



Educating doctors for the future

Evaluation of undergraduate medical education in Finland

Mäkelä, Marjukka; Möller, Riitta; Stephens, Cristopher; Croiset, Gerda; Telkkä, Joel; Haavisto, Ermo; Seppälä, Hannele; Mustonen, Kirsi; Hiltunen, Kirsi; Huusko, Mira

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Educating Doctors for the Future – Evaluation of undergraduate medical education in Finland (Tulevaisuuden lääkäreitä kouluttamassa – Lääketieteen peruskoulutuksen arviointi Suomessa)

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The first national evaluation of undergraduate medical education in Finland was carried out by the Finnish Education Evaluation Centre (FINEEC) in 2016–2018. The evaluation covered all five universities that offer the Licentiate Degree in Medicine programme: Universities of Eastern Finland, Helsinki, Oulu, Tampere and Turku. The evaluation is based on the principles of enhancement-led evaluation, emphasising active participation and trust. Both the process and its results are intended to help education providers to identify the strengths, good practices and areas in need of development in undergraduate medical education.

The evaluation aimed at producing an overall picture on the current state, strengths and challenges of undergraduate medical education, and developing recommendations that reflect the changing competence requirements in doctors' work and their future operating environment.

The evaluation team identified the following areas as strengths that apply to all five Medical Schools:

- Undergraduate medical education programmes are regularly reviewed and developed; various drivers for changes have been identified and processes of quality management exist, and the Schools seem committed to improve their education continuously.
- Each School has many good practices of education planning and implementation that others can share.
- National collaboration is increasing, and joint analyses of core learning contents have started.
- Student engagement is particularly strong; the students are involved in the development of education in all five Schools at all levels of studies through feedback and representatives.
- All Schools provide decentralised clinical placements outside the university hospital and early patient contact, often in primary care. There is good collaboration with teaching units outside the university, especially in primary health care featuring enthusiastic teachers as role models.

The core recommendations to support the development of undergraduate medical education are:

- **Defining the “Finnish Doctor”.** To engage effectively with the forthcoming health and social care (SOTE) reforms, there must be a consensus on the skills, attitudes and role of a newly graduating doctor. Currently there is no national consensus about what is a “Finnish Doctor” – how they are educated and what they should master at graduation. The structure of medical curriculum varies between universities. Medical Schools need to take more of a leadership role in defining the “Finnish Doctor” and involve a range of stakeholders (patients, students, other health professions, employers) to develop a shared vision and agree on key curricular outcomes.
- **Curriculum mapping and alignment.** Curriculum mapping – displaying the key elements of curriculum and the relationship between them – can make curriculum planning more effective, the scope and sequence of student learning explicit, and the result more transparent to all stakeholders. Medical Schools could then continue collaboration to align the curricula so that shared national programme outcomes can be taught, learnt and assessed with certainty.
- **Development of key skills.** A doctor’s key task is diagnostic work with patients. Particularly important for learning, then, is assessment of clinical skills and reasoning in patient encounters with constructive feedback. Readiness to apply new technologies with a critical attitude, teamworking skills, and abilities to manage difficult situations constructively are also core competencies to be facilitated throughout undergraduate learning.
- **Learning environment.** Increased medical student intake has coincided with organizational and budget changes, affecting student and staff well-being. Larger groups especially in the clinics increase teacher workload and decrease opportunity for hands-on experience and personal feedback. Medical Schools’ approaches to preventing, identifying and managing problems in student and staff well-being should be developed.
- **Valuing teacher skills.** Medical School teachers balance between demands from teaching, clinic, research, and family. Finnish Medical Schools should explore ways of appreciating teaching and consider creating tenure tracks in medical teaching. Centres for medical education could support systematic provision of pedagogical training for all who teach medical students.

Achieving changes required by the rapidly changing operating environment can be done while protecting the unique flavours of the five Medical Schools. The Faculties can collaborate to ensure that graduates are trained in the skills they need as fledgling practitioners, in further speciality training, when taking on roles in research, management, education or health policy, and for lifelong learning. Ultimately the changes will improve the quality of graduates, increase patient safety, and result in better medical care in Finland.

Keywords

Evaluation, higher education institutions, universities, undergraduate medical education, medicine.

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Tekijät

Marjukka Mäkelä, Riitta Möller, Christopher Stephens, Gerda Croiset, Joel Telkkä, Ermo Haavisto, Hannele Seppälä, Kirsi Mustonen, Kirsi Hiltunen & Mira Huusko

Lääketieteen peruskoulutuksen ensimmäinen kansallinen arviointi toteutettiin Kansallisessa koulutuksen arviointikeskuksessa (Karvi) vuosina 2016–2018. Arviointi kattoi kaikki viisi yliopistoa, jotka tarjoavat lääketieteen lisensiaatin koulutusta: Itä-Suomen, Helsingin, Oulun, Tampereen ja Turun yliopistot. Arviointi perustuu kehittävän arvioinnin periaatteisiin, jotka korostavat aktiivista osallistumista ja eri osapuolten välistä luottamusta. Sekä prosessin että sen tulosten tarkoituksena on auttaa koulutuksen tarjoajia tunnistamaan vahvuuksia, hyviä käytäntöjä ja kehittämiskohteita.

Arviointi tuotti yleiskuvan lääketieteellisen koulutuksen nykytilasta, vahvuuksista ja haasteista sekä antoi suosituksia, jotka heijastavat lääkäreiden työn muuttuvia osaamisvaatimuksia ja tulevaisuuden toimintaympäristöä.

Arviointiryhmä tunnisti useita vahvuusalueita, jotka ovat yhteisiä kaikille viidelle koulutusyksikölle:

- Lääketieteen koulutusohjelmia kehitetään säännöllisesti, muutostarpeita on tunnistettu ja laadunhallinnan keinoja käytetään. Tiedekunnat ovat sitoutuneet koulutuksen jatkuvaan parantamiseen.
- Tiedekunnat voivat soveltaa toistensa hyviä käytäntöjä koulutuksessa ja sen suunnittelussa.
- Kansallinen yhteistyö on lisääntymässä ja yhteisten ydinainesten analysointi on alkanut.
- Opiskelijat osallistuvat vahvasti koulutuksen kehittämiseen kaikilla opintojen tasoilla sekä edustajiensa kautta että antamalla palautetta.
- Tiedekunnissa on hajautettua kliinistä harjoittelua yliopistosairaaloiden ulkopuolella ja opiskelijoilla on mahdollisuus varhaisiin potilaskontakteihin, tavallisesti perusterveydenhuollossa. Tiedekuntien yhteistyö yliopiston ulkopuolisten opetusyksiköiden kanssa toimii hyvin, erityisesti perusterveydenhuollossa, jossa on innostuneita opettajia roolimalleina.

Tärkeimmät suositukset lääketieteen peruskoulutuksen kehittämiseksi ovat:

- **Suomalaisen lääkärin määritelmä.** Tekeillä oleva sosiaali- ja terveydenhuoltopalvelujan uudistus (SOTE) edellyttää yhteistä näkemystä työhön valmistuvien lääkäreiden taidoista, asenteista ja roolista. Tällä hetkellä ei ole kansallista konsensusta siitä, mikä on ”suomalainen lääkäri” – kuinka hänet on koulutettu ja mitä hänen pitäisi osata valmistuessaan. Lääketieteen opetussuunnitelmien rakenne vaihtelee yliopistosta toiseen. Lääketieteelliset tiedekunnat voisivat ottaa johtoaseman ”suomalaisen lääkärin” määrittelytyössä ja kutsua mukaan tarvittavat sidosryhmät (potilaat, opiskelijat, muut terveydenhuollon ammattilaiset, työnantajat) luomaan yhteistä näkemystä ja sopimaan keskeisistä oppimistuloksista.
- **Opetussuunnitelmien kartoitus ja linjakkuus.** Opetussuunnitelman kartoittaminen – siis oppisisältöjen keskeisten osien ja niiden välisten suhteiden kuvaus – voisi tehostaa sisällön suunnittelua, selventää opintojen laajuutta ja keskinäistä järjestystä ja tehdä tavoitteista selkeitä kaikille sidosryhmille. Lääketieteelliset tiedekunnat voivat jatkaa yhteistyötä opetussuunnitelmien yhteensovittamiseksi, jotta yhteisistä kansallisista oppimistuloksista voitaisiin sopia ja niiden saavuttamista arvioida luotettavasti.
- **Avaintaitojen kehittäminen.** Lääkärin tärkein tehtävä on diagnoosin määrittäminen. Erityisen tärkeää oppimiselle onkin potilaskontakteissa tapahtuva kliinisten taitojen ja päättelykyvyn arviointi ja rakentava palaute. Lääkärityön ydinosaamista ovat myös valmius soveltaa uutta teknologiaa kriittisesti arvioiden, tiimityötaitot sekä kyky kohdata vaikeita tilanteita rakentavasti; näitä kaikkia pitäisi harjoitella lääketieteellisen peruskoulutuksen aikana.
- **Koulutusympäristö.** Kasvaneet opiskelijamäärät yliopistojen organisaatio- ja budjettimuutosten rinnalla ovat väistämättä vaikuttaneet niin opiskelijoiden kuin opettajien hyvinvointiin. Isot opiskelijaryhmät erityisesti klinikoissa lisäävät opettajien työmäärää ja vähentävät opiskelijoiden mahdollisuuksia oppia käytännössä tai saada henkilökohtaista palautetta. Tiedekuntien tapoja ehkäistä, tunnistaa ja hoitaa opiskelijoiden ja henkilöstön ongelmia tulisi kehittää.
- **Opettamisen arvostaminen.** Lääketieteen opettajat tasapainoilevat opetuksen, kliinisen työn, tutkimuksen ja perheen vaatimusten välillä. Tiedekuntien olisi hyvä pohtia, kuinka opetusta voisi arvostaa enemmän, ja harkita lääketieteellisen opetuksen urapolkujen luomista. Lääketieteen koulutuksen kehittämisyksiköt voisivat tukea pedagogisen koulutuksen järjestelmällistä tarjoamista kaikille, jotka opettavat lääketieteen opiskelijoita.

Nopeasti muuttuvan toimintaympäristön edellyttämiä muutoksia voidaan toteuttaa suojaten samalla lääketieteellisten tiedekuntien erityispiirteitä. Tiedekunnat voivat yhdessä varmistaa, että tuoreilla lääkäreillä on riittävät taidot potilastyöhön, erikoistumiskoulutuksessa jatkamiseen tai tehtäviin tutkimuksessa, hallinnossa, opetuksessa tai terveyspolitiikassa, sekä elinikäinen oppimisen into. Pitkällä tähtäimellä muutokset tuottavat parempia lääkäreitä, lisäävät potilasturvallisuutta ja kehittävät Suomen terveydenhuoltoa.

Asiasanat

Arviointi, korkeakoulut, yliopistot, lääketieteellinen koulutus, lääketiede.

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Educating Doctors for the Future – Evaluation of undergraduate medical education in Finland (Utbildning av framtidens läkare – Utvärdering av grundutbildningen i medicin i Finland)

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Den första nationella utvärderingen av grundutbildningen i medicin i Finland genomfördes av Nationella centret för utbildningsutvärdering (NCU) under 2016–2018. Utvärderingen omfattade de fem universitet som erbjuder utbildning för medicine licentiatexamen: Östra Finlands, Helsingfors, Uleåborgs, Tammerfors och Åbo universitet. Utvärderingen genomförs enligt principen om utvecklande utvärdering, med fokus på aktiv delaktighet och förtroende. Såväl processen som resultaten är avsedda att hjälpa utbildningsanordnarna att identifiera styrkor, god praxis och utvecklingsområden i grundutbildningen i medicin.

Syftet med utvärderingen var att skapa en helhetsbild om nuläget, styrkor och utmaningar i grundutbildningen i medicin och att ta fram rekommendationer i förhållande till de föränderliga kompetenskraven i läkares arbete och deras framtida verksamhetsmiljö.

Utvärderingsteamet identifierade följande områden som styrkor som alla fem utbildningsenheter har gemensamt:

- Grundutbildningen i medicin granskas och utvecklas kontinuerligt, olika orsaker till förändringar har identifierats och kvalitetshanteringsprocesser används. Samtliga fakulteter har förbundit sig till kontinuerlig utveckling av utbildningen.
- Alla fakulteter har många goda rutiner för planering och genomförande av utbildningen som också de andra fakulteterna kan tillämpa.
- Det nationella samarbetet ökar och gemensamma analyser av det centrala innehållet i utbildningen har startat.
- Studerandenas delaktighet är särskilt stark. Studerandena deltar i utveckling av utbildningen vid alla fem fakulteter och på alla utbildningsnivåer såväl genom att ge feedback som via representanter.
- Alla fakulteter ordnar decentraliserad klinisk praktik utanför universitetssjukhuset och tidiga patientkontakter, ofta inom primärvården. Fakulteterna har ett bra samarbete med utbildningsenheter utanför universitetet, särskilt inom primärvården, med entusiastiska lärare som rollmodeller.

De viktigaste rekommendationerna för att stöda utvecklingen av grundutbildningen i medicin är:

- **Definitionen av ”finländsk läkare”.** Den pågående vårdreformen (SOTE) kräver en gemensam syn på nyutexaminerade läkares kunskaper, attityder och roller. För närvarande saknas nationell konsensus om vad en ”finländsk läkare” är – hur de utbildas och vad de bör behärska efter examen. Strukturen i läroplanerna i medicin varierar mellan universiteten. De medicinska fakulteterna bör ta en ledarroll när det gäller att definiera vad en ”finländsk läkare” är och involvera olika intressentgrupper (patienter, studerande, andra yrkesutbildade personer inom hälso- och sjukvården, arbetsgivare) för att utveckla en gemensam vision om centrala inlärningsresultat.
- **Kartläggning och samordning av läroplanerna.** Kartläggning av läroplanerna – att visa nyckelelementen i läroplanen och förhållandet mellan dem – kan effektivisera planeringen av innehållet, förtydliga studiernas omfattning och inbördes ordning och göra resultaten tydligare för alla intressenter. De medicinska fakulteterna kan då fortsätta samarbetet för att samordna läroplanerna så att det är möjligt att avtala och bedöma uppnåendet av de nationella inlärningsresultaten med säkerhet.
- **Utveckling av nyckelfärdigheter.** En nyckelfärdighet för läkare är att fastställa diagnoser för patienter. Därför är det av stor vikt för inläringen att de kliniska färdigheterna och kliniskt resonemang vid patientmöten bedöms och att konstruktiv återkoppling ges. Färdigheterna att tillämpa ny teknologi med en kritisk attityd, förmåga att arbeta i grupp och att hantera svåra situationer konstruktivt är också nyckelfärdigheter som ska övas genom hela grundutbildningen.
- **Lärmiljö.** Det ökade antalet antagna medicine studerande parallellt med organisations- och budgetändringar har påverkat studerandenas och personalens välmående. Större studerandegrupper särskilt inom kliniskt arbete har ökat arbetsbördan för lärarna och minskat studenternas möjligheter till direkt kontakt med patienten och personlig återkoppling. Fakulteternas tillvägagångssätt för att förebygga, identifiera och hantera problem i studerandenas och personalens välbefinnande bör utvecklas.
- **Uppskattning för undervisningen.** Lärare i medicin balanserar mellan krav som ställs av undervisning, kliniskt arbete, forskning och familj. Fakulteterna bör utforska olika sätt för att uppskatta undervisningen och överväga s.k. tenure tracks inom undervisning i medicin. Utvecklingsenheter för undervisning i medicin kunde stöda ett systematiskt utbud av utbildning i pedagogik för alla som undervisar medicine studerande.

Ändringar som den snabbt föränderliga verksamhetsmiljön kräver kan uppnås samtidigt som de unika särdragen hos de fem medicinska fakulteterna bibehålls. Fakulteterna kan tillsammans säkerställa att nyutexaminerade läkare har tillräckliga färdigheter för patientarbete, fortsatt specialistutbildning eller uppgifter inom forskning, förvaltning, utbildning eller hälsopolitik samt för livslångt lärande. På lång sikt kommer ändringarna att skapa bättre läkare, öka patientsäkerheten och utveckla hälso- och sjukvården i Finland.

Nyckelord

Utvärdering, högskolor, universitet, grundutbildning i medicin, medicin.

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1 Introduction

In May 2016, the Higher Education Evaluation Committee (HEEC), which is part of the Finnish Education Evaluation Centre (FINEEC), decided to carry out a nationwide evaluation of undergraduate medical education in Finland. The decision was based on a proposal submitted by the Ministry of Education and Culture. This is the first nationwide evaluation of undergraduate medical education in Finland.

Major changes are taking place in the Finnish healthcare environment and medical education must therefore be adjusted to ensure the competence of future medical doctors. Social welfare and health care are undergoing rapid technological change. Development in digitalisation is a central part of the current social welfare and health care reform (Sosiaali- ja terveystieteiden ministeriö 2014). This together with other technological innovation will mean better tools and treatments, better access to information, more research opportunities, and changes in services offered to citizens and patients. Medical education must adapt to fulfil the needs arising from the rapidly changing operating environment. The reforms now in progress will require close cooperation between the universities and the service system (Sosiaali- ja terveystieteiden ministeriö 2016a; 2016b).

As part of the social welfare and health care reform (so called SOTE reform), the Government also intends to redesign the operating culture of social welfare and health care in Finland. The aim is to develop collaborative working between professionals, so they can work more flexibly while also concentrating on tasks needing their special core competences. From training perspective, this means that students must develop excellent professional core competencies as well as excellent generic skills. The educational focus is shifting from basic training toward developing the skills of lifelong learning through continuous professional development. The Ministry of Education and Culture launched a national project in 2017 to develop education to meet the requirements of the new service system and provided project funding of 10 million Euros to higher education institutions to develop education, for example digitalisation (Opetus- ja kulttuuriministeriö 2018).

In future doctors' work, more emphasis will be placed on managing complex information and interpreting it to patients, interactive skills, and interprofessional team working. Clinical work will require a broad range of skills. For keeping up-to-date, doctors must have the time and capacity

for continuous professional development. Currently, there is no clear consensus at a national level on what the product of medical undergraduate education – a Finnish doctor – should be, and the structures of medical curricula vary between universities.

FINEEC and the international evaluation team had a unique opportunity to take a close look at the five universities providing medical education in Finland. Medical students' associations and the universities provided extensive and insightful self-evaluations. At site-visits, students, teachers, administration and other stakeholders openly presented their views and considered future developments. The process of redesigning medical undergraduate education is already underway: the evaluation seems to have given additional energy and direction toward necessary changes. This report gives some further suggestions for future developments. The evaluation team thanks warmly all those who have given their time, energy and ideas to make the evaluation possible and wish them success in training great doctors for the future.

Aims and areas of the evaluation

The main aims of evaluating the undergraduate medical education were to produce an overall picture and information on the current state, strengths and challenges of the education, and to develop recommendations that reflect the changing competence requirements in doctors' work and their future operating environment. An additional aim was to identify good practices in the evaluated areas to support development work in units providing medical education.

The evaluations conducted by FINEEC are based on the principle of enhancement-led evaluation (Government Decree on the Finnish Education Evaluation Centre 1317/2013). Enhancement-led evaluation emphasises participation of units being evaluated, trust between these and the party implementing the evaluation, and responsibility of higher education institutions in enhancing the quality of their operations. Evaluations are designed to support the process, its results and decision-making at local, regional and national level (National Education evaluation plan 2016–2019, 2016). The evaluation is also expected to provide information for decision-makers to steer educational policy. In enhancement-led evaluation, the emphasis is also on considering the views of units providing medical education, medical students as well as different stakeholders from working life including service users and encouraging interaction between the different parties.

The undergraduate medical education was evaluated on the following areas:

1. *Planning of the education* – information about the pedagogic framework of the education and the curriculum preparation process, how changes in the operating environment and future competence requirements are considered in the planning of education, and the objectives laid out for the education and the degree structure.
2. *Implementation of the education* – a picture of the learning environments, teaching and supervision methods, assessment of learning and learning outcomes, teacher competence and its development, and the well-being of the university community.
3. *Competence and working-life skills produced by the education* – internship, career guidance and career paths, the basis for continuous professional development provided by the education, cooperation with working life and the management of its quality in future operating environments.

4. *Continuous development and renewal of education* – information about forecasting competence and renewal needs, and the use of evaluation and feedback information as well as cooperation between universities.

Provision of medical education in Finland

3.1 Provision of undergraduate medical education

Medical education is provided in Medical Faculties at five Finnish universities: University of Eastern Finland, University of Helsinki, University of Oulu, University of Tampere, and University of Turku (later referred to as Medical Schools). For students, the purpose of their undergraduate medical training leading to the Licentiate Degree in Medicine is to obtain the right to practice medicine as a licensed doctor. The degree is a higher university degree and provisions on its overall objectives and structure and the studies required for the degree are contained in the Government Decree on University Degrees (794/2004). As self-governing entities, Finnish universities have extensive powers to decide on the content and organization of their teaching. No common nationwide learning objectives have been specified for the training.

In the medical sector, a university may provide the training leading to a higher university degree so that it does not include a lower university degree. The scope of the studies required for a Licentiate Degree in Medicine is 360 ECTS (European Credit Transfer and Accumulation System) credits if the university provides the training directly leading to a higher university degree, without including a lower (candidate) degree. One academic year corresponds to 60 ECTS credits. A university must provide training so that students can complete the studies in six academic years when studying on a full-time basis. The studies include a compulsory practical training period (often four months). Each unit providing medical education is linked to a university hospital where most of the clinical teaching takes place. Some clinical teaching is provided in primary care or hospitals outside the university hospital.

According to Government Decree on University Degrees 794/2004, studies leading to a higher university degree may include: (1) basic, intermediate and advanced studies, (2) language and communication studies, (3) interdisciplinary study programmes, (4) other studies, and (5) an internship improving expertise (compulsory for studies for the degree of Licentiate of Medicine). The extent of basic studies in a subject or a corresponding entity shall be a minimum of 25 credits.

The extent of intermediate studies in the subject or a corresponding entity shall be a minimum of 60 credits. The extent of advanced studies shall be a minimum of 60 credits. The major subject or a corresponding entity included in the degree or the advanced studies of a degree programme shall include a thesis of at least 20 and at most 40 credits. The provision of education leading to the degrees of Licentiate of Medicine must comply with the Council Directive 93/16/EEC of 5 April 1993 to facilitate the free movement of doctors and the mutual recognition of their diplomas, certificates and other evidence of formal qualifications.

The Faculty of Medicine of the University of Helsinki is the only Medical School where there is a programme pathway with about half of the teaching delivered in Swedish. Less than five per cent of all students admitted to medical education are admitted to this pathway. Finnish-speaking students who have passed a Swedish-language test may also be admitted to the study line.

Student admission and student selection procedures have been at the discretion of individual universities. A joint student selection procedure was launched for the first time in 2018. Joint selection means that an individual can apply to several universities and up to six study programmes with one application, placing the programmes in order of preference. An applicant may be admitted on the basis of entrance test results alone or a combined score of her/his matriculation examination certificate and the entrance test.

In Finland, medical students may temporarily work as doctors under the direction and supervision of a licensed doctor. A medical student who has completed at least the first four years of studies may work on a temporary basis as a doctor in a specialised medical care unit or a health centre ward, and after the first five years of studies also in emergency services. Such work must be carried out directly under the direction and supervision of a licensed doctor (Health Care Professionals Decree 564/1994).

Over the past seven years, on average about 600 students graduate each year with a medical degree from Finnish universities. In 2017, Finnish universities awarded altogether 574 Licentiate Degrees in Medicine (see Appendix 2). Under an agreement between the universities and the Ministry of Education and Culture, the intake was increased by 25%, from 600 to 750, between 2014 and 2016. According to the ministry, medical education needed to be expanded because ageing of the Finnish population increases the need for care and many doctors are retiring in the next few years. The universities decided themselves at which stage they would increase student intake.

Traditionally, most Finnish medical students complete their studies. Between 93 and 95 per cent of all students admitted to Faculties of Medicine at Finnish universities graduate with a Licentiate Degree in Medicine (Vipunen 2018) which is similar attrition rate to other European programmes. See Appendix 2 for the number of applicants and students admitted in 2013–2017 to the Medical Schools.

The number of Finns studying abroad for a medical degree has doubled in past five years; there is now a “sixth faculty” of Finnish students studying abroad. During the 2016–2017 academic year, 956 Finnish students were studying for a medical degree in a foreign country. 32 % were studying in Sweden and other popular countries were Latvia, Estonia, Romania and Russia. According to

a survey by the Finnish Medical Association (FMA), three out of four students studying abroad reported having applied earlier to medical schools in Finland, and 80% indicated they were not accepted to Medical schools in Finland, which was one reason for going abroad (Suomen Lääkäriliitto 2018). Most of the students will be returning to Finland when they graduate. The National Supervisory Authority for Welfare and Health (Valvira) grants upon application the right to practice as a doctor in Finland to health care professionals trained in Finland or abroad (Health Care Professionals Act 559/1994).

3.2 Continuing education

Under the Health Care Professionals Act (1994), medical doctors must maintain and improve their professional knowledge and skills required to carry out their professional activity and be acquainted with the provisions and regulations concerning their work. Continuing education occurs at workplaces in the form of in-service training (usually about two hours each week) as well as outside the workplace. The Finnish Medical Association recommends that doctors should participate in continuing education outside the workplace for at least ten days each year (Suomen Lääkäriliitto 2014). According to the Finnish Medical Association's survey in 2016, 25 % of physicians had 10 days or more in continuing education, 64 % had less than 10 days and 11 % had none (Suomen Lääkäriliitto 2016).

Most training outside the workplace is arranged by scientific and professional associations in the medical sector. To ensure that doctors receive adequate continuing education, the Finnish Medical Association, the Finnish Medical Society Duodecim and the Finska Läkaresällskapet have jointly established the association Pro Medico (see page <https://www.promedico.fi/in-english.html>), which provides doctors with tools for planning, registering and assessing their professional development and maintains a training calendar of continuous professional development events for doctors.

3.3 Provision of medical specialist training and its reform

A large proportion of Finnish doctors acquire a specialist competence in one or more fields during their careers. Some 80 per cent of all Finnish doctors aged 50 are specialists. According to a 2015 survey among Finnish doctors who obtained their right to practice medicine between 2002 and 2011, nearly all had acquired specialist competence, were in specialist training or intended to take a specialist medical degree. Only 1 % of the respondents had decided not to become specialists and 4% had not yet made a decision on the matter (Sosiaali- ja terveystieteiden ministeriö 2015).

Training is provided in 50 specialities. The universities are responsible for the content and quality of training and award the participants a certificate for completing the training. Based on this, Valvira grants the medical specialist a license to practice. Provisions on medical specialist training and special training in general practice are contained in the legislation (Health Care Professionals Act

559/1994; Sosiaali- ja terveystieteiden ministeriön asetus 56/2015). In 2016, 59 % of all doctors of working age were specialists, and 60 % of these were women. There were 12300 medical specialists in Finland possessing 15,000 specialist degrees. (Suomen Lääkäriliitto 2016.)

Medical specialist training is undergoing major changes. The nationwide steering of medical and dental specialist training was transferred from the Ministry of Education and Culture to the Ministry of Social Affairs and Health at the start of 2015, in order to provide better opportunities to steer the specialist training, to ensure the intake reflects national needs, and to secure a closer link to international developments (See Sosiaali- ja terveystieteiden ministeriö 2013; 2016a).

A programme for developing medical and dental specialist training was announced in December 2016. It lays out guidelines and timetables for the development of this training during 2017–2019 (Sosiaali- ja terveystieteiden ministeriö 2016a; 2016b). The overall need for undergraduate medical education and specialist training will be jointly assessed by the two ministries and the universities. The Ministry of Social Affairs and Health provides the public service system a compensation for costs arising from general medical and dental education, as well as medical and dental specialist training.

3.4 Placement of graduates in the labour market and in the service system

The number of doctors in Finland has grown steadily since 2000. In 2016, there were 28,600 licensed doctors in Finland of whom 54 % were women. Of the licensed doctors, 21,000 lived in Finland and were working age (under 65). Finland has 262 people per doctor of working age. Many doctors from other EU countries also apply for the right to practice medicine in Finland. See Appendix 1 for a description of the Finnish health care system.

In 2016, the medical employment rate was almost 90 % and 70 % of all Finnish doctors were employed by the public sector: 67 % in local government and 2 % in state service, leaving 30 % at work in the private sector. Most (65 %) doctors worked in hospitals or health centres and 4 % in other municipal locations, 17 % in private clinics, 4 % in universities, 3 % for central government agencies, and 2 % worked in foundations, associations or organisations. The rest are employed by e.g. the pharmaceutical industry or temporary employment agencies (Suomen Lääkäriliitto 2016).

Finnish doctors are overall quite satisfied with their choices. More than 80 % of all doctors would still apply for admission to medicine if they could make a new decision and nearly 90 % of all medical specialists would select the same specialist field (Heikkilä et al. 2015, Heikkilä et al. 2016).

Evaluation process: methods and implementation of the evaluation

4.1 Planning and implementation of evaluation

The project planning and implementation was organized in two stages: preparation of the evaluation project plan (October 2016-May 2017) and implementation and reporting (May 2017-June 2018.) The timetable presenting the phases is in Appendix 4.

FINNEEC's Higher Education Evaluation Committee (HEEC) appointed in 2016 a group to plan the evaluation. Each university appointed a representative to the planning group, so all units providing medical education in Finland participated in the process. By engaging, HEEC wanted to strengthen the impact of the evaluation and ensure universities could use the evaluation results in developing their medical education. The task of the group was to prepare a proposal for an evaluation project plan to HEEC. This plan should lay out the objectives of the evaluation, areas to be evaluated, evaluation questions, methods and a preliminary timetable for the project. The composition of the planning group was as follows:

Katrina Nordström, Professor, Aalto University, Member of HEEC (Chair)

Kati Hakkarainen, Director of Medical Education, University of Tampere.

Teppo Heikkilä, Senior Medical Officer, Ministry of Social Affairs and Health

Henni Hiltunen, Medical student, Finnish Medical Students' Association

Jussi Huttunen, Professor Emeritus, Duodecim

Risto Huupponen, Vice-Dean, Professor, University of Turku

Jyrki Mäkelä, Professor, University of Oulu

Tiina Paunio, Vice-Dean, Professor, University of Helsinki

Jukka Pelkonen, Head of Department, Professor, University of Eastern Finland

Counsellors of evaluation (FINNEEC) **Kirsi Hiltunen** and **Hannele Seppälä** supported the work of the planning group.

In May 2017, HEEC appointed an international evaluation team to carry out the evaluation, with three members from Finland and three experts from abroad:

Professor **Marjukka Mäkelä**, National Institute for Health and Welfare in Finland and University of Copenhagen (Chair of the evaluation team)

Associate Professor **Riitta Möller**, Karolinska Institutet (Vice Chair)

Professor **Gerda Croiset**, VU University of Amsterdam, since 1.1.2018 University Medical Center Groningen

Medical Director **Ermo Haavisto**, Satakunta Hospital District

Emeritus Professor **Christopher Stephens**, University of Southampton

Medical Student representative **Joel Telkkä**, University of Helsinki, Finnish Medical Students' Association

The evaluation team made the decisions on practical implementation of the evaluation (application of evaluation methods, division of work between team members, etc.). All members of the evaluation team took part in all phases of evaluation and take joint responsibility for the report. The Chair and Vice-Chair edited and finalised the report and the representatives of FINEEC supported the work throughout. The report and the conclusions of the evaluation are based on the information produced, collected and documented during the evaluation.

FINEEC staff members, Head of Higher Education Unit Hannele Seppälä, Senior advisors **Kirsi Mustonen** and **Mira Huusko** (started in February 2018), were responsible for the practical implementation of the project in close cooperation with the evaluation team. The main task was to ensure implementation of the project plan by providing information to universities and stakeholders about the evaluation project, organising collection of the data as well as workshop and seminars, and participating in the preparation and editing of the final report.

4.2 Evaluation methods

Data were collected to cover the four areas of evaluation: 1) Planning of education, 2) Implementation of education, 3) Competence and working-life skills produced by the education, and 4) Evaluation of the continuous development and renewal of education. The evaluation team used the framework suggested by the planning group and applied also the World Federation for Medical Education (WFME) Global Standards for Quality Improvement (2016) in designing the evaluation. Selected WFME standards relevant to the aims of the evaluation were included.

To obtain a comprehensive picture of undergraduate medical education, the education was examined from three perspectives: 1) universities providing the education, 2) medical students, and 3) various stakeholders in working life.

The evaluation data were collected in stages, proceeding in a cumulative manner so that each phase of data collection built on the evaluation information collected during the preceding stage. When evaluation methods were selected, consideration was also given to the workload arising from the information collection process.

The evaluation included the following methods and data:

- **Summaries of the curricula**, containing objectives laid out for the education; degree structure listing all study units and ECTS credits granted for them; two descriptions of example study units from each year (including learning objectives, teaching and learning methods and assessment methods); description of internship and its objectives.
- Views of stakeholders at the **launching seminar** of the evaluation in Helsinki 21.9.2017.
- **Self-evaluations of the units** providing medical education. The purpose was to produce descriptions of the planning, implementation and development of medical education, as well as assessments of the strengths of current operations and areas where improvements are needed. The units were asked to supply concrete descriptions of their activities and a reflective and analytic review of their own work. Units could freely choose how to conduct the self-evaluation and produce the report. However, it was recommended that representatives of both the management and personnel take part in the carrying out of the self-evaluation.
- **Students' self-evaluations.** Medical students' associations were asked to coordinate students' self-evaluation at each medical school, resulting in one report per school. Questions in the self-evaluation form covered the four areas of evaluation. Each medical students' association could choose how common responses were produced within a framework and many used questionnaires and focus group to gain the students view.
- **Background materials** to the evaluation group: Descriptions of Finnish health care system and legislation on health care and education, statistics of student and doctor numbers, and material from Finnish Medical association surveys.
- **One-day evaluation visits** to the units providing medical education. The purpose was to explore and triangulate the views of the management, teaching staff, students and alumni, and other stakeholders of medical schools. Group interviews and facilitated group working were used in collecting data during the visits (see Appendix 3 for the programme of site visits). The evaluation team was split into two groups traveling to site visits. Group A (Marjukka Mäkelä (chair), Christopher Stephens and Joel Telkkä) traveled to Oulu, Kuopio and Tampere, and group B (Riitta Möller (chair), Gerda Groiset and Ermo Haavisto) visited Turku and Helsinki. FINEEC staff members Hannele Seppälä and Kirsi Mustonen participated in all visits in the following schedule:
 - University of Oulu 28.11.2017
 - University of Eastern Finland 29.11.2017
 - University of Tampere 13.12.2017
 - University of Turku 19.12.2017
 - University of Helsinki 20.12.2017.
- **A working seminar** with the medical schools and students was arranged in Tampere 20.3.2018. The aim of the seminar was to discuss the preliminary findings of the evaluation with the representatives of university units and medical students' associations.
- **A national seminar** and the publication of the final report took place in Helsinki on 15.6.2018.

Several core concepts of teaching and learning methodology are used in the unit descriptions, recommendations and conclusions. These reflect educational principles that typically

- to encourage students to understand concepts and principles rather than merely reproduce factual knowledge;
- to provide a clinical context enabling students to relate learning to future practice;
- to help students to integrate their learning across systems and disciplines; and
- to encourage students to adopt independent thought and self-direction in their learning.

These concepts are briefly explained in the following chapter.

4.3 Core concepts

- **Assessment blueprinting:** A blueprint is a map and specification for an assessment, which ensures that all aspects of the curriculum and educational domains are covered by assessments over a specified period of time. A blueprint links assessment to learning objectives.
- **Collaborative learning:** An educational approach in which groups of students learn together, in an active process, for example by solving problems or completing a task.
- **Constructive alignment:** The underpinning theory of outcomes-based education; a method of devising teaching activities that directly address learning outcomes. Defined as continuity and similarity between learning outcomes, teaching and learning activities, and assessments (Biggs 1999; Biggs & Tang 2007).
- **Core curriculum:** A set of learning outcomes from courses and modules required from a student before graduation. There are several definitions of curriculum in medical education literature.
- **Curriculum mapping:** The process of indexing or diagramming a curriculum to ensure that curriculum outcomes are achieved and that academic gaps, redundancies, and misalignments are identified and addressed, to improve the overall coherence of a course of study and its effectiveness.
- **Digital learning or e-learning:** Learning facilitated by digital technologies enabling access to learning materials at any time, often including collaboration outside the traditional classroom.
- **Flipped classroom:** A blended learning strategy activating students. Changes traditional learning by delivering some classroom content (e.g. by videos and other digital material) for students before teaching sessions, so active participation in a classroom situation is facilitated.
- **Interprofessional learning (IPL)** has been described as when two or more professions learn with, from, and about each other, to improve collaboration and the quality of care.
- **Mini-CEX (Mini Clinical Evaluation Exercise):** A learning event with direct observation of doctor (student) – patient encounter by a teacher or clinical supervisor (Norcini et al. 2003).
- **OSCE (Objective Structured Clinical Examination):** A practical assessment comprising several stations in which practical procedures and clinical skills including communication are assessed, often by observation.

- **Outcomes-based education:** By the end of each module or course, students should have achieved predefined learning outcomes. Different teaching and learning activities may be blended and used to facilitate achievement of the learning outcomes, and many types of assessment can be used.
- **Problem-based learning:** A student activating learning method where authentic patient related problems are solved, often as a group, with support of an experienced supervisor.
- **Programme outcomes:** Outcomes (knowledge, skills and attitudes) defining what students should have attained when they graduate from a programme.
- **Systems based curriculum:** An integrated curriculum that combines different disciplines, often both basic sciences and clinical sciences, around an organ or system of the body.

5 Results of the evaluation

Results of the evaluation and feedback for universities presented in chapters 5.1–5.5 are based on the analysis of evaluation data: summaries of curricula, examples of modules, unit self-evaluation reports, students’ self-evaluation reports, site-visits, and workshop for the universities and students. The evaluation team took joint responsibility for analysing the data and writing the results of evaluation. In the unit-specific chapters the emphasis of the analysis and the content varies due to variation in original data and the ways of producing the self-evaluation reports.

In the university-specific reports, numbers of staff and medical students for 2017 are given in full-time equivalents (FTEs). Each report follows the structure of evaluation questions and comments represent a compilation of self-evaluation and interview results. At the end of each unit description, we have compiled summary lists of the key points of strengths as well as development priorities for the unit and found several examples of good practice for other Medical Schools to consider applying. The Schools have many differences, starting from their self-reported degree structure (see Table 1) and this chapter is mostly concerned with the uniqueness of each School. In chapter 6, the similarities and common trends are discussed.

TABLE 1. Degree structure displayed as ECTS credits in Medical Schools 2017

	UEF	Helsinki	Oulu	Tampere	Turku
Basic studies	~40	274	81	293	267
Intermediate studies	~205		152	-	
Advanced studies	~70	85	60	20	60
Language and communication studies	~10	15	6	8	
Other studies	0–15	2	37	15	
Internship	24–30	24	24	24	33
In total	360	360	360	360	360

The material was extensive, so the evaluation group has tried by triangulation to summarise essential information that can be used in developing work at Medical Schools. The universities have checked draft versions of the individual reports and some facts and misunderstandings were corrected.

The evaluation team was impressed to see how carefully the management, teachers, students, and stakeholders had prepared for the site-visits and interviews, and how openly they considered strengths and shortcomings in their education. According to the feedback from all Medical Schools, the review process itself – self-evaluations, seminars as well as comments from and discussions with the evaluation team – was considered useful and beneficial.

5.1 University of Eastern Finland

5.1.1 Introduction

The number of medical students at the University of Eastern Finland (UEF) is 1057. There are 375 staff (288 teaching and research staff, 87 other staff). The School of Medicine in Kuopio is the largest department in the Faculty of Health Sciences and is divided into four units: Institute of Biomedicine, Institute of Dentistry, Institute of Public Health and Clinical Nutrition, and Institute of Clinical Medicine. At the University of Eastern Finland students can accomplish the degrees of Licentiate of Medicine and Licentiate of Dentistry, Bachelor's and Master's degrees in biomedicine, clinical nutrition or health promotion, and Master's degree in public health.

The objective of the medical education is to give students the qualifications necessary to perform duties of a medical doctor, to practice medicine independently and to give the qualifications necessary for further education, as well as ability and motivation to lifelong learning. In addition to working as a medical doctor, the graduates are able to take teaching duties, engage in research, or carry out various administrative tasks requiring medical expertise.

5.1.2 Planning of education

Mission of medical school

The mission of the university is to provide higher education based on research, and to educate youth to serve society and humanity. According to the management, the medical school aims at educating top-level experts and professionals for the health and well-being sectors, and at being the best academic learning environment in Finland.

Educational outcomes

A core content analysis of the curriculum according to the Bologna process was performed in 2004. In 2014, the contents and credit points of the courses were re-evaluated. Preclinical renewal of the curriculum based on core content analysis will be launched in 2018. In clinical studies, detailed core content analysis is used in most subjects; for some specialties (neurology, ophthalmology, pediatrics and surgery) national core content analyses are done collaboratively by all medical schools in Finland.

The education aims at providing Medical Degree programme graduates with cognitive, psychosocial and professional abilities needed to work independently as a medical doctor, to continue in further education, and to be motivated for lifelong learning. Even though the programme has been reviewed based to Bologna process, no overarching intended learning outcomes nor curriculum framework for the Licentiate of Medicine degree are described, which is a problem. Thus, it is not possible to assess how the learning outcomes for the modules (courses) relate to the program-level learning outcomes. The evaluation team urges the School to create overarching learning outcomes, which would enable mapping of learning outcomes of each module against programme-level learning outcomes. Further, continuous check on the content at both course level and the whole curriculum level seems to be missing.

There is collaboration with other University of Eastern Finland's faculties in teaching ethics, psychology and sociology as applied to medicine. Teachers and students from other faculties (theology, nursing etc.) come for shared teaching sessions or theme days. Both students and teachers encourage more collaborative teaching of this type. In the new curriculum, ethical and legal issues will be presented in seminars through patient cases.

Pedagogic framework of the education and the curriculum preparation process

Several teaching and learning methods are described but a pedagogical model with underpinning theory for the programme is missing. Life-long learning and scientific basis are mentioned in the self-evaluation, but the programme could be clearer about what their educational model is and how it is considered in teaching. Presenting different teaching methods can concretize but is not enough to present a pedagogical model.

The current subject-based curriculum has two phases; the first two years comprise mainly basic science studies whereas the last four years include mainly clinical education. Studies in communication skills start early, which is positive. Epidemiology, biostatistics and public health are introduced in year 2 and seem to follow each other, which will certainly enhance students' learning opportunities. There are multiple small courses, about 78 in total, contributing to the degree.

A new integrated organ/system-based curriculum will be introduced in 2018 for the first two years. Active learning and classroom interaction will be emphasized and learning methods will be more based on problem solving and interaction. Most teachers also do research and several clinical teachers participate in national clinical guideline groups and embed this in their teaching. Student representatives have been recruited to small groups for planning module contents. There are challenges in incorporating theory to clinic, as preclinical and clinical teaching are not always synchronized.

A committee of teachers and students uses an agreed process for developing course content. Student members selected by their peers and teacher coordinators for each year discuss the objectives, and subject based groups develop the material. Learning objectives are approved by the Faculty Council of the Faculty of Health Sciences.

Student feedback after each course is collected electronically but number of respondents is usually small. Feedback is discussed in regular teachers' meetings for necessary changes. Students listed several changes resulting from their feedback. For general practice, stakeholder feedback is yearly collected but otherwise feedback from working life is occasional. Programme planning has not involved stakeholders. Planning for optional courses seems mainly based on teacher interests.

Students are encouraged to find evidence-based therapeutic approaches for each patient together with their teacher. University of Eastern Finland offers an optional international study programme in public health. A broader range of optional courses and ways of integrating these with students from other fields and faculties could be considered. Stakeholders have the impression that University of Eastern Finland is emphasizing prevention and primary care. However, public health, health promotion and motivating interview methods are covered as separate units instead of being integrated in clinical work.

Students are overall happy with how well teaching prepares them for clinical work except for the amount of practical skills training. They would like more teaching in critical appraisal of studies, academic writing and how to do research, legal aspects of physicians' work, and more knowledge on other health professionals' roles (physiotherapy, social work, nursing, nutrition).

Consideration of changes in the operating environment and future competence requirements

Both the service system and economics in health care are changing, both should be included in the curriculum. Learning in multiprofessional groups in both hospital and primary health care environments could model interprofessional working. University of Eastern Finland has an optional interprofessional course for health care and social work students. There is need to provide more teaching in holistic elderly and terminal care, remembering ethical questions. Good teaching in several electronic patient record systems is essential, including skills to provide sufficient and logical documentation. The reform of social welfare and healthcare (SOTE) will certainly create a need for new teaching and learning activities when the reform legislation is finished.

Strengths and development priorities in planning of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Systematic student participation in curriculum planning. • Quality Manual of the School of Medicine. • Participation in national discussions on teaching and its evaluation. • Teaching in primary care environments on most courses. • Integration with health care system and good contact with teachers in the field. 	<ul style="list-style-type: none"> • Clarification of curriculum framework and programme level learning outcomes. • A curriculum mapping to ensure that learning outcomes, teaching and learning activities and assessment are aligned. • Increasing exchange between teachers across the courses (also outside UEF). • Large group sizes challenge sufficient clinical skills teaching.

5.1.3 Implementation of education

Learning environments and teaching and supervision methods

The undergraduate medical education learning environment at University of Eastern Finland comprises teaching facilities at the School of Medicine, the Institute of Clinical Medicine, Kuopio University Hospital (KUH) with nearby hospitals, Kuopio Health Centre and Partner Healthcare Network and the central hospitals of Central Finland, Mikkeli and Northern Karelia. UEF offers learning environments (Taitostudia) where students can exercise their medical skills in small groups or independently. This possibility of learning practical skills is highly praised. Simulation-based learning materials (e.g. 3-D anatomical, physiological and biochemical modelling) are available online. Collaboration agreements are in place with three central hospitals and numerous health centres for clinical placements.

In the early years, lectures seem to be used predominantly, possibly due to increase in student intake without increase in teacher numbers whereas during clinical courses there is a good variety of teaching and learning activities. Students report teaching of variable quality and lecture materials are not always available. Video lectures can be used in the online learning environment, but rarely are. Students suggest more interactive elements in the lectures and use of the electronic learning platform (web quizzes etc.). The learning objectives of the seminars prepared by students are rarely reached, they say. Problem-based learning (PBL) is used in primary care. The quality of materials in the electronic learning environment varies. Teachers have some support for using the new teaching tools. Students get so far little support in evaluating and using new technologies with patients.

Increase in student numbers has resulted in major need to rearrange teaching. Teaching content and the methods of teaching do not always support each other. The links between teaching and learning activities, intended learning outcomes and student assessments are not very visible. Invaluable *teaching nurses* for each clinical year solve any practical issues to a large extent. Excessive group sizes have had a negative effect on the quality of *clinical teaching*. Students keep a journal

of the procedures they have carried out during courses and would appreciate external feedback on this. Students with difficulties in progressing are systematically identified and supported in a preplanned manner.

At the start of studies, each student is appointed a teaching tutor and a student tutor from higher year. Tutoring takes place in groups for the first year or two. Teachers seem not to get extra credit for this work. Students expressed need for guidance focusing not only on the start of the studies but also on transition to clinical work and to the labor market. Student IDs rather than names are now used in assessment results and student achievement lists, which students consider a good practice.

Ensuring students to develop appropriate professional behavior is mostly integrated depending on teacher interest. Structured communications teaching around the doctor-patient relationship and more difficult encounters, takes place within general practice, oncology, and psychiatry. Interprofessional team skills are now learned together with nursing students and more psychology / social care skills will be added. Health center teaching includes community issues and personal behavior change.

Assessment of learning and learning outcomes

There is no overall assessment strategy for the program. The assessments are planned and carried out by subject teachers and from the self-evaluation report, it was sometimes difficult to understand whether an assessment was formative or summative. Some courses use entrance examinations. Most courses have a final examination. Written summative examinations of knowledge at the end of the units are most common. Some assessments of practical skills have been described but a system for assessment for skills and behaviors and their grading is unclear.

Use of learning diaries includes both theory and reflection. During courses there are tests for self-assessment, and teachers give written feedback on patient record texts produced by students. Local progress examinations to assess accumulating interdisciplinary cognitive knowledge are not used yet.

University of Eastern Finland has set indicators for quality assurance, e.g. the percentage of students who complete the target of 55 credits per academic year. Integrated assessment of learning outcomes for years 1–2 is now being planned. For some subjects, there are nationally agreed methods. The progress of studies is monitored in different phases with study thresholds, i.e. items to pass before acceptance for next level teaching. Intervening in study progress of an individual student is rare unless problems are encountered in passing these thresholds.

During internships, the quantity of guidance depends on the placement, and during advanced studies and Master's thesis, on the supervisor's active approach. Many general practitioner (GP) supervisors provide holistic feedback that includes skills and attitudes.

Students suggest arranging a possibility for sitting re-examinations several times a year, including in the summer, to ensure they can complete courses on time. They also felt that the current assessment model is outdated and encourages competition between students, as the grades are used e.g. for assigning placements as junior house officers. Most students proposed that numeric assessment should be replaced by a pass/fail system and the bar for passing should be raised. Assessment methods could be diversified by using learning journals on patient encounters, interactive exams, and mid-course exams. Also, a Progress Test or other national or international quality indicators could be used.

Systematic and comprehensive assessment of knowledge, skills and behaviors is not provided at any point. Assessment strategies could be reconsidered to provide information to guide learning as well as to support lifelong learning.

Teachers' competence and how to develop it

Most teachers have some training in university pedagogics. In four PEDTA coffee meetings per year, teachers share their best practices. An education unit exists for the whole faculty but not separately for medical school. For clinical teachers in regional hospitals, training with specified goals was provided by web meetings well before they started teaching. Primary care teachers regularly meet in seminars. The university offers a professional development programme where several clinical teachers have participated. Frequent changing of clinical teachers is a challenge.

Teacher career paths are being considered and new positions based on teaching are planned. Project managers are provided to help in organizing teaching with new methods (e.g. flipped classroom). Officially teaching is not yet visibly recognized with extra funding or other rewards.

Well-being of the university community

For students, tutors are pivotal persons at the start of studies in creating a safe and innovative learning environment. University of Eastern Finland has a study psychologist and a study priest on campus. Student health care is organised by the Finnish Student Health Service (YTHS). Options for leisure time activities and exercise are rich.

A teaching nurse specialized in student counselling can help in organizing studies in case of delays or other problems. Personal study plans are rarely needed, typically, in case of illness or other unexpected issue. If changes are needed, schedules are often inflexible. In cases of illness, students felt it was difficult to find help or support and taking a gap year may be the only option if it is not possible to arrange personal study plan.

An improvement of the outdated electronic learning environment and more computers in breakrooms would support students' work. Breaks during long lectures would promote learning. A more even distribution of the workload over the academic year in some courses would be appreciated.

Staff well-being is covered in each unit with assigned persons and annual appraisal discussion.

Strengths and development priorities in implementing education

Strengths	Development priorities
<ul style="list-style-type: none"> • Tutoring structure for first years is functioning well. • Communication about curriculum and its requirements is mostly sufficient. • Active student feedback systems using IDs instead of names for privacy. • Teaching nurses are easy to reach and provide help when needed. • Identification and support system for students who lag behind. • On-line training of teachers in distant locations. • Good support to students with disabilities. 	<ul style="list-style-type: none"> • Curriculum mapping to ensure that the intended learning outcomes and activities are in the curriculum. • A programme-level assessment policy showing that assessments are in line with the learning outcomes. • Developing assessments to include knowledge, skills and behaviours. • Develop supervisors' roles throughout the programme, especially during clinical courses. • Use of e-learning and digitalization. • Evaluation/use of new technologies (Health Technology Assessment, HTA). • Review the scheduling process enabling earlier publication of students schedules. • Possibility to participate in pedagogical courses and tenure track for teachers.

5.1.4 Competence and working-life skills produced by the education

Internship

The degree programme in medicine includes mandatory practical training worth a total of 24 ECTS credits completed during studies. University of Eastern Finland provides structured instruction for internships but practices vary. In addition, common learning outcomes for internships are missing. Each student should receive proper induction training by an assigned senior physician, and feedback during internship should be mandatory; these are not always available at present. Students suggest the Finnish Medical Association could produce common guidelines for internship. Internships abroad are difficult to get accepted.

Since the clinical education is a central part of the medical programme, it is urgent to review how the supervision is carried out, what the central learning outcomes are, and how the supervision may be evaluated so that the programme may identify the entities where students are supervised well and where the supervision is below the expectations. If there are no clear objectives and expectations it is less likely that the students learn what they should learn. Thus, supervision and assessment of internship is one of the main educational development goals.

Career guidance and career paths

Career opportunities are introduced during preclinical studies, but otherwise career guidance is minimal. Personal career guidance is not offered systematically. Information about general practitioner work and specialist training is provided in the last study year; otherwise the role of events organized by employers, associations and recruitment firms is large. Graduates are typically still considering several options as their medical career and working life clarifies career choices. The Finnish Medical Association (FMA) new website on career choices could be used.

Students suggest access to career guidance organized by the university. Typical features of different fields of specialization could be discussed in a career guidance event. A broader range of optional courses to test possibly interesting fields could be available.

The basis provided by the education for continuous professional development

First year studies include teaching on research ethics, philosophy of science, critical thinking, literature searching, and data retrieval skills and introductory sessions to research. More senior students have possibilities to participate as teachers for lower courses. Plans are underway to offer courses in leadership and management. Clear approaches to support continuous professional development are missing.

Cooperation with working life and its quality management in the future operating environment

The Faculty of Health Sciences is multidisciplinary and some joint teaching with students of other health fields (nursing, pharmacy, etc.) is taking place. Clinical teaching is partly decentralized to other hospitals in the district and to health centers. Collaboration with private health care currently does not occur.

The exponential growth of available data, arrival of pharmacogenetics and personalized medicine, and use of artificial intelligence in diagnosing diseases will change both health care and medical teaching. Providing adequate training that covers all these trends will be a major challenge. Increased cultural diversity and the new SOTE system also require changes in the curriculum. The learning methods and environments as well as assessment of learning outcomes must also reflect these needs. One important common aim will be to introduce national learning outcomes.

Students felt University of Eastern Finland provides them with a good selection of tools for a physician's job. For those aiming for a career in research or an international career path, more optional courses would be useful. There is sufficient instruction on interaction skills, though additional training in encountering difficult situations might be useful. More leadership training and interprofessional simulated exercises would be welcomed.

Strengths and development priorities in competence and working life skills

Strengths	Development priorities
<ul style="list-style-type: none">• Students can participate in teaching their juniors.• Multidisciplinary faculty of health sciences.• Training in interaction skills throughout medical school.	<ul style="list-style-type: none">• Development of learning outcomes, supervision and assessment of internships.• Digital skills for learning and working in health systems.• Reanalysis of future skills needed and integration of these in curriculum content.• Development of career guidance.

5.1.5 Continuous development and renewal of education

Forecasting competence and renewal needs

The Teaching Development and Assessment Committee of the Medical School (KOSTI) coordinates renewal needs of teaching. An optional international study programme in public health is offered. Erasmus exchange is active and internships at hospitals abroad can be accepted as credits. University of Eastern Finland's teachers are active in scientific discussions on university pedagogics or medical education.

Use of evaluation and feedback information

The School of Medicine monitors the students' graduation rates and times. Course feedback is collected yearly through various channels and used in revising teaching. There are student members at the Faculty Council, Faculty Education Work Group of Health Sciences and Work Group for Teaching Development and Assessment. Feedback from health care employers are not systematically collected but informal comments are noted.

Students want systematic responses to their feedback on teaching. There were multiple examples of actual changes based on student feedback. In the ongoing study reform, students felt their representatives could have been invited to participate from the start. They suggest setting up an electronic feedback box in the Moodle learning environment for each course.

Cooperation between universities

The level of national co-operation between Medical Schools was reported as increasing. In some fields of medicine, e.g. paediatrics and neurology, there is already collaboration working toward common national learning outcomes for undergraduates. Areas for improving co-operation include consolidation of core content; making use of digitalisation and shared material banks;

developing practices in advanced studies; and joint courses for elective studies. Field-specific teacher networking plays a crucial role in this co-operation. All medical faculties are involved in the digital study environments project as well as in developing practices for advanced studies (Syväriportti). Annual national meetings with all Medical Schools discuss educational issues. Joint assessment methods are discussed between clinics as well as in annual national meetings. The evaluation team recommends the exchange of experience and knowledge through international cooperation to improve the quality of education. When the local curriculum and its content are put into a wider context, the staff and students are given a chance to compare their education with others, initiate co-operation and find new innovative solutions for their own curriculum.

Strengths and development priorities in continuous development and renewal of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Active working group for teaching development and assessment. • Multiple channels for student feedback. • Actual changes based on feedback yearly. 	<ul style="list-style-type: none"> • The electronic learning environment would need a thorough update. • Electronic feedback box for each course.

Good practices and suggestions for development

During the site-visit, the faculty management, academic staff, students and stakeholders identified many strengths and key areas for development, as well as good practices. The evaluation team has selected the most relevant examples of good practices for other universities to follow, and interpreted observations on needs to change through theories or learning into ideas for development.

Examples of Good Practices at the University of Eastern Finland

- Operating in the multidisciplinary Faculty of Health.
- “Keystone teachers” model for sharing good health education practices.
- A functioning system of small adjustments based on student feedback.
- Teaching nurses are invaluable and highly trusted.
- Support for students with innovative ideas or job prospects in technology companies.
- A noncompetitive atmosphere and sufficient amount of patient contact.
- Distributing studies to regional hospitals and health centers, with teacher training, works well.
- Teaching on patients with complex problems, case managing and challenging situations.

Suggestions for development

- More cooperation between universities in assessments, teaching materials and digital learning.
- Develop programme level learning outcomes.
- Create curriculum mapping to ensure that the teaching and learning content, activities and assessments are aligned with intended learning outcomes.
- Ensure that integrated topics such as public health, legislation, social care or rehabilitation systems, and ethics have enough space in the curriculum.
- Modernize the methods of student assessment and integrate these to the system.
- Create clear learning outcomes, supervision and assessment methods for internships.
- An update of the electronic platforms used in teaching is needed.
- Develop interprofessional education in practical situations, health economics and technology assessment.
- More practical skills teaching aspects to preclinical studies and OSCE exams would be welcomed.
- University funding systems should value teaching also, not only research.
- Support the Work Group for Teaching Development and Assessment, which is trusted by all but seems to have many responsibilities.
- Create a tenure track for teachers and mandatory pedagogical courses for teaching staff.

5.2 University of Helsinki

5.2.1 Introduction

There are 826 medical students and 936 staff at the University of Helsinki (740 teaching and research staff and 196 other staff). The Faculty of Medicine and the undergraduate medical education programme is located at the Meilahti campus and the Academic Medical Center Helsinki. Practical teaching is widely decentralised to hospitals and health care centers of the hospital district. There are three units: Medicum, Clinicum, and the Research Programme Unit. Medicum consists of the former Institute of Biomedicine, the Haartman Institute, and the Department of Forensic Medicine at the Hjelt Institute. Clinicum comprises the former Institute of Dentistry, the Institute of Clinical Medicine and the disciplines of public health and occupational health at the Hjelt Institute. In addition to physicians, the Faculty of Medicine educates dentists, psychologists, and speech therapists as well as Master's degree holders in translational medicine.

The University of Helsinki medical degree provides a curriculum supporting students' development both as professionals who can work in primary health care or continue their career in medical specialist training. Based on the objectives, a graduating medical doctor from University of Helsinki possesses a good professional and ethical behaviour, clinical expertise, biomedical and research competence, interaction and co-operation skills, management and system skills, and competence for health promotion and life-long learning.

5.2.2 Planning of education

Mission of medical school

According to the vision of University of Helsinki, the Faculty of Medicine wants their doctors to be students for life. Medical practice is evidence based. Based on the University of Helsinki's tradition, science is core to the academic part of the curriculum. According to the vision, patient safety is an important part of education and integrated in clinical teaching. As the only medical faculty in Finland, Helsinki is responsible for training Swedish speaking students; 25 % of the students follow the Swedish-language track.

Educational outcomes

The medical programme at University of Helsinki has reviewed the curriculum continuously in recent years. The outcomes were defined in 2012 and redefined in 2013 in a collaborative process involving a majority of the teachers (faculty and clinicians, study year coordinators, study unit teachers) as well as student representatives. The outcomes of biomedical studies were reviewed in 2016. National surveys and recommendations from specialty associations considering learning outcomes were taken to account. The learning outcomes for the Licentiate of Medicine degree at the University of Helsinki are grouped to themes based on the CanMEDS framework:

1. Clinical expertise: Knowledge, skills and attitudes
2. Biomedical competence
3. Physicians' research expertise
4. Interaction skills
5. Professionalism and ethics
6. Co-operation, management and system skills
7. Health promotion
8. Life-long learning.

The first two years of the programme are dedicated to biomedical sciences. Clinical aspects and early patient contacts have been integrated into the early years in the Primary Health Care track and From Student to Professional track. The courses in years 3 and 4 are clinically oriented. Integration between basic science and clinic is attained through problem-based learning (PBL) in

the early years. In years 5 and 6 clinical internships are scheduled. There are many short courses/modules throughout the program. The curriculum offers students a choice of electives, so they are able to explore their areas of interest. New technology and mobile learning (for example tablets are given to new students) is used since 2013 and still increasing.

The strength of the competence framework is that areas like professionalism, interaction, system skills and health promotion belong to core competence areas. Even lifelong learning that is important for maintaining competence in the future has its own intended learning outcomes. However, the framework is not really mirrored in the learning outcomes of study units, which is a weakness.

Learning objectives (and contents) for basic science studies have been defined in small groups consisting of specialists from different fields, primarily university lecturers and professors. They emphasize teaching in basic science throughout the program. For some clinical disciplines (e.g. neurology and paediatrics), definition of learning objects and core content analysis have been carried out in national collaboration. Otherwise, the management team trusts that teachers (study unit coordinators) have expertise for determining curriculum content and learning goals for their area. Thus, teachers have a high level of autonomy, while an overall check on the content at the study year and whole curriculum levels is missing. Curriculum mapping, with learning outcomes of each module mapped against the overarching learning outcomes for the programme, would benefit the program.

The alumni and staff commented that students from University of Helsinki are academically well trained. They have adequate knowledge, clinical skills and a good attitude, but education does not pay enough attention to skills such as interprofessional education, teamwork and patient safety. More time for clinical training is suggested to improve professional performance, self-confidence and competencies in interprofessional collaboration.

Pedagogic framework of the education and the curriculum preparation process

Self-evaluation shows a clear and well-structured description of the underpinning theory: a constructive learning theory is implemented by providing students learning assignments, which activate their prior knowledge and skills. The first two study years are based on problem-based learning (PBL), having as a key principle that learning is a constructive, self-directed, collaborative and contextual process. PBL brings theory and practice together to solve authentic medical problems. However, it remains a bit unclear how the underpinning theory transmits from the programme level to the individual modules.

Between 2012 and 2014, two working groups (SISU I and II) evaluated the curriculum under the leadership of the Vice Dean of Education and planned the new curriculum content. In 2014, the six academic year coordinators and a project manager led the curriculum reform process. The goals are in general in line with future requirements of health care workers and requests of the stakeholders and the alumni. However, neither stakeholders nor patients were involved revising the curriculum. The goals for the curriculum reform were:

- to improve the work relevance of studies
- to improve graduates' competencies for working in primary health care
- to improve opportunities to select study modules of personal interest (electives)
- to strengthen leadership competencies
- to strengthen research competencies
- better integration and clarity of the program
- to encourage student-centered learning
- to enable comprehensive learning.

The Educational Cycle (Plan-Do-Check-Act) in the form of self-evaluation, repeated evaluation meetings and constructive student feedback is used to implement the changes required by the reformed curriculum. The Board of the Degree Programme in Medicine reviews the curriculum annually. The board makes proposals to the Faculty Council on the overall content of the degrees, on teaching methods and on student options for completing studies. The Board ensures that the study units form a coherent and cohesive curriculum. Several working groups including groups for feedback, assessment, international teaching, core curriculum, and curriculum reform evaluation (SISU III) have been set up. Recently, a core content analysis of 65 study modules was done to guarantee comprehensive studies with essential contents known to everyone. In basic medical studies, the content was evaluated by small groups consisting of specialists from different fields, mainly university lecturers and professors. Biomedical study modules have been evaluated by a Clinical Expert Group. Clinical blocks consulted general practitioners to redefine intended learning outcomes.

Students are represented and active at different levels of educational planning. Some of the external stakeholders were not clear about the learning outcomes or the development of the program. Stakeholders from local healthcare services felt they were not involved in the planning of the curriculum in a systematic manner.

Consideration of changes in the operating environment and future competence requirements in the planning of the education

The Faculty identified several skills that must be prioritized in the future. During primary care rotation, students meet other professionals such as nurses and physiotherapists. There are even some optional courses including collaboration with students of other professions. However, the management team believe that increased exposure to interprofessional learning is required. The team also wants to develop digital communication with patients. Mobile learning is incorporated in the programme since several years and some courses uses the flipped classroom technique (students are introduced to learning content before the class e.g. by videos and other digital material). The faculty aims to develop this further. Other areas needing attention that were mentioned in the self-evaluation and interviews were legal issues, patient safety, e-health, and electives.

Strengths and development priorities in planning of education

Strengths	Development priorities
<ul style="list-style-type: none">• Clear underpinning theory for the programme with a well-structured framework.• Several recent curriculum reforms with increased teacher interaction, and content analysis.• Active co-operation between Study Unit leaders, teachers, students, the degree programme committee and the Centre of Medical Education.• Innovative mobile learning.• Committed and enthusiastic staff, good team spirit.	<ul style="list-style-type: none">• Constructive alignment – learning, teaching and assessment align in all elements of the curriculum.• Curriculum mapping, assessment policy.• Interprofessional education, more than in primary health care and a couple of electives.• Faculty to consult its own working Life advisory board (stakeholders).

5.2.3 Implementation of education

Learning environments and teaching and supervision methods

The undergraduate medical education learning environment at University of Helsinki is both physical and virtual. The medical education is undertaken as a collaboration of two units, Medicum (mainly responsible for basic science education) and Cliniicum (responsible for clinical medicine). The biomedical education takes place at Meilahti campus in Biomedicum 1, where the largest lectures halls and numerous seminar rooms are located. Clinical teaching mostly takes place in the university hospital but also elsewhere in the University hospital district. Moodle is used as the virtual learning platform.

Teaching and learning activities show good variation throughout the curricula. Most common activities are PBL- and case-based learning with small group teaching, lectures and practical exercises. Mobile learning has been strongly developed during the recent years. Students get a tablet of their own when they enter the Medical School to stimulate preparation for the use e-Books and flipped classroom teaching where class time is student-centred active learning and content delivered through videos or other online material. Both students and teachers get support in integrating mobile teaching and learning activities. The clinical studies are based on versatile active and interactive learning methods like bed-side teaching and team-based learning. In the fourth year there is clinical training to prepare for internships. However, there is no curriculum mapping to ensure that the intended learning activities are met. Electives are included in the latest curriculum renovation. Students can take up to 5 electives of 5 credits and optional studies comprising 10 credits at other faculties.

Students reported that the teaching is mainly good, but a large variation in quality of teachers, PBL tutors and supervisors during internship influences whether students learn essential course contents. Information about course content varies between courses and is not always complete. Lectures could be more interactive. Sometimes too many students are scheduled for small group

teaching with patients, which impacts both students' learning and patient experience negatively. During some clinical placements, students are mostly observers, whereas in other places students are well guided and are assigned to patients of their own. Students suggest appointing a personal supervisor who could take responsibility for clinical training. There are many courses with few credits throughout the programme. The evaluation team strongly recommends considering reduction in the number of small courses and exams.

The tutoring model was adopted from the University of Turku, but it did not work well in the University of Helsinki setting due to difficulties in recruiting tutors, among other things. A new plan for tutoring has been composed.

Assessment of learning and learning outcomes

There is no overall assessment strategy for the program. Assessments are planned and carried out by subject teachers and it was sometimes difficult to understand from the report whether an assessment was formative or summative. Some courses use entrance examinations to emphasize continuity between preclinical and clinical courses, requiring students to brush up their knowledge before going to the next level. In general, the students stated that too many topics are marked as very important to master.

Written individual summative examinations at the end of the units are most common. At the end of year 6, an Objective Structured Clinical Examination (OSCE) after which feedback is given has been used for several years. The OSCE includes 8 stations, which is quite a low number. It was unclear if there are other summative practical exams such as work-based assessment (WBA) or direct observation of procedural skills (DOPS) during the program. A new final examination in the 6th year will be introduced, focusing on everyday day symptoms and the diagnostic process.

Study years 5 and 6 comprise different clinical placements and a four-month period as junior house officer. There seems to be no instructions nor guidelines for the supervision and formative assessment during these periods. Students stated that there is no structured feedback and wished that supervision and methods for assessment of clinical skills would be developed.

Progress tests are organized biannually, allowing students to follow their own development. The progress test owned by the Faculty was replaced by the International Progress test (IPT). The purpose of implementing IPT or its benefits for students were not detailed. The number of exams is high and there seems to be little feedback.

Clinical training, in particular learning clinical skills and reasoning, is a central part of the medical programme, and student learning and development are strongly promoted by frequent feedback. There is a need to review how the systematic formative assessment is structured across the programme and how this system is linked with the system for summative examinations.

Teachers' competence and how to develop it

The Faculty of Medicine was the first at the University of Helsinki to provide teachers with pedagogical training (since 1993). More than 500 teachers have taken a dedicated course of 10 credits. The pedagogical research and development unit took charge of the training. However, due to a recent reorganization, the faculty development programme is now provided by the Centre for University Teaching and Learning in the Faculty of Educational Sciences and no longer dedicated to medical education. Thus, there are no courses that focus only on medical education. Moreover, clinicians outside the University who are responsible for a fundamental part of the undergraduate education are not allowed to attend the courses.

The teachers stated that courses for teachers in medical education should be ensured for all teachers, including clinicians. The decision to discontinue the courses is remarkable, regarding the level of scholarship and contribution to international conferences among medical teachers from University of Helsinki. The evaluation team advises to reconsider the decision and to reinstall the faculty pedagogical development programme at the Faculty of Medicine.

There is no tenure track for teachers. Many teachers are scientifically active and publish also pedagogical papers in international journals. Eight members have been appointed to the University of Helsinki Teachers' Academy, which is a network of distinguished university teachers.

Well-being of the university community

In 2016, a research group on students' health and wellbeing was established in Helsinki. Their study looks at 1st, 3rd and 5th year medical students to explore how individual and environmental factors influence students' stress, well-being and study performance. Based on the first results (presented in the AMEE conference in 2017), a new programme will be developed to enhance student well-being.

There used to be a student counselor at the Faculty of Medicine but during the last organizational change this service was discontinued and is now centralized at the university. The students are somewhat aware that there is a psychologists' service, but this service is not visible. Both teachers and teaching nurses often help students who are struggling with their studies. Health care services are available for the students via Finnish Student Health Services (YTHS). There is a voluntary course available in stress management.

Teachers' well-being is supported by means of development days of the departments and teachers have access to occupational health services. Increase in student intake combined with cutdowns in teaching staff and organisational reforms in the administration are probably having an effect on teachers' well-being.

Strengths and development priorities in implementing education

Strengths	Development priorities
<ul style="list-style-type: none">• Continuous development of education.• Mobile learning and e-books are widely used and students are provided with tablets from first year on.• High number of pedagogically trained teachers.• Eight members at the Teachers' Academy.• Two pedagogical lectures devoted to medical education.• Electives (collaboration with other faculties and the school of applied sciences).	<ul style="list-style-type: none">• Curriculum mapping to ensure that intended learning activities from the blueprint are in the curriculum.• Improvement of assessment methods to include skills and behaviours.• Improvement of individual feedback.• Reinstall Faculty development programme for the Medical Faculty.• Create educational career possibilities, tenure track, e.g. associate professors of medical education.• Reduction of the number of students in the clinical context.

5.2.4 Competence and working-life skills produced by the education

Internships

The degree programme in medicine includes mandatory practical training in years 4, 5 and 6. The goal is to deepen students' knowledge and practical skills, and to explore interprofessional teamwork and the operation of hospitals and health centers under supervision. The supervision and practices during the internship vary in different clinical settings. Further, there are no common instructions for supervisors for setting objectives, assessment, or feedback. Students particularly wish for regular feedback on clinical skills from supervisors.

Clinical training is an essential part of the medical programme, so it is important to review the central learning outcomes, how supervision is carried out and students evaluated. This would identify where students are supervised well and also where supervision does not meet expectations. Without clear objectives and expectations, it is difficult for students to learn what they need. Supervision and assessment of the internship needs to be one of the main educational development goals.

Career guidance and career paths

The Faculty of Medicine regards working life orientation as a part of career planning and systematic career guidance is under development. This should support students' self-awareness as well as examine individual career goals and motivational factors to help students make choices. Practical skills, such as job hunting and networking will be included. An alumni survey, organised by the University of Helsinki and Aarresaari-network is in use, but it's not clear if the results are used in any way in the program.

The University of Helsinki Career services unit has provided individual career counseling for all students since 2001. Since 2016, individual career counselling has been aimed specifically at students on Meilahti campus. Optional lectures on what to do after graduation are organized at

the later stages of studies. Students, however, considered the amount of career guidance to be low and asked for more information and services such as support for the transition from studies to working life and help in seeking a suitable career.

The basis provided by the education for continuous professional development

Continuous professional development should keep future doctors up to date and competent in all areas of their work. Life-long learning is one of the themes in the educational framework used in curriculum planning. Continuous professional development is emphasized from the first day of the program. Skills are taught parallel with study modules using PBL methods including data searches. Students develop information searching skills, critical appraisal and other skills for Evidence Based Medicine (EBM). In addition, there is a MD-PhD track for students who want to develop their research skills further. Formative and summative practical assessments and personal feedback are important in facilitating students' development.

Cooperation with working life and its quality management in the future operating environment

Because clinical teaching and training is decentralised to several facilities in the capital region, the teachers at these units are a natural base for collaboration and building a Working Life Advisory Board to support the curriculum development. There was no description of how the contacts and collaboration with these professionals are organized but it seems that the relationship between the university and health care sector is stable.

The Faculty collaborates with Aalto University and the University of Tampere in implementing advanced and elective study modules. In collaboration with Aalto University, collaborative courses in health care management have been arranged. In addition, there is a collaborative project with the University of Tampere regarding a course in global health.

The stakeholders and alumni are not involved in curriculum planning. They think students need more interactive skills, interprofessional learning, simulation, and teamwork training. In medical education, working life competencies should be trained to improve the self-awareness of the students and to help them to be fit for practice.

Strengths and development priorities in competence and working life skills

Strengths	Development priorities
<ul style="list-style-type: none"> • Widely decentralised teaching and training in health care centers and smaller hospitals providing a diverse patient mix. • Good basis for continuous professional development. 	<ul style="list-style-type: none"> • Development of learning outcomes, supervision and assessment of internships. • Development of guidelines for clinical supervision and training and assessment. • Development of career services.

5.2.5 Continuous development and renewal of education

Forecasting competence and renewal needs

Future competence requirements, arising from working with the ageing population, shifting services to ambulatory care, big data, e-health, and need for enhanced communication skills were some of the drivers behind the curriculum reform in 2012 and are still actual development areas. Interprofessional education as a mandatory activity is lacking. The increasing requirements for patient safety, health care efficiency and increasing complexity of the organization and delivery of health care put high requirements on teamwork and therefore, the evaluation team recommends that more focus should be put on interprofessional education.

Use of evaluation and feedback information

Feedback is collected via the net (WebOodi-system) after each study module. The teacher responsible for the study module analyses the feedback. In coordination meetings 2–3 times a year, the course coordinator, responsible teachers of the modules, planning officers, coordinators and student representatives are invited. The course coordinator is responsible for the coherence of the modules within the study year. The Educational PDCA Cycle (Plan-Do-Check-Act) is implemented to promote development, including self-evaluation, repeated evaluation meetings and student feedback. The Board of the Degree Programme in Medicine reviews the curriculum annually, as explained in 6.2.2.

The Finnish Bachelor Graduate Survey is a national online feedback survey collected after the fourth year of the studies. It maps the graduates' satisfaction with their university and study experiences. The results are utilized in developing and steering university education and its financing nationally. It was somewhat unclear if and how the results were used to improve teaching at the University of Helsinki.

Cooperation between universities

The level of national co-operation between Medical Schools is increasing which teachers considered positive. Areas for improving co-operation include consolidation of core content; making use of digitalisation and shared material banks; developing practices in advanced studies; and joint courses for elective studies. Field-specific teacher networking plays a crucial role in this co-operation. All medical faculties are involved in the digital study environments project as well as in developing practices in advanced studies (Syväriportti).

The faculty takes part in the annual national event of developing medical studies where representatives of all medical faculties meet. In addition, faculty and students participate in international medical education congresses, such as Association for Medical Education in Europe (AMEE). These practices are indeed encouraged. The exchange of experience and knowledge

through international cooperation contributes to improving the quality of education. When the local curriculum and its content are put into wider context, the staff and students have a possibility to compare their education with others, initiate co-operation and find new innovative solutions for their own curriculum. It is unclear how the medical faculty views or supports student exchange.

Strengths and development priorities in continuous development and renewal of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Active participation in international meetings of medical education. • Regular evaluation of study modules. • Co-operation with primary health care units. • Continuing curriculum development. 	<ul style="list-style-type: none"> • More focus on interprofessional education. • Utilization of study module feedback should be increased.

Good practices and suggestions for development

During the site-visit the faculty management, academic staff, students and stakeholders identified many strengths and key areas for development, as well as good practices. The evaluation team has selected the most relevant examples of good practices for other universities to follow, and interpreted observations on needs to change through theories or learning into ideas for development.

Examples of Good Practices at the University of Helsinki

- The structured curriculum framework with eight domains.
- Problem-based and case-based learning introduced early.
- Mobile learning and electronic-books to support teaching methods such as a flipped classroom.
- Several electives have been recently introduced.
- Close collaboration between staff and students to implement the educational reforms.
- Good team spirit and enthusiastic staff.
- A high number of teachers with a teaching qualification.
- Scholarship and active participation in international conferences on medical education.

Suggestions for development

- More collaboration nationally and internationally to share best practices.
- Create curriculum mapping to ensure that the learning outcomes and teaching and learning activities are in the curriculum and in line with assessments.

- Create an assessment strategy including a clear structure for formative assessments and feedback, especially during the clinical phase.
- Provide guidelines for the supervisors including training, assessment and feedback during the internships.
- Reinstall a pedagogical unit at the Meilahti campus and provide medical education courses for all teachers and supervisors.
- Create a research unit in medical education.
- Create tenure tracks in education and make time invested in teaching transparent.
- Develop opportunities for interprofessional education and provide more simulation training.
- Ensure emphasis on professional attitudes in clinical teaching as well as a sufficient amount of supportive individual feedback.
- Support professional development and coping with uncertainty (mentally and legally).
- More possibilities for international exchange, including placements for incoming students.

5.3 University of Oulu

5.3.1 Introduction

There were 872 medical students and 305 staff at the University of Oulu (234 teaching and research staff and 71 other staff). The Faculty of Medicine is a part of the Life Sciences Campus in Kontinkangas, situated next to the University Hospital of Oulu. At the Faculty of Medicine, students can accomplish Master's level education also in nursing science, health management, health science teacher education, or medical bioengineering.

The objective of the medical education at the University of Oulu is that a graduating student has the knowledge, skills and psychosocial capabilities to successfully function in healthcare roles as an expert, developer, team member and leader. Other objectives include ensuring that graduates have adequate capabilities for engaging in research and further studies as well as the ability and motivation for lifelong learning.

5.3.2 Planning of education

Mission of medical school

The mission of the Medical School is to produce doctors able to work in Europe, capable of reacting to changing environments, and who also understand the context for conditions in the North of Finland with its dispersed, isolated, rural communities. Most doctors in the region are trained at University of Oulu.

Educational outcomes

There have been several attempts at curricular reviews and reforms. Preparatory work for developing the 2011 curriculum was carried out by the LOKUS education development working group through extensive discussions with student and teachers in 2006/7. External stakeholders such as employers or service users were not involved much in the process though there was collaboration with units providing health care education in Oulu and with the Faculty of Medicine of University of Turku in developing the outcome competencies. Primary health care and interprofessional learning were emphasized in the 2011 curriculum reform.

In 2011 a core content analysis was conducted in several subjects and the objectives of medical education were defined (see above). Following further discussions, a new curriculum planned since 2015 was introduced in 2017 and had just started when the evaluation team visited in November 2017. The pedagogical basis of the curriculum consists of development of skills for lifelong learning, while achievement of the objectives provides students with the ability to work as a doctor.

A clear overarching framework of six areas in the curriculum holds together the various learning outcomes. A particularly innovative area of the curriculum is “A doctor as a human being”, supporting self-awareness and underpinning many aspects of continuing professional development and patient safety.

There was not much evidence of actual change other than updating the outcomes when the 2017 curriculum was introduced, nor any rationale for these changes. There is no mapping of the curriculum against the intended programme and module learning outcomes.

Despite the innovative curriculum framework, the module learning outcomes do not seem to relate to the areas of curriculum which is a major problem. Students reported that though they were usually aware of module learning outcomes, these were not linked to the outcomes of the programme and students were broadly unaware of the programme outcomes. According to students, renewing the modules often resulted in simply adding new material with no decrease anywhere, so the curriculum became overloaded.

In students' eyes, the nominal European Credit Transfer and Accumulation System (ECTS) credits do not correspond to delivered course content. Students wish to learn in an integrated manner particularly for subjects like anatomy or physiology and ask for emphasis on important content by ensuring a clinical context. They wanted better teaching of ethics and legal issues, more use of patient cases and more opportunities for formative feedback perhaps through midterm tests.

In addition to individual modules there are also three themes: Professionalism in Medical Education (PME), Environment, Lifestyle and Health Studies (ELH) and Evidence Based Medicine (EBM). While the focus is on Interprofessional learning in the Professionalism in Medical Education (PME) theme, there did not appear to be a clear definition of interprofessional learning.

Pedagogic framework of the education and the curriculum preparation process

Regular meetings of the LOKUS development working group and organisation of training sessions have played a key role in the continuous development of the curriculum. Repeated discussion rounds with subject representatives were used to explore delivery of all subjects and the implementation of the curriculum. Academic year committees have given feedback on teaching developments.

Students participated in development of the curriculum in 2011 and 2017 and attended expert working groups on curriculum reform. Their views were heard through many different surveys as well as in the feedback given by teacher or subject and for academic year working groups. Students participate regularly as subject representatives in academic year working groups, degree programme committee and Education Committee meetings. The students were not clear on the influence their feedback had as the outcomes were not routinely fed back. The Medical School identified increasing patient contacts, increasing the number of optional studies and ensuring an adequate number of teaching personnel as developmental priorities.

There have been many innovations and changes in the curriculum with the introduction of interprofessional learning. Some attempts at integration, developing simulation and defining the overall learning outcomes have been taken, but there is not a clear strategy for the overall educational delivery that transmits from the programme outcomes to the individual modules. Despite curriculum reviews, developing programme aims and learning outcomes, there isn't an explicit description of the type of curriculum aimed at, for example, "a spiral curriculum that integrates and builds upon knowledge, skills and behaviors with increasing complexity and with early patient content to give students a learning context".

The curriculum development has been a continuous process with feedback from students and teachers obtained by a variety of methods:

- Individual teacher feedback,
- Feedback during small group teaching,
- Feedback days twice a year, and
- Module feedback and year feedback for all 6 years to the programme committee.

The curriculum developers have tried to integrate learning across the specialties and provide a clinical context. However, all departments have not engaged in the integrated model. Students report that in every subject there is a different way of doing things, it is complex and course structures very different.

The University funding model for teaching was felt to be unsupportive of educational changes or reduction of an overcrowded curriculum, as departments sustain financial loss if their teaching is reduced. It will require strong educational leadership to bring about the changes with sustained commitment from the academic community.

Discussions with several stakeholders are held regularly. However, many of the external stakeholders the evaluation team met were not clear about the curricular reforms or their role in influencing them. Stakeholders have met active students, eager to learn and participate in teaching, but were concerned that this atmosphere might not be maintained with higher intake and less resources.

Consideration of changes in the operating environment and future competence requirements in the planning of the education

There is no systematic view among the education planners on the new skills that might be needed to support health care professionals working after the planned SOTE reform. However, site-visit interviews indicated that there is a shared view on some competence requirements: interprofessional working skills, health economics, business administration, value-based thinking, health technology assessment, assistive technology and robots. Some mentioned University of Oulu as a hub for new technology and internationalization.

Some aspects of interprofessional learning have been built into the curriculum and a simulation session dealing with emergency patients was provided for the first time in autumn 2016 together with students of the Oulu University of Applied Sciences. A working group on educational technology has been set up in the faculty to plan for considering technology in teaching and the opportunities offered by digitalization in various projects. In the 2017 curriculum, elective studies were added, making it possible to respond flexibly with new educational content.

Strengths and the development priorities in planning of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Active co-operation between subjects, academic year working groups and the degree programme committee. • Core curriculum content analysis. • Working group on educational technology. • Professionalism in Medical Education (PME) curriculum theme. 	<ul style="list-style-type: none"> • Institutional leadership and support for a curriculum revision which may require a different funding model, transition funding, and resources to enable curriculum changes. • Constructive alignment – learning, teaching and assessment aligned in all elements of the curriculum. • Increasing patient contacts. • Increasing the number of optional studies. • Ensuring an adequate number of teaching personnel.

5.3.3 Implementation of education

Learning environments and teaching and supervision methods

The undergraduate medical education learning environment in Oulu includes both physical and virtual teaching facilities, variable learning sites, and the culture of the University with its social network and student support. The Faculty feels the learning environment is student-friendly and

teachers are encouraged to provide student-centred instruction. However, large course sizes pose challenges to the adequacy and functionality of educational facilities and make small group teaching difficult. Some lecture halls are too small and many facilities need updating. Not all hospital wards and outpatient clinics have enough space (in some cases, none) reserved or suitable for teaching. The Optima study environment, a platform used by the University of Oulu, serves as a centralised information and learning material bank, significantly supporting the students' learning throughout their studies. Each academic year has its own workspace in the e-learning environment.

Student guidance is provided by course directors, teachers and administrative staff. Students who are struggling with progressing are supported by their group tutor and if needed a psychologist. According to students, education could be more student-centred, and sufficient study guidance is not always provided in practice. They felt guidance is mainly given at lectures in the beginning of the academic year, and suggested instructions should be clearly compiled in one place rather than scattered all over Optima. Lectures are by far the most common method of teaching, followed by group instruction and theme days. The large group sizes of groups make instruction difficult. The students valued meetings with tutor teachers but wanted them more frequently than just 1–4 times a year. The students feel a clear need for meeting doctors engaged in clinical work.

The teachers felt it was hard to ensure that the curriculum is delivered according to the plan and felt a need to re-evaluate this with the new curriculum. A major issue that needs addressing is that programme outcomes are not mapped against module outcomes nor against assessments.

Assessment of learning and learning outcomes

There is no overall assessment strategy for the programme, but one is being considered. The teachers felt that knowledge is assessed well, some skills are assessed in Objective Structural Clinical Examination (OSCE), but professional behaviors less so. Clinical skills are not systematically assessed. There does not seem to be a formal group who monitors and supports student progress and has responsibility for investigating and dealing with student fitness to practice.

Last academic year the Faculty took the first step and set up a working group for evaluation, which charted the evaluation methods used as well as developmental needs. The review identified written examinations at the end of courses as the commonest form of assessment. Many courses also use preliminary and mid-term examinations to give formative assessment, while in some courses a mid-term examination can affect the final grade. Group work skills evaluation, peer review and self-evaluation are used in only a few courses and primarily as part of the formative evaluation, which also includes the learning journal and logbook.

Clinical competence is evaluated by an integrated OSCE given at the end of the fifth year; Clinical Evaluation Exercises (miniCEX) which assess clinical skills, attitudes and behaviours, Case-based discussions (CBD) or Directly Observed Procedural Skills (DOPS) are not commonly used. The assessment of clinical work has recently been recognised as needing improvement, and at the degree programme level, there are plans to use the curriculum mapping process to help with this.

Feedback to aid learning is variable across the courses and the programme and it is clearly an issue with some of the students. Some feedback is given in OSCEs and by the named 5th and 6th year supervisors in health centers, and pediatrics, gynecology, and exercises with actors were also mentioned as good examples. In the pulmonary diseases course students had to write up a patient encounter and then got an email from the teacher with detailed feedback. Some courses do provide model answers to exams.

Teachers' competence and how to develop it

Educational staff development programmes are not compulsory, though there is a University pedagogical 25 ECTS certificate open to all academics. The faculty organises teacher development days three times a year for teaching staff to share knowledge, increase co-operation and enhance teaching skills. Topics have included presentation of new teaching or evaluation methods, educational technology and course reforms. Local and national educational seminars and training days are held in different units and specialist fields. The faculty also provides evaluation guides. Teaching staff are encouraged to participate in national and international training. However, students reported teaching was delivered in a traditional manner mainly by lectures.

The teachers felt they were not valued or rewarded for innovations in teaching. They felt the balance between teaching and research is a major problem and that no one cares if you wish to develop teaching, though most agreed their teaching role was considered in annual development discussions.

There is no education focused promotion pathway or tenure track for teachers. There is no educational staff development strategy, nor any excellence of teaching awards though they a best teacher award is organised and selected by students.

Students reported that there is a good atmosphere, and teachers are easy to approach. *"Teachers care about you"*. Many clinical courses teachers were aware of their mission; special mention was given to GPs in primary care where there was good quality group work especially in the preclinical phase.

Well-being of the university community

Little seems to have been available to ensure student well-being. There were not enough joint guidance or info sessions, the academic work is tough and coping with studies was not discussed with students. Perhaps due to such feelings, the Demola project was launched in spring 2017 by the Faculty to support medical student in coping with stress and time management. An intervention model was developed to be used in the new degree programme in medicine beginning in autumn 2017. These measures will strengthen the support currently provided by the teachers, course leaders, administrative staff and a psychologist.

There are also plans in response to the increased workload and student numbers for teachers to receive university and degree programme-level training, providing tools for teaching and guidance with teaching development, and theme days to share good practices. Teaching staff can utilise all well-being services intended for University of Oulu personnel (e.g. occupational health care, cultural services, exercise services, a model for early support) and these are monitored in a biannual well-being survey.

Strengths and development priorities in implementation of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Unified campus area. • Introducing a new versatile support services to ensure students' well-being. 	<ul style="list-style-type: none"> • Promoting teachers' well-being through supporting and valuing their work. • Enhancing the pedagogical competence of teachers. • Promoting the use of active learning methods. • Improvement of evaluation methods to include skills and behaviours. • Developing digitalisation and e-learning activities.

5.3.4 Competence and working-life skills produced by the education

Internship

The students report that internship success largely depends on the motivation and active participation of the doctor providing supervision. Supervision practices that work well included setting objectives for the internship, preparing a programme for the placement and giving feedback. The University of Oulu has also introduced an internship book which the student can use to follow her/his learning process during the junior house officer placement with a final compulsory section where the supervisor signs off the period. Students felt the internship record could be improved and used more actively, and regular supervisor meetings would be helpful.

Career guidance and career paths

In addition to access to the University's general career guidance services, students can receive guidance on postgraduate educational opportunities personally and at public information sessions run irregularly during their studies. Students considered the amount of career guidance insufficient and hoped for more information about different employment prospects, the contents of the practical work in different specialities, and pathways for specialty training.

The basis provided by the education for continuous professional development

Throughout the curriculum, doctors' need for continuous training and development is emphasised. Students develop information searching skills and one of the study objectives is ability and motivation for lifelong learning after graduation. The ability to self-evaluate plays a role throughout studies, both in clinical teaching and through the Professionalism in Medical Education (PME) and Evidence Based Medicine (EBM) themes.

Students generally wished for more feedback on their work, especially assessment on their clinical practice – and consequently more patient contact, more communication skills feedback, more use of actors and simulations, and more practical assessments such as OSCE.

Cooperation with working life and its quality management in the future operating environment

The Faculty of Medicine works in close co-operation with public sector services, particularly the Oulu University Hospital but including both municipalities and hospital districts, so the Faculty is an essential part of the Oulu Health regional ecosystem. This produces a range of placements with a diverse patient mix for the student to experience.

Over the next ten years the changes brought about by an extensive operational renewal programme (Future Hospital) will give opportunities for a more student-centered approach to learning, with active learning in classic as well as digital learning environments. There is need to increase formative and summative evaluation of learning outcomes benchmarked to the highest international standards. Patient centred clinical work will be more integrated with teaching of basic sciences. The students broadly supported more emphasis on interactive skills, interprofessional learning and team work.

Strengths and development priorities in competence and working life skills

Strengths	Development priorities
<ul style="list-style-type: none">• Organizing teaching and practical training in Northern Finland health care units.• Diverse patient mix by using local healthcare providers.• Strong clinical knowhow of teachers and close connection to working life.	<ul style="list-style-type: none">• Promoting teacher autonomy in combining clinical work and teaching.• Development of learning environments through the renewal programme.• Functional co-operation with study administration.• Combining teachers' clinical work and teaching.• Improving practical training procedures and feedback from these.

5.3.5 Continuous development and renewal of education

Forecasting competence and renewal need

The Northern Ostrobothnia social services and health care project teaching and education development group submitted its final report in the spring of 2017 and the need for change in research and teaching was also addressed in a joint Northern Ostrobothnia Hospital District and Faculty of Medicine working group. An effort was made to take changes in primary health care and future needs into consideration in the new 2017 curriculum. Primary health care representatives were involved in preparation of the curriculum from the very beginning, commenting on the curriculum numerous times during the preparatory process.

The new evaluation working group has issued its recommendation for developing evaluation. They support a move toward incremental continuous learning (e.g. continuous evaluation and the completion of courses in smaller parts). Concerning evaluation at the degree programme level, they recommend use of the curriculum mapping method. Additional recommendation is for strengthening pedagogical education through e.g. educational development sessions organised by the faculty within research units or jointly (spreading good practices).

The Faculty has identified that greater emphasis needs to be placed on education around continuity of care; cost-effectiveness and health benefit; critical appraisal of scientific information; the ethical questions in medical care and ethical principles of the profession; using health care and information technologies and understanding their possibilities and limitations; information searching skills and the ability to engage in continuous learning (e.g. the inclusion of genomics and personalised medicine in mainstream medicine); interaction and co-operation skills; and interprofessional team working. It remained unclear how renewal of study content and methods regarding the upcoming SOTE reform would be tackled.

Use of evaluation and feedback information

Students felt there was too little evaluation, particularly regarding clinical and practical skills. More feedback from teachers on student performance was desired. Students felt that direct feedback, mid-term examinations, final examinations and clinical skills tests were very important and useful during practical training.

Cooperation between universities

The level of national co-operation between Medical Schools is increasing. Areas for improving co-operation include consolidation of core content; making use of digitalisation and shared material banks; developing practices in advanced studies; and joint courses for elective studies. Field-specific teacher networking plays a crucial role in this co-operation.

Strengths and development priorities in continuous development and renewal of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Teacher networking. • LOKUS activities with regular instructional training. • Primary health care representative's active participation to planning of education in the new curriculum. • Continuing curriculum development. 	<ul style="list-style-type: none"> • Strengthening teachers' pedagogical education. • A stronger role for stakeholders in curriculum developing work.

Good practices and suggestions for development

During the site-visit the faculty management, academic staff, students and stakeholders identified many strengths and key areas for development, as well as good practices. The evaluation team has selected the most relevant examples of good practices for other universities to follow, and interpreted observations on needs to change through theories or learning into ideas for development.

Examples of Good Practices at the University of Oulu

- The structured framework of programme learning outcomes.
- The explicit recognition of “A doctor as a human being” in learning outcomes.
- The use of themes to enhance vertical alignment of the curriculum, such as Evidence Based Medicine (EBM), Environment, Lifestyle and Health Studies and Professionalism in Medical Education.
- Promotion of self-reflection in curricular outcomes and Professionalism in Medical Education themes.
- Involvement of more primary care teachers and their active participation in curriculum planning.
- The use of the OSCE in year 5 to assess clinical competence.
- Module in year 6 on the critically ill patient and patient safety.
- Collaboration with other Medical Schools on curriculum development.

Suggestions for development

- Continue collaboration between Medical Faculties to discuss joint development of learning outcomes, learning resources and assessment.
- Define the core curriculum with mapped learning outcomes as a basis for planning the modules.

- Plan a transparent assessment strategy, with formative feedback in clinical settings, to help students recognize a good enough / excellent performance.
- Senior leadership is needed to support the proposed changes in curriculum, as well as a strong programme leadership team to implement and monitor curricular developments and assessments.
- Recognition for staff in educational leadership roles (e.g. coordinators for clinical courses) for the high quality and amount of their work.
- Create education-focused career pathways for interested teachers.
- Develop a systematic approach to courses in medical education and supervision skills for teachers, including facilitation in the use of e-learning methods.
- Provide more hands-on teaching with real patients, including supervision and feedback on performance.
- The teaching and assessment of clinical and practical skills needs development.
- Ensure a sufficient number of clinical teachers to facilitate individualized teaching and feedback.
- Increase collaboration between scientists, clinicians and nursing staff across faculty and university.

5.4 University of Tampere

5.4.1 Introduction

The number of medical students at the University of Tampere is 768 and number of staff 462 (311 teaching and research staff and 151 other staff). The University consists of two campuses, the City centre campus and the Kauppi campus where medical and health sciences are primarily located. The Faculty of Medicine and Life Sciences offers the Licentiate of Medicine degree, and the degrees of Bachelor of Science and Master of Science. The Faculty also offers a Degree Programme in Biotechnology.

The objective of the Faculty of Medicine and Life Sciences of the University of Tampere is to train physicians who will encounter patients with a humane approach, possess problem-solving skills, are able to obtain, assess and adapt information in a critical manner, and have good clinical and teamwork skills.

5.4.2 Planning of education

Mission of medical school

Tampere Medical School wants to produce the best physicians in Finland to benefit their stakeholders (though it is not clear how the best physician might be measured). The graduates should be active players in changing the society, with ability for lifelong learning. They should be ready for a variety of careers besides a traditional doctor or researcher, such as an administrator or a medical advisor working with industries other than medicine. A clear mission statement was not mentioned.

Educational outcomes

The educational objectives emphasize encountering patients with a humane approach, problem solving abilities, undertaking research and using new information, excellent clinical skills and team working, and preparing for lifelong learning. The CanMEDS and General Medical Council's Tomorrow's Doctors frameworks were used for developing a framework for the curriculum. Learning outcomes are described as knowledge, skills and attitudes. Currently curricular outcomes are not strictly mapped to specific courses or modules. The core curriculum content analysis was revised in 2016 by all disciplines and specialties working together with the Director of Medical Education. The core curriculum is divided in three categories: Core competencies, important issues and issues worth mentioning.

Public health is taught by epidemiologists and health promotion is covered in the prevention course, with exercises in interviewing to change behavior. Clinical IT skills are mainly learned when students participate in hospital or health centre work. Teaching ethics is integrated in tutorials, cases and seminars. Health Technology Assessment is to some extent covered in electives for those interested.

Pedagogic framework of the education and the curriculum preparation process

The curriculum model at Medical School in Tampere is an integrated spiral systems-based curriculum with elements of problem-based learning (PBL). The vertically integrated units (1st to 4th year) are formed around obligatory tutorial sessions. Clinical content is present from the start of the curriculum and gets more complex over time. Each unit combines several areas of basic sciences, clinical science and health system sciences. The vertically integrated spiral curriculum offers increasingly complex PBL scenarios over time. Most students like PBL although it depends on group dynamics, and though some topics are split over to many sessions.

An underpinning theory for the programme is not clearly stated. Active learning, collaborative learning and self-directed learning are mentioned in the self-evaluation, and then one is likely to think of e.g., a constructivist view of learning, but the programme could be clearer about how this is expressed in the educational model and considered in teaching.

The curriculum is reviewed regularly by the faculty. All the groups considering curriculum design and content have student representatives. Although working life does not have externally appointed representatives in the committees, many of the academics are practicing physicians. Synergies between medical and biotechnology studies are actively being developed and interprofessional learning is increasingly used in co-operation with the Tampere University of Applied Sciences. The units cooperate and integrate student learning both vertically and horizontally. The unit planning committees and others can contact the Director of Medical Education and the Dean if they have proposals for changes or developments. These are presented to the Degree Planning Committee, which plans curriculum changes for the Faculty Council for approval, based on the university strategy and developments in practice. Suggestions for revision and fine-tuning can also be proposed by the research track steering group or period planning groups where the contents of whole modules are discussed. Student feedback from each period is mandatory, collected and reviewed by the staff. The students report having very good relations with administration, especially Director of Education and Study Affairs.

In addition to PBL, team-based learning methods are used in the clinical skills sessions, especially in multiprofessional settings. Students are encouraged to collaborative learning in tutor groups and integrated seminars with several specialities. Early patient contact starts from first weeks of studies to ensure clinical context. Active learning is encouraged through e-learning, and virtual learning supports teaching and flipped classroom techniques. The faculty has been involved in international development of learning software that enables production of virtual patient cases used as self-study material. The impact of changes and new methods of teaching is monitored through feedback, evaluation and assessment data.

Integration of learning is pursued in every setting and the Medical School aims at a better representation of primary health care. Leadership skills are learned in simulations and in small tutor groups where students function in different roles. Students write and present case histories of patients and receive feedback on their notes. Challenging situations are experienced in simulation using unfolding scenarios.

Consideration of changes in the operating environment and future competence requirements in the planning of the education

During the clinical phase, digital communication with patients, such as remote consulting is discussed. A test virtual hospital for a subgroup of patients is developed, and community-oriented center for health promotion and treatment is in planning, but practical digital applications seem not to be in place yet. Patient safety issues are covered for radiation safety and hygiene only. Technology assessment or health economics are touched upon only occasionally.

Strengths and development priorities in planning of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Well-designed modern curriculum encouraging active learning. • Clear objectives for learning based on international frameworks. • Collaboration between specialties and disciplines in PBL. • Development of active team-based interprofessional learning. • Use of flipped classroom, virtual and e-learning to encourage active student learning. • Development of software that enables production of virtual patient cases. • Excellent Centre for Skills Training and Simulation. 	<ul style="list-style-type: none"> • Map curricular outcomes to outcomes of specific courses or modules. • Develop feedback sessions after exams. • Integrate aspects of patient safety, health economics and HTA into cases. • Develop a more systematic approach to teaching and evaluation of IT skills. • Further increase the representation of primary health care in the curriculum.

5.4.3 Implementation of education

Learning environments and teaching and supervision methods

The University has centralised healthcare teaching and research into the Arvo building. In addition to medicine, life sciences and health sciences are taught and researched in the Kauppi campus. Tampere University of Applied Sciences and Department of Health Sciences of the Faculty of Social Sciences are part of the campus. The administration staff is part of the learning environment and the students receive information from study coordinators, the Head of Study Affairs and the Director of Medical Education.

The Tampere Centre for Skills Training and Simulation has a well-equipped simulation and skills facility. The university library gives students access to a large number of digital journals and textbooks. Moodle is used as the virtual learning platform, with lecture and exam tools and a programme for creating virtual patients. Notifications on any changes are sent through students' online desktop. An online form is used for collecting feedback. The Finnish Medical Society Duodecim's learning portal Oppiportti and health portal Terveystietti are available to students.

An integrated systems-based approach has been used in medical studies in Tampere since the early 1990s. The principal learning method during the first 3.5 years is problem-based learning. PBL problems have been formulated for the key topics of each period, and students get together to solve these problems in small groups (8 to 10 students) twice a week. The small group composition changes every six months throughout the studies. Tasks given to students can be for instance scenarios in PBL, cases in Case-Based learning, or assignments for Team-Based learning (TBL). The PBL implemented in Tampere is blended so that students are offered also lectures, group works and laboratory sessions. Clinical skills and communication skills studies are integrated within the units, starting from the first unit so that they offer a possibility to apply theoretical knowledge acquired in PBL sessions. The process of combining of PBL and TBL is underway to increase the pedagogical strength of clinical skills sessions by combining the underlying theoretical knowledge

to rehearsing of clinical skills. The exercises form a continuum: simpler skills are rehearsed first, and more demanding skills during the clinical phase. Group work and clinical skills sessions are used to cover patient examination and treatment procedures and guidelines, but also to make students think about the theories and research these procedures and guidelines are based on.

Students can monitor their own progress with the Progress test, which has a set of single best answer questions. Unit exams are graded pass or fail so these do not provide detailed feedback on performance. Students feel this makes the environment less competitive.

The degree has been divided into preclinical (3.5 years) and clinical stage (2.5 years). The clinical stage begins later than in other medical faculties in Finland. The students find that comparisons solely based on the starting time of the clinical stage are slightly problematic. However, the students in Tampere already study disease mechanisms, diseases, diagnostics and treatment before the clinical stage. During the clinical stage students mainly stay at Tampere University Hospital, with some teaching in central hospitals and health centres. The degree includes four months (24 ECTS) of compulsory internships outside the semesters. Any work as a junior house officer and locum physician completed after year 3 can be included in the internships.

In the clinical stage, the students study one medical speciality at a time in periods. This includes teaching clinics, being on call, procedures, ward rounds, shadowing a physician, practising procedures, assisting in operations, meetings with physicians, group assignments, simulation teaching, virtual patient cases and online material. No PBL sessions are organised in the clinical stage. Some of the teaching takes place at decentralisation hospitals. The students are content with decentralised teaching where the methods listed above are also used.

Assessment of learning and learning outcomes

In the undergraduate medical programme the cumulative progress made in knowledge, clinical skills, interactive skills and working as a physician is comprehensively assessed. The assessment includes both summative and formative elements. Knowledge is assessed at the end of each unit in a summative written exam that includes structured essays as well as short items.

During the clinical stage, knowledge is assessed at the end of each clinical term in a written summative exam that covers all clinical disciplines addressed during the term. The assignments are based on authentic patient cases ('long case'). One case can contain learning items of several clinical specialties. After three weeks, a 're-sit exam' is arranged for those who failed the exam. All exams are graded pass or fail, the acceptance limit being 50 % of the theoretical maximum score. The aim is to promote internal motivation and a collaborative learning atmosphere.

Progress test, the key feature of the PBL curriculum is used since 1995 for formative assessment of students' cumulative knowledge. The Single Best Answer (SBA) format has been used in this testing since 2010. The test is arranged three times a year for all medical students. Taking the test is mandatory; 80 % of the tests must have been completed before graduation. The test consists of 175 SBA items and the performance gives students feedback against the cohort.

In the preclinical phase student's clinical skills are assessed by Objective Structured Clinical Examination (OSCE) in two test rounds during the 3rd and 4th year. Clinical disciplines conduct their own assessment of the student's performance at the end of their respective clinical units. In final stages of their studies, students are assessed by the work-based assessment (WBA). Students' interactive skills are assessed in patient exams in clinics based on Calgary-Cambridge model adapted to local context. Students videotape at least one of their patient appointments at a community health centre and assess their performance in terms of interaction and clinical content using a structured form. An experienced general practitioner who is familiar with the assessment of interaction and clinical content will then watch the video with the student and provide feedback using a more extensive structured form. Overall, there seems to be a central assessment strategy until the 5th year; thereafter the disciplines conduct their own assessments without coordination. It would be an advantage for the programme to take a lead also in the clinical assessments and create a blueprint to ensure the central learning outcomes are assessed.

Teachers' competence and how to develop it

The faculty has a staff development strategy for Medical teachers which recognises medical education as an area of academic interest. The basic pedagogical competence of teaching staff is ensured as all staff must complete an initiation course on the theoretical background, structure and practical implementation of undergraduate medical education, emphasizing problem-based learning. In addition to lessons and discussions on various topics, the training days consist of practical training in small groups. All PBL tutors have an initial two-day training and regular meetings. Every semester, the teaching staff is invited to training sessions under various themes, e.g., methods for assessing students' knowledge or skills.

The faculty arranges training on teaching and learning, organised and coordinated by the Director of Medical Education. This course of 25 credits for 10–15 people at a time is intended for teachers with some experience who aim to continue teaching. The scope is significantly wider than the Finnish Medical Association's requirements for the specialist qualifications of medical teachers. The themes discussed include learning theories, methods and platforms; skills assessment; supervision and feedback; planning and evaluating teaching; and conducting research on learning. During the course, participants receive feedback on their own teaching and review each other's work. The course work includes a concrete development project for teaching and a report on it. During the course a community of teachers that crosses the boundaries of specialty fields is formed; teachers will share their experiences with teaching practices and provide peer support.

Well-being of the university community

A well-functioning student union supports students' well-being. Second year students' function as tutors to first-year students, particularly at the beginning of the studies. The student tutors receive training for this task. They can also contact a study coordinator or the Director of Medical Education if they are concerned for another student's well-being.

The degree structure balances out the units' workloads between semesters. The units have clear and realistic learning objectives. The grading system pass or fail for assessments promotes student well-being by supporting a non-competitive atmosphere of collaborative learning because students are not ranked based on assessments results. During the Introductory unit, students discuss how they should function in a group. Students' collegiality is considered when assessing their participation in the PBL sessions, and feedback and instruction is provided. Different learning methods and strategies are discussed. The study psychologist gives a lecture on study-related stress and coping.

The unit 'Coping' (Jaksaminen) deals with problems in work management and coping, also from a viewpoint of a young doctor. The clinical phase seminar 'Doctor's work' prepares students for their first summer as a doctor's locum. The challenges of the work are deliberately brought to discussion. Particularly cases with difficulties, mistakes or errors in diagnostics or treatment are included, and cases where the outcome was not what was hoped for. In addition to biomedical factors, related ethical issues are considered. Instead of looking for guilty parties, the root reasons for problems are sought to prevent a similar situation from happening again.

A seminar at the end of the studies uses students' own real-life patient cases are to discuss the challenges in being a doctor and the mistakes that can occur. Challenging situations when communicating with patients or the next of kin are discussed in small groups towards the end of the studies. The aim is to support coping and resilience. The unavoidable feelings of imperfection and the uncertainty inherently connected with practicing medicine are discussed repeatedly as a part of supporting professional growth, as well as ways of coping.

Feedback on students' progress, skills and participation is important for their well-being. During the tutoring sessions, students get feedback on their actions. Unit exams, the progress test and structured learning assessments (patient exams during multiple clinical units) provide this feedback.

There was little discussion on teachers' well-being, apart from mentioning occupational health care and the need for peer support in planning teaching and learning new methodology. Ensuring clear career paths and possibly creating a tenure track for teachers were held up as a necessary development.

Strengths and development priorities in implementation of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Well-designed modern curriculum. • Unified well equipped campus area with excellent clinical skills facility. • The comprehensive co-operation with health care centres and hospitals around to support teaching. • Incremental high quality educational staff development programme including systematic training for PBL tutors. • Well designed and supportive learning environment that ensures student welfare and combines peer mentoring and teacher support. • Using a variety of assessment methods with pass/fail grade only to reduce student stress. • Use of the progress test to give formative feedback. • Good use of e-learning and digital resources. 	<ul style="list-style-type: none"> • Promoting teachers through supporting and valuing their work. • Private sector would like to be part of the education, could provide to the training, or send doctors to participate in teaching. • Create an assessment blueprint to ensure the learning outcomes are assessed, especially during the clinical courses.

5.4.4 Competence and working-life skills produced by the education

Internship

The internship yields 24 credits, which equals four months of work. An agreement has been made with the hospital district that a personal supervisor is appointed for students to guide and monitor their work. A weekly programme for the intern has been made for over thirty different special fields at the university hospital, containing detailed learning objectives in a specific field. The feedback system applies to these internship situations as well. The application procedure for junior house officer positions should be revised and modernised and should be expanded to include application to health centers.

Career guidance and career paths

Information on specialisation is provided at points in time selected according to students' wishes. In year 1, the students have a specialisation panel where various specialists talk about their own starting points and career paths. Shortly before graduation, the students have an information session on specialisation. Unofficial career counselling is given during the tutoring sessions, internship and clinical phase. At the end of the studies, students receive information on how to apply for specialist training, what the current specialist situation is and how this situation is estimated to change in different fields. However, the perspective of primary health care seems to be forgotten. The student association together with the teaching staff as well as the Finnish Medical Association and Duodecim organise more informal specialisation evenings.

The basis provided by the education for continuous professional development

Throughout the curriculum, it is emphasised that doctors require continuous training and development. Students train information literacy, i.e. to search and evaluate new information. PBL supports continuous maintenance of professional skills, because its key elements are the ability to formulate relevant questions, to identify the need to increase one's own knowledge, and to think how and where the necessary information can be attained. Students also learn to appraise new information, combine it with their prior knowledge, and update outdated information. Students are systematically trained to take responsibility for their own learning and skills, as medical students and doctors. The formative elements of competence evaluation, like progress test, support this process. One of the learning objectives is that the students will possess the ability and motivation for lifelong learning when they graduate.

Cooperation with working life and its quality management in the future operating environment

There is cooperation with other faculties within the University particularly with Health Sciences and Social Sciences as well with Tampere University Hospital. Students conduct most of their clinical placements in the university hospital. Nearly all clinical supervisors have a secondary clinical post at the university hospital. The Dean, Vice Dean and the Director of Medical Education are in contact with the management of the hospital and the hospital district.

An important partner is the Seinäjoki Central Hospital where students spend four weeks during the clinical phase of surgery and internal medicine. General practice representatives meet regularly with leading doctors from health centres in Southern Ostrobothnia and the Tampere Region.

The Faculty identified that in the future greater emphasis will need to be placed on education around continuity of care; cost-effectiveness and health benefit; ethical principles; making use of health care and information technologies and understanding their possibilities and limitations; critical appraisal of scientific information; information searching skills and the ability to engage in continuous learning (e.g. the inclusion of genomics and personalised medicine in mainstream medicine); interaction and co-operation skills; and interprofessional working.

Strengths and development priorities in competence and working life skills

Strengths	Development priorities
<ul style="list-style-type: none"> • Internship guidance and support is good with learning outcomes and named supervisor. • The Faculty identified that in the future greater emphasis will need to be placed on education around a range of developing areas such as interprofessional working, health economics, IT and personalised medicine. • Teaching and assessment of student s' communication and teamwork skills. • Teaching about the stresses and rewards in being a doctor are included in the curriculum. 	<ul style="list-style-type: none"> • The application procedure for junior house officer positions should be modernised to become paper free and include application to health centers. • Develop a more systematic approach to career counseling that includes primary care. • The primary health care perspective could be more emphasized throughout teaching. • Interprofessional working experiences.

5.4.5 Continuous development and renewal of education

Forecasting competence and renewal needs

Staff and management identified that the social services and health care system reform (SOTE) will increase interprofessional work. Focus will be on primary health care, and the line between specialised health care and primary health care will be less rigid and visible than now. Competition will increase, with rapid changes in the operating environment as the line between private and public service gets blurred. New technological monitoring tools will become available also for

outpatients. Medical information will develop faster than ever, gene technology and biological medicines will find more practical applications. Digital support systems for decision-making improve. The ability to manage whole systems and cooperate with different fields and groups of health care professionals will become more important. Structures or processes to identify and integrate needs brought by changes were not specifically mentioned outside continuous renewal of curriculum content.

The Faculty of Medicine and medical students of the University of Tampere understand the complexity of medical education, have developed a very good curriculum and are aware of some areas that need further development. Students are supported in operating in an ever-changing environment. It is impossible to predict all changes that will take place during the careers of current students or to prepare students for them. Most important is to provide students with general capacities for reflective self-evaluation, information retrieval, assessment and application, clinical decision-making and communication with the patients, their families and different professional groups.

Use of evaluation and feedback information

Anonymous electronic feedback, giving every student an opportunity to influence teaching, is collected after each study module and is forwarded to the Vice Dean, the Director of Medical Education, unit lead and the hospital department heads. The University hospital uses student feedback as a performance indicator. Feedback is also collected by teaching staff following assessments and on the PBL cases. The Degree Planning Committee methodically goes through and discusses the feedback of each unit and conveys their viewpoints to unit planning committees if needed. The unit planning committee evaluates the development needs based on feedback from students and teachers and constantly decides on changes to be made to the unit and how they can be implemented.

Several examples of changes made to units where given: University Hospital provided separate computer facilities for students; neurology education was expanded; the clinical phase of psychiatry was placed one year earlier in the curriculum, based on student feedback. Simulation teaching was also expanded. Student feedback was clearly in favour of the progress test changing from true/false items to one best answer items and had an impact on the scoring.

Students are strongly involved in the development of the education. At the university level, Faculty Council, the Degree Planning Committee and the Medical Teaching Development Committee have a strong and active student representation. The student representatives meet with the Director of Medical Education and the Vice Dean once a year or more often if needed. The Director of Medical Education works in close cooperation with study affairs at the Medical Students Union; they meet several times a semester.

Cooperation between universities

The level of national co-operation between Medical Schools was reported as increasing. In some fields of medicine, e.g. paediatrics and neurology, there is already collaboration working toward common national learning outcomes for undergraduates. Areas for improving co-operation include consolidation of core content; making use of digitalisation and shared material banks; developing practices in advanced studies; and joint courses for elective studies. Field-specific teacher networking plays a crucial role in this co-operation. All Medical Faculties are involved in the digital study environments project as well as in developing practices for advanced studies (Svääriportti).

Medical research and information is highly international, although treatment practices vary from country to country. Annually, Tampere receives 6 to 8 medical exchange students and Tampere students go to one-month exchanges during summer. Several (5–15) faculty members participate in AMEE conferences annually. The development of new initiatives like TBL implementation is based on Best Evidence data in Medical Education. Tampere participates in the international cooperation to create virtual patient cases and develop the software with which they are created. Representatives from general practice have visited Denmark, Sweden, Estonia and the UK getting to know general practice teaching.

Strengths and development priorities in continuous development and renewal of education

Strengths	Development priorities
<ul style="list-style-type: none">• Student and teacher feedback is collected and monitored effectively resulting in changes to the curriculum.• Active and involved student participation in developing teaching methods and content.• Functional two-way communication between the faculty and health care bodies and staff, feedback and suggestions conveyed easily in both directions.• The University hospital uses student feedback as a performance indicator.	<ul style="list-style-type: none">• The Health care reform of Finland will have to be taken into consideration and implemented into the curriculum.• More standardization of the feedback system.• Involving stakeholders, especially primary health care professionals more actively into curriculum planning and evaluations.• Teaching in some disciplines, e.g. pharmacology, could be more integrated.

Good practices and suggestions for development

During the site-visit the faculty management, academic staff, students and stakeholders identified many strengths and key areas for development, as well as good practices. The evaluation team has selected the most relevant examples of good practices for other universities to follow, and interpreted observations on needs to change through theories or learning into ideas for development.

Examples of Good Practices at the University of Tampere

- The development of a core curriculum.
- Having a Director of Medical Education leadership role.
- The integrated vertical spiral systems-based curriculum with early patient contact.
- The design of the curriculum using PBL and teamwork to encourage active learning, interprofessional working and the skills of lifelong learning.
- Structured learning outcomes in knowledge, skills and attitudes and categorization of learning objectives to core, important, of interest.
- Effective feedback mechanisms to monitor the programme but also to give student a clear idea of their performance.
- E-learning and virtual learning supporting other learning opportunities and involvement in an international collaboration of virtual learning software.
- A variety of assessment styles in general practice – Written; Video consultation analysis; Learning journal.
- Learning to work in an interprofessional team from the beginning is useful.
- Excellent learning outcomes in the unit on human reproduction, which includes teaching around relationships.
- Good teaching in communication skills and on a holistic approach to patient care.
- Interprofessional learning in the geriatrics course, which also includes aspect of sexuality in old age.
- Highly valued elective in palliative care.

Suggestions for development

- Share good practices with other Medical Faculties and move toward developing an agreed national set of programme outcomes, learning resources and assessments.
- Strengthen local collaboration within the new university, including faculty of applied sciences and technical university, and between disciplines (medicine, nursing, technology, social sciences).
- Continue interprofessional education and consider involving students from economics and management.
- Continue developing e-learning and other innovations in education and assessment, including individual feedback to students.
- Ensure enough staff so that student groups are a size conducive to effective learning.
- Sufficient training and development in pedagogical skills for all teachers.
- Provide options for career paths and a tenure track for teachers.
- Consider including more about patient safety, technology assessment, leadership / management as well as sexual and gender diversity in the curriculum.

- Integrate primary care content / environments in every teaching unit.
- Support professional development in areas such as exploring your own feelings when a mistake is made.

5.5 University of Turku

5.5.1 Introduction

There were 867 medical students and 614 staff at the University of Turku (434 teaching and research staff and 180 other staff). The Faculty of Medicine hosts several Master's degree level programmes (Dentistry, Medicine, Nursing Science, Biomedicine and Biomedical Imaging). In teaching, the Faculty cooperates closely with the Turku University Hospital. The Faculty of Medicine works in tight collaboration with the Hospital District of Southwest Finland and BioCity Turku.

Based on the objectives, a graduating medical doctor from the University of Turku must have comprehensive and up-to date biological, biomedical, clinical, and social knowledge. In addition, s/he must have a sufficient amount of knowledge on the basics on medical practice, the function of the health care system and the roles and responsibilities of basic and specialised health care as well as on their development.

5.5.2 Planning of education

Mission of medical school

The overall philosophy of the programme is described as multidisciplinary based on context. The medical students are trained in evidence-based medicine to become good clinicians with a scientific attitude, ability for critical appraisal, and a sense of well-being. The University of Turku Medical School is especially profited by the wide variety of electives and interprofessional education.

Educational outcomes

Several curriculum reforms have been initiated by the Faculty. In the current curriculum the European Tuning Medicine project outcomes were used as a baseline and modified for local needs. In addition, results from a survey regarding general skills considered important by students and young doctors graduated a few years earlier were observed. Study unit leaders and teachers were asked to define the learning objectives of their courses, and present the content, as well as

learning and assessment methods. The Centre for Medical Education collected this information and revised it before the Board for Planning of the Medical Curriculum made final approval. This cycle has been replicated several times with continuous updating of the contents.

In general, the programme wants to emphasize the importance of diagnostics and treatment of common diseases. In 2015, the center for Medical Education prepared guidelines and recommended to grade the learning outcomes into three categories: 1) essential to know; 2) good to know; 3) nice to know. Nationwide co-operation in categorization of learning outcomes has been performed in some specialities. The strategy is to encourage the disciplines to define their learning goals based on competencies rather than factual content, and to write them in sufficient detail to make them graspable for the student. To put the learning objectives into a more functional structure, horizontal and vertical integration of biomedical and clinical knowledge has been applied and multidisciplinary study modules have been created whenever feasible. There are quite many short courses/modules throughout the program. The curriculum offers students a choice of electives in several years, so they can explore areas of interest.

Despite this innovative curriculum framework, the module learning outcomes do not seem to relate to the four overarching areas, which really is a problem. A curriculum mapping with learning outcomes of each module mapped against the overarching learning outcomes would benefit the program. Further, a continuous check on the content at the course level and the whole curriculum level seems to be missing.

Communication skills are trained by simulation, actors, by “shadowing” a doctor in the clinic but also integrated in courses. Students train clinical skills at clinical skills learning centre (Portti) and integrated in the courses. Public health and health promotion are taught in a separate course but also integrated in other courses. Based on the interviews, students wished teaching would be even more focused on the indicated learning outcomes. They stated that the clinical teaching has become better, but it can be improved further. Students wanted more teaching in clinical hands-on skills, handling uncertainty and mistakes, and the complexity of the clinical cases, as well as “difficult” discussions with patients and their next-of kin.

Even if the development of Health Systems Science (HSS) was not explicitly stated in the self-evaluation, curriculum areas such as interprofessional collaborative work in teams, delivering population-based medical care, and understanding limited health care resources and economic consequences were mentioned and seem to be part of the curriculum. HSS will need greater emphasis in the following new curriculum regarding the planned reforms in social and health care (SOTE), which were undecided by the time of the evaluation. The Working Life Advisory Board will certainly be helpful in this process.

Pedagogic framework of the education and the curriculum preparation process

Several methods for teaching and learning are described but a pedagogical model with an underpinning theory for the programme is missing. Active learning is mentioned in the self-evaluation, pointing to a constructivist view of learning, but the programme could be

clearer about how this is expressed in the educational model and considered in teaching. Presenting different teaching methods can concretise but is not enough to present a pedagogical model.

Learning outcomes have been compiled by applying the European Tuning Project (Medicine) learning outcomes. However, there is not a clear strategy for the overall educational delivery that transmits from the programme outcomes to the individual modules. Some courses/modules have clear description of the learning outcomes while others only define the content of the course, not learning outcomes. The overall programme outcomes were not mapped against module outcomes nor against assessments, which is a major issue that needs addressing. The management team has insight in the fact that alignment is not fully implemented.

The Board of Study Unit Leaders, chaired by the vice-dean of undergraduate education, works actively with horizontal and vertical integration. The Board also prepares initiatives to curriculum changes, based on feedback and discussions with teachers and students. There are student representatives in nearly all working groups and decision-making bodies.

The curriculum is under continuous development. Turku University applies a 2-year feedback cycle in curriculum development since 2014. The collection and analysis are organized by the Centre of Medical education that sends feedback to course leaders. Additional feedback from students and teachers is obtained by a variety of methods such as individual teacher feedback, during small group teaching, and during Board of Study Unit meetings. The center of Medical Education has also invited experienced physicians and younger colleagues from health care centers and hospitals to comment the learning objectives. This development is encouraging, and the evaluation team would like to advice the management team to incorporate general practitioners even more in future curriculum development. Stakeholders from the local healthcare system who felt that they were not involved in the planning of the curriculum in a systematic manner could also be included.

Consideration of changes in the operating environment and future competence requirements in the planning of the education

The curriculum is constantly renewed toward changes in work life. The programme has a working life advisory board consisting of primary health care doctors and a resident in medicine. This Board supports curriculum development using surveys of the Finnish Medical Association to review the preparedness of graduates for work.

Interprofessional working is one of the focus areas. Even if interprofessional education has been a part of the curriculum for years the university wants to develop it further. Students and teachers from the Turku University of Applied Sciences have participated in simulation education and structured clinical work has taken place during clinical placements in medicine. The programme has a multiprofessional group of teachers from the universities developing this area of education and new courses, such as a common course in health promotion, have been suggested.

Other issues that have been raised were communication skills, digital learning and legal issues (mainly targeting the forthcoming SOTE renewal). To enhance communication skills doctors are recruited and trained as simulated patients. The programme also plans to have health technology as a part of the next curriculum, and collaboration has started with Technology Engineering programme of the Turku University of Applied Sciences and the department of IT Sciences.

Strengths and the development priorities in planning of education

Strengths	Development priorities
<ul style="list-style-type: none"> • Active co-operation between Study Unit leaders, teachers, students, the degree programme committee and the Centre of Medical Education. • Health campus Turku, university wide collaboration with Social Sciences, IT Sciences and Turku School of Economics. • Working life advisory board. • Teachers of the decentralised clinical learning (also from primary health care) participate in the development of the curriculum. 	<ul style="list-style-type: none"> • Constructive alignment – learning, teaching and assessment align in all elements of the curriculum. • Curriculum mapping – a process to collect curriculum outcomes, content and assessment data from each module to find possible redundancies and gaps. • Use of e-learning and digitalisation.

5.5.3 Implementation of education

Learning environments and teaching and supervision methods

The undergraduate medical education learning environment in Turku includes the physical and virtual teaching facilities, the learning environment, and the culture of the University with its social network and other student support. The Faculty feels the learning environment is student-friendly and teachers are encouraged to provide student-centred instruction.

Health campus Turku is a significant multidisciplinary education cluster within medicine and health care. It also unites research and education in practice as the buildings are close to each other. The Faculty of Medicine in Turku delivers primary education in medicine, dentistry, nursing science, biomedicine and biomedical imaging.

The campus is directly adjacent Turku University Hospital. Facilities of the University Hospital are under reconstruction which will bring clinical teaching facilities even closer. The preclinical studies are carried out at the Medisiina campus area. A new building Medisiina D will be inaugurated in 2018, offering e.g. a new simulation center providing excellent facilities for interprofessional training. In addition, medical education is widely decentralised to health care centers of the hospital district.

The large sizes of the courses pose challenges to the adequacy and functionality of educational facilities and make small group teaching difficult; too small size of group rooms was specifically mentioned. The Moodle virtual study environment, a platform used by the University of Turku, serves as a centralised information and learning material bank, supporting the students' learning throughout their studies.

Teaching and learning activities include lectures, small group teaching, seminars, practical exercises, minor procedures clinic, and observing clinical work/shadowing a doctor. The lectures are by far the most commonly used method of teaching.

Student guidance is provided by course directors, teachers, mentors, tutors and administrative staff (teaching nurses). Students who are struggling with progressing may get support from a study advisor, their mentor and also from teaching nurses. At the students' health services (YTHS) a psychologist is available if needed. The students report guidance is not well provided in practice. They felt the guidance is primarily realised in lectures at the beginning of each academic year. The students felt that their progress/development is not really controlled in assessment situations. Feedback is given at a general level; instead, a personal feedback would be desirable and more useful. Supervision methods and structured feedback during internship, important for professional growth, were not addressed.

Areas that are particularly interesting in the medical programme at the University of Turku are the mentorship programme and the paths for research and pedagogy. The mentorship programme was introduced in 2003. Every medical student gets a mentor whom s/he will meet annually individually and in a group. Mentoring aims at supporting students' professional development and ability to reflect their own capacity in e.g. clinical situations. Areas such as coping with uncertainty and continuously changing knowledge base, handling of mistakes and learning from them, working under pressure and developing communication skills are covered to promote students' well-being. This is a strong example of good practice. The programme has also two research paths (biomedical and clinical) in which 40–50 medical students participate annually. In addition, there is a pedagogical two-year elective path (20–25 ECTS) to which 3–4 medical students are selected annually.

Assessment of learning and learning outcomes

There was no overall assessment strategy for the programme. The assessments are planned and carried out by subject teachers and it was sometimes difficult to see whether an assessment was formative or summative.

Written individual summative examinations of knowledge at the end of units are most common forms of assessment. Some courses use entrance examinations to emphasize the continuity between preclinical and clinical courses, so students must brush up their knowledge before going to the next level. These examinations are formative and diagnostic. In some courses, mid-term (interim) examinations are used. Clinical skills are not systematically assessed. There does not seem to be a formal group who monitors and supports student progress or has a responsibility for investigating and dealing with students' fitness for practice.

Practical clinical skills are assessed e.g., by microscopy exam; patient presentation; simulation; or videotaping consultations to assess patient-doctor interaction. Summative assessment of practical skills (OSCE) is arranged during 5th year. Clinical Evaluation Exercise (miniCEX) which assesses clinical skills, attitudes and behaviours, Directly Observed Procedural Skills (DOPS) or Work based Assessment (WBA) are not commonly used. The assessment of clinical work has recently been recognised as needing improvement and there is a working group with representatives from Working Life Advisory Group and students who are developing a logbook for clinical use. The teachers and students felt that knowledge was assessed well but clinical skills and professional behaviors less so. Students recommended that assessment should be carried out in practical situations with patients.

Feedback to enhance learning is variable across the courses and across the programme and it is clearly an issue with some of the students. It seems that no feedback is given regularly after summative assessments. Students would like to have more formative assessments and structured feedback. Students rarely get individual teaching or personal feedback during clinical practice. Students also wished to find the learning outcomes in the assessments tasks/questions and to align the learning outcomes and assessments from course to course.

Since clinical education, in particular learning of clinical skills and clinical reasoning, is a central part of the medical programme and student learning and development, and strongly promoted by frequent feedback, the evaluation team urges the programme to review how the systematic formative assessment is structured and how this system is linked with the system for summative examinations.

Teachers' competence and how to develop it

The Centre of Medical Education has a tradition of organising a one-year course in medical education (10 ECTS) in which more than 200 teachers have participated. The design is interactive with seminars, group work, peer-review of teaching and a personal developmental work. Thus, the course is connected to teachers' daily work and training at the same time. Further, the Centre organizes web-based mini courses (2 ECTS) that have been especially popular among teachers working at more peripheral hospitals and health centers. Even these shorter courses are interactive with group work and development projects. In 2016–2017 a tailor-made teacher course (10 ECTS) in Swedish was arranged for teachers in Vaasa region. The teachers are also encouraged to acquire a special competence in medical education hosted by the Finnish Medical Association.

The University arranges courses for teachers from all faculties, altogether for 60 ECTS. Further, web-based courses in university pedagogy are arranged in English by the Department of Education. New thematic courses in e.g. in digital skills are planned to start in 2018. The teachers and the management group mentioned that the number of students has increased while the number of teachers is actually decreasing. More teachers are needed to develop the programme further.

There is no education focused promotion pathway or tenure track for teachers. There were no excellence of teaching awards.

Well-being of the university community

Turku has a mandatory mentoring programme for the students. It comprises group meetings as well as face-to-face meetings. Theme-based group meetings are arranged at critical time points for students. Students have an electronic Growth and Development portfolio in which written annual reflections about their own Journey to Becoming a Doctor is included, in addition to other assignments before the meetings. Optional courses in Study skills and Mindfulness are organized for the students. There is also a psychologist available for students as well as health care services via Finnish Student Health Services (YTHS). Students reported a good atmosphere, and that teachers are friendly and respectful.

The increasing number of students and decreasing number of teachers pose challenges for faculty's and students' wellbeing. The evaluation team did not notice any plans in response to the increased workload. The faculty arranges faculty meetings and a Faculty Café where faculty management teams provide information. These are open for all teachers and provide an opportunity for free discussions on whatever matters teachers will bring up. Faculty information is distributed also through social media. Supervisory and leadership training is organized for those interested.

The courses in medical education seem to have an important impact on teachers' well-being. The faculty also has structured peer collaboration since some years. The teachers work in pairs for 3–4 months, create their own goals, and get support when needed. A peer review of teaching is included in this concept. In the future work counselling will be available for teachers. Teaching staff can utilise all well-being services intended for all University of Turku personnel (e.g. occupational health care).

Strengths and development priorities in implementation of education

Strengths	Development priorities
<ul style="list-style-type: none">• Comprehensive co-operation with health care centres and hospitals around Turku University to support teaching (decentralised learning).• Professional development is supported by mentorship programme.• Continuous development of education.• Interprofessional education started even if it is still optional.	<ul style="list-style-type: none">• Development of an overall assessment strategy.• Improvement of assessment methods to include skills and behaviours.• Improvement of individual feedback.• Ensuring an adequate number of teaching staff.• Be attentive to students' well-being.• Develop digitalisation and e-learning activities.

5.5.4 Competence and working-life skills produced by the education

Internship

The degree programme in medicine includes mandatory practical training worth a total of 33 ECTS completed during studies. The programme complies with article 23 of the European Council Directive 93/16 in that the period of basic medical training comprises 5,500 hours of theoretical and practical instruction. The goal of practical training is to deepen the medical students' skills and knowledge under supervision. During practical training, the student puts the skills learned in theoretical studies into practice, performs procedures under supervision, and explores interprofessional work and the operation of hospitals and health centres.

The general learning outcomes for internships are described in the curriculum summary. Based on the self-evaluation the supervision and practices during the internship vary in different clinical settings, which student interviews confirmed. The assessment is restricted to a general medicine consultation and a teacher –doctor's assessment at the end of the fifth year. Oral feedback is mentioned but appears not to be structured to support professional growth. The students, who asked particularly for regular feedback from supervisors, confirmed this. Supervision and assessment of internship is one of the main educational development goals of the faculty and the Head of the Centre of medical education in Turku has suggested a nationwide collaboration to develop the content of the internship. The aim is to set learning outcomes and assessments that would function in busy clinics.

The clinical education, in particular the learning of clinical skills and reasoning, is a central part of the medical program. The evaluation team strongly advice to describe clear learning outcomes for the internship, and create guidelines for the supervision comprising frequent formative and summative feedback and a clear description of the assessments. Furthermore, the evaluation team advice to monitor and evaluate how the supervision, the feedback and assessments are carried out to be able to identify the entities where the students are supervised well and where the supervision is below the expectations. If there are no clear objectives and expectations it is less likely that the students learn what they should learn.

Career guidance and career paths

An introductory course in the beginning of the programme includes presentations on career options. In addition, seminars of different aspects of doctors' work are held as a part of the Mentorship program. The students have access to the University's general career guidance services and in addition to this, students can receive guidance on postgraduate educational opportunities personally and at public information sessions run from time to time during the programme. However, the students considered the amount of career guidance to be very low or even non-existent. The students wish for guidance on the different areas of the work of a doctor and different specialities.

The basis provided by the education for continuous professional development

Continuous professional improvement should keep the becoming doctors up to date and competent in all working areas. Thus, it should include development of knowledge, skills and attitudes and behaviours across all areas in professional practice. It includes maintaining and improving the quality of care and other services and addressing the areas requiring improvement. Responsibility for personal learning and identification of own learning needs are cornerstones for life-long learning. The students at the University of Turku have a mandatory Mentorship programme aiming to support students' professional development in which reflection and self-evaluations are comprised. In addition, students develop information search skills, critical appraisal and skills in Evidence Based Medicine (EBM). Formative and summative practical assessments and personal feedback are important in facilitating students' development.

Cooperation with working life and its quality management in the future operating environment

Health Campus Turku is a multidisciplinary knowledge cluster within medicine and health care. The collaboration involves besides University of Turku, also the Hospital District of Southwest Finland, Åbo Akademi University, Turku University of Applied Sciences, Novia University of Applied Sciences and Turku Science Park. Joint education programs have been planned and a leadership programme is already going on. There is collaboration e.g. between Turku University of Applied Sciences within simulation. One elective course (Brain) is given in collaboration of Medical faculty and Turku University of Applied Sciences, another (Monelle) in collaboration with Turku University of Applied Sciences (Social Welfare, physiotherapy and occupational Therapy), Åbo Akademi University (Psychology and Logopedics) and Turku University (Medicine and Social Welfare Sciences, Psychology and Logopedics). The courses for teachers in medical education are realized by co-operation with the Faculty of Education.

The Faculty of Medicine works in close co-operation with the public service sector, including both regional municipalities and hospital districts, and particularly the Turku University Hospital. There is also collaboration regarding curriculum development. The Faculty has a Working Life Advisory Board (primary health care doctors and one resident). The Faculty has contacts with pharmaceutical industry but this collaboration do not seem have a clear role in the undergraduate education.

The Faculty identified that in the future greater emphasis will need to be placed on education in areas such as continuity of treatment (elderly patients and those with chronic diseases), elderly patients in general, cultural diversity; cost-effectiveness and health care economy in general; and the ability to engage in continuous learning (e.g. the inclusion of AI and genomics and personalised medicine in mainstream medicine); interaction and co-operation skills, leadership skills; and Interprofessional working.

Over the next ten years the changes brought about by an operational renewal programme, will result in a more student-centric approach to learning with active learning, using more digital learning environments, increased teaching/learning in technological skills and increased formative and summative assessment of learning outcomes. In addition, more collaboration between stakeholders is needed to create a continuing medical education from undergraduate to postgraduate education. The curriculum also needs to be benchmarked to international standards.

The students supported more emphasis on interactive skills, interprofessional learning and teamwork in doctors' work.

Strengths and development priorities in competence and working life skills

Strengths	Development priorities
<ul style="list-style-type: none"> • Solid collaboration with University Hospital and between universities in Turku. • Widely decentralised teaching and training in health care centers and smaller hospitals providing diverse patient mix. • Close connection to working life. • Good basis for continuous professional development. 	<ul style="list-style-type: none"> • Development of learning outcomes, supervision and assessment of internships. • Develop guidelines for supervision of internships. • Improving practical training procedures.

5.5.5 Continuous development and renewal of education

Forecasting competence and renewal needs

Preparation of the curriculum 2016–2018 was started in 2014 and preparation of the next curriculum is going on. The Board of Study Unit Leaders is responsible for integration and prepares initiatives to curriculum changes, based on feedback and discussions with teachers and students. Even teachers of the decentralised clinical learning and Working Life Advisory Board participate in the development of the curriculum. The identified areas of development are interprofessional education, e-learning, assessment, feedback, internship and Internationalisation among other things. In addition, students welcome teamwork and interaction training and leadership training. Stakeholders mentioned that students are generally active and well prepared for the work at graduation but recommended more teaching in how to handle insecurity, how to handle mistakes and cope with that kind of demanding situations.

International student exchanges are encouraged. The Faculty of Medicine has a wide network of partner universities, and about half of the medical students in Finland participating in the FIMSIC exchange programme are from Turku. In the current curriculum reform special attention is given to facilitate students' participation in international exchange programs and to get full credits for the exchange studies.

Use of evaluation and feedback information

The Faculty collects feedback both systematically and spontaneously. Two-year cycles of curriculum were implemented university wide in 2014 and the Faculty moved to every other year systematic electronic feedback at the same time. The feedback is collected with Webropol during the “first curriculum cycle year”, the results are analysed and used in developing the curriculum during the “second curriculum cycle year”. Response frequency is sometimes low and therefore, option for annual feedback has been discussed. The feedback comprises general questions for all courses and open-ended questions (what was good, what should be improved, and open comments). The departments can add their own questions to this survey. The general questions are collected and analysed university wide. Also, general questions about the professional performance of clinical teachers have been used some years. The teachers of each study module review the feedback and make suggestions on changes in the curriculum. The departments that have suggested changes are later contacted by the Centre of Medical Education to follow up possible changes and get feedback.

In addition to university wide feedback, students are encouraged to use the continuous feedback possibility in Moodle. The Faculty also encourages students and teachers to discuss and have an ongoing dialogue during the courses to improve education when necessary. Students participate in the development of the curriculum through different working groups, e.g. Study Year Leaders’ group, and consider that they have a strong influence on the education. The attitude to students is friendly and respectful but feedback to students’ feedback is often non-existent. Some of the external stakeholders the evaluation team met were not clear about learning outcomes or their role in the development of the program. The SOTE renewal was not discussed here.

Cooperation between universities

The level of national co-operation between Medical Schools is increasing. Areas for improving co-operation include the consolidation of core content; use of digitalisation and sharing teaching material; and developing practices in thesis studies (e.g. Syväriportti). Field-specific teacher networking plays a crucial role in this co-operation. In some fields of medicine, there is already considerably active national co-operation and shared curriculum outcomes have been agreed in e.g. neurology and paediatrics.

Strengths and development priorities in continuous development and renewal of education

Strengths	Development priorities
<ul style="list-style-type: none">• High number of pedagogically trained teachers.• Teacher networking, e.g. study year leaders.• Co-operation with primary health care units.• Continuing development of curriculum.	<ul style="list-style-type: none">• The courses could use more continuous feedback possibility in Moodle.• Involving stakeholders in planning.

Good practices and suggestions for development

During the site-visit the faculty management, academic staff, students and stakeholders identified many strengths and key areas for development, as well as good practices. The evaluation team has selected the most relevant examples of good practices for other universities to follow, and interpreted observations on needs to change through theories or learning into ideas for development.

Examples of Good Practices at the University of Turku

- The structured framework of programme learning outcomes.
- Explicit recognition of professional development supported by mentorship program.
- High number of pedagogically trained teachers.
- Co-operation with primary health care units.
- The use of OSCE in year 5 to assess clinical competence.
- Effective facilitation of student participation in international exchange programs and getting credits for exchange studies.
- Positive attitude toward clinical teachers.
- Approaches to ensure wellbeing of students and teachers.
- Mentoring programme provides students support for professional development and learning.

Suggestions for development

- More collaboration between the Medical Faculties, e.g., by creating common learning outcomes, learning resources and assessments practices.
- Build a clear governance structure for the program.
- Continue good work with learning outcomes to make them clear at every course.
- Map the programme and module outcomes and ensure demonstrating these at assessments.
- Create clear learning outcomes also for the internships.
- Develop assessment strategies, increase practical assessments and feedback during clinical courses, and provide opportunities to train in giving supervision and feedback.
- Develop academic career progression with possibility for an education focused career pathway.
- Allow pedagogical skills and educational merits count more when recruiting new faculty.
- Create possibilities for teachers to do research, meet and discuss educational development, and diminish their administrative burden.
- Ensure enough faculty and adequate teaching facilities (e.g. room sizes) to facilitate learning.
- Develop e-learning and other innovations in education or assessment, particularly clinical assessment.
- Improve organization for study counselling.

- Continue strengthening general practitioners' perspective in education.
- Support professional development discussing e.g. coping with the complexity of the health care and learning from mistakes.
- Develop further interprofessional education and skills in lifelong learning.

Medical education in Finland – Strengths and recommendations

This chapter presents and discusses an overview of the evaluation findings, similarities between the Medical Schools as well as common trends in medical education and some examples of good practices. A summary of common strengths and development priorities in Medical Schools is provided to support universities and their stakeholders in developing medical undergraduate education.

6.1 Overview of the findings of the evaluation of undergraduate medical education in Finland

All five Finnish Medical Schools indicated their education programmes were regularly reviewed and developed; they had identified various drivers for those changes and had processes of quality improvement and enhancement. Some Medical Schools had considered this extensively and strategically, others perhaps less so. All the Schools indicated when and how the curriculum had been reviewed.

Current frameworks in curriculum design

The structure of the medical undergraduate curriculum varies between universities; some have many (up to 70) short courses in their curriculum, most of which are examined separately without synoptic integration. This is sometimes an advantage as important areas such as health promotion or drug prescribing then get a place of their own in a curriculum. The disadvantage is fragmentation and lack of integration (integration is left for students) and that the curriculum becomes subject matter based. One for the evaluation team's major concerns was that most Schools don't treat their curriculum as a programme but a cluster of courses. This results in fragmentation: programme outcomes not being mapped to the curriculum and a lack of alignment between teaching and learning activities and assessment across the curriculum at the programme level.

The integration between basic and clinical sciences is strong in the beginning of the medical education especially at the University of Tampere, while the University of Eastern Finland seems to have a more traditional basic science teaching followed by clinical sciences approach.

Underpinning curricular theories, strategies and frameworks

All the Schools have described the degree program aims and seem to have a rationale guiding the curriculum structure, but the underpinning theories or strategies are not so explicit in all descriptions. However, the University of Tampere has an integrated spiral curriculum with intended outcomes in three categories. University of Helsinki uses a framework that resembles CanMEDS and outcomes like those in the UK Tomorrow's Doctors (General Medical Council). The curriculum at the University of Turku originates from EU Tuning project and uses priority categorization of content.

Most of the Schools did not refer to current theories of teaching and learning in their self-evaluation reports or in the summaries of curriculum. However, based on the curriculum structures, it seems that theories of constructive learning (Entwistle 2009; Marton and Säljö 1976; Ramsden 2007) and constructive alignment (Biggs 1999; Biggs & Tang 2007) may have been applied when the curricula were designed but not always implemented. Further, in some self-evaluation reports it appears that facilitating students' learning processes and applying student-centred approaches to learning (Entwistle & Ramsden 1983; Ramsden 2007) have been considered. In problem-based learning, the key principles are self-directed learning and adult learning (Mezirow 1991) while in clinical training and mentoring the principles of reflective learning (Boud et al. 1985; Moon 2007; Schön 1983) have been applied. The evaluation team would like to encourage the Medical Schools to implement contemporary theories of teaching and learning in their curriculum design, or when in use make them more explicit.

Currently some Schools have clear programme and module learning outcomes while in others the programme outcomes are more general aims and the course content equals learning outcomes. There were many similarities between the outcomes but also considerable variation. There was no consistent approach to structuring the outcomes across the curriculum of the five Medical Schools, which makes it difficult for students to take courses elsewhere than at their home university.

Managing change

There were many examples of where curricular change had been attempted but what is effectively a major organisational change had been thwarted. This is a common finding in many attempts at change – a lot fail. There were major reasons behind the lack of success, for example failure to move to integrated teaching due to a lack of stakeholder engagement and lack of programme leadership teams.

Bland et al. (2000) in a large review of medical curricula reforms identified a consistent set of characteristics associated with successful curricular change (Table 2). In addition, the role of politics (internal networking, resource allocation, relationship with the external environment) is essential, and after the change, a performance dip (i.e. a temporary decrease in an organization's performance as a new programme is implemented) is to be expected. This evidence can be used to support and develop curriculum change in the Schools.

TABLE 2. A selection of characteristics affecting success of curriculum change (Bland et al., 2000).

History of change in the organization
Organizational mission and goals
Need for curriculum change
Leadership and communication
Scope and complexity of the innovation
Organizational structure
Cooperative climate and participation by the organization's members
Communication
Human resource development
Evaluation
Performance Dip
Leadership

Kotter (1995) studied many examples of transformational changes in organisations and why these failed. He identified a process supporting effective change that shares many factors with Bland et al. (2000):

- Establish a sense of urgency;
- Form a powerful guiding coalition;
- Create and communicate the vision;
- Empower others to act on the vision;
- Plan for and create short-term wins and
- Sustain the momentum.

Curriculum development and feedback

Harden (2001) explains the curriculum is a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and programme of work.

Curriculum mapping can help both teachers and students by displaying these key elements of the curriculum, and the relationships between them. Students can identify what, when, where and how they can learn. Teachers need to be clear about how their role contributes to the overall programme plan. The scope and sequence of student learning is made explicit, links with assessment are clarified and curriculum planning becomes more effective and efficient. In this way the curriculum is more transparent to all the stakeholders: teachers, students, curriculum developers, managers, employers, etc.

Examples of students' comments:

"In some courses the alignment is OK, but in some not in such good shape. Learning outcomes should be clear for students at the beginning of the course – in every course."

"I wish to find the learning outcomes in the assessments tasks and questions. It would be good to align the learning outcomes and assessments from course to course."

The Finnish Medical Schools did not mention how they mapped learning outcomes of the programme against the modules and assessments to ensure all the programme outcomes were adequately taught and assessed. This can result in a patchwork of modules without a clear progression or plan. If study content development is mostly done within subjects or courses, few people have an overall view of the entire study process and planning is difficult. When the content of studies is traditionally set, "strong subjects" can claim more study volume than necessary in undergraduate training.

Most Schools use a combination of electronic feedback on courses plus face-to-face meetings with staff and students as well as contributions from stakeholders such as health care professionals and employers. In some medical schools the programme committee takes an overview of the whole programme, goes through and discusses the feedback of each unit, and conveys their viewpoints to the planning committee of the unit. The unit planning committee evaluates the development needs based on the feedback from students and teachers and decides on changes to be made to the unit and how they can be implemented. The unit planning committees use feedback to make constantly changes and adjustments to improve the unit.

An example of students' comments:

"I feel that our feedback is really listened to. The modules are genuinely modified according to the feedback."

At the Medical School of the University of Helsinki, electronic feedback is collected after each study module and analysed by the module lead. Each year's course holds coordination meetings 2–3 times a year, using the Educational Cycle. In the University of Turku, the Centre for Medical Education analyses feedback and has noted improved education following the feedback. The University of Turku also mentioned the importance of spontaneous feedback and encourages an interactive and conversational education culture that allows feedback in everyday education. The Medical School of the University of Oulu has provided training in evaluation. Their evaluation working group has recommended developing evaluation at the programme level using curriculum mapping. Tampere University Hospital uses student feedback as a performance indicator for hospital units, which clearly signals the importance of engaging clinical teachers and hospital systems in teaching.

Medical education units

There was mention of a medical education unit at University of Turku and the recent disbanding of one at the University of Helsinki. The Centre for Medical Education in the Faculty of Medicine in Turku was founded in 2002 and it acts as a community of scholars to plan, prepare, develop and research education and does systematic quality assurance of teaching and learning in the Faculty. There was recognition that medical education is an academic discipline. The Centre supports implementation and evaluation of the Undergraduate Education Programme, coordinates the Mentorship Programme for students and organises pedagogical training courses and events. It also carries out educational scientific research, publishes educational reviews and reports, and organises training in study skills for students.

In many countries, Academic Medical Education Units have been set up in medical schools to support the reform and modernisation of medical curricula by employing medical educationalists and people with a teaching background and expertise in assessment, curriculum and teacher development. Like the Centre for Medical Education at the University of Turku, they instill a culture of educational best practice by leading, evaluating and researching curricula changes and developments as well as ensuring medical education is evidence based. The evaluation team was concerned about the changes at the University of Helsinki where the Pedagogical Unit had been centralized away from the Medical School and clinical non-university teachers excluded from taking part in teacher development.

None of the Medical Schools in Finland seemed to have an effective systematic medical teacher development strategy that encompassed all those who teach the medical students, whether they be scientists, clinicians or other healthcare professionals. Hill and Stephens (2004) described a model of education staff development focused on the needs of the organization rather than on the needs of individual teachers. It was driven by the conviction that meeting the needs of students (and, in the longer term, patients) required a strategic approach to the development of medical teachers. Meaningful change only occurs through participation; the model aimed to negotiate staff development strategy at every stage of the process despite competing demands on staff, recognizing they can have heavy clinical and research roles in addition to teaching. Education staff development requires leadership and strategic direction. Course and year coordinators welcome and benefit from education leadership training. Focusing on student needs helps overcome tensions between individual staff development needs and the needs of the organization.

Internationalization and benchmarking

There is varying, mostly limited international engagement, with Finnish students taking courses and placements abroad, and international students coming to Finland for studies or placements in the local health service. The University of Eastern Finland hosts many Erasmus exchange students from abroad and special study programmes for the exchange are offered. In addition, these foreign students participate in clinical work. Every year several students from the University of Turku participate in exchange programs (Erasmus, Nordplus) and carry out a part of their undergraduate studies abroad. The University of Helsinki's degree programme provides international exchange students several study modules in English and an elective course in Global Health is offered. The University of Tampere incorporates international standards and recommendations into their outcomes and curriculum design. None of the five Finnish Medical Schools currently embrace the Bologna process of a three-year Bachelor degree followed by two-year Masters. With different curricula and phasing of education it is hard to ensure equivalence of learning experiences in one country, let alone different countries.

There was some evidence of engagement with international concepts and standards of medical education and engagement with scholarship around medical education particularly at the Universities of Helsinki, Tampere and Turku. It is helpful to have a centre or team that is interested and focused on medical education to explore, develop and evaluate good practice at the programme level. The evaluation team did not observe benchmarking practices between Medical Schools in Finland.

The Association of Medical Education in Europe (AMEE) has initiated a programme called AMEE Aspire award to recognise international excellence in medical, dental and veterinary schools. The areas that can be assessed by an international panel include Assessment of Students, Student Engagement in the curriculum, Social Accountability of the school, Faculty Development and Simulation. So far, no Finnish Medical School has achieved an Aspire award.

Learning environment in Medical Schools

Increased intake in Medical Schools has coincided with personnel cuts and organizational changes. It is unavoidably also affecting student and staff well-being. The group sizes have grown. Although many thoughtful changes in teaching have been made to manage this, larger groups especially in the clinics result in additional workload for teachers, while students have less opportunity of getting hands-on experience and personal feedback. A sufficient number of clinical teachers to support effective learning in reasonably sized groups might help both students and teachers to cope with stress.

Early patient contact allows learning in context, and there is good diversity in learning environments and patient mix in all Schools. Students unanimously wish for more practical skills teaching, most also for skills evaluation. New competence needs arising from the SOTE reform should be incorporated into the curriculum, including preparedness to communicate in social media and with media. These were not visibly part of the programme in any Medical School.

An example of students' comments:

“Competence in theoretical knowledge is measured in examinations. Practical skills are not assessed in any way.”

Students' well-being

A Finnish Medical Association survey from 2016 shows that 40 % of medical students find the studies rather or very demanding (Suomen Lääkäriliitto 2016). Their risk of burnout, however, is low compared to other university students (2 % vs. 12 %), and the proportion of medical students in Finland that have psychic distress during the studies (20 %) is lower than for students in other faculties (30 %) (Suomen Lääkäriliitto 2016). The students have gone through a demanding selection process and study together as a class for six years in a close-knit learning community; these may act as protective factors for students' well-being.

Psychological distress among physicians can start already during medical school and persist throughout their careers (Dyrbye et al. 2006) and depressive disorders are more common among medical trainees compared to age matched controls (Mousa et al. 2016). Recently, the #metoo campaign has increased interest also in medical students' and young doctors' decent treatment at work and mental well-being. Well-being is mentioned in the strategy of one university (University of Tampere) where an aim of the education is to train good clinicians with a sense of well-being.

In addition to coping with financial issues and life as young adults, medical students face stressors related to work in clinical environment, career choices and information overload, sometimes curriculum overload, too. Besides mandatory student health services, the peer tutors are a key source of support in all medical schools. Otherwise the Medical Schools' approaches to preventing, identifying and managing problems in well-being are rather different in both extent and quality. Several Schools report cut-downs in student counselling services and other on-campus support personnel.

The students use and trust their peer tutors, but the duration and style of tutoring as well as training for peer tutors vary markedly. The University of Turku's Medical School has built a stable and well-liked system of mentoring throughout the school, with training and peer support for mentors, and the University of Eastern Finland has student mentors for the first years, while most schools do not provide mentoring at all. Otherwise students report receiving support from course teaching coordinators (nurses). Some Schools have systems for identifying students that repeatedly fail exams and calling them to a supportive discussion. The role and opportunities of medical teachers in observing student problems and intervening seems to vary both by School and individually. The last backup is students taking care of each other.

The options for addressing student well-being in the long term include teaching stress management techniques and discussing what it is to work under pressure, cope with uncertainty and a continuously changing knowledge base. During medical studies, it would be important to establish practices for openly discussing work overload, mistakes and how to handle and learn from these at both individual and organizational level. Such skills would carry stress prevention into doctors' working lives.

Well-being of staff

Medical School teachers balance between demands from teaching, clinic, research, family, and personal time. Staff well-being is monitored, like in other Finnish work places, by their occupational health service. All faculties also provide regular development discussions to all staff. Most Medical Schools report that development days are regularly arranged for teams or at clinic level.

Some Schools (e.g. Turku and Helsinki) noted the importance of pedagogic training on well-being at work. The amount and standard of systematic pedagogic training for medical teachers vary markedly between Schools. Some teaching is usually offered also to doctors that supervise students outside the university hospital. Some Schools (e.g. Turku) provide opportunities for peer reviewing each other's teaching. Until now, Finnish Medical Schools have not established chairs for medical education or otherwise created career paths for teachers. All these items were recognized by the teaching staff as possibly supportive for their well-being at work.

There have been many reforms in Finnish higher education in recent years and the sector has also undergone budget cuts; these have had an effect on staffing also in Medical Schools. A long-term personnel strategy is an increasingly important instrument to ensure high-quality and research-based teaching in the future.

Curriculum mapping and assessment

None of the Medical Schools clearly mapped their programme learning outcomes against module or course outcomes, so it was difficult to demonstrate whether these in fact had been taught and assessed. The lack of programme assessment strategies was also a problem. There is a need to develop constructive alignment in the curriculum so that teaching and learning activities and assessment meet in all elements of the curriculum. The assessment of clinical work needs improvement. Written summative examinations of knowledge at the end of the units seemed to be most common and assessments of skills were not regularly presented. Setting acceptance limits for assessments should be guided by a standard process and based on evidence-based education.

Lack of high-quality teaching in patient contacts is a well know problem. Irby (1995) observed learners seeing a limited range of patients, case discussions were infrequent and short with little teaching, and feedback was minimal. He also noted clinical teaching was variable, unpredictable, immediate and lacked continuity. Van der Vleuten et al. (2000) explored learning in clinical practice and found that there was much less patient contact than assumed and many activities had little educational value. There was a large variation between student experiences as well as in the quality of supervision. Direct observation of patient contacts was uncommon.

Examples of students' comments:

“At the moment, we receive no feedback on the encounters with patients, even though this is the most important experience offered by the training.”

“There should be more OSCE style tests, more evaluation on how you treat the patient, more hands-on practices – to help students to feel safe when they move to the working life.”

Student and stakeholder involvement in developing education

Student engagement seems particularly strong in the Finnish Medical Schools. Students are involved in the development of education in all five Schools through feedback and representatives participating in education committees. The evaluation team encountered representation of patient groups at the University of Tampere where the team met a representative of the National Rheumatoid Arthritis Society who was also an “expert patient”. At the University of Turku, the evaluation team met an “expert patient” from the Finnish Federation of the Visually Impaired. Several Medical Schools collaborate with institutes teaching other health professionals, typically offering joint interprofessional teaching sessions.

In general, formal collaboration with other stakeholders was weak. The University of Oulu reported the most extensive with PopSTer (Northern Ostrobothnia social services and health care project) teaching and education development group, the Northern Ostrobothnia health care district working group for teaching and educational co-operation, and the faculty board. There was also co-operation with the City of Oulu (teaching health centre project, instruction in public health) and Oulu University of Applied Sciences. The situation is quite similar at the University of Turku. The Faculty of Medicine works in close co-operation with the public service sector, including both regional municipalities and hospital districts, and particularly the Turku University Hospital. There is also collaboration regarding curriculum development. The faculty has a Working Life Advisory Board (primary health care doctors and one resident) that commented the learning outcomes in the latest curriculum reform, as did the teachers in decentralised learning (outside Turku).

Co-operation between the five universities providing medical education

The degree planning committees of Finnish universities with medical studies meet annually, sharing successful practices and discussing current issues. National cooperation is set up for Neurology, Otorhinolaryngology, Pathology, Paediatrics, Psychiatry, and Palliative medicine to prepare a core analysis of learning content intended for national use in all five undergraduate curricula.

However, there has been little cooperation in producing concrete learning materials, adopting materials from another university or shared programme outcomes. Factors limiting cooperation include differences in curricula, learning outcomes and learning methods used, as well as the fact that cooperation would require reciprocity.

All Medical Faculties in Finland are involved in the Digital Study Environments project coordinated by University of Oulu's Faculty of Medicine. For the material to serve several universities well, its planning and implementation should most likely be done together from the start. The lack of common technical platforms and different operating systems have hindered the sharing of virtual materials. The Faculty of Medicine at the University of Turku started nationwide collaboration in simulation education four years ago and invited all schools and other bodies active in medical simulation to meet in Turku in 2013 and this collaboration has continued.

Starting from 2018, the Finnish universities providing medical education will have a joint student selection procedure where students can apply to several medical faculties but may be offered (if eligible) only one place of study at the highest ranking site on her/his application.

The final report of Universities Finland (UNIFI) project, examining the strategy and effectiveness of medical education in Finland, also recommended more cooperation, core curriculum work and division of work in small and narrow specialist fields (UNIFI 2015). They also recommended closer cooperation between universities and other local institutions (other universities, universities of applied sciences, state-owned research institutes, etc.) as well as closer research and teaching cooperation between universities and university hospitals.

What is a Finnish doctor?

The needs of Finnish Health Services cannot be met now or in the future unless there is a clear understanding of what part each healthcare professional plays and how this might change in the future. The review revealed no clear definition of what a Finnish doctor is, and there is a lack of acknowledgement of which essential professional attributes the doctor brings to the healthcare team.

Medical workforce planning is hampered by lack of clarity regarding doctors' roles. Tooke (2007) wrote that "Without such definitions it is impracticable to pursue outcome focused medical education or attempt to plan the workforce." He went on to describe the role of a doctor: "The doctor's role as diagnostician and the handler of clinical uncertainty and ambiguity requires a profound educational base in science and evidence-based practice as well as research awareness. The doctor's frequent role as head of the healthcare team and commander of considerable clinical resource requires that greater attention is paid to management and leadership skills regardless of specialism."

With the impending healthcare, social services and regional government reform (SOTE) there seemed to be little evidence of Medical Schools being involved in or contributing to the leadership the reforms nor defining what sort of doctor is needed in the future.

What now for medical education in Finland?

The five medical education providers gave varying answers to the difficult question of future competences. It was clear that there was a degree of uncertainty about the impact of the forthcoming SOTE reform, and how the medical curriculum should be designed to support any changes. A consensus on the role of a newly graduating doctor must be reached; the Schools could together lead in planning such role, collaborating with a range of stakeholders, including patients and future employers. Many Schools mentioned increased interprofessional working as a future development area but none seemed to be involved in leading the reforms.

The Schools might consider working together to develop some shared educational principles, such as:

- Encourage students to understand concepts and principles rather than merely reproduce factual knowledge;
- Provide clinical context to enable students to relate their learning to future practice;
- Encourage students to integrate their learning across systems and disciplines;
- Encourage students to adopt independent thought and self-direction in their learning; and
- Develop systems to allow students and teachers to monitor their progress and ensure curricula outcome are covered and achieved.

It would be enormously helpful if Medical Schools could then continue working together to create a shared national framework of programme outcomes. Aligning the curriculum would ensure that these outcomes – especially clinical reasoning and clinical skills – can be taught, learnt and assessed with certainty.

6.2 Summary of strengths and development priorities of undergraduate medical education in Finland

Below is a summary of what the evaluation team observed as strengths and development priorities in undergraduate medical education in Finnish Medical Schools. These items apply to most or all Schools and many of them are relevant in working toward more collaboration between universities. The choices of the evaluation team are likely to be biased by the values the team holds and that the Medical Schools and teachers may see the matters differently. In general, the evaluation team encourages evidence-based planning, dialogue, openness, structure, assessment and collaboration, and recommend keeping in mind the working life for which students are trained. In addition, the evaluation team recommends the universities would together explore the different higher education levels in medicine and discuss whether medical education is really an exception in the Bologna process.

Planning of education

Strengths

1. All medical schools have made a core curriculum content analysis.
2. Student participation and engagement in the development of the medical education.
3. National collaboration is increasing.
4. National evidence-based guidelines provide common clinical content.

Development priorities

1. Increase national collaboration in curriculum planning and start developing a national framework on joint learning outcomes aiming at a core curriculum with increasing complexity (spiraling) shared by all Faculties in Finland.
2. Explore international frameworks such as UK GMC's Graduate outcomes ("Tomorrows Doctors"), or other frameworks and consider applying them to the medical curriculum.
3. Comprehensive mapping of the programme outcomes against teaching and learning activities and assessment in the curriculum to achieve constructive alignment.
4. Develop an integrated assessment strategy at a program level.
5. Faculty development to support curriculum changes should be funded, prioritized and valued.

Implementation of education

Strengths

1. Early patient contact, often in primary care.
2. A good variety of patient mix by decentralised clinical placements outside the university hospital.
3. Good collaboration with outside teaching units.
4. All Medical Schools involved in a joint digital study environment project.

Development priorities

1. Provide pedagogical training for all those who teach medical students, also supervisors outside universities.
2. Explore ways of valuing and rewarding teaching and teachers' skills, e.g. by creating tenure tracks in medical teaching.
3. Establish and support centres for medical education.
4. Ensure early patient content to give students learning context.
5. Structured system for assessment including structured formative feedback to students are needed, particularly during clinical training.

6. Sufficiently long clinical rotations are needed to develop practical procedures and professional competencies.
7. Ensure e-learning activities can be shared across different virtual platforms and used with all types of mobile technology, supporting access anytime, anywhere, e.g. clinical placements.
8. Internships should have structured learning outcomes, introduction, supervision and assessment and guidelines for supervisors.
9. Interprofessional education should be strengthened, organized and assessed.

Competence produced by the education

Strengths

1. Good teaching of generic competences, e.g. communication skills.
2. Good collaboration with primary health care featuring enthusiastic teachers and role models.
3. Many good practices of teaching and learning, e.g. mobile learning, promotion of self-reflection skills as well as interprofessional collaboration.

Developmental priorities

1. Medical Schools should together engage in and lead the social and health care reform.
2. Enable general practitioners to have a stronger role in curriculum development and expand community-based teaching.
3. Enhance basic skills in research, the application of evidence-based medicine, and the use of electronic patient records.
4. Ensure the assessment of clinical skills and reasoning
5. Introduce the basics of health economics, patient safety, and leadership and management skills and advocacy into the curriculum.
6. Students' basic teaching competencies could be further developed as all doctors are teachers.
7. Provide medical career advice so students can explore their aspirations and be aware of the national need.
8. Introduce support systems for students' professional development (such as appraisal and mentoring).

Continuous development and renewal of education

Strengths

1. The mix of methods and processes used to evaluate and renew medical education programmes.
2. Emerging national collaborative groups developing a national analysis of core undergraduate learning content in Otorhinolaryngology, Paediatrics, Pathology, Psychiatry, Neurology, and Palliative medicine.
3. Active participation in FINEEC 's evaluation gives a great starting point for development.

Developmental priorities

1. Through national collaboration in curriculum planning define what is a “Finnish doctor”, i.e. the core knowledge, skills and behaviours that graduated Licentiates of Medicine have achieved.
2. Develop shared national programme outcomes to support the planned SOTE reforms; General Practitioners should have a strong role in this work.
3. Use increased input from active working life and patients to develop the curriculum.
4. Collect feedback from students, recent graduates and employers; compile it at programme level and use in curriculum development.
5. Further develop shared digital resources (up to digital courses with shared feedback systems).
6. Consider options for registering the quality of education provision particularly in placements and how to use the results as a performance indicator.
7. Medical education leaders and management need to support the use of educational innovations and understand the value of sharing the good practices and innovations across universities.

Validity of the evaluation

The validity of the evaluation can be discussed through the subject and evaluation expertise of the evaluation team, their independence, the validity of the materials, the validity of the analyses and the justification of the choices made. Moreover, it must be considered whether the evaluation is done thoroughly, whether the correct questions were asked about the material and at the site-visits, and if the results obtained are relevant to the development activities.

From the early planning phase, the evaluation of basic medical education in Finland included a set of experts both in evaluation methods and the subject matter, medical learning and teaching. Those to be evaluated – the Medical Schools – also participated in the planning. In this way, their engagement was secured and they enriched the evaluation expertise. The FINEEC team had drafted a set of questions based on the suggestions of the planning team; the evaluation team wished to add structure to the site-visits and suggested rearranging some questions and applying relevant items from the World Federation for Medical Education (WFME) Global Standards for Quality Improvement.

The evaluation team has been selected to cover broad expertise in the development of medical education. Three of the members were professionals in medical education and had experience in evaluating Medical Schools in various countries. They can be expected to know the methodology for developing basic medical training, which was reflected in presenting important and precise questions when drafting self-evaluation requests and at site-visits, as well as critically reading the provided material.

The expertise of the evaluation team was also important in highlighting the presented strengths, development targets and recommendations. The team represented four medical specialities and had experience of teaching in more than a dozen Medical Schools. Half of the evaluation team was from abroad and while those who were Finnish had experiences of studying and teaching at various Medical Schools, none had a vested interest for a specific school. They also avoided participation in site visits to their own alma maters.

The evaluation started with self-evaluation reports produced by staff and students. The self-evaluation reports were asked to be written so that possible different and even critical views would come out. The respondents had worked in teams and produced rich descriptions of medical teaching and learning activities. While the replies seemed honest they were somewhat variable, and undoubtedly reflected well the different learning environments, methods, and assessment practices. In addition, the evaluation team read curriculum summaries, research on student and doctor numbers, positions, their opinions and well-being, various statistics and other background material.

The launching seminar of the evaluation was held in Helsinki in September 2017, with faculty representatives, students and other stakeholders being invited. Thus, many ideas and suggestions for implementing the evaluation were obtained from the attendees, and these influenced the implementation of the evaluation. The idea of enhancement-led evaluation was communicated clearly from the start to the wider medical community and presented to stakeholders at a session of FMA education committee and in the Finnish Medical Journal.

The evaluation team went to all five Medical Schools and asked questions to deepen the picture based on the self-evaluation reports. Structured group interviews of the management, staff, students and stakeholders in one day in their teaching environment provided a useful triangulation for highlighting successes and points needing improvement.

After site-visits, the evaluation team compiled an initial list of national strengths and development targets as well as good practices, and these were discussed with faculties and students' representatives in Tampere in March 2018 in an invitational seminar. The event aimed at exploring the validity of conclusions and increasing ownership of the evaluation among the faculty and students, while at the same time committing them to joint development.

In writing the report, the FINEEC representatives compiled a draft report base and wrote the introductory chapters on evaluation aims, processes and context. The evaluation team shared writing the unit reports based on team notes and cross-checked each other's drafts; the unit reports were edited into a uniform style. Drafts of unit-specific reports were sent to the faculties for inspection in April 2018. In this way, the evaluation team wished to remove mistakes from unit reports and increase their validity. The few factual correction suggestions were implemented.

Suggestions from the Faculties also asked for more detail; mostly the evaluation group was aware of these details but chose not to include them due to space limitations. A few wishes for correction concerned students' comments (for example, large group sizes) with which the faculty respondent disagreed. In these cases, we chose to let student observation prevail, as planned teaching resources may not always materialize in practice. Some comments asked for instructions on how to improve the situation; the evaluation group's task was to ask questions and point out possible methods of responding to these, as only the university itself can have answers in their specific context.

The education experts wrote together an overall summary of national findings, considering the results in the light of educational theories and different teaching models. The last three chapters were checked by the entire team for content validity and relevance of conclusions. The chairperson

checked the content of the entire report, adding content and context to summary chapters, removing duplication and editing for clarity. During the whole process, the student and working life representatives made sure that these points of view were sufficiently covered.

To the final seminar of the evaluation on June 15th, 2018, representatives of the medical faculties and stakeholder groups were widely invited. The final validity of the evaluation will be tested by how well its results and recommendations will bear fruit and support ongoing development work in medical faculties.

An analysis of undergraduate education in any medical school requires looking at more than 5000 hours of training over six years. In a limited time frame, it's impossible to appreciate all details, but a structured analysis, with strong support from the experienced FINEEC team, has hopefully helped to see the forest from the trees. While some misunderstandings and misinterpretations are unavoidable, the evaluation team wishes that the overall picture represents the Schools and Finnish medical education well enough to give relevant material for thoughtful renewal.

Finland has a long heritage of producing good doctors. The evaluation team identified many examples of good practice in undergraduate education from the five Medical Schools. The team was impressed by the openness and commitment of the faculties, teachers, students and stakeholders in engaging with the process, compiling the self-evaluation material and discussions during seminars and site-visits. This exercise has already produced reflection and supported further development. There are many ideas the Schools can share and learn from each other, as they all seem ready to improve their education continuously.

The evaluation team identified several areas of strength that apply to all five Medical Schools. They all provide decentralised clinical placements outside the university hospital. There are many well-trained and enthusiastic teachers and teaching in communication skills is good. The Finnish students are actively involved in the development of their studies at all levels through feedback and representatives. Undergraduate education programmes are regularly reviewed, and all Schools seem committed to improve their education continuously. National collaboration is increasing, and joint analyses of core learning contents have started. Active participation in FINEEC 's evaluation gives a great starting point for development.

However, there currently is no consensus at a national level about what is a “Finnish Doctor” – how they are educated and what they should master at graduation. To engage effectively with the forthcoming health and social care reforms, there must be a consensus on the skills, attitudes and role of a newly graduating doctor. Defining the “Finnish Doctor” needs to involve a range of stakeholders including patients, students, the health care professions, the employers as well as the five medical schools in developing a shared vision and agreeing on key curricular outcomes. It seems that Medical Schools need to take more of a leadership role in the planning and development of these changes.

The Schools could then continue collaboration to create a shared national framework of programme outcomes as well as work on the developmental opportunities we have identified in this report. It would be important to align the curricula so that programme outcomes can be taught, learnt and assessed with certainty. Particularly important is the assessment of clinical reasoning and

clinical skills. Readiness to apply new technologies with a critical attitude, teamworking skills and abilities to manage difficult situations constructively must be integrated in undergraduate learning.

For this, the five Schools will need the support of the Rectors of their respective Universities, and also of the Ministry of Social Affairs and Health and the Ministry of Education and Culture. It might include creating a project group to oversee this work including a leadership team, curriculum designers, assessment specialists and educational project managers. In this way the work will be undertaken in a timely manner to blend in with the SOTE reforms.

Over the past few years, increased medical student intake has coincided with organizational and budget changes in all Medical Schools. This unavoidably affects both student and staff well-being. Larger groups especially in the clinics decrease opportunity for hands-on experience and personal feedback while increasing teacher workload. Medical Schools need effective tools to prevent, identify and manage problems in student and staff well-being. Finnish Medical Schools should also explore ways of appreciating teaching and consider creating tenure tracks in medical teaching. Centres for medical education could support systematic provision of pedagogical training for all who teach medical students.

Achieving these changes is both practicable and feasible without damaging the unique flavours and profiles that reflect the strengths of each of the five Schools. It will ensure that graduates are trained in the skills they need as fledgling practitioners, for further training into general practice or other specialities, for taking various roles in education, research, management or health policy, and for lifelong learning as a medical practitioner. Ultimately the changes will improve the quality of graduates, increase patient safety and result in better medical care for the population of Finland.

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APPENDIX 1. Finland's health care system

The Finnish health care system is based on health care provided at the municipal level and subsidised by the central government. In addition to the public sector, private companies also provide health care services. Finland has a broad range of health care organisations that provide both free and chargeable services.

Steering The *Ministry of Social Affairs and Health* is responsible for the steering of the health care system. It prepares legislation and steers its implementation, directs and guides the development of health care services and health care policy, defines health care policy guidelines, prepares key health care reforms and steers their implementation and coordination.

Licenses and monitoring *Regional State Administrative Agencies*¹ steer and supervise health care provided by the municipalities and the private sector and evaluate the availability and quality of the municipal basic services. They also issue private health care providers with licences. In cooperation with the municipalities, Regional State Administrative Agencies promote the development of health care services in accordance with national targets and the implementation of preventive health policy. The National Supervisory Authority for Welfare and Health *Valvira* steers, supervises and manages the administration of licences in social welfare and health care.

Municipalities are responsible for organising health and social care and they also provide most of the health care services. They may provide primary health care services on their own or establish joint municipal authorities with other municipalities. A municipality may also purchase health care services from other municipalities, organisations or private service providers. A *health centre* is the basic unit of the Finnish health care system. It may comprise several branch health centres and hospitals. A health centre has overall responsibility for primary health care. Central government subsidises the provision of the services with money transfers, determined on the basis of the population of the municipality, age breakdown of the population, morbidity and a number of other factors. Municipalities may also charge fees for the use of the services. On 1 January 2017, there were 311 municipalities in Finland (Kuntaliitto 2017).

The Finnish health centres operate in a broad range of different sectors, which is also reflected in the work of the doctors employed by the health centres. They provide services that in many other countries are the responsibility of specialists (such as minor surgery, endoscopies and gynaecological examinations). Health centres also have wards for patients requiring nursing

¹ There are six Regional State Administrative Agencies in mainland Finland. The State Department of Åland serves as the Regional State Administrative Agency in Åland.

care, rehabilitation, or other clinical services; further they arrange school and student health care services, counselling for the aged, mental health services, screening and vaccinations. Many health centres especially in cities also provide specialist medical services.

The decisions on the scope, content and organisation of the services laid down in the law are made at the local level. The operations and services are mainly funded through local income tax. The most important public health and specialised health care services that municipalities must provide are specified in the law.

Hospital districts comprised of municipalities are responsible for providing specialised health care in their areas. Each municipality must be a member of a health care district. The joint municipal authorities maintaining the hospital districts plan and develop specialised health care so that primary health care and specialised health care function as a single system. The services must be based on unified medical and dental criteria. On 1 January 2017, there were 20 hospital districts in Finland (Kuntaliitto 2017). Highly specialised health care services are provided at five university hospitals based on special responsibility areas. The membership of each health care district in the special responsibility areas is specified by Government decree.

Private services Private service providers (companies, organisations and foundations) may sell their services to municipalities, joint municipal authorities or directly to individual customers. The share of companies and organisations in the provision of health care services has grown steadily in the 2000s. The Ministry of Social Affairs and Health is also responsible for the overall steering of the private services and for the legislation concerning the services.

A municipality may purchase private social welfare and health care services for specific customers. In that case, the customers will pay for the services as legislated. Customers can also pay for the use of private services purchased by the municipality with service vouchers. A municipality or a joint municipal authority may decide whether to introduce a service voucher scheme and determine the services that it covers. Patients are entitled to partial reimbursement for fees they pay for using private medical and dental services. The reimbursements are provided under the national health insurance scheme and they are paid by Kela (the Social Insurance Institution of Finland).

Occupational health care supplements the service system of health centres and hospital districts. Finnish employers have a statutory obligation to provide their employees with preventive occupational health care. Employers may also provide their personnel with treatment at general practitioner level. In fact, occupational health care providers are responsible for a large proportion of the primary health care of Finland's working age population. Employers can purchase occupational health care services from municipal health centres or from private clinics. Kela reimburses employers for the necessary and appropriate costs arising from the provision of occupational health care. Employees can use occupational health care services free of charge.

APPENDIX 2. Number of applicants, students, graduates and staff

A Planned intake, applicants and students admitted in 2013–2017 in Medical Schools

University of Eastern Finland

UEF	2013	2014	2015	2016	2017
Planned intake	132	164	164	164	164
Applicants	1013	1214	1234	1336	1354
Students admitted	134	168	164	168	168

University of Helsinki

Helsinki	2013	2014	2015	2016	2017
Planned intake, Finnish language track	90	88	112	115	118
Planned intake, Swedish language track	23	32	39	35	32
Applicants; Finnish language track	1315	1374	1335	1577	1477
Applicants, Swedish language track	225	301	294	288	310
Students admitted, Finnish language track (% of all applicants)	7	7	8	7,3	8,1
Students admitted, Swedish language track (% of all applicants)	9	10	13	12,5	10,3

University of Oulu

Oulu	2013	2014	2015	2016	2017
Planned intake	125	145	145	145	145
Applicants	970	1052	1157	1155	1273
Students admitted	130	148	148	148	147

University of Tampere

Tampere	2013	2014	2015	2016	2017
Planned intake	105	105	117	145	145
Applicants	1269	1133	1279	1365	1529
Students admitted	107	107	119	146	149

University of Turku

Turku	2013	2014	2015	2016	2017
Planned intake	153	153	153	153	145
Applicants	1069	1198	1191	1306	1324
Students admitted	157	154	156	154	145

B Number of graduates (by gender) in 2013–2017 in Medical Schools

University of Eastern Finland

UEF		2013	2014	2015	2016	2017
Number of graduates	Female	77	92	72	84	73
	Male	55	56	59	54	57
	Total	132	148	131	138	130

University of Helsinki

Helsinki		2013	2014	2015	2016	2017
Number of graduates	Female	82	65	74	83	62
	Male	42	52	50	59	42
	Total	124	117	124	142	104

University of Oulu

Oulu		2013	2014	2015	2016	2017
Number of graduates	Female	63	67	50	81	53
	Male	51	58	73	61	42
	Total	114	125	123	142	95

University of Tampere

Tampere		2013	2014	2015	2016	2017
Number of graduates	Female	59	66	64	65	65
	Male	35	39	56	48	58
	Total	94	105	120	113	123

University of Turku

Turku		2013	2014	2015	2016	2017
Number of graduates	Female	63	80	67	75	57
	Male	37	61	60	51	65
	Total	100	141	127	126	122

C Number of teaching, research and other personnel in 2013–2017 (FTE) in Medical Schools

University of Eastern Finland

UEF	2013	2014	2015	2016	2017
Professors	71,0	70,0	65,0	66,0	66,0
Teaching personnel	108,6	108,0	107,0	109,0	108,5
Research personnel	114,0	117,3	99,0	92,0	113,3
Other personnel	100,0	102,0	84,7	88,7	87,4
Total	393,6	397,3	355,7	355,7	375,2

University of Helsinki

Helsinki	2013	2014	2015	2016*	2017*
Professors	104	109	122	119	126
Teaching personnel	129	135	137	125	157
Research personnel	338	350	378	403	457
Other personnel, Faculty of Medicine	102	91	89	143	176
Other personnel, study administration, Degree Programme in Medicine	24	24	24	21	20
Total	697	709	750	811	936

*N. B. Years 2013–2015 are non-compatible with years 2016–2017.

University of Oulu

Oulu	2013	2014	2015	2016	2017
Professors	40,8	43,6	44,8	44	44,3
Teaching personnel	32,7	33,1	36,3	36,3	33,6
Research personnel	125,9	105,1	104,4	122,4	155,7
Other personnel	100,8	87,5	92,0	86,5	71
Total	300,1	269,3	277,4	289,1	304,6

University of Tampere

Tampere	2013	2014	2015	2016	2017
Professors	52	55	49	49	55
Teaching personnel	75	75	73	76	92
Research personnel	210	188	64	71	164
Other personnel	9	13	91	102	151
Total	346	323	277	298	462

University of Turku

Turku	2013	2014	2015	2016	2017
<u>Institute of Biomedicine</u>					
Professors	30	30	29	29	31
Teaching personnel	55	56	55	51	46
Research personnel	105	123	135	132	127
Other personnel	203	189	103	113	104
<u>Dep. of Clinical Medicine</u>					
Professors	61	66	57	59	60
Teaching personnel	81	95	96	89	97
Research personnel	65	66	78	68	73
Other personnel	31	45	52	63	76
Total	631	670	605	604	614

APPENDIX 3. Programme of the site-visits

Evaluation of undergraduate medical education: Programme draft of the site-visits

Date and place:	28 November 2017, 9–16; University of Oulu
	29 November 2017, 10–17; University of Eastern Finland
	13 December 2017, 10–17; University of Tampere
	19 December 2017, 8.30–15.30; University of Turku
	20 December 2017, 9–16; University of Helsinki
09.00–10.30	Interview of the management and teaching staff, 6–8 persons: <ul style="list-style-type: none">management and development of the undergraduate medical education; e.g. programme director, planning officers, year/module leaders, person responsible for quality management.
10.45–12.15	Workshop with the teaching staff, 6–8 persons: <ul style="list-style-type: none">implementation of the undergraduate medical education; e.g. university staff, teachers from health centres and university hospitals.
12.15–13.15	Lunch
13.15–14.45	Workshop with the students and alumni, 8 persons: <ul style="list-style-type: none">students and alumni with different background; e.g. students from different phases of studies without the role in the university’s administrative activities, recently graduated alumni (within 3 years), representative of students’ association.
14.45–15.00	Coffee
15.00–16.00	Interview of the stakeholders, 8 persons: <ul style="list-style-type: none">stakeholders outside the university; e.g. health centres, hospitals, private services, occupational health care, patient organization, hospital district, VALVIRA (only University of Helsinki), Regional State Administrative Agency AVI (person responsible for health care tasks), some other stakeholders important to the university.

APPENDIX 4. Timetable of the evaluation

Phase of the project / action	Date
Information of the evaluation and request to universities to appoint the contact persons	19 September 2016
Appointment of the planning group / Higher Education Evaluation Committee (HEEC)	24 October 2016
Planning of the evaluation and preparing the project plan / Planning group	November 2016 – March 2017
Approval of the project plan / HEEC	13 March 2017
Collection of the curricula summaries from the medical schools	31 March 2017 – 31 May 2017
Appointment of the evaluation team / HEEC	21 April 2017
Self-evaluations of the units providing medical education and students' self-evaluation	15 May 2017 – 30 September 2017
Meeting with the contact persons of the medical schools and student associations (Lääketieteen kandidaattiseurat)	1 June 2017
Seminar for the medical schools, student associations and stakeholders	21 September 2017
Site-visits to the medical schools	28 November 2017, University of Oulu 29 November 2017, University of Eastern Finland 13 December 2017, University of Tampere 19 December 2017, University of Turku 20 December 2017, University of Helsinki
Working seminar with the medical schools and student associations	20 March 2018
Presentation of the results to the Evaluation Council	15 May 2018
Presentation of the results to the HEEC	23 May 2018
Publishing the report in the concluding seminar	15 June 2018
Feedback from the universities and the evaluation team	June 2018

The Finnish Education Evaluation Centre (FINEEC) is an independent, national evaluation agency responsible for the external evaluations of education from early childhood education to higher education in Finland. It implements system and thematic evaluations, learning outcome evaluations and field-specific evaluations. Moreover, FINEEC supports providers of education and training and higher education institutions in matters related to evaluation and quality assurance, as well as advances the evaluation of education.

The first national evaluation of undergraduate medical education in Finland was carried out by FINEEC in 2016-2018. The evaluation covered all five universities that offer the Licentiate Degree in Medicine programme: University of Eastern Finland, University of Helsinki, University of Oulu, University of Tampere and University of Turku.

The evaluation aimed at producing an overall picture on the current state, strengths and challenges of undergraduate medical education, and developing recommendations that reflect the changing competence requirements in doctors' work and their future operating environment.

This report presents the evaluation process and the results of the evaluation of undergraduate medical education in Finland.

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