



**MASTEROPPGAVE**  
**Education of dentists**  
**A comparison of the three dental  
programs in Norway**

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## Background

The idea of dental education in Tromsø was launched in parallel with medical education in the early 1970s (1). For various reasons the process was halted, and no dental school was established in Tromsø at that time (2). In the late 1990s, the idea was brought up again and a working group was established in order to evaluate the need for dentists in Norway and the possibilities for establishing a dental school at the University of Tromsø (3). In November 2002 the Norwegian parliament decided (with a very narrow margin) to establish dental education in Tromsø. The main premises were:

- The education in Tromsø shall contribute to increase the total number of dentists in Norway
- The program shall specifically meet the needs for dentists and dental specialists in Northern Norway
- The program shall comply with a decentralized educational model
- The program shall visualize the tasks and responsibilities in the public dental health service

The suggestion to establish a new dental school in Tromsø was controversial, both politically (4,5) in the academic environment (6) and in the Norwegian Dental Association (7) due to the following reasons:

- Where would they get the qualified personnel needed when the established dental schools in both Oslo and Bergen lacked qualified applicants? (6,7)
- What about the costs? It would be much cheaper to increase the capacity in Oslo and Bergen
- With the strong focus on public dental practice, the Tromsø model (6, 7, 9, 12) might be of inferior quality compared to Oslo and Bergen. Dentists graduating from Tromsø might be “second-class” dentists (6,7).

With the discussion and controversy related to the education in Tromsø, we figured it would be interesting to study possible differences in the professional profile and qualifications among dentist educated in Tromsø, compared with those examined from the more “traditional” faculties in Oslo and Bergen. This is the main reason why we are writing a paper regarding this subject.

## Purpose

To investigate if dentists educated in Tromsø have a different professional profile and qualifications compared to dentists educated in Oslo and Bergen.

## Material and methods

Searches were performed in the database of the Norwegian Dental Journal with keywords: “education” and “Tromsø”. We also looked at different newspaper articles and papers published during the planning of a dental school in Tromsø. We have also read and compared the different study plans regarding the dental educations and been in contact with supervisors of the educational programs in Oslo, Bergen and Tromsø

## Results

### The dental faculty, University of Oslo (10)

Semester one and two are an introduction to further studies together with the medical students. The main goal is to provide the students with sufficient knowledge, attitude and skills as a basis for later courses, particularly related to basic science topics, giving the students an overall understanding of the biological, psychological and social aspects of the human being (human- and cell biology). In the first semester the students have so called “early patient contact” where they visit a public dental clinic (a total of 2 days). This is to give them a basic understanding of what their future occupation will be like, and how the co-relation between dentist and patient works.

In the third semester the focus is on organ systems and the relation between host and microbes. The students are also thought how to do a general medical anamnesis. The first half of the fourth semester is focused on pharmacology, nutrition and digestion systems. A course in tooth morphology and anatomy is also given during this term.

The second half of the fourth semester marks the beginning of the dental courses, and the students are no longer part of the education of the medical students. The main focus now shifts from general medicine to head and neck. It is given an introduction to the practical skills in dentistry by pre-clinical practice on phantom models. The students are also introduced to oral radiology.

During the fifth semester, the students are prepared for practice in the general student clinic both theoretically and by continuing to train on the phantom models. The theoretical part consists of knowledge about oral ecosystems, biomaterials and oral pathology in the oral cavity (in both soft and hard tissue). The students will learn how to perform a dental examination (examination in the oral cavity) and simple restorations. It is also given lessons in clinical routines, -hygiene and -safety.

A majority of the subject thought in the fifth semester will continue in semester six, with focus on general dentistry and oral disease. Furthermore the students will be introduced to treating patients on their own; this includes mainly diagnostics, simple treatment procedures and radiologic examinations. In the pre-clinic the students practice to perform more complicated treatments (e.g. fixed prosthodontics and sub-gingival periodontal treatment).

Semester seven consists mainly of clinical training, where diagnostics again are given a substantial role. The students should develop an independent position and be able to argue regarding the choice of treatment he/she has suggested for the patients. Every student is required to treat periodontal disease systematically in at least one patient. The students shall develop a suitable attitude towards patient communication and quality of treatment.

The 8<sup>th</sup> semester is focused on oral rehabilitation of patients in different branches of dentistry – e.g. missing teeth, cariology, periodontology, malocclusions, ageing and oral tumors. This term is also devoted to the master thesis. In this semester, examination and treatment of adult patients is given a major role, and where the previous term sought to provide the students with baseline skills in different aspects of dentistry, this semester will give more thorough practice training. The students are given a course in sedation with nitrous oxide and pre-medication of anxious patients.

In the 9<sup>th</sup> semester and during the final year of the education, the main goal is to provide the students with knowledge, attitudes and ethical perspectives to become skillful general dental practitioners. The students should have sufficient knowledge about overall diagnostics and treatment modalities, and be able to develop a treatment plan adapted to the specific patient.

The final semester will provide the skills required to become authorized general dental practitioners (according to the Law of health personnel). It is similar to the 9<sup>th</sup> semester in regards of subjects; only this time with increased difficulty and more focus on the needs of the individual patient. Five weeks of this term is devoted to external clinical training. The purpose of this external training is to give the student experience about what it is like to practice dentistry in “the real world” and ease the transfer from being a student to becoming a working dentist.

Table 1. The Dental faculty, University of Oslo curriculum

| SEMESTER | SUBJECTS/DESCRIPTION   |  |
|----------|--|--|
| 1        | Examen philosophicum   | <b><u>ODSEM1</u></b> <i>Introduksjon</i> : Humanbiologi, individ og kommunikasjon, samfunn og metode |
| 2        | <b><u>ODSEM2</u></b> <i>Livsprosessene</i> : Cellebiologi  |  |
| 3        | <b><u>ODSEM3</u></b> <i>Organsystemene</i> : Signalsystemer, sirkulasjon/respirasjon, blod, immunologi, mikrobiologi, syre-base (nyre) |  |
| 4        | <b><u>ODSEM4A</u></b> Fordøyelse/ernæring  | <b><u>ODSEM4B</u></b> Hode/munn  |
| 5        | <b><u>ODSEM5</u></b> Forberedelse til klinikk/normalfunksjon   |  |
| 6        | <b><u>ODSEM6</u></b> Allmen odontologi/oral sykdom   |  |
| 7        | <b><u>ODSEM7</u></b> Allmen odontologi/bivirkninger  |  |
| 8        | <b><u>ODSEM8</u></b> Oral rehabilitering/voksne  |  |
| 9        | <b><u>ODSEM9</u></b> Oral rehabilitering/barn  |  |
| 10       | <b><u>ODSEM10</u></b> Individrettet behandling   |  |

(19)

### The dental faculty, University of Bergen (11)

During the 1<sup>st</sup> year the students are introduced to basic medical and dental subjects in chemistry, biochemistry, anatomy, physiology and cell biology. The majority of this year is identical for medical and dental students. Other subjects are medical statistics and oral biology – which include tooth anatomy and morphology. Dental students are also introduced to the different branches of clinical dentistry and routines in the student clinic.

In the second year teaching continues in anatomy, physiology and oral biology. During this year dental students are presented with biomaterials and propedeutical training, and are also thought general pathology, immunology and microbiology. Another subject introduced in the second year is dental radiology and radiological diagnostic. In the propedeutical training, students are educated in principles of materials, their use and possible adverse reaction. They are also expected to know how to prepare different dental cavity types.

Year three consists mainly of practical training, and seeks to tie the preclinical and the clinical

training together. Much focus is given to patient related topics, such as clinical routines, hygiene, patient communication, diagnostics, examination and treatment planning. During this year, students have patient of their own for the first time, and are expected to make diagnoses and treatment plan based on the findings. The propedeutical course continues, and new subjects in clinical dentistry are introduced (prosthodontics, periodontology, endodontology and cariology). Dental pharmacology is also thought.

The different branches within clinical dentistry continue in the 4<sup>th</sup> year, only on a more advanced level. Students are introduced to new subjects such as orthodontics, oral pathology, oral surgery, pedodontics, dental public health and general dentistry. Students are required to handle children, adults and elderly patients with treatment needs of limited difficulty. During the fourth year, students begin working on their master thesis. General dentistry integrates subjects that earlier on were handled as separate problems (endodontology, cariology, periodontology, prosthodontics and masticatory function) to give a more thorough understanding of the co-relation between these subjects. Based on this, students are required to produce an individualized treatment plan adapted to the specific patient (see the patient as a whole) for 2-3 patients.

In the beginning of the 5<sup>th</sup> year, students have three weeks of external practice at public dental clinics – mainly to prepare them for the role as dentists and to ease the transfer from being a student. Back at the university, teaching continues in orthodontics, oral surgery, dental public health, pedodontics, x-ray diagnostics and general dentistry. Students are also given time to finish their master thesis (1 day a week in the 4<sup>th</sup> and 5<sup>th</sup> year). Clinical and theoretical training within general dentistry continues, and a few more subjects are integrated (pharmacology, biomaterials, oral surgery and oral medicine). After finishing this year, students are expected to have the required knowledge, practical skills and attitudes that are expected from a general dental practitioner.

Table 2. The Dental faculty, University of Bergen curriculum

| SEMESTER | SUBJECTS/DESCRIPTION                      |   |   |   |                            |
|----------|---|---|---|---|----------------------------|
| 1        | <b>EX.PHIL</b> Examen philosophicum       | <b>BIOBAS</b><br>Biomedisinsk basablokk           | <b>NOM</b> Medisinsk nomenklaturlære      | <b>MED1ETIKK</b><br>Etikk og klinikk      |                            |
| 2        | <b>MEDSTA</b> Medisinsk statistikk        | <b>OD1ORBI</b> Oral biologi del 1                 |   | <b>OD1INKURS</b><br>Introduksjon klinikk  |                            |
| 3        | <b>OD1ANA</b> Anatomi                     |   | <b>OD1FYS</b> Fysiologi                   |   |                            |
| 4        | <b>OD1ORBI2</b> Oral biologi del 2        | <b>OD2PATI</b><br>Generell patologi og immunologi | <b>OD2PROP1</b><br>Propedeutikk del 1     | <b>OD2BIM</b><br>Biomaterialer            |                            |
|          | <b>OD2RØN</b> Radiologi                   | <b>OD2MIKR</b><br>Mikrobiologi                    | <b>OD2KLIFØR</b> Klinisk innføring        |   |                            |
| 5        | <b>OD3PER</b> Periodonti                  |   | <b>OD3KAR</b> Kariologi                   | <b>OD2PROP2</b><br>Propedeutikk del 2     |                            |
| 6        | <b>OD3PRO</b> Protetikk                   |   | <b>OD2FAR</b> Farmakologi                 | <b>OD3END</b> Endodonti                   |                            |
| 7        | <b>OD3KAR</b><br>Kariologi                | <b>OD3PER</b><br>Periodonti                       | <b>OD3END</b><br>Endodonti                | <b>OD3PRO</b><br>Protetikk                | <b>OD3PED</b><br>Pedodonti |
|          | <b>OD3ALM</b><br>Allmenn odontologi       | <b>OD3PROSJ</b><br>Masteroppgave                  | <b>OD3KJE</b><br>Kjeveortopedi            | <b>OD3KOS</b> Kjeve- og slimhinnelidelser |                            |
| 8        | <b>ODO-3303</b> Klinisk odontologi del 2  |   | <b>ODO-3208</b> Radiologi                 |   |                            |
| 9        | <b>OD3PRA</b> Rapport praksisstudie       |   | <b>OD3KOS</b> Kjeve- og slimhinnelidelser |   | <b>OD3PED</b><br>Pedodonti |
| 10       | <b>OD3KOS</b> Kjeve- og slimhinnelidelser |   | <b>OD3RØN</b> Radiologi                   |   |                            |

(18)

### The Institute of clinical dentistry, University of Tromsø (12)

The first- and part of the second year are integrated with the education in medicine. During this year the students are given an understanding of biological processes as a basic for all living creatures and principles in medicine such as biochemistry, physiology, genetics, embryology and histology. Part of the education in year one is also to prepare the students for social and ethical challenges they might face in their future occupation as dentists or doctors, and their role as a primary contact for the patient in the general health service. Dental students are given a brief view of the role as dentists



by two days of observation at an external clinic, followed by a written report on that subject.

Semester three and four are providing the students with knowledge of medical and dental subjects as a basis for further learning. The goal of the organ based education is to give the students a basic knowledge about bodily functions and composition and prepare them for clinical problems regarding these subjects. The role of scientific methods and evidence based learning when practicing medicine and dentistry are also focused on. Furthermore the students are educated in statistics and epidemiology and public health in relation to these subjects. During the third semester dental students become increasingly separated from medical students and are given separate courses in anatomy of the head and neck, tooth morphology and oral physiology.

When reaching the third year, dental students are no longer a part of the education in medicine, and the focus now shifts to clinical dentistry, which is the main component of the following three years. Subjects in the fifth semester mainly concerns biomaterials used in dentistry, manual training in operative dentistry and specific subjects in clinical dentistry such as cariology, endodontology, prosthodontics and so on. Students are given thorough knowledge in the most commonly used materials in regards of how to use them, physical properties and adverse reactions.

The students are also given a course in oral ecology – a subject who seeks to tie relevant knowledge thought in the first two years into a thorough understanding of health/disease and functions in the oral cavity (oral microbiology, oral physiology, oral pathology, oral pharmacology and nutrition). The students are further given lectures in dental public health. They have the first patients on their own in the 6<sup>th</sup> semester and are required to give each patient a therapy plan based on the patients needs (although patients are screened to fit the proper knowledge of the students).

The 7<sup>th</sup> semester is solely dedicated to external practice, where the students are placed in pairs at carefully selected and prepared public dental clinics. One experienced dentist from each clinic is given the role as clinical instructor, and prior to this all of the instructors are required to participate in courses given at the university.

At the external clinic students are expected to continue the holistic view of patients in regards of therapy planning and treatment. Most of the education is manual practice, but students are required to be theoretically prepared for the treatments given. There are also weekly seminars in form of video conferences with the other external clinics and the university. The students are continually being evaluated by their clinical instructor, and progress is monitored on a monthly basis. Every pair of students is expected to write a paper on a given subject during their time in the external clinic.

When returning to the university at semester eight the theoretical teaching in all aspects of clinical

dentistry continues, only now at a more advanced level. In addition students continue with clinical training at the university clinic, and are expected to perform treatments of increasing difficulty. A new subject in the clinic is orthodontics, and the students are required to set diagnosis, create therapy plans, perform simple treatments and follow up their patients. In the last three semesters the students are also given time to work on their master thesis.

Theoretical subjects in the different branches of clinical dentistry continue throughout the 9<sup>th</sup> and 10<sup>th</sup> semester. In addition to the theory, students continue the clinical training at the university clinic, and are expected to plan and treat patients more independently. Most of the theoretical teaching are finished early in the 10<sup>th</sup> semester, and towards the end of this semester the students are again placed on external clinics, this time for 2 ½ months. When returning to the university, students evaluate the external training and are given time to complete their master thesis and prepare for the final theoretical exams

**Table 3. The Institute of clinical dentistry, University of Tromsø curriculum**

| SEMESTER | SUBJECTS/DESCRIPTION                                  |                                       |                               |
|----------|---|---------------------------------------|-------------------------------|
| 1        | <u>EX.PHIL</u> Examen philosophicum                   | <u>MED100</u> Biologiske basalfag     |                               |
| 2        | <u>MED100</u> Biologiske basalfag                     |                                       |                               |
| 3        | <u>ODO-2001</u> Biomedisin I                          |                                       |                               |
| 4        | <u>ODO-2003</u> Oral anatomi og fysiologi             | <u>ODO-2004</u> Biomedisin II         |                               |
| 5        | <u>ODO-2512</u> Dentale biomaterialer og propedevtikk | <u>ODO-2503</u> Oral økologi          |                               |
| 6        | <u>ODO-2505</u> Klinisk odontologi del 1              | <u>ODO-2504</u> Samfunnsodontologi    |                               |
| 7        | <u>ODO-3005</u> Ekstern praksis del 1                 |                                       |                               |
| 8        | <u>ODO-3303</u> Klinisk odontologi del 2              | <u>ODO-3208</u> Radiologi             |                               |
| 9        | <u>ODO-3303</u> Klinisk odontologi del 2              | <u>ODO-3323</u> Kjeveortopedi         |                               |
| 10       | <u>ODO-3303</u> Klinisk odontologi del 2              | <u>ODO-3505</u> Ekstern praksis del 2 | <u>ODO-3901</u> Masteroppgave |

(12)

## **External practice (12)**

In general, the study plans from Oslo, Bergen and Tromsø present with a lot of similarities. External practice is a component in all of the above mentioned curricula, but differs greatly when it comes to the extent. Whereas Oslo and Bergen respectively have five and three weeks, Tromsø dedicates 26 weeks to this (1/3 of the entire clinical training). The main purpose of the external practice in Oslo and Bergen is to give the students an impression of what it is like to practice as a dentist “in the real world”. In Tromsø on the other hand, the external practice is a substantial part of the practical training given. “The aim of this is to train the students in clinical dentistry in a teaching situation that is as realistic as possible, and to recruit dentist to the public dental service, especially in Northern Norway. To serve this aim, IKO in Tromsø has recruited a total of 20 clinics around Norway (the majority in the northern part) which function as an integrated part of the student clinic.” (17) To become a University Clinic, IKO in Tromsø has listed a number of demands the clinics need to fulfill, to ensure that they are of sufficient quality.

External tutors are coursed in Tromsø before they are allowed to teach students, and the majority of the tutors are experienced dentists. In addition, all of the tutors are given courses in Tromsø on a yearly basis.

Below follows a listing of the total amount, and when the external practice takes place:

### **Oslo**

1<sup>st</sup> semester: 4 x ½ a day at external clinic.

2<sup>nd</sup> semester: 2 x ½ a day at the student clinic.

10<sup>th</sup> semester: 5 weeks at external clinic, 1 week theory prior to this.

### **Bergen**

10<sup>th</sup> semester: 3 weeks at external dental public clinic.

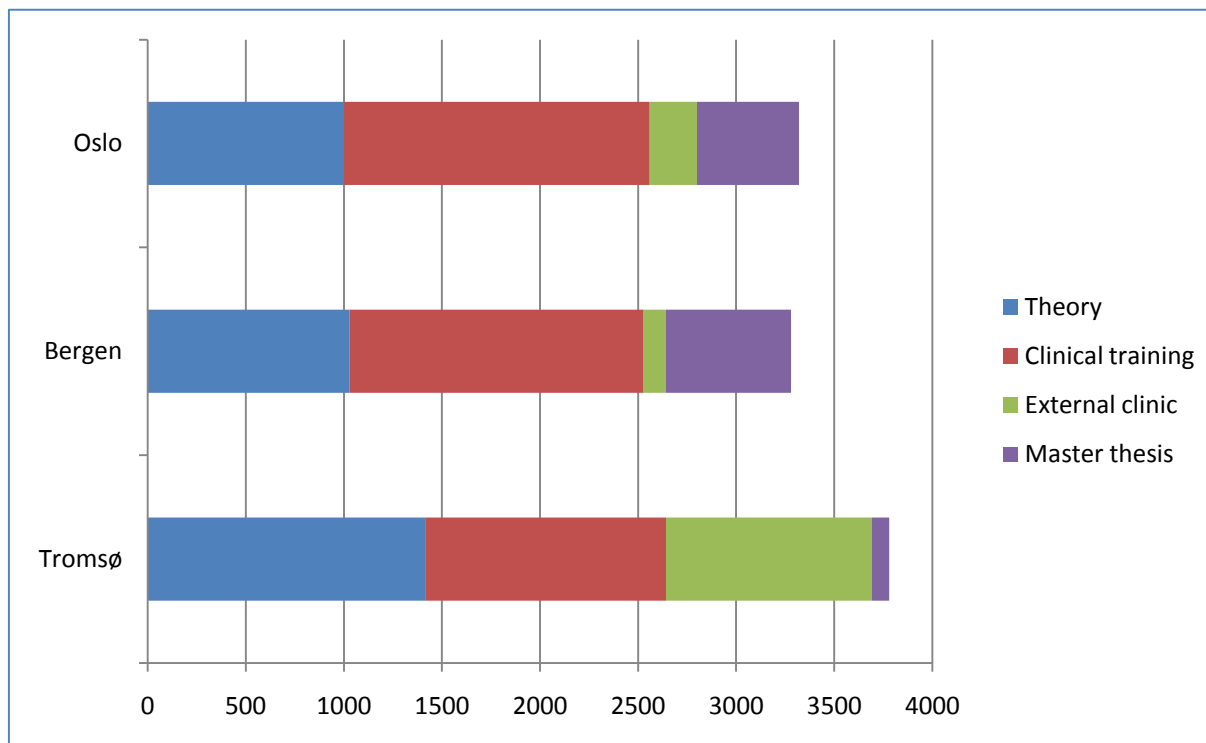
### **Tromsø**

1<sup>st</sup> semester: 2 days at external dental public clinic.

7<sup>th</sup> semester: 16 weeks at external dental public clinic.

10<sup>th</sup> semester: 10 weeks at external dental public clinic.

Table 4. Number of hours allocated to theory, internal and external clinical training in Oslo, Bergen and Tromsø (3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> year)



(12,13,20)

The numbers listed in the graphic above are all estimates - Tromsø and Bergen shows the maximum number of hours available in regards of planning the schedule of teaching, thus all of these hours are not necessarily spent. Also it does not take into account that some teaching are done in groups whereas other is given to the entire class. Only the final three years are counted. “Theory” includes seminars, PBL and lectures, and may give the wrong impression since PBL allows for more time for the students to work on their own. “Clinical training” includes both pre-clinical training in the phantom lab (some of the second year are counted, as Oslo and Bergen start their phantom lab in the second year) and hours in the student clinic treating patients.

## Clinical requirements (13-16)

Dental educations in both Oslo and Bergen have detailed clinical requirements for each semester, which the students need to fulfill before they are allowed to progress. In Tromsø the demands are not stressed to the same degree, and the focus rather lies on each patient. Either way it seems reasonable to investigate the minimal requirements specified for each University. The following table shows a selection of different treatments and their requirements. One should be aware that the “clinical production” during external clinical activities is not included in the requirements stated. This may partly explain the difference between Oslo/Bergen and Tromsø (Tables 5 and 6)

Table 5. Clinical requirements from Oslo, Bergen and Tromsø

|                                       | OSLO | BERGEN | TROMSØ         |
|---------------------------------------|------|--------|----------------|
| Endodontics (number of teeth)         | 9    | 8      | 3              |
| Cariology (number of surfaces filled) | 150  | 120    | No requirement |
| Fixed prosthodontics (prepared teeth) | 14   | 24*    | 8-10           |
| Removable denture                     | 5    | 5      | 2              |
| Simple extractions                    | -    | 5      | No requirement |
| Periodontology (number of patients)   | 5    | 6      | 8              |

(13,14,21-23)

\*includes pontices in bridges

Table 6. Clinical production from external clinical practice, 7<sup>th</sup> semester, Tromsø

| Kliniske «prosedyrer»       | 2007<br>11 studenter | 2008<br>18 studenter | 2009<br>26 studenter |
|-----------------------------|----------------------|----------------------|----------------------|
| Antall bite-wing-bilder     | 87 (48–133)          | 99 (46–187)          | 81 (35–137)          |
| Antall apikalbilder         | 30 (12–57)           | 30 (17–58)           | 38 (21–75)           |
| Profesjonell rengjøring     | 10 (5–19)            | 13 (0–34)            | 14 (1–42)            |
| Fluorbehandling (lakk)      | 21 (5–34)            | 25 (2–64)            | 17 (0–62)            |
| Fissurforsøgling            | 20 (2–57)            | 13 (0–41)            | 9 (0–42)             |
| Depurasjon (supraging.)     | 18 (6–28)            | 19 (5–37)            | 24 (2–48)            |
| Depurasjon (subging.)       | 4 (0–16)             | 6 (0–16)             | 6 (0–22)             |
| Anestesi (infiltrasjon)     | 57 (20–120)          | 63 (36–105)          | 68 (42–95)           |
| Fylling (klasse I)          | 25 (16–40)           | 34 (8–70)            | 32 (6–56)            |
| Fylling (klasse II)         | 33 (14–55)           | 43 (20–83)           | 54 (20–114)          |
| Fylling (klasse III)        | 7 (0–14)             | 11 (4–20)            | 9 (1–30)             |
| Fylling (klasse VI)         | 3 (0–10)             | 5 (2–12)             | 9 (0–33)             |
| Fylling (klasse V)          | 11 (4–15)            | 15 (4–28)            | 15 (0–36)            |
| Enkel krone                 | 1 (0–4)              | 1 (0–3)              | 1 (0–6)              |
| Endodonti (antall tenner)   | 1 (0–6)              | 3 (0–8)              | 4 (0–14)             |
| Ekstraksjon (antall tenner) | 19 (4–51)            | 15 (7–36)            | 21 (8–47)            |
| Akuttbehandling             | 4 (0–10)             | 12 (1–28)            | 15 (0–56)            |
| Traumekontroll              | 3 (0–7)              | 4 (0–21)             | 3 (0–9)              |

(17)

## Discussion

Trying to compare entire programs like this paper do, does have limitations. For instance it cannot disclose minor differences between schools, and takes no regard of judging quality of teaching or how the literature looks (which will be a near impossible task, and in the end probably not provide much useful information). Also this was not the reason why this paper was written. Therefore only major differences are focused on and discussed here.

Where Oslo and Bergen follow a more traditional approach to teaching, Tromsø has selected a rather different method. From the study plans and ruling documents much is similar – in the end all of these universities seek to educate dentist, and in order to do that you cannot just implement changes without having them approved. To sum up; the first two years are more or less identical, and give students the bio-medical basis required for many health professions. Phantom labs and practical skills are focused on in the third year, naturally as patient contact is at the end of this year regardless of which university you study at.

Coming to the fourth year things start to look a bit different, at least when concerning Tromsø. An entire semester is dedicated to external practice and students travel off to clinics scattered around Norway (mostly in the Northern part). Will this affect the student's attitudes towards being a dental practitioner? An appropriate answer will probably be "yes". Meeting many different patients at such an early stage (only one semester phantom lab and one at the student clinic before external practice) is surely challenging for students – you have to face the entire patient and all of his or hers problems instead of being presented one patient who needs subgingival scaling and another in need of a removable denture. This way you learn to take every aspect of the patient wishes and concerns into account from the first day. For example, if the patient you meet "in the real world" is in need of some sort of prosthodontic treatment it is your responsibility to get the patient to the stage where it is appropriate to do so.

Another aspect that needs to be considered is quantitative requirements. With a patient-centered approach like Tromsø have (holistic view), specific requirements cannot be stressed to the same degree as it is in Oslo and Bergen (see Table 5), simply because treatments have to be done in the correct order (e.g. stabilize periodontal conditions before doing fixed crowns and bridgework). Will this mean that students graduated from Tromsø might perform fewer (or even too few) specified clinical procedures compared to students graduated from the dental faculties in Oslo or Bergen? To some degree we have to agree with this statement – it is easier to fill the demands when you can

select patients according to your own need and liking, but on the other hand external practice give students a good opportunity to tick off requirements in the logbook (see Figure 6). A quick look at that figure shows a quite large dispersion from student to student (e.g. one student have done 47 extractions and another only 8), but all in all it is a substantial production, and if every student keep in mind what they have done and what they need to do, round two of external practice will for the most part make sure that every student have filled the minimal requirements before they graduate.

Treating patients at the student clinic is for the most part a “safe environment” and in many cases not very similar to how things are done in the “real” world (as mentioned before). Of course, this might be considered a good thing – tutors know what students are doing all the time and make sure patients are selected to fit the current skill level of the student. Also you have more than enough time to finish your treatment, and access to specialists if things do not turn out as planned. With the holistic patient view in Tromsø, much of the clinical training and treatment planning function as problem-based learning (PBL) since the students are faced with the entire patient and all of his/hers problems and wishes, thus being closer to how a dentist will work “in the real world”.

Another thing that might be considered positive in external practice is that there are only two students for every tutor – at the student clinic it is at best one tutor for every seven student. Although the tutors in external practice still treat patients, time is reserved in order to be available for the students. A challenge for Tromsø`s part is to keep track of the students progress and production when they are away and to make sure the teaching follow the set standards.

Another question to be raised is: will students in Tromsø miss out on important theory when they are away? After all it is a substantial amount of time spent away from the University (and for many students also a break from all the books), so it is a relevant question. But judging from Table 4, it seems that students in Tromsø have more theory than the other two. To be fair, much of the theory in Tromsø are presented as lectures, whereas Oslo and to some extent also Bergen have more problem based learning (PBL), which will require students to have more free time to study compared to lectures. Also this table does not take into account that some theory are given in groups and some are presented to the whole class, but even with this in mind, it does not seem like students in Tromsø are spending less time on theoretical subjects compared to Oslo and Bergen

## Conclusions

The first two basic science years appear very similar for all of these dental faculties. Collaboration with the medical students and focus on bio-medical topics are common features.

The third year represents introduction to clinical work, with phantom lab training and patient related topics. Internal and external clinical training are similar in Oslo and Bergen, while Tromsø has approximately 1/3 of their clinical training at external clinics. The patient-centered approach from the first day of patient care is unique for Tromsø and functions like PBL in a clinical environment.

Students in Tromsø will most likely get a different professional profile - students are guided towards public dental clinics in a greater extent than those graduating from the dental faculties in Oslo and Bergen (a pre-requisite to establish a dental school in Tromsø).

There seems to be no major differences between dental schools in Norway besides external practice.



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