

What to do? Wait for the number of students to accumulate, so that the criterion for the defense of the dissertation is lowered. That is wrong and leads to quantity, and not quality. That also leads to a decline in the university's rating, because without indexed publications there is no progression, and such university is not attractive to anyone. The question of the social and scientific use of investment in hyperproduction should be clearly raised (the sense of large number of Master degree and PhD degree in science, especially in the field of biomedicine is quite questionable), of which the benefit is for individuals and their titles and there is a little benefit for the science and society in general. Quit the studies? That should certainly not be a reasonable option in the middle of the course with investments already done without return. The third option is to try something on your own, is considered as an imperative, with the question of whether it essentially has a meaning or satisfy ethical standards in science and publishing (tendency to fabrication and falsification of research data, plagiarism), and whether it is possible at all to do so in such environment because it has a very uncertain outcome.

The fact is that something has to be changed. The degree of scientific excellence must be preserved and the high quality must be aspired. If the practice of enrollment of a new generation in year after year continues, the students need to have infrastructure with high quality, high quality mentoring and counseling, because essentially, in the end, science is powerful tool that one country must use for its promotion. In the end, it is only right to combine the maximum of the academic community and students themselves, who can only achieve something more with their integrated activities.

This text is written with hope that in a few years there will be a new group of PhD students who will analyze the scientific output of this generation of PhD students, and from different time point say, whether this generation that strived to scientific excellence, managed to raise the level of medical science as well as clinical practice on the territory of Bosnia and Herzegovina.

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Thank you again to Dr. Eike-Henner W. Kluge for his dedication and time to IMIA on this important work.

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Greetings from the President of IMIA, Dr. Chris Lehmann

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