

2016

Survey of Dental Education in Europe Summary Report



ADEE

Promoting Dental
Education in Europe

Anderson, Eugene

Anderson Policy Consulting on behalf of

ADEE

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About the Authors



Eugene L. Anderson, Ph.D., is a higher education policy expert and consultant. He previously served as the Chief Policy Officer and Managing Vice President at the American Dental Education Association (ADEA). In this role he led the ADEA Policy Center (APC) and integrated the Association's educational research, access and diversity programming and public policy advocacy activities to address contemporary issues facing dental education and the oral health needs of the public. Under Dr. Anderson's leadership the ADEA Policy Center expanded its research, advocacy and programmatic activities. During his tenure at ADEA, Dr. Anderson also was

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As a predoctoral student, she served as President of the European Dental Students' Association and as a resident - National Representative for the American Dental Education Association (ADEA) Council of Students, Residents and Fellows. She was the only postgraduate student selected nationally for the Academic Dental Career Fellowship Program.

As an enthusiastic and dedicated Junior Faculty at TUSDM, she received fellowships from the ADEA Emerging Academic Leaders Program and the Institute for Teaching and Learning Program. She has been honored for most of her work: most recently in 2015 & 2016 by the American Academy of Periodontology Foundation, and in 2016 by the ADEA - Chair of the Board Citation.

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Table of Contents

2016 Survey of Dental Education in Europe Summary ReportError! Bookmark not defined.

About the Authors2

Acknowledgements.....3

List of Tables and Figures5

Introduction7

Methodology8

Summary Findings and Tables11

Funding and Programme Offerings11

Program Structure and Curricular Format13

Dental Students in Europe.....17

Conclusion22

Appendix23



Promoting Dental
Education in Europe

List of Tables and Figures

Table 1: Number of Dental Schools In Europe and ADEE Members by Country.....9
Table 2: Survey Response Rate by Country10
Table 3: Dental School Institution Type at Respondent Dental Schools.....11
Table 4: Fields of Study/Professions Offered by Respondent dental schools.....12
Table 5: Postgraduate Programmes Offered at Respondent Dental Schools13
Table 6: Length of Dental Surgery/Dentistry Programme at Respondent Dental Schools.....14
Table 7: Year Dental Students Begin Treating Patients at Respondent Dental Schools14
Table 8: Level of Curriculum Integration at Respondent Dental Schools16
Table 9: Use of Technology in Curriculum by Percentage of Respondent dental schools17
Table 10: Percentage of Dental Students at Respondent Dental Schools by Age18

Figure 1: Year Dental Students Begin Treating Patients by Length of Programme at Respondent Dental Schools.....15
Figure 2: Dental Students Gender at Respondent Dental Schools18
Figure 3: Nationality & EU Status of Dental Students at Respondent Dental Schools19



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Education in Europe



Dear ADEE colleagues and the wider European dental education arena,

It is with great pleasure that as President of the Association for Dental Education in Europe (ADEE) I can present to you on behalf of ADEE the first in-depth survey of ADEE membership. In late 2015, the ADEE executive identified a deficit in information and understanding of the profile of dental schools within its membership. Thus, it committed to developing and delivering this comprehensive survey of ADEE membership. The ultimate aim for this survey was two-fold.

In the first instance, it will serve a useful purpose for ADEE in helping us meet the diverse and multicultural needs of our membership. Drawing together membership from diverse European countries brings with it a broad range of educational, political and cultural challenge. This survey is a first step in helping ADEE explore and understand such diversity. It will enable the development and delivery of services required by our membership and ultimately enable our membership benchmark against each other in key criteria.

Secondly, the completed survey will greatly assist the Executive in its engagement with the European legislative bodies and lobby groups. Being better prepared to present the span and diversity of our membership will enable ADEE demonstrate to bodies such as the European Committee that ADEE is 'the voice of dental education in Europe', and as such, a key enabler and partner in developing and delivering world class dental education.

It is in this context that the Executive and survey working-group made conscious decisions with regards the content of the survey. Issues such as funding sources, language, student and faculty profile, clock hours and programme characteristics are explored. With an initial circulation to 118 schools, I am delighted to say we had a response rate of over 70% making the survey truly representative of our School membership database. We hope you find this a useful piece of information and we would welcome your comments and feedback.

To conclude I would like to acknowledge and thank on behalf of the Executive, the survey working group led by Prof. Damien Walmsley. I must also thank Dr. Eugene Anderson and Dr. Irina Dragan for delivering this project for us with such enthusiasm and commitment. Finally, I would also like to acknowledge the ADEE Dublin office for assistance with this project.

Prof. Corrado Paganelli
ADEE president
June 2017

Introduction

The findings presented in this report from the first survey of members of the Association for Dental Education in Europe (ADEE) provides a comprehensive and in depth overview of dental education in Europe in 2016. With 85 respondent dental schools in 25 countries represented, this report reveals both unique and common aspects of dental education across Europe. Dental education in Europe is as diverse as the nations represented. However, many of the respondent dental schools in Europe are closely aligned with the Framework for Dental Programme recommended by ADEE. This combination of alignment and uniqueness fits with ADEE's policy goals for dental education in Europe. According to the ADEE *Curriculum Structure, Content, Learning and Assessment in European Undergraduate Dental Education* (2010),

"ADEE is keen to preserve diversity in undergraduate dental education in order to give Universities and learners real choice. However, choice should be achieved within a common framework and with a high level of transparency, in order to promote cohesion. This framework should stimulate the discussion necessary to provide our dental students with tertiary educational structures that have a genuine European, rather than an purely national, background."¹

More than 20 languages are used across the continent. Nearly all respondent dental schools use their native language for instruction, are publicly funded (by the national or regional government), are 5 or 6 years in program length, offer postgraduate programmes in orthodontics and oral surgery, are working on some level of curricular integration, are using various forms of educational and clinical technology, enrol predominantly students from the same country and employ educators from the same country. However, programme diversity exists in some very important areas. The respondent dental schools use several different names for the dental surgery or dentistry degree. These schools vary in the type of allied dental and postgraduate programmes offered. There is tremendous variation in clock hours and what year dental students begin treating patients. Although most are implementing some level of curricular integration, educational technology and clinical technology, there is a range of activity and use of technology.

The overview of dental education in Europe is as complex as all the nations represented in the study. The following report will provide a detailed look at each of these similarities and unique aspects of dental education in Europe.

¹https://www.adee.org/documents/taskforces/task_force_ii_curriculum_struct_content_learning_assessment.pdf (pg. 2)

Methodology

2016 Survey of Dental Education in Europe Summary Report provides information and analysis on the programmes offered by dental schools in Europe on topics such as curriculum and instruction, use of technology and student and faculty profile. ADEE formed a working group consisting of dental educators and experts from across Europe to assist with the development of the survey instrument. It is important to note that not all European dental schools are members of ADEE. In 2016, there are nearly 200 dental schools in Europe (see Table 1). The survey was distributed electronically, via email, on 22 June, 2016 to 116 ADEE member dental schools in 25 European countries.

The survey was closed officially 20 August, 2016, after several reminder emails and individual follow ups. Eighty-five schools responded (which includes several schools not originally sent the survey) for an overall response rate of 73 percent. Excluding the 5 countries that did not have any dental schools participating, the response rate varied by country from 50 percent to 100 percent (see Table 2).

After a complete analysis of the respondents' data it was determined that missing cases (schools) and data should not be imputed or estimated. It is standard practice to not impute or estimate missing data when it is determined that data is missing at random, therefore we believe there is minimal nonresponse bias.

Note: the overall number of dental schools that responded is 85, however not every school answered each question. Therefore, the total count on many of the tables will be less than 85.

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SURVEY OF DENTAL EDUCATION IN EUROPE SUMMARY REPORT

Table 1: Number of Dental Schools In Europe and ADEE Members by Country

Country	No. of Dental Schools per CED Manual 2015	No. of ADEE Member Dental Schools Surveyed (2016)	Surveys Submitted	% of Dental Schools in Analysis
Denmark	2	2	2	100%
Lithuania	2	2	2	100%
Estonia	1	1	1	100%
Iceland	1	1	1	100%
Latvia	1	1	1	100%
Malta	1	1	1	100%
Slovenia	1	1	1	100%
Finland	4	4	3	75%
UK	16	17 ²	12	75%
Croatia	3	2	2	67%
Netherlands	3	3	2	67%
Norway	3	3	2	67%
Portugal	7	4	4	57%
Hungary	4	2	2	50%
Switzerland	4	2	2	50%
Sweden	4	3	2	50%
Greece	2	2	1	50%
Ireland	2	2	1	50%
Germany	30	25	14	47%
Italy*	34	7	14	41%
Spain	17	7	5	29%
Belgium	5	2	1	20%
France	16	4	3	19%
Romania	13	4	2	15%
Poland	10	2	0	0%
Bulgaria	3	1	0	0%
Austria	4	1	0	0%
Turkey	NA	5	3	-
Serbia	NA	2	1	-
Russia	NA	2	0	-
Bosnia & Herzegovina	NA	1	0	-
Total	193	116	85	44%

² Includes school new to dentistry since CED Manual publication and some changes in UK dental education market

Table 2: Survey Response Rate by Country

Country	No. of Dental Schools Surveyed	Surveys Submitted	Country Response Rate
Portugal	4	4	100.0%
Croatia	2	2	100.0%
Denmark	2	2	100.0%
Hungary	2	2	100.0%
Lithuania	2	2	100.0%
Switzerland	2	2	100.0%
Estonia	1	1	100.0%
Iceland	1	1	100.0%
Latvia	1	1	100.0%
Malta	1	1	100.0%
Slovenia	1	1	100.0%
Finland	4	3	75.0%
France	4	3	75.0%
Spain	7	5	71.4%
UK	17	12	70.6%
Netherlands	3	2	66.7%
Norway	3	2	66.7%
Sweden	3	2	66.7%
Turkey	5	3	60.0%
Germany	25	14	56.0%
Italy*	14	7	50.0%
Romania	4	2	50.0%
Belgium	2	1	50.0%
Greece	2	1	50.0%
Ireland	2	1	50.0%
Serbia	2	1	50.0%
Russia	2	0	0.0%
Poland	2	0	0.0%
Bosnia & Herzegovina	1	0	0.0%
Bulgaria	1	0	0.0%
Austria	1	0	0.0%
Total	116	85	67.5%

*Include 7 ADEE member schools in Italy and 7 dental schools in Italy that were not ADEE members but expressed plans to join ADEE.

Summary Findings and Tables

Funding and Programme Offerings

Public funding of higher education has long been the dominant structure throughout Europe, therefore it is not surprising that 86% of respondent dental schools are public institutions supported by the national, regional or local government (**see Table 3**). Only 9 respondent dental schools are private and 5 of these schools are located in Spain and Turkey. The three countries with the largest number of respondent dental schools, Germany, United Kingdom and Italy, each responded as to having a private dental school element as did Portugal.

Table 3: Dental School Institution Type at Respondent Dental Schools

Institution Type of Respondents	No. of Respondent dental schools	Percent
Public (government or regional funded)	72	85.7%
Private	9	10.7%
Other – public & private combination	3	3.6%
Total	84³	100%

According to the respondent dental institutions, the name of the dental surgery/dentistry qualification/degree varies by country. While all of these qualification/degree awards confer a title that allows someone to practice as a general dental practitioner, the name varies from Diploma, Bachelor’s, Master’s and Doctorate. The different nomenclatures used throughout Europe, particularly regarding the term “Master”, should be taken into account when assessing the results of the current survey, considering that a Master may not always be a separate Second Cycle educational program.

The German respondent dental schools have a final exam named "Staatsexamen." In addition to offering dental surgery/dentistry degree programs, many of the respondent schools offer programs of study in one of the allied oral health professions, such as dental hygiene, dental assistant/nurse, dental laboratory technician and dental therapy. Nearly half of the schools offer degree programs in dental hygiene and about a quarter offer programs in dental assistant/nurse (**see Table 4**). Most of the respondent dental schools offer either a diploma or bachelor’s degree in an allied oral health profession.

³ One respondent did not address this question

Table 4: Fields of Study/Professions Offered by Respondent dental schools

Field of Study/Profession	No. of Respondent dental schools	Percent of Schools Offering
Dental Surgery/Dentistry	73	100%
Dental Hygienist	36	49%
Dental Assistant/Nurse	19	26%
Dental Laboratory Technician	17	23%
Dental Therapy	13	18%

While not all dental specialties are recognized across Europe (by the European Union/Economic Area), various European countries recognize multiple dental specialties.⁴ According to Sanz et. al, 25 countries recognize Orthodontics, 21 countries recognize Oral Surgery, followed by Pedodontics and Periodontics which are both recognized by 15 countries and Prosthodontics which is recognized by 10 countries. The number of respondent dental schools offering dental specialties mostly corresponds with this same order; the most commonly offered postgraduate programmes are Orthodontics and Oral Surgery, 81 percent and 72 percent respectively (**see Table 5**). A majority of respondent dental schools in Europe also offer Periodontics, Prosthodontics, Endodontics, Pediatric Dentistry and Restorative Dentistry. Nearly half of the respondent dental schools in Europe offer 6 or more of the 12 postgraduate programmes listed in the study. Six respondent dental schools offer all of the postgraduate programmes listed in the study. Fifteen respondent dental schools only offer 1 or 2 types of postgraduate programmes listed in the study.

⁴ Sanz, M., Widstrom, E., and Eaton, K. A.. Is there a need for a common framework of dental specialties in Europe?. Eur J Dent Educ 12 (2008) 138–143.

Table 5: Postgraduate Programmes Offered at Respondent Dental Schools (select from pre-determined list including other)

Postgraduate Programme	No. of Respondent dental schools	Percent of Schools Offering
Orthodontics	67	80.7%
Oral Surgery	60	72.3%
Periodontics	54	65.1%
Prosthodontics	50	60.2%
Endodontics	46	55.4%
Pediatric Dentistry	45	54.2%
Restorative Dentistry	43	51.8%
Oral Medicine	24	28.9%
Dental and Maxillofacial Radiology	22	26.5%
Oral and Maxillofacial Pathology	20	24.1%
Dental Public Health	18	21.7%
Oral Microbiology	8	9.6%

Program Structure and Curricular Format

Teaching at respondent dental schools is performed primarily in the native language of the country where the school is located, 95 percent. Among the 85 schools in the study, 22 different languages are used as the primary language of instruction across 25 countries in Europe. Among those respondent dental schools that use a non-native language for primary instruction: one school in Malta and one school in Turkey each use English for instruction. Two respondent dental schools in Switzerland use German. Some schools offer a combined training in their native language and English, in order to accommodate international students. However, this study did not ask about use of multiple languages, so exact details on this format are not currently available.

Dentistry, is a profession that has been previously part of the medical education in multiple European countries. In many countries students are entering dental school right after high school graduation. An examination is administered to the students interested in pursuing this profession: the examination typically covers subjects such as anatomy, organic chemistry and physics or “numerous clausus”. In the UK, some respondent dental schools allow their applicants to enter as “graduate students”, but they must have a primary degree (their first degree) in biological sciences. In France students are required to take one year of “health” studies before entering a dental school.

The European Union (EU) has brought significant change in the curriculum of academic institutions with the goal of calibrating graduates for practice in all countries within the EU. “The Bologna Declaration” (1999) was aimed to facilitate professionals to move from one country to the other, while practicing their

profession. According to Directive 2013/55/EU of The European Parliament and of the Council of 20 November 2013, amending Directive 2005/36/EC, “Basic dental training shall comprise a total of at least five years of study, which may in addition be expressed with the equivalent ECTS credits, and shall consist of at least 5 000 hours of full-time theoretical and practical training.”⁵ Therefore, it is not surprising that the majority (72 percent) of the academic institutions require 5-year for preclinical, clinical and didactic education (**see Table 6**). Some countries have a 6-year (27 percent) program of dental education.

Table 6: Length of Dental Surgery/Dentistry Programme at Respondent Dental Schools

Length of Program	No. of Schools	Percent of Schools
5 years	57	72.2%
6 years	21	26.6%
8 years	1	1.3%
Total	79 ⁶	100.0%

There is a statistically significant correlation between length of dental surgery/dentistry programme and when dental students begin treating patients; the longer the program, the later students begin treating patients. Half of dental students begin treating patients in Year 3 (**see Table 7**). However, where Year 3 falls within the curriculum varies by total length of programme. At 5-year programmes 83 percent of students have begun treating patients by the 3rd Year compared to only 67 percent of students at 6-year programmes (**see Figure 2**).

Education in Europe

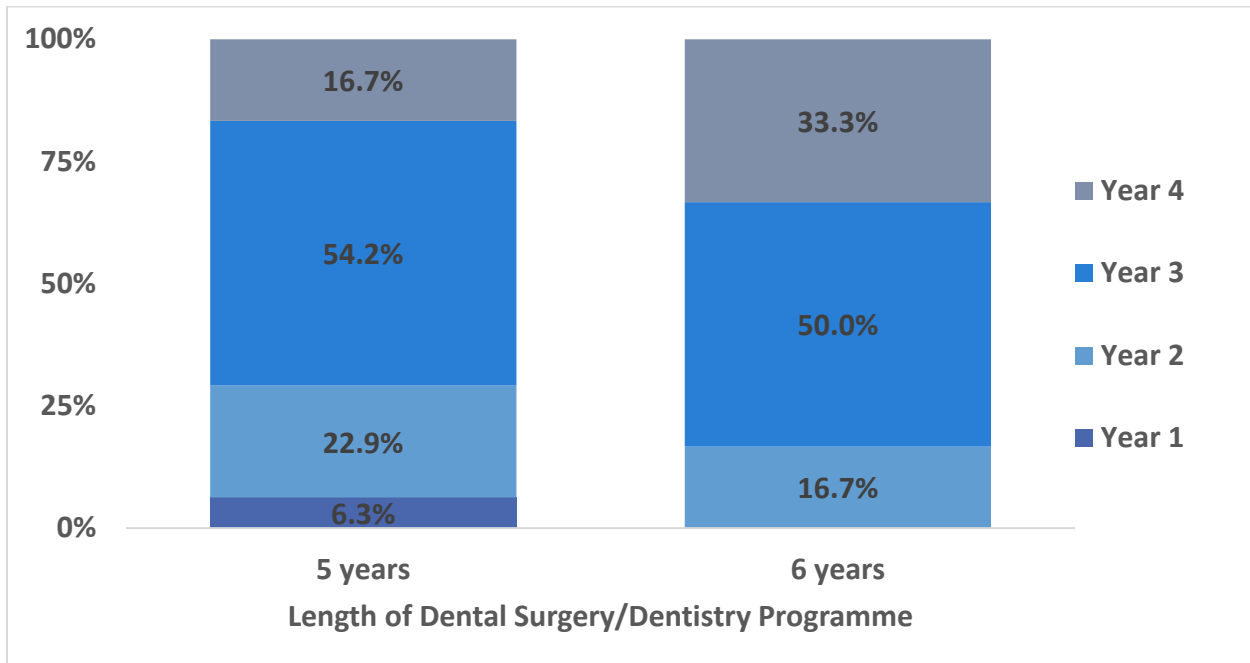
Table 7: Year Dental Students Begin Treating Patients at Respondent Dental Schools

	<i>No. of Schools</i>	<i>Percent of Schools</i>
Year 1	5	7.4%
Year 2	12	17.6%
Year 3	34	50.0%
Year 4	14	20.6%
Year 5	1	1.5%
Year 6	2	2.9%
<i>Total</i>	68	100%

⁵ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013L0055&from=EN> (pg. 153).

⁶ 6 respondents did not address this question

Figure 1: Year Dental Students Begin Treating Patients by Length of Programme at Respondent Dental Schools



There are several anomalies in the data for this question and should be further examined before conclusions are made about the quality of the education at several respondent dental schools.

According to the Institute of Medicine (IOM) report, *Dental Education at the Crossroads (1995)*, curricular integration is defined as, “an integrated basic and clinical science curriculum that provides clinically relevant education in the basic sciences and scientifically based education in clinical care.”⁷ There are lesser variations of this concept that involve a few courses only, or thematic units within the curriculum. The level of curricular integration occurring in Europe appears to be a mixture of minor integration (43 percent of schools) and major integration (35 percent of schools) (**see Table 8**). Few respondent dental schools in Europe have no curricular integration or full curricular integration. This assertion, should, however, be considered under the IOM’s definition, rather than being regarded as an overall integration of curricular unit’s content as defined in several of ADEE’s educational papers (e.g. Manogue M et al. Curriculum structure, content, learning and assessment in European undergraduate dental education - update 2010. *Eur J Dent Educ.* 2011; 15: 133-41).

⁷ Feld MJ, ed. *Dental education at the crossroads: challenges and change*. An Institute of Medicine report. Washington, DC: National Academies Press, 1995.

Table 8: Level of Curriculum Integration at Respondent Dental Schools

<i>Level of Curriculum Integration</i>	<i>No. of Respondent Dental Schools</i>	<i>Percent of Schools</i>
No integration: traditional discipline-based	6	9.2%
Minor integration: a few courses integrated	28	43.1%
Major integration: multiple curriculum components integrated	23	35.4%
Full integration: the entire curriculum is integrated	8	12.3%
Total	65	

Respondent dental schools in several countries reported similar levels of curricular integration. However, schools in 11 countries had various types of curricular integration across several institutions. Not surprisingly, the countries with the most respondent dental schools had the most variation in curricular integration. Across the 11 respondent dental schools in Germany just more than half, 55 percent, had minor integration, 36 percent had major integration and 9 percent had no integration. Just over half, 56 percent, of the 9 respondent dental schools in Italy have major curricular integration and 11 percent have full integration. Twenty-five percent of the 8 respondent dental schools in the UK have full integration and another 25 percent have minor integration. The largest share of the 8 respondent dental schools in the UK have major curricular integration.

Technology in dental education can take many forms. The survey focused on a specific set of technologies related to four important areas: 1) technology that enhances clinical skills and abilities, 2) technology that enhances patient care, 3) technology that assist with curriculum management and 4) technology that affects how students study. Adoption of new technologies varied considerably, but a third of respondent dental schools said they had partially or fully implemented advanced simulation (which includes use of computer-aided design (CAD) and computer-aided manufacturing (CAM)), lecture capture and required a laptop or mobile device (**see Table 9**). There is no statistically significant correlation between the level of curricular integration and use of the listed types of technology. However, there is a statistically significant correlation between several combinations of technology. Respondent dental schools utilizing a greater level of digital radiography are more likely to have implemented use of digital textbooks and manuals (**see Appendix**). Respondent dental schools using more advanced simulation, which includes use of computer-aided design (CAD) and computer-aided manufacturing (CAM) technology, are more likely to have a greater level of implementation of digital textbooks and manuals, and digital radiography. Not surprisingly, respondent dental schools using a greater level of Learning Management System are more likely to have greater implementation of Lecture Capture.

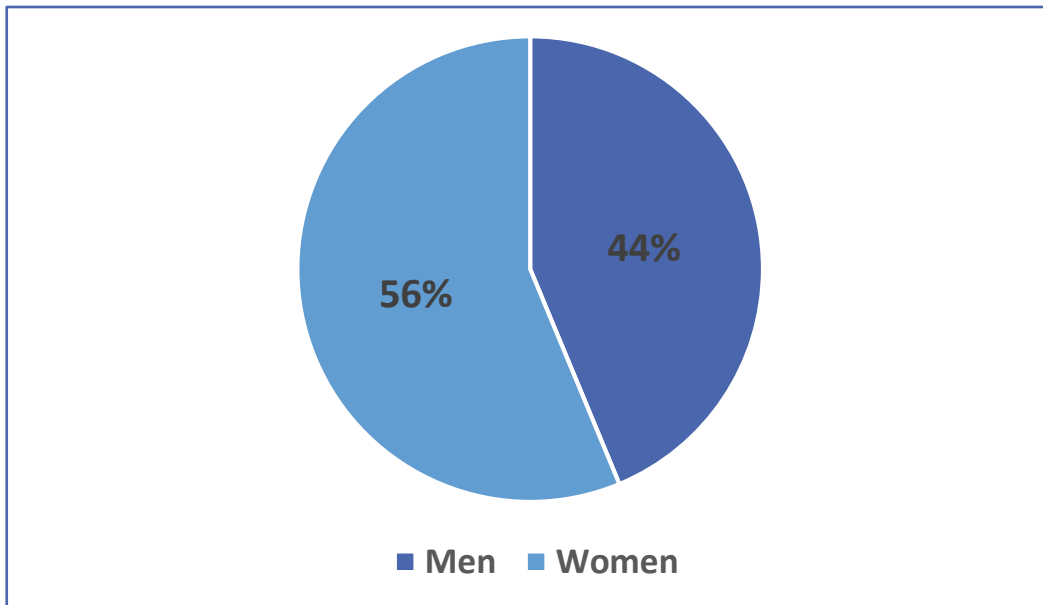
Table 9: Use of Technology in Curriculum by Percentage of Respondent dental schools

	Not Utilized	Developing/ Pilot Project	Partially Implemented	Fully Implemented
Patient Care Tools				
Digital Radiography	54.1%	17.9%	9.0%	4.5%
Electronic Health Records	38.8%	21.5%	16.9%	10.8%
Clinical Skills Tools				
Advanced Simulation	20.0%	40.3%	22.4%	11.9%
Student Work Tools				
Digital Textbooks and Manuals	15.3%	64.2%	6.0%	10.4%
Required laptop/mobile devices	16.5%	44.8%	13.4%	20.9%
Curriculum Management Tools				
Learning Management System	25.9%	37.9%	12.1%	16.7%
Lecture Capture	15.3%	47.7%	13.8%	18.5%

Dental Students in Europe

The majority of dental students at respondent dental schools are women, 56 percent (**see Figure 3**). For each country represented, women comprise more than half of the dental students at respondent dental schools. Although the gender breakdown in dental surgery/dentistry programmes across Europe is fairly even, there are several countries where women make up the overwhelming majority of students at respondent dental schools. Led by Croatia and Norway, 65 percent or more of dental students at respondent dental schools are women in 10 European countries.

Figure 2: Dental Students Gender at Respondent Dental Schools



Nearly all dental students at respondent dental schools are 25 years old or younger, 88 percent. Slightly more than half of dental students at respondent dental schools are between the ages of 20 and 23, 52 percent (**see Table 10**).

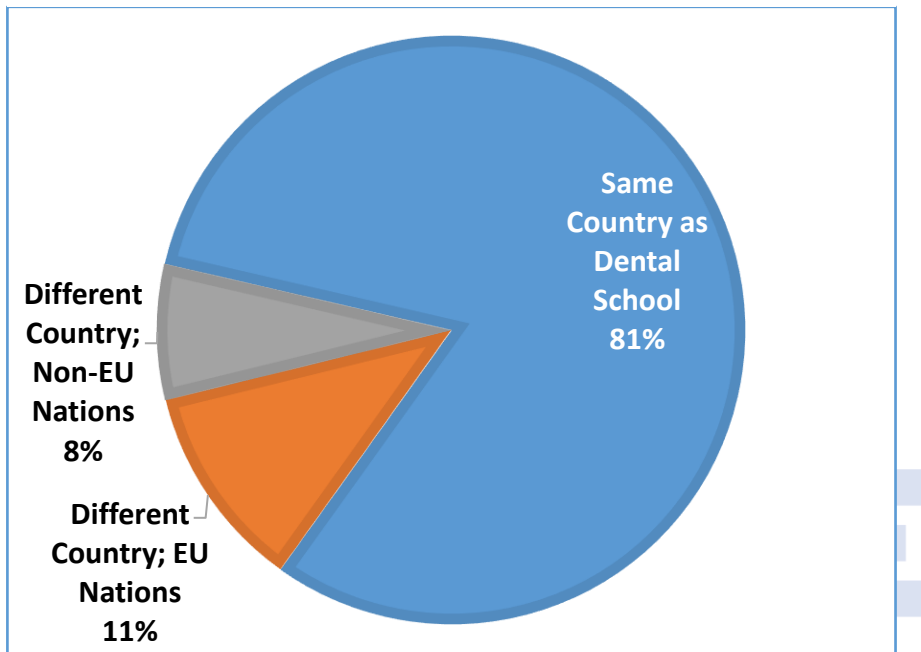
Table 10: Percentage of Dental Students at Respondent Dental Schools by Age

Age of Dental Students	Percent
Under 20	17.2%
20-21	23.9%
22-23	27.9%
24-25	18.8%
26-27	6.4%
28-29	2.5%
30-34	2.4%
35+	1.0%

Not all schools that completed the survey provided detailed information on the nationality of their students, so the following is based on data from 57 of the 86 schools participating in this survey. The majority of dental students at respondent dental schools attend a school in their home country, 81 percent (**see Figure 4**). Further analysis reveals that most of the respondent dental schools have very few

non-EU students. The overall percentage is higher because respondent dental schools in several countries have a significant share of students from non-EU countries; 44 percent of dental students at respondent dental schools in Hungary and 35 percent of dental students at respondent dental schools in Romania come from outside the EU.

Figure 3: Nationality & EU Status of Dental Students at Respondent Dental Schools



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Discussion

Respondent dental schools across Europe have developed programmes of study with differing ways of using time for didactic, simulation and clinic/patient care. Most of the surveyed schools offer patient care within the dental school, organized by departments. It is clear from the study that curricular integration is not a unified national effort in most countries with more than two respondent dental schools. We must continue to track curricular integration to truly understand if European dental schools are embracing this concept.

Nonetheless, within the limitations of the current snapshot, our results show that much more must occur to move dental education in Europe toward major vertical and horizontal curricular integration, along the lines advocated by ADEE's taskforces on curricular development. Although, curricular integration is considered a type of innovation future research should explore the effectiveness of various levels of curricular integration and reasons for the lack of curricular integration and determine if dental school educators in Europe see curricular integration as a goal.

It is possible for clinical care to take place at associated special sites within student campuses or hospitals, where dental students can rotate and render dental care. During the summer, students are encouraged to join private-practice settings where they can become more familiar with the environment and even work as dental assistants. The population treated at schools may vary from country to country, as the healthcare system may cover different types of procedures and further diversify the patient pool at various institutions.

The teaching background and the educational skills of staff supervising student's training in non-academic settings remains a conundrum that may be addressed in future surveys. In fact, this should be regarded as pivotal, since a desirable diversification of learning environments must not collide with the overall educational consistency in term of teaching methodologies and learning outcomes assessment.

Although the survey asked about year when students begin treating patients, it did not ask for more details about the clinical experience. The clinical experience compiles exposure in the medical and dental environment. Certain institutions require dental graduates to be qualified in basic medical testing procedures (intravenous line set-up, intramuscular injection, etc.). Clinical training involves "specialty rotations" where students visit different dental departments and perform the required procedures. Multiple departments prefer a "team-approach" for the case-based training, where for example, one member of the team prepares the teeth, another takes the impression, and another inserts the restoration. Depending on the dental school, some students begin treating patients in their first year, while others do not treat patients until their final year.

The dental clinical environment includes dentists, clinical dental auxiliaries and other dental auxiliaries. Dentists are also known as stomatologists or odontologists.

The responsibilities and roles of dental auxiliaries (dental chairside assistants, hygienists, therapists and dental technicians) varies from country to country. Inter-professional education sessions when medical, dental, pharmacy and nursing students gather to explore professional roles and responsibilities for collaborative treatment planning are mentioned by some institutions, but requires further in depth study.

This survey did not include questions about additional requirements to practice, but some countries require a vocational training year. The vocational training is required in order to obtain the dental license in countries such as Belgium, Croatia, Slovenia, Poland, Germany, Switzerland, and the UK. Depending on the type on the practice setting desired by the student, the duration of the vocational training is 1 or 2 years. Continuing education and training after graduation is either mandatory or a part of an organized system in place for all practicing dentists. For example, in Romania, the Romanian College of Dentists requires 200 continuing education (CE) credit hours within a 5-year time period, without having an annual minimum requirement. The CE hours can be obtained either at national or international conferences.

The use of technology varies at the respondent dental schools across Europe. The use of technology in dental education can facilitate preclinical, clinical, and didactic education, while supporting the administrative part of the institution. Students can interrogate different electronic databases (PubMed), collect and present evidence-based decision making to inform clinical decisions. The use of Electronic Health Records, (of which the market now has a number of alternatives) can support the patient-care educational training of students, while also allowing for operational support of a complex array of patient data. Lecture capture and video recordings can facilitate students the access to information at any given point in time they decide to study. CAD/CAM software, digital planning, and haptic systems are technology designed to readily integrate into treatment planning and facilitate improvement of clinical care. A school's technology committee can suggest appropriate use and implementation of information technology, by assessing the facilities and equipment in relation to current educational concepts of dental practice and training for dental practice.

The minority of respondent dental schools in Europe use digital radiography, use little to no advanced simulation, use digital textbooks and manuals, use electronic health records, use lecture capture and use a learning management system. Although some technologies may merely offer a digital version of what is already utilised, others can offer innovation that provides improved learning and patient care. While the lack of technology at respondent dental schools in Europe does not equate to a poor-quality education it may show that schools are not taking advantage of the benefits of various innovations.

One factor that may influence the use of technology is national health policies and dental school finances. Because nearly all of the respondent dental schools in the study are public, national policies regarding electronic health records, digital radiography might influence the implementation and availability of resources and

limited funding may limit implementation of other technologies. Further research is needed to understand the impact of the current use of technology on the education and patient care experience, barriers to increasing use of technology and future plans for greater use of technology.

The majority respondents are publicly funded institutions, who may be susceptible to the same challenges facing the wider higher education system. Economic challenges in many countries have led to numerous cuts in funding to higher education. One result of funding cuts is the need for higher education institutions to diversify funding sources. This has been accomplished in some instances by, “growth of private contributions (e.g. fees levied for lifelong learning programmes, differentiated tuition levels for non-EU international students and greater private industry funding for research and innovation).”⁸ ADEE will continue to monitor these developments to better understand how they impact the structure and cost of dental school in Europe.

Conclusion

One of the most significant findings of the first survey of ADEE member dental schools in Europe is the level of curricular variation across schools with the same programme length. All but 2 of the respondent dental schools that responded have a dental programme length of 5 or 6 years. However, what is done during that time might vary according to the institution. The variation that exist in level of curricular integration is also important for understanding the state of dental education in 2016 and beyond.

This report details some very important findings from the first survey of dental education in Europe. The study also provides a foundation for future study. In addition to the suggestions for further study already mentioned several other topics include; level of institutional focus on faculty and student research, clinic setup (specialty/department or practice based care), time spent on specialty areas of dentistry and financing dental education and cost to students.

⁸ Sursock, Andrée. Trends 2015: Learning and Teaching in European Universities. 2015. European University Association. (pg. 16).

Appendix

Correlations Between Level of Curricular Integration and Use of Technology									
		Level of Curricular Integration	Use of Technology: Digital Radiography						
			Digital Radiography	Advanced Simulation	Digital Textbooks and Manuals	Electronic Health Records	Required laptop/mobile devices	Learning Management System	Lecture Capture
Level of Curricular Integration	Pearson Correlation	1	-0.177	-0.062	-0.197	-0.241	-0.185	-.300	-0.065
	Sig. (2-tailed)		0.165	0.628	0.123	0.062	0.148	0.018	0.621
	N	65	63	63	63	61	63	62	61
Use of Technology: Digital Radiography	Pearson Correlation	-0.177	1	.350**	.348**	.247	0.075	.275	0.143
	Sig. (2-tailed)	0.165		0.003	0.004	0.046	0.543	0.024	0.252
	N	63	68	68	68	66	68	67	66
Use of Technology: Advanced Simulation	Pearson Correlation	-0.062	.350**	1	.455**	.250	-0.024	0.155	0.089
	Sig. (2-tailed)	0.628	0.003		0.000	0.043	0.844	0.212	0.480
	N	63	68	68	68	66	68	67	66
Use of Technology: Digital Textbooks and Manuals	Pearson Correlation	-0.197	.348**	.455**	1	0.168	.261	0.227	0.207
	Sig. (2-tailed)	0.123	0.004	0.000		0.177	0.032	0.065	0.095
	N	63	68	68	68	66	68	67	66
Use of Technology: Electronic Health Records	Pearson Correlation	-0.241	.247	.250	0.168	1	.303	0.232	0.015
	Sig. (2-tailed)	0.062	0.046	0.043	0.177		0.013	0.063	0.909
	N	61	66	66	66	66	66	65	64
Use of Technology: Required laptop/mobile devices	Pearson Correlation	-0.185	0.075	-0.024	.261	.303	1	0.098	0.240
	Sig. (2-tailed)	0.148	0.543	0.844	0.032	0.013		0.429	0.052
	N	63	68	68	68	66	68	67	66
Use of Technology: Learning Management System	Pearson Correlation	-.300	.275	0.155	0.227	0.232	0.098	1	.459**
	Sig. (2-tailed)	0.018	0.024	0.212	0.065	0.063	0.429		0.000
	N	62	67	67	67	65	67	67	66
Use of Technology: Lecture Capture	Pearson Correlation	-0.065	0.143	0.089	0.207	0.015	0.240	.459**	1
	Sig. (2-tailed)	0.621	0.252	0.480	0.095	0.909	0.052	0.000	
	N	61	66	66	66	64	66	66	66

*. Correlation is significant at the 0.05 level (2-tailed).
 **. Correlation is significant at the 0.01 level (2-tailed).

SURVEY OF DENTAL EDUCATION IN EUROPE SUMMARY REPORT

Participating Dental Schools by Country	Name of Respondent
BELGIUM	
Dental School Ghent University	Prof Dr Hugo De Bruyn
CROATIA	
School of Dental Medicine University of Zagreb	Prof Hrvoje Brkic
University of Rijeka	Prof Alan Šusti?
DENMARK	
University of Copenhagen, School of Dentistry/Department of Odontology	Anonymous
Inst. of Odontology and Oral Health, HEALTH, University of Aarhus	Anonymous
ESTONIA	
Institute of Dentistry, Faculty of Medicine, University of Tartu	Docent Mare Saag
FINLAND	
Institute of Dentistry, University of Eastern Finland	Prof Liisa Suominen
University of Turku	Prof Juha Varrela
University of Oulu	Anonymous
FRANCE	
Faculte de chirurgie dentaire Universite Paris Descartes	Professeur Louis Maman
Faculty of Odontologi	Anonymous
Université d'Auvergne	Prof Stéphanie Tubert-Jannin
GERMANY	
University of Witten/Herdecke	Prof Dr Stefan Zimmer
Charite Universitätsmedizin Berlin	Prof. Dr. Sebastian Paris
Christian Albrechts University Kiel	Prof Dr Christof Dörfer
Universität Rostock	Prof Dr Bernhard Frerich
Universitäts Leipzig, Medizinische Fakultät, Universitätszahnmedizin	Prof Dr Holger Jakstat
University Hospital of Heidelberg - Dental School	Anonymous
University of Giessen	Prof. Dr. Bernd Woestmann
University of Greifswald	Prof Alexander Welk
Klinik für Zahn-, Mund- und Kieferheilkunde, Universitätsklinikum Regensburg	Prof. Dr. Wolfgang Buchalla
Georg August University	Prof. Dr. Heyo Kroemer
Zentrum der Zahn-, Mund- und Kieferheilkunde (Carolinum)	Prof. Dr. Hans-Christoph Lauer.
Technische Universität Dresden	Prof Dr Michael Walter
University of Freiburg; Faculty of Medicine; Center for Dental Medicine	Prof. Dr. Joerg Strub

SURVEY OF DENTAL EDUCATION IN EUROPE SUMMARY REPORT

University of Mainz	Prof Dr N. Behneke
GREECE	
Aristotle University of Thessaloniki , Faculty of Health Sciences, School of Dentistry	Prof Giorgos Palaghias
HUNGARY	
Semmelweis University of Medicine	Prof Dr István Gera
Faculty of Dentistry University of Szeged	Anonymous
ICELAND	
University of Iceland, Faculty of Odontology	Peter Holbrook
IRELAND	
Trinity College Dublin School of Dental Science	Prof Brian O'Connell
ITALY	
University of Naples "Federico II"	Anonymous
Corso di Laurea magistrale a ciclo unico in Odontoiatria e Protesi Dentaria	Anonymous
Corso di laurea magistrale in odontoiatria e protesi dentaria, Pisa, Italy	Anonymous
school of dentistry university of bologna	Anonymous
Università degli Studi di Milano	Prof Antonio Carrassi
Università degli Studi di Torino - Italy - C.I.R. Dental School via Nizza, 230 10126 Torino Italy	Anonymous
Università degli Studi dell'Insubria	Anonymous
Dental School University of Sassari	Anonymous
Sapienza University of Rome Dental School	Anonymous
School of Dental Medicine, University of Siena-Italy	Anonymous
Università degli Studi di Parma	Anonymous
University of Brescia	Corrado, P
Università degli Studi di Trieste	Anonymous
Dental School, Vita-Salute San Raffaele University	Anonymous
LATVIA	
Riga Stradins University	Prof Ilga Urtane
LITHUANIA	
Vilnius university Faculty of Medicine Institute of Odontology	Assoc Prof Vytatue Peciuliene
Lithuanian University of Health Sciences	Prof Ricardas Kubilius
MALTA	
Faculty of Dental Surgery, Univeristy of Malta	Prof Nikolai Attard
Netherlands	
ACTA	Anonymous

SURVEY OF DENTAL EDUCATION IN EUROPE SUMMARY REPORT

Dental School Groningen	Anonymous
NORWAY	
Department of clinical Dentistry, Faculty of Health Sciences, UiT the Arctic University of Norway, Tromsø, Norway	Prof Claes-Göran Crossner
University of Oslo	Anonymous
PORTUGAL	
Instituto Universitário de Ciências da Saúde (new designation of the Instituto Superior de Ciências da Saúde Norte)	Prof Joaquim Moreira
University of Lisbon, Faculty of Dental Medicine	Anonymous
Universidade Catolica Portuguesa	Prof Aires do Couto
Faculdade de Medicina da Universidade de Coimbra	Prof Dr Fernando Guerra
ROMANIA	
Apollonia University IASI	Dr Liliana Gabriela Halitchi
Iasi University of Medicine & Pharmacy	Prof Dr Norina Forna
SERBIA	
University of Belgrade School of Dental Medicine	Anonymous
SLOVENIA	
Medical faculty, Dental division, University of Ljubljana	Anonymous
SPAIN	
Faculty of Dentistry. University of Granada (Spain)	Prof Alberto Rodriguez Archilla
Universidad CEU Cardenal Herrera	Prof Alicia López
Universitat Internacional de Catalunya	Dr Lluís Giner Tarrida
School of Dentistry. Complutense University of Madrid	Prof Carlos De la Macorra
Universidad Europea de Madrid	Elena Gazapo
SWEDEN	
Malmö University	Daniel Bengmark
Institute of odontology, University of Gothenburg	Anonymous
SWITZERLAND	
University of Bern	Prof Dr Christoph A. Ramseier
Centre for Dental Medicine	Prof Christoph Hämmerle
TURKEY	
Istanbul Kemerburgaz Üniversitesi	Prof Dr Türker Sandalli
Istanbul Aydin University Dental School	Prof Dr Ali Zaimoğlu
Hacettepe University	Prof Dr Ahmet Serper

SURVEY OF DENTAL EDUCATION IN EUROPE SUMMARY REPORT

UNITED KINGDOM

King's College London Dental Institute	Anonymous
BPP University Faculty of Dentistry	Dr Maher Almasri
Peninsula Dental School	Prof Christopher Tredwin
School of Dental Sciences, Newcastle University	Anonymous
School of Dentistry, University of Leeds	Anonymous
University of Central Lancashire	Anonymous
University of Leeds School of Dentistry	Anonymous
University of Manchester	Prof Paul Coulthard
University of Sheffield	Prof Chris Deery
Dundee Dental School	Anonymous
University of Bristol	Prof Peter G. Robinson
University of Liverpool	Prof Callum Youngson



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