

Medical universities in Austria: impact of curriculum modernization on medical education

Abstract

During the last decade medical education in Austria has seen more changes than in the whole of the previous century, with a complete overhaul of the structure of undergraduate curricula. Curricula now are organized in thematic, integrated modules, students have early patient encounters, the number of examinations has been drastically reduced, objective examinations have been introduced throughout the entire course as has skills training, and quality management is assured. As a consequence of the judgement of the European Court in 2005 against discrimination and in favour of equal treatment of EU citizens, free enrolment was abandoned and admission tests were introduced. In postgraduate training, licensing examinations are now obligatory. Crucial results from the point of view of students as well as with regard to the supply of manpower to the health care system are a sharp decrease in the formerly extremely long mean duration of study programmes and a sharp fall in drop-out rates. The now fully autonomous medical universities have the opportunity to intensify collaboration and to embark on a process of continuous renewal. Structural reform of undergraduate and postgraduate curricula will eventually ensure full equality of Austrian and other European medical qualifications.

Need for change

During the last decade Austria has seen more fundamental changes in medical education than in the whole of the previous century. These changes happened for a number of reasons and impact students' entire educational careers from admission until well after postgraduate training. Prior to new regulations taking effect the old structures, dating back to the time of the monarchy, were much the same as when they were described by Th. Billroth in his seminal work of 1876 [1]. Since 1999 the three public medical faculties had been engaged in efforts to develop completely new undergraduate curricula. The results of this endeavour were implemented in 2002, when a substantial change of university organization came into effect in Austria. The three medical schools (Vienna, Graz, Innsbruck) were separated from the 'old universities' and established as autonomous medical universities [2].

Up till then curricular structures had been highly traditional [3], [4]. Preclinical and clinical education were strictly separate, teaching was organized exclusively along disciplinary lines and almost exclusively didactic, subject by subject was examined sequentially in one-to-one oral examinations, the proportion of electives was minimal, and a thesis was voluntary and only written by students wishing to pursue an academic career. The outcome was a far cry from fitness for practice [5].

Admission to medical undergraduate education was completely free. Anyone who had finished the required secondary education was entitled to enrol. This approach

resulted in cohorts of enormous sizes (up to 1800 first-year students in Vienna in the 1980s) and inhibited careful course planning. Drop-out rates were high: approximately 50% over the entire curriculum, with approximately two thirds of the drop out occurring 'due to the preclinical years'. Although the curriculum was planned as a six-year programme, mean time to completion was more than eight years.

In contrast to Germany and Switzerland, Austria had no national comprehensive examinations ('Staatsexamen'), a characteristic difference that was already noted by Billroth [1].

Passing 23 examinations eventually resulted in graduation. This was the last formal assessment in medical education. Postgraduate training consisted of stipulated training periods which, apart from spending the required amount of time, required only a portfolio-like confirmation of content.

Elements of change

Structure of the curriculum, assessment

Medical universities in Austria are completely free in structuring their curricula. Nevertheless, the new curriculum structures, which were developed independently by the three state medical schools, show considerable similarities (<http://www.meduniwien.ac.at>, <http://www.medunigraz.at>, <http://www.i-med.ac.at>, <http://www.pmu.ac.at>) [6], [7], [8]. The strict separation of theory

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and practice has been abandoned; students are offered early patient contacts with an increasing proportion of practice-based learning as they progress through the curriculum. Undergraduate education which had been organized according to a two-cycle model (preclinical / clinical phase) has been reorganized into an integrated one-cycle model. Based on a profile of competencies [9], teaching and learning are now organized in thematic, integrated modules. Modules and additional courses, such as skills training, critical appraisal and research, are integrated horizontally as well as longitudinally. The number of examinations has been reduced considerably, albeit with local differences [10]. In general, assessment in the knowledge domain is done by written objective examinations, and skills are increasingly assessed systematically. In order to promote scientific thinking all students are obliged to write a thesis which is prepared, planned and written during a course on 'critical appraisal and research' [11].

A paradigm change in admission to undergraduate education

A decision by the European court in June 2005 (matriculation had already begun) determined that all students from EU member states applying to Austrian universities were subject to the same regulations that applied to Austrian citizens. This resulted in a sudden increase in applications, which, unsurprisingly, were mainly by German students. Free admission which had been adhered to for better or worse came to a sudden end. Federal legislation was amended in order to allow pre-admission selection. Class sizes were set at 740 students in Vienna, at 400 students in Innsbruck and at 300 students in Graz 300 (http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf, http://www.bmwf.gv.at/publikationen_und_materialien/wissenschaft/universitaetswesen/spiel_studie/, <http://www.medunigraz.at/5460>, <http://www.pmu.ac.at/de/195.htm>). Because of the autonomy of medical universities in Austria, each medical university uses different admission procedures. Vienna and Innsbruck medical university decided to cooperate and are applying a well known instrument to test academic abilities, the Eignungstest für das Medizinstudium in Österreich (EMS, ability test for medical education in Austria) (http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf, http://www.bmwf.gv.at/publikationen_und_materialien/wissenschaft/universitaetswesen/spiel_studie/, <http://www.medunigraz.at/5460>, <http://www.pmu.ac.at/de/195.htm>), and at Graz medical university a local instrument (test of basic knowledge) is applied (http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf, http://www.bmwf.gv.at/publikationen_und_materialien/wissenschaft/universitaetswesen/spiel_studie/, <http://www.medunigraz.at/5460>, <http://www.pmu.ac.at/de/195.htm>)

Licensing examinations

In accordance with amendments to the law, licensing examinations, in addition to clinical rotations and a portfolio-like report, have been required for family physicians since 1999. Licensing examinations for all the other specialties were introduced in 2004. These examinations are organized with technical support from the Medical University of Vienna (<http://www.arztakademie.at/pruefungen/oeaek-allgemeinmedizin/berichte/>).

New universities

Established as independent universities in 2004, the three state medical schools are no longer part of the classic universities but fully autonomous institutions. In 2003 the first private medical university was founded in Salzburg. Its five-year curriculum is completely new to medical education in Austria. This first private medical school in Austria trains small classes (42 highly selected students per year). Study delays are not acceptable and students have to pass the United States Medical Licensure Examination (USMLE) as an obligatory element (http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf, http://www.bmwf.gv.at/publikationen_und_materialien/wissenschaft/universitaetswesen/spiel_studie/, <http://www.medunigraz.at/5460>, <http://www.pmu.ac.at/de/195.htm>).

Bologna and medicine

Legislation in 2002 incorporated many elements of the Bologna process, which are applicable to medical education as well (e.g. quality assurance, ECTS credits, diploma supplement). In order to address the main source of resistance to change, undergraduate medical education was set up as a six-year diploma course which was one-phased by definition. Amendment of the law in 2009 changed the one-phase model to a two-phased curriculum, which will come into effect in 2012 when a new medical curriculum is to be implemented [2]. Existing curricula can remain unchanged but the medical universities will be free to change to the bachelor-master system if they wish to do so.

Impact, problems and perspectives of change

Consequences of the changes during the last decade can be identified at several levels of the educational system.

University level

Between 2002 and 2009 new regulations for medical curricula were rolled out in step with the progression of the cohort entering medical education in 2002. This phase coincided with the first term of office of the governing bodies of the new autonomous medical universities

(2004 to 2008). This may have caused additional stress to the universities, which had to cope with a paradigm change in curricular structure and methods and at the same time were engaged in setting up a new organizational structure according to an entirely new concept of institutional management.

Impact on organization and logistics

New curricular structures required new ways of governance and administration (<http://www.meduni-graz.at/848>, http://www.meduniwien.ac.at/bemaw/ck/linkverzeichnis_handbuch.php). The shift from a curricular organization along disciplinary lines to an integrated curriculum with a thematic, modular organization helped to move decentralized resources to new, higher level organizational structures within the university (details differ from school to school). Content and examinations are planned by coordinators who are responsible for modules or different phases of the curriculum. As a result, an underlying structure of interdisciplinary communication is emerging, which is completely different from the previous structure based on discrete subjects.

Just as important as the new curriculum structure is the structure resulting from the change to new exam methods, which were implemented rather late in Austria, compared to similar changes in Germany and Switzerland. Measures such as division of labour, blueprinting, review procedures before and after exams, constant application of the 'four eyes principle' in quality- and result-related steps, new challenges in communication with students about requirements, application of objective examinations and feedback on results have considerably improved the transparency of this key element of education, which used to be very unstructured and unreliable in the past. As a result of increased emphasis on the teaching and assessment of skills and competencies, learning centres were set up in all medical schools. The need to structure and support the learning process became – in conjunction with the demands of teaching large groups of students – an incentive for the use of e-learning strategies [12].

Further problems

Bland et al. point to problems that are likely to occur when substantial changes are implemented in a curriculum [13]. One of these is a performance dip, which almost inevitably occurs when old routines are abandoned. Problems of this kind probably occurred at all universities and were dealt with in different ways. In Vienna, some changes and adjustments of initial intentions were made as is documented in the self report to the voluntary accreditation project [6] In Graz considerable resistance to change had to be overcome, which was accomplished by a thorough external evaluation (http://www.meduni-graz.at/qualitaetssicherung_studium/). In Innsbruck new examination methods, which had been planned initially, were suspended, and a comprehensive evaluation has been postponed until the first cohorts will have completed the entire new curriculum [7]. The Salzburg school already has had to undergo the required accreditation and re-accreditation process for private universities twice, and

is presently expecting the results of its graduates in the USMLE.

Admission – methodology, gender bias

One of the longest standing, most tenacious problems was free entrance to undergraduate education. Prior to the judgement of the EU court in 2005 there was political consensus that unlimited admission should be allowed in contradiction to the position of the medical faculties. 'Selection' was mainly 'self selection'. The inevitable introduction of pre-admittance selection procedures has changed the root of the problem. Currently, the ratio of applications to places at all schools is roughly five to one. Completely new and unfamiliar admission procedures were subject of heated debate throughout the country. The debate focused on the misconception that admission tests should have predictive value, ensuring that graduates would be 'good' doctors, whereas the procedure was conceived as a way of fair selection based on academic abilities. Both the national EMS and local instruments have revealed reliable results.

In striking contrast to previous experiences in Germany and Switzerland, the results for women were significantly worse than were those for men at all three universities. The resulting debate on this gender gap is ongoing. There have been in-depth discussions about the admission procedure and possible underlying causes of the gap, which has been mainly attributed to differences between men and women in their socialization process in secondary education (http://www.eignungstest-medizin.at/Bericht_EMSAT08.pdf, http://www.bmwf.gv.at/publikationen_und_materialien/wissenschaft/universitaetswesen/spiel_studie/, <http://www.medunigratz.at/5460>, <http://www.pmu.ac.at/de/195.htm>).

Perspectives

The considerable reduction in drop-out rates and mean study time provides new opportunities for students. While official data of the ministry are lacking medical schools are reporting times to completion of studies of 12-14 semesters and drop-out rates below 10%. This 'change of habits' will not only impact students' individual careers but also planning for manpower development in the health sector.

Also the transition from undergraduate education to postgraduate training appears to be changing. At two places (Graz, Innsbruck) the final year is composed of clinical rotations, and Vienna currently is changing in this direction. In conjunction with a competency based catalogue of outcomes at graduate level this will contribute to comparability of medical education in the German speaking countries thereby increasing personal mobility and opportunities for employability.

There are new opportunities for teachers as well. In conjunction with new requirements with regard to educational competencies (teaching, learning, assessment, evaluation) career tracks in education are emerging. In 2009 new promotion criteria were implemented in all medical universities as a late consequence of the establishment of medical universities and the complete remodelling of the university landscape. This in turn requires structured

programmes for faculty development (<http://www.meduniwien.ac.at>, <http://www.medunigraz.at>, <http://www.i-med.ac.at>, <http://www.pmu.ac.at>).

Postgraduate training level

Whereas all elements of teaching, learning, assessment and evaluation in undergraduate education have been altered to a remarkable extent, the implementation of new teaching and learning methods in postgraduate training is yet to come. Postgraduate training is affected by new obligatory licensing examinations in a way that necessitates further adaptations. (<http://www.arztakademie.at/pruefungen/oeaek-allgemeinmedizin/berichte/>).

National level

Three completely autonomous medical universities have implemented curricula which are structurally similar but differ in details according to the profiles and local circumstances of the different institutions. This is true for examinations as well and – quite importantly – for admission procedures too. But independence has also revealed similarities, and the approach based on individual autonomy probably has advantages over a collective approach by decree. The current system has demonstrated possibilities for synergy as well: development of national competency-oriented educational objectives (graduates should be licensed to work as a medical professional in all parts of Austria), exchange of exam questions and common accord and mutual support in faculty development.

International level

International discussions are increasingly dealing with the Bologna process also in medicine. Disputes about one or two cycle curricula often seem to overshadow other important issues. A significant feature of the Austrian approach is a top down process in structuring medical education. The uppermost Bologna level (3 years PhD education) provides ample opportunities for a career in research. The title of Medical Doctor ('six years, 5,500 hours') is deemed a professional qualification, which nevertheless relies on science-based education to an even greater extent than in the previous curriculum. Thus, both the PhD and Master levels are firmly established (<http://www.meduniwien.ac.at>, <http://www.medunigraz.at>, <http://www.i-med.ac.at>, <http://www.pmu.ac.at>). The implementation of the basic qualification of a Bachelor in Medicine has been made conceivable by the 2009 amendment of university legislation [2]. This has opened possibilities for implementing a Bachelor course if an urgent need should arise or a significant added value would be perceived (e.g. interprofessional education, health sciences university).

An important criterion on an international level is 'mobility', both during the whole course and at the points of in-

tersection. In the foreseeable future Austrian graduates will be on an equal footing with graduates from other German speaking countries both formally and with regard to the quality of their education, and they will no longer be burdened with the disadvantages (e.g. in relation to postgraduate training in Germany) which currently still exist.

In conclusion

We do not intend to create the impression that the changes described resulted solely from the ideas of those concerned and their efforts to resolve the problems at hand. A number of external factors also facilitated the changes in the content and structure of medical education, which had been repeatedly discussed and called for since the 1970s. External influences are in evidence at all levels: from the international/European level all the way to individual medical schools. Combined with the fact that problems had been acknowledged for a very long time, internal and external factors have led to results that are demonstrable at all levels.

The changes pertain to all elements of the educational system, the undergraduate programme in particular; in some respects they are also becoming evident in postgraduate training. Curriculum modernization significantly affects university structures, such as coordination, funding, logistics, quality assurance and faculty development. Changes also affect students, who today are learning in fundamentally different conditions (admission, duration of studies, graduate qualifications, international match of the medical degree).

A very important asset of the Austrian system are the excellent opportunities for collaboration among the medical universities, which are benefiting from the synergy created by joint efforts, while still remaining autonomous and able to determine their own profiles – as they should be able to do.

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