

Delivering teaching in dentistry at Queen's University, Belfast for 100 years

Chris Irwin,*¹ Wendy Turner,¹ Amanda Willis,¹ Amanda Beresford¹ and Chris Johnston¹

Key points

Dentistry has been taught in Queen's University for over 100 years, the course and curriculum evolving to reflect the advancements in clinical knowledge and treatments, educational theory and, most recently, in digital learning.

The COVID-19 pandemic created huge challenges for education providers in the delivery and assessment of the undergraduate programme, requiring flexibility and creativity, and resulting in a much greater use of technology and a drive towards blended learning.

Queen's University has fully embraced internationalisation, increasing our student number and widening student demographics, enriching the student experience.

Abstract

Dental education has been delivered in Queen's University for just over 100 years, with the Dental School celebrating its centenary in 2020. During that time, the undergraduate curriculum has evolved greatly, through innovations in the delivery of teaching and assessment driven by changes in educational practice, developing technologies and, most recently, the COVID-19 pandemic. Throughout all of these changes, our focus remains on our students, their wellbeing, and their development as lifelong learners for a career in the dental profession.

Humble beginnings

The creation of a Dental School in Queen's University, Belfast has been recorded by Philip Stoy, professor of dentistry and dean of the Dental School from 1947–1971. In a beautifully written paper,¹ Professor Stoy recounts the decision-makers, the facilities and the politics of developing a dental school at that time.

The first step towards the creation of a dental school in Belfast was on 18 June 1919, when the University's Senate agreed a proposal to consider 'what steps, if any, should be taken to provide teaching in dentistry in the university'. A committee was subsequently formed, including the Professor of Medicine, medical members of Senate, the headmaster of a local grammar school and the Lord Mayor of Belfast. The committee found that, while there was no dental school in the University, a small number of undergraduates

were already enrolled as dental students, required to complete their training at external units, including Edinburgh, Dublin and London. The committee duly recommended the creation of a dental school within the University. The recommendation, accepted by Senate, was to undertake the necessary steps to enable Queen's to confer degrees in dentistry. Lectureships in dental surgery, dental mechanics and orthodontia, alongside the rather wonderfully titled 'materia medica and metallurgy', were advertised at a salary of £50 per annum and subsequently filled. The members of staff took up their posts on 1 October 1920, the date which could be considered as the beginning of a dental school at Queen's.

Meanwhile, the delivery of dental care within the nearby Royal Victoria Hospital was also being reviewed. Reference to dental work in the hospital, mainly extractions, was reported in 1903, with treatments almost certainly being undertaken by medical staff. In 1920, two dental surgeons were appointed to the hospital staff. A suitable room – the spare pathology laboratory! – was lent to the fledgling dental department, which housed two dental chairs. The patients' waiting room was an outside corridor. The department was

expected to be cost-neutral and so a small patient charge for fillings and extractions was included. At the same time, the first two dental students were enrolled onto the undergraduate course. As such, the Dental School, a joint venture between University and Hospital, was created.

Subsequent years saw expansion of the clinical facilities, part funded by the university, the hospital and through a fundraising event organised by students (something akin to the modern rag day). Additional clinical space was created through the purchase of two army huts, creating a fully equipped and 'well-lighted' conservation clinic, a laboratory and a waiting room. The exodontia clinic remained in the borrowed clinical space in pathology, expanded to a three-chair unit. Additional staff in dental mechanics and anatomy were recruited as the Dental School began to grow from its humble beginnings.

The subsequent stages in the history of the Dental School in Belfast resonate closely with today's world – the ongoing need for additional clinical space, state-of-the-art equipment, appropriate teaching facilities and academic staff, alongside the importance of effective cooperation between hospital and university. Dental schools need to continue to adapt to the

¹Centre for Dentistry, Queen's University, Belfast, Northern Ireland, UK.

*Correspondence to: Chris Irwin
Email address: C.R.Irwin@qub.ac.uk

Submitted 24 June 2022

Accepted 7 July 2022

<https://doi.org/10.1038/s41415-023-5477-6>

ever-changing NHS, developing of technology and the academic environment, and need to manage the expectations of dental students, external stakeholders and patients.

An evolving curriculum

As the practice of dentistry continues to develop, both the content of and the delivery of our curriculum has also evolved. We have moved away from the traditional model comprising two years of teaching in medical sciences, followed by three years of clinical training. Students are now exposed to dentistry – clinical skills and knowledge – from the beginning of their course. There is a much greater focus on the development of communication skills, professionalism and the expected behaviours required of a well-rounded dental graduate.

Assessments are more meaningful and test the application of knowledge in a range of scenarios, not simply a test of regurgitation of facts. Alongside formal assessment, longitudinal, continuous assessment and feedback has become integral to students developing their clinical practice and applying their knowledge. Provision of constructive feedback to our students, on all aspects of their academic and clinical performance, is central and vital to our teaching ethos. Feedback can be provided to students in many ways and at Queen's, clinical feedback is largely provided contemporaneously through an iPad-based, electronic system at every clinical encounter both with patients and in the simulated environment. This clarifies and reinforces the verbal feedback given and enables learners and staff to depict patterns in students' clinical performance across a range of domains, including clinical skills, professional behaviours, knowledge acquisition and leadership development. This feedback is intended to enable students to be aware of and to address their individual developmental needs through reflection and is central to our learning process and for preparation of lifelong learning as a dentist.

Changing demographics

Admission to dentistry continues to be highly competitive, with applications to our course increasing year-on-year. Queen's has fully embraced internationalisation as a key priority and we have been successful in attracting students from across the globe – non-UK students now make up 25% of our annual

intake. As a result, our School and University now has greater ethnic diversity than at any other time, with students benefiting from a multi-cultural experience on campus and greater international connections.

Gender rates in dentistry have also changed: in 1921, almost all of the 5,831 registered UK dentists were men;² in December 2021, the majority (51.5%) of 43,292 registered dentists were women.³ The trajectory to a female majority for dentistry is set to continue: in 2021, 67% of dental school admissions in the UK were from women.⁴ The continued disparity of genders is an area which we are actively exploring, developing means to promote dentistry as a career option for young men.

We are also committed to providing widening participation opportunities in dentistry. Our combined, year-long pathway programme for Year 13 students, amalgamating dentistry, medicine and biomedical sciences, aims to break down barriers to progression into university by giving practical advice and support with regard to applying to and studying at Queen's University. The programme culminates in a week-long 'campus summer school', which immerses students in evidence-based, subject-specific education and gives a true flavour of a week in the life of a student. Those who successfully complete the programme are guaranteed an interview for a place on the course. We, as with most dental schools, use multiple mini interviews (MMIs) in the selection of applicants. While academic performance remains centrally important to our selection process, MMIs are designed to assess personal traits, ranging from resilience and maturity to empathy and ethical values – important behaviours for any future member of the profession.

The impact of the COVID-19 pandemic

The need for change in the way we deliver our curriculum was never more apparent than during the past few years, with the arrival of the COVID-19 pandemic forcing dental schools to rethink teaching strategies in a greatly restricted environment. The initial closure of universities and dental schools meant a total move to online learning, which was quite a challenge for a very practical, clinical degree course! In Queen's, lectures were recorded, case-based learning scenarios were developed and assessments, including virtual objective structured clinical

examinations, were created for online delivery. As access to teaching reopened, simulation-based teaching was expanded in preparation for a return to clinical practice and to ensure clinical skills were being maintained and enhanced. Electric micromotors with speed-increasing handpieces were procured to increase the range of treatments carried out in poorly ventilated, open-plan clinics. Aerosol generating procedures were relocated to single-chair surgeries and students were rapidly fit-tested for FFP3 respiratory masks to ensure these could be undertaken safely. The past two years have been extremely challenging for dental schools, but as restrictions ease and we move back to a more 'normal' world, there is no doubt that some of the changes made to the delivery of the course during the worst days of the pandemic will remain. This will undoubtedly enrich our curriculum – in particular, a greater emphasis on blended learning and student access to a rich resource of online content created to enhance and reinforce their learning.

Student support and wellbeing is also key to the student experience. To achieve our goal of producing well-rounded individuals who are safe practitioners and ready to begin their journey of life-long learning as healthcare professionals, dedicated support is essential. The Dental School has a strong record of providing support for students who, for various reasons, experience difficulties. This was particularly important during the COVID-19 pandemic, when students faced many uncertainties over two academic years, resulting in significantly increased levels of stress and anxiety. The ability to demonstrate the range and breadth of clinical experiences required to meet the essential learning outcomes at graduation was hugely challenging during COVID-19 restrictions. In addition, students faced financial concerns related to the required extensions of the course. Microsoft Teams was used to facilitate student group meetings and was also useful in maintaining contact for morale-boosting purposes during the lockdown phase of the pandemic, when students were sent to study at home. During these periods, personal tutors hosted a variety of inclusive meetings, ranging from cookery events to quizzes and film reviews. Fostering a supportive environment with clear communication updates from the teaching team, alongside access to pastoral support, remains crucial as we emerge from the pandemic.

The future

As we look to the future, our course will adapt to ensure our students have the knowledge, skills and experience to succeed in dental practice in an ever-challenging environment. We have moved into the era of 'digital dentistry' and it is vital that we prepare our graduates with the requisite skills in this area. In collaboration with our regional postgraduate medical and dental training agency (Northern Ireland Medical and Dental Training Agency), our students now have access to haptic 3D virtual reality dental training simulators, providing standardised cases, objective assessment and interactivity, while enhancing learning and psychomotor skill acquisition. Fully digital workflows in dentistry, such as incorporating intraoral scanners and computer-aided treatment planning and design, has also increased dramatically in recent years and we will ensure our graduates have experience in these new technologies.

We have also begun the process of decolonisation of our curriculum and will ensure that equality, diversity and inclusivity is fully embedded in our degree programme. Similarly, we have taken initial steps to ensure students are aware of the importance of sustainability in dentistry, in line with United Nations goals. A strong student voice is central to our approach to developing our course and, with the significant involvement of our students, these areas will be a major focus moving forward.

Conclusions

As the dates above indicate, the Dental School in Queen's University marked its centenary in October 2020. Unfortunately, because of the pandemic and the restrictions in place at that time, we were unable to celebrate that milestone. Over those 100 years, the Dental School has undergone many changes. Continued development and enrichment of our curriculum content and delivery, most

recently driven by the pandemic, will ensure our graduates are fully prepared for their transition into the workplace.

Ethics declaration

The authors declare no conflicts of interest.

Author contributions

Chris Irwin, Wendy Turner, Amanda Willis, Amanda Beresford and Chris Johnston contributed to the development and completion of this manuscript.

References

1. Stoy P J. A History of The Queen's University of Belfast Dental School. *Ulster Med J* 1951; **20**: 118–130.
2. Gallagher J E, Scambler S. Reaching A Female Majority: A Silent Transition for Dentistry in the United Kingdom. *Prim Dent J* 2021; **10**: 41–46.
3. General Dental Council. Registration Statistical Report 2021. Available at https://www.gdc-uk.org/docs/default-source/annual-reports/gdc_registration-statistical-report-2021-22-final-accessible.pdf?sfvrsn=78d3f4e_3 (accessed January 2023).
4. Office for Students. Health education funding: Medical and dental intakes. 2021. Available at <https://www.officeforstudents.org.uk/advice-and-guidance/funding-for-providers/health-education-funding/medical-and-dental-intakes/> (accessed January 2023).

Correction to: Book review: *Tooth wear: an authoritative reference for dental professionals and students*

The original article can be found online at <https://doi.org/10.1038/s41415-022-5369-1>

Journal's correction note:

Book Review *Br Dent J* 2022; **233**: 990.

The journal would like to publish a minor clarification to this review, that it is the authors' royalties which will be donated to the two charities named. In addition, the correct pricing information is £95.50 (eBook); £119.99 (hardcover).