aaq

schweizerische agentur
für akkreditierung
und qualitätssicherung

agence suisse
d'accréditation et
d'assurance qualité

agenzia svizzera di
accreditamento e
garanzia della qualità

swiss agency of
accreditation and
quality assurance

Quality Audit 2013/14 Ecole Polytechnique Fédérale de Lausanne, EPFL

Final report | 05.06.2015

Preliminary remarks

Completing a Quality Audit is a formal requirement for cantonal universities if they are to continue to be entitled to financial support; i.e. to receive state funding under the Federal Law on Financial Aid to Universities (Universitätsförderungsgesetz, UFG).
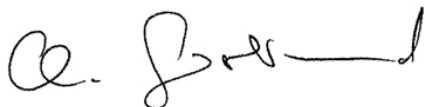
The 2013/14 Quality Audit cycle was the third time that the Swiss Center of Accreditation and Quality Assurance in Higher Education (Organ für Qualitätssicherung und Akkreditierung, OAQ)[1] had conducted Quality Audits at Swiss universities on behalf of the respective department.

These Quality Audits are based on the Quality Assurance Guidelines of the Swiss University Conference (SUC), which define the minimum requirements for quality assurance systems in terms of seven quality standards. To accommodate the different directions and structures of higher education institutions that have developed over time, these standards have been deliberately formulated as open standards. They are designed to answer the question of whether a higher education institution has set up and operates a QA system. Due to their generic nature, they are less suited to assessing the QA system in fine detail.

For the 2013/14 Quality Audit, AAQ and the Q-network of the Rectors' Conference of Swiss Universities have developed a total of 17 quality criteria that differentiate the seven quality standards of the SUC. In the 2013/14 Quality Audit, the expert groups were asked for the first time to assess the quality criteria as 'fulfilled', 'partially fulfilled' or 'not fulfilled'. A system of assessment that is rated at three levels can not necessarily remain clear-cut; however, it serves as guidance for the higher education institutions in respect of their institutional accreditation under the Funding and Coordination of the Higher Education Sector Act (Hochschulförderungs- und -koordinationsgesetz, HFKG).

Since the quality standards have been broken down into the different quality criteria for the purposes of the 2013/14 Quality Audit, a direct comparison with the 2007/08 Quality Audit is not possible.

The expert group reports provide a snapshot of quality assurance at the cantonal universities, and at EPFL (Swiss Federal Institute of Technology Lausanne) and ETH Zürich (Swiss Federal Institute of Technology Zurich), which are also subject to the Quality Audits; they give an overview of the quality assurance systems at the higher education institutions and a summary evaluation of the QA systems in respect of the standards defined in the Quality Assurance Guidelines. The reports do not provide a basis for a qualitative or quantitative comparison between the quality assurance systems of the higher education institutions.

Dr. Christoph Grolimund
Director
AAQ

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[1] On 1st of January 2015, the OAQ became the AAQ, Agency for Accreditation and Quality Assurance. In this document, the new denomination will be used.

Content

1 Result of the Quality Audit at EPFL

The State Secretariat for Education, Research and Innovation (SERI) evaluates Swiss universities periodically as a prerequisite for entitlement to financial support, according to the Federal Law on Financial Aid to Universities (Universitätsförderungsgesetz, UFG)[2].

This report covers the Quality Audit 2013/14 and presents the result of the assessment of the quality standards by the expert group and recommendations for the development of EPFL's quality assurance system.

The expert group mandated by AAQ concludes after the Quality Audit on-site visit that EPFL fulfils 13 out of 17 quality criteria, with four quality criteria partially fulfilled. These are concerned with governance, teaching and recruitment and development of staff.

As related to the standards of the Swiss University Conference (SUC) Quality Assurance Guidelines[3], this means that Standards 1-3 and 7 are fulfilled and Standards 4-6 are partially fulfilled.

EPFL fulfils the requirements according to Article 3 of the Swiss University Conference (SUC) Quality Assurance Guidelines.

The expert group examined implementation of EPFL's quality assurance system in the study programmes and found good compliance with most SUC standards and the study-relevant instruments of EPFL's quality system. Thus, EPFL fulfils in large part the requirements according to Article 4 of the SUC Quality Assurance Guidelines.

The result of this Quality Audit in no case prejudges the results of the institutional accreditation that will replace the Quality Audits after 2015.

2 Quality Audit

In December 2011, the SERI mandated AAQ to plan and conduct the Quality Audit cycle 2013/2014. In 2012, EPFL was invited to select the time slot for the procedure. At a meeting of the Vice-President of EPFL with the Director of AAQ, the EPFL asked AAQ to consider conduct of the Quality Audit as a joint procedure with the French accreditation of each master in engineering delivered by EPFL. AAQ immediately started deliberations with the French *Commission des titres d'ingénieur* (Cti) in order to evaluate the feasibility of a joint procedure.

The objective of a joint procedure was to guarantee the direct implication of all stakeholders, without burdening them in an excessive manner, mainly through the development of formats for a single self-evaluation report, a joint reference framework, a joint group of experts and a single on-site visit. The two agencies, AAQ and Cti, having cooperated for nearly 10 years, found that a joint Audit was possible.

The required plans and documents were prepared and thoroughly discussed at the kick-off meeting at EPFL in December 2013. The agencies agreed with EPFL that the programme in architecture should be evaluated according to the joint reference framework and according to a specific set of programme outcomes.

The joint procedure is presented in Chapters 2.1-2.6.

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[2] SR 414.20 Federal Law on Financial Aid to Universities and Cooperation in Matters Relating to Universities (Universitätsförderungsgesetz, UFG).

[3] SR 414.205.2 Quality Assurance Guidelines of the Swiss University Conference (SUC).

2.1 Group of experts

A joint group of experts was proposed by the two agencies. In order to come to agreement with EPFL about the profiles of experts in the group, a long-list was submitted and discussed at the kick-off meeting. The scientific advisory board of AAQ then confirmed the long-list on 26 February 2014.

The list of potential experts comprised nearly 50 names, plus the names of several potential student experts.

The final group consisted of 13 experts, all with multiple competencies (relating to discipline, institutional management, quality assurance, industry experience), who participated fully in the joint Audit. The group was led by the chairperson appointed by AAQ and the *Rapporteur principal* of Cti, usually referred to as the peer leaders in this report.

The group of experts comprised:

– Prof. Hans Jürgen Prömel, president of TU Darmstadt, Germany (Chairperson AAQ)

– Prof. Jacques Schwartzentruber, French Ministry of Industry, France (*Rapporteur principal* of Cti)

– Jean-Claude Arditti, former director of international relations, Supméca, France

– Dr. Endika Bengoetxea, deputy head of Partnerships Management Unit, European Institute of Innovation and Technology, Budapest, Hungary

– Thomas Dewael, president of the Akademischer Ingenieurverein AIV, ETH Zürich, Switzerland (student expert)

– Dr. François Fleury, professor and researcher, ENSA Lyon, France

– Prof. Anne-Marie Jolly-Desodt, Ecole polytechnique de l'Université d'Orléans, France

– Prof. Guido Langouche, former Vice Rector KU Leuven and former Vice-President NVAO, Belgium

– Raphaël Mathieu, member of BNEI, France (student expert)

– Prof. Dominique Pareau, former director of education, Ecole Centrale Paris, France

– Robert Pelletier, former director, Total, France (industry expert)

– Prof. Pascal Ray, Director of Ecole Nationale Supérieure des Mines de Saint Etienne, France

– Dr. Stéphane Wojcik, ICT Education & Training and Employment Advisor, Agoria, Belgium (industry expert)

Each expert received a specific mandate for both the Quality Audit and the accreditation of programmes in engineering. An expert was mandated to conduct the evaluation of the programme in architecture.

2.2 Schedule

11.12.2013	Kick-off meeting
24.07.2014	Delivery of self-evaluation report
07.10.2014	Preparation for the on-site visit by the expert group

08.10.2014	Preparation for the on-site visit with EPFL management
24-27.11.2014	On-site visit (four full days)
26.01.2015	Preliminary expert report sent to EPFL
25.02.2015	Response statement by EPFL
13.04.2015	Definitive expert report
05.06.2015	Approval by Swiss Accreditation Council

2.3 Self-evaluation report

While preparing for the kick-off meeting in December 2013, EPFL and the two agencies came to an agreement on the plan for the self-evaluation report. The main part of this report consisted of the self-assessment of the quality criteria by EPFL. The set of criteria had been prepared by the two agencies and was delivered to EPFL in the form of a Joint Reference Framework. The EPFL decided to write the report in English and to present additional information in annexes and through web links, either in French or English.

EPFL's Self-Assessment Report is dated 15 July 2014. Henceforth, the report will be referred to as the 'SAR'. It is organised into eight booklets: the main booklet contains the self-assessment of all the criteria applicable to the institution as a whole; seven booklets present the programme self-assessments grouped by school and college. A short guideline for the reader has been added to the electronic version of the reports delivered on a USB stick and through a shared fileserver portal.

The self-assessment was conducted by a project group and closely accompanied by the steering committee, headed by the Dean of Bachelor and Master programmes (Dean Ba/Ma). All stakeholders were represented in the process, including a representative of the senior management, a programme director (*directeur de section*), a professor, a member of the intermediary body, a member of the technical and administrative body, a PhD student and two undergraduate students.

The group of experts acknowledged that the presentation of the self-assessment was a valuable basis for the external evaluation; as an example, the experts agreed that the strengths and weaknesses profile of EPFL was prepared by a thorough SWOC analysis. The experts found that sufficient information was presented in the SAR for most parts of the Joint Reference Framework. They identified some items for which insufficient information was given. In these cases, EPFL provided additional evidence either before the visit or during the appropriate interview session(s) during the on-site visit.

2.4 Preparatory meeting and on-site visit

The preparatory meeting took place on 7 and 8 October 2014 in Lausanne, with the 13 members of the expert group and three representatives of the two agencies. At the beginning of the meeting, Prof. William Pralong from EPFL was invited to present EPFL in its Swiss and global higher education landscape. The experts used the opportunity to clarify some of the open questions concerning EPFL and its organisation. Then the two agencies briefed the expert group by introducing it to the objectives and conditions of the Swiss Quality Audit and the French accreditation procedure.

The structure of the on-site visit was then explained and the different roles of the speaker (leader) and secretary during the interview sessions discussed. In respect to the writing of the reports, the drafting of specific sub-chapters by the experts was discussed and distributed among the group.

The experts sent their feedback on the SAR in a preparation sheet to the peer leaders and the agencies. The main strengths and weaknesses, open questions and missing documents were presented briefly and discussed. A list of data and documents required from EPFL as a complement to the SAR was provided to the peer leaders, along with the main aspects to be discussed with EPFL management at the meeting on 8 October, following the meeting with the experts.

At this meeting, which took place at EPFL, Prof. Prömel and Prof. Schwartzentruber took the opportunity to discuss issues identified during the preparatory meeting among the experts with the Vice-President, Prof. Gillet, and members of the steering committee. The meeting ended with exchanges on some organisational issues related to the on-site visit.

During the on-site visit, scheduled for 24-27 November 2014, the experts participated in interview sessions and internal meetings. Some interviews were attended by the whole group, others by split groups. Interviews were arranged with the management of the institution, with stakeholders closely related to the quality assurance system, with schools and colleges (clustering several teaching programmes) and with the programme director (*directeur de section*) of each engineering programme and the architecture programme.

The experts were able to collect the required evidence for the quality criteria during the interview sessions. They were particularly satisfied with the openness and commitment they experienced with all groups participating in the interview sessions.

The experts also appreciated having access to key documents during the on-site visit. They examined with particular interest the outcome of the peer reviews conducted regularly by each school and college.

During the debriefing session with the senior management, the peer leaders presented the general findings of the expert group on strengths and weaknesses as prepared at their final meeting.

After this, a general debriefing session provided any interested members of EPFL with the findings of the expert group and further development of the procedure.

2.5 Report of the expert group

Two reports have been prepared: one for the Swiss authorities (this report) in English, the other for the French authorities in French.

The Quality Audit report of the expert group follows in chapter 4, the main part of this document. First, the experts evaluate the effect of the recommendations of the last Audit; they then give a general description of the quality assurance system of EPFL and its implementation in the study programmes. Most importantly, they assess the 17 quality criteria to be evaluated in the actual Audit. These criteria are included in Section F of the Joint Reference Framework. The report ends with a conclusion outlining the strengths and weaknesses and giving some recommendations for the further development of EPFL.

The assessment of each quality criterion is based on an analysis and concludes with one out of the three following statements: fulfilled, partially fulfilled or not fulfilled. For some criteria, the assessment of the criterion is completed by a recommendation or a suggestion for further development of the quality assurance system. The assessment of the quality criteria is based on agreement among all members of the expert group.

2.6 Statement of EPFL

The preliminary experts' report was submitted to EPFL in January 2015. EPFL returned its opinion on the assessments and conclusions to the expert group. This statement is available as an appendix at the end of this report. EPFL took the opportunity to comment on some analyses and recommendations in the preliminary report. On the basis of the feedback, the expert panel decided to adapt the report where appropriate.

3 Ecole Polytechnique Fédérale de Lausanne

Ecole Polytechnique Fédérale de Lausanne (EPFL) is a highly dynamic university in technology, natural sciences and architecture. Today, EPFL has a solid position in a very competitive international higher education landscape. In Switzerland, EPFL is one of the two universities in technology under the strategic supervision of the ETH Board. Its national anchorage in (western) Switzerland appears to be very strong.

EPFL consists of five schools and two colleges; all are active in research and offer undergraduate and graduate degree programmes in engineering, sciences, architecture and economics. Some joint programmes are offered in collaboration with other universities, such as the programmes in continuing education with the University of Lausanne. The main campus comprises various facilities for technology transfer and for contact with society at large. An innovation park with 1,600 work places is part of the campus. Other interfaces for technology transfer and external contacts are implemented in several antennae in Switzerland and abroad.

In 2013, nearly 10,000 students were enrolled at EPFL, including doctoral students and participants in continuing education. Half the students were Swiss; the other half came from abroad. In the last decade, the growth of student numbers has exceeded 60%. More than 3,400 staff members work in EPFL laboratories, teaching and central service units, etc. Nearly 3,000 scientific publications were referenced in the Web of Science in 2013, and 76 ERC grants were obtained between 2007 and 2013.

The annual expenditure was reported to be CHF 859 million in 2013, 70% of which is covered by the Swiss Federal budget. External funding sources include research support, project partnerships, sponsorship and public-private partnerships.

The senior management of EPFL consists of the president and four vice-presidents. The Vice-President for Academic Affairs (VPAA) coordinates and supervises the EPFL schools and colleges. School deans, college directors and 'transversal' deans (e.g. the Dean for Ba/Ma teaching, etc.) have predefined duties in running education and research.

Teaching at all levels and the development of an EPFL brand culture have been identified as priorities for development over the next five years. Bearing in mind the growth of student numbers, EPFL is facing important challenges and has reacted to this with the appointment of two new vice-provosts as members of the senior management. The report on the external review (chapter 4) is based on the structure as it is presented in the SAR.

4 External review

4.1 Recommendations from the Quality Audits 2007/08

EPFL's previous Quality Audits are described in the Self-Assessment Report (SAR) at the end of chapter 1, page 12. In contrast to the other cantonal universities and ETH Zürich, which passed a Quality Audit in 2008, AAQ organised two Audits, both jointly with Cti, in 2006 and 2010. In the final report of the first Audit, dated September 2008, AAQ stated that EPFL fulfilled all quality standards. However, it recommended that data analysis should be improved in relation to student cohorts and the use of results of graduate surveys. It also recommended that schools more systematically consider the business environment in relation to the design and update of educational programmes. Finally, it recommended a consolidation of intermediate governance by schools and programmes in order to obtain better coordination among the teaching staff.

In the 2010 report, AAQ analysed the way in which EPFL took account of the recommendations of the previous Audit. The experts mandated by AAQ expressed the view that EPFL had made remarkable progress, in some cases even beyond the recommendations. A dedicated office for the production of educational statistics had been established and graduate surveys conducted on a regular basis. Advisory committees had been installed in order to include the requirements of employers in the redesign of programmes. The position of programme directors (*Directeurs de section*) within the management of schools was recognised and clarified. However, in 2010, the experts recommended that programme directors were provided with proper instruments in order to fully play their key role when implementing the required pedagogic approach in updated or new programmes.

In 2014, programme directors are part of the management board of some schools. The expert group acknowledges this development and suggests an extension of it to other schools and colleges.

Moreover, programme directors are currently trained by CAPE and the Quality office in the introduction of competence-based approaches in planning and revision of the study programmes, a process started in 2011-2012.

4.2 System of quality assurance at EPFL

EPFL's Quality Management System (QMS) was implemented decisively at the first AAQ/Cti Quality Audit of November 2006. The QMS covers all the missions and domains of the institution: management and strategy, education, research, innovation and technology transfer. It is deployed from the level of employees to the whole ETH Domain, of which EPFL is one of six institutions.

The quality assurance strategy is clearly described and documented at all levels of the institution. Continuous quality improvement is administrated by means of many (self-) assessments, surveys and dedicated committees.

Management and strategy are assessed in relation to the mandate given by the ETH Board. Schools and colleges are evaluated by regular external peer reviews (every six years).

Education is assessed by the programme director (*Directeur de section*) based on student evaluations. The programme director is informed by three committees: a teaching committee, an advisory committee and an academic committee.

Programmes are evaluated by both an academic committee and an advisory committee, based on the Campus survey (for bachelor and master students) and conducted every six years. The evaluation now also includes the intended and the acquired learning outcomes. Doctoral

surveys (PhD students), ATMOS surveys (EPFL employees) and alumni surveys are also conducted on a regular basis.

Quality assurance of research is performed both internally and externally. The performance of the Innovation and Technology Transfer department is reported and audited annually. Specific services are evaluated externally by ISO.

Performance of a comprehensive SWOC analysis based on these assessments, results in detailed action plans.

4.3   Implementation of the quality assurance system in the study programmes

From the programmes' self-assessment reports, it seems that the creation and measurement of indicators are derived from different sources, mainly:

–   Campus survey, the last two dating from 2004 and 2011

–   Employability survey, the last covering promotions 2009-2012

–   ATMOS survey, the last two dating from 2004 and 2012

–   Teaching committees

–   Advisory committees

–   Reports of the academic committees, newly formed within the programmes

–   Student evaluations

Indicators such as work load, proximity of students to *conseiller d'études* and key staff, teachers' pedagogical skills, teaching quality, study plans, internships, knowledge of job opportunities, etc. should be the object of retroaction at the programme level. In the self-assessment reports by programmes, there is very little data from these various sources, with no mention of how the data is used for corrective action.

The newly created academic committees should play an important role in quality assurance: according to the SAR, they "ensure that courses introduced in the study plan of the programme meet the objectives of the intended training; establish an annual report for the office of the Dean Ba/Ma containing the findings obtained from the study of the quality of the performed assessment tests, the analysis of exam protocols, the evaluation criteria used in the assessment, the scale of rating of the exams and assessment of the quality of course materials; develop a set of recommendations to improve any weaknesses found in the structure or teaching methods of the curriculum".

In their reports, most programmes refer to that committee, but exclusively regarding tests and exams and their ability to assess acquisition of learning outcomes and competencies. During the on-site visit, the expert group consulted academic committee reports and found some examples that demonstrated the proper functioning of such committees. In the physics programme, the academic committee prepared an extensive report on the revision of five courses, one of which was considered problematic in the student evaluation.

The unique question for the indicative evaluation of each course gives limited information and no global vision. It seems the programmes have poor visibility in the general coherence of the degree courses as a whole and its perception by students. A number of weak points emerge from the Campus and ATMOS reports, but the related indicators may be difficult to use in practice (utility of SHS courses, lack of teamwork among professors, lack of links between courses).

The teaching committees thus have an important role in identifying opportunities for progression at the level of global degree course coherence. Apart from the organised, traceable and statically compiled indicators, these committees rely on the informal feedback of their members.

4.4 Analysis of the quality criteria of the Quality Audits 2013/14

Area 1: Quality assurance strategy

> **Criterion 1.1**
>
> *"The university defines its quality assurance strategy and communicates it publicly. This strategy includes the guidelines to a quality assurance system whose objective is to ensure and continually improve the quality of university activities, as well as to promote the development of a quality culture."*

Analysis

EPFL has implemented a strong and comprehensive Quality Management System (QMS) that covers all the missions and activities of the institution. The QMS is divided into two major sections:

– Common standards (self-assessment documents, audit reports, remedial actions since the 2006 AAQ/Cti audit).

– Internal quality assurance at all levels of the ETH Domain (regular external evaluation of the schools and colleges). A clear and structured distribution of tasks between the ETH Board and the management of the institution has been defined and demonstrates a strong management involvement in the continuous improvement of quality.

EPFL strategy and projects are presented annually during the DIALOG session. Audit reports are not published, but the audit results are communicated to employees directly by the dean of the schools after they have been discussed with EPFL management and the ETH Board.

In-depth global SWOC analysis is implemented at school level and a detailed action plan is described.

QMS contents, processes and procedures are in principle accessible to everybody concerned through the EPFL's website. However, some parts of the QMS may not reach all stakeholders. During the site visit, members of EPFL, and in particular students, stated that they were well acquainted with the QMS.

Conclusion

A quality assurance strategy is clearly present at the level of the university management. It is accessible to everybody concerned and the fact that people appear to be very familiar with the quality procedures demonstrates that it can be described as a quality culture.

Criterion 1.1 is fulfilled.

Criterion 1.2

"The quality assurance system includes the following areas: Management, teaching and research as well as the related services and resources."

Analysis

EPFL's QMS covers the following areas: management and strategy, education, research, resources management and innovation and technology transfer.

The quality assurance in management and strategy is subject to reporting and debate between the senior management of EPFL and the ETH Board, in particular at the annual DIALOG day, and is followed by possible remedial action at a strategic level.

The monitoring of quality cases, in particular in education, is the responsibility of the Quality Delegate who reports directly to the Vice-President of Academic Affairs.

The quality system for education is supported by the student satisfaction survey and three committees: a teaching committee (teacher involvement in challenges and opportunities in educational services), an advisory committee (provision of advice from the labour market) and an academic committee (responsible for verification of the quality of courses and examinations).

Continuous monitoring of research activities is performed by means of annual reporting of school deans, dean of research, school audits and remedial actions. EPFL's central Research Office produces a confidential document every year addressed to EPFL senior management, which evaluates the different indicators for the quality of research at EPFL.

Several certifications and accreditations are granted to laboratories and EPFL units (ISO 17025, SPF, ISO 9001, ISO 14001, ISO 20121, etc.) and demonstrate a strong commitment to quality processes at all institutional levels.

Conclusion

EPFL has implemented a strong and comprehensive QMS that provides all required information for the support of continuous quality improvement.

Criterion 1.2 is fulfilled.

Criterion 1.3

"The quality assurance processes are defined and provide for the participation of all members of the university and especially the students. The responsibilities for quality and quality assurance are assigned clearly and transparently."

Analysis

The quality assurance processes are well defined, well documented and include the participation of students (including PhD students) and EPFL employees. Dedicated questionnaires, validated by EPFL management, comprise:

– The Campus II survey (2011/2012), which surveyed bachelor and master students. The results are globally positive (unsatisfied respondents below 3%) and show a significant improvement in student satisfaction.

- The Doctoral II survey (2012) for PhD students. Although it showed a slight decrease (-5%) in student satisfaction compared with the 2005 survey, the results are globally positive.

- The ATMOS II survey is dedicated to EPFL employees. The involvement and satisfaction of the employees and co-workers, particularly professors, are very good.

Investigative reports and proposed corrective actions are validated by the EPFL management and presented to the ETH Domain during the DIALOG meetings. Corrective actions are monitored by the deans (Campus and Doctoral survey) and by an ad-hoc committee for the ATMOS survey.

Other EPFL units and departments also execute specific surveys (Career Center, Educational Affairs, AGEPoly, etc.)

Management decisions concerning corrective actions are communicated internally through meetings, committees, assemblies and newsletters. Student opinion is discussed with various bodies of the governance. Intermediate bodies and students associations could be strengthened in their communication skills, in order to improve their role as opinion builder.

Although external stakeholders participate to a large extent in the management system of EPFL, the employer's feedback is occasionally limited due to the lack of effectiveness of some advisory boards.

Conclusion

EPFL has a very good Quality Management System (QMS), which is well understood in all parts of the institution. The responsibilities for quality and quality assurance are assigned clearly and transparently.

Considering that students and intermediate bodies already contribute to the decision processes, experts suggest improving their capacity and continuity in opinion building and communication, in order to increase the transparency of the decision making process for all relevant stakeholders. In addition, detailed employer satisfaction surveys could be strengthened.

Criterion 1.3 is fulfilled.

Area 2: Governance

> **Criterion 2.1**
>
> *"The quality assurance system is an integral part of the overall strategy of the university and supports its development."*

Analysis

EPFL has a quality assurance system that covers all areas from the top management to faculty collaborators; it indicates the levels of responsibility and the roles of each around a quality assurance system that appears to balance strategic and operational aspects in a coherent manner. This quality assurance system appears to be sound and EPFL has internalised institutionally and actively promotes a culture of quality assurance.

Currently, EPFL is structured along five schools, two colleges, seven interdisciplinary centres, 26 institutes and more than 300 laboratories/research groups. This complex environment demands a challenging leadership of the presidential governance system. EPFL has

demonstrated that it can deliver successfully in the different areas of education, research and societal outreach. Proof of this is its reputation in all these areas, exemplified by its high position in international rankings. The accreditation and quality management is located high in EPFL's organisational chart and is closely related to the Vice-President for Academic Affairs, ensuring that the quality assurance system is at the core of decision making at EPFL.

An illustrative example of the capacity of EPFL governance to implement strategic decisions is the current policy of enforcement of the learning outcome approach in education. Although it may not have achieved all expectations, it shows that EPFL management can internalise gradually at the different EPFL constituencies that challenge decisions.

The global strategy is also illustrated in EPFL's strategic development plan 2012-2016, which indicates the priority areas of action in education, research and societal outreach aspects. This appears to be the result of an internal institutional reflection in which EPFL managers had sufficient information to take strategic decisions. Educational strategic aspects and targets are convincingly explained and addressed, while the explanation of the choice for the research action lines is less explanatory and seems to have been adopted through a bottom-up approach, but appears to be sound.

Conclusion

EPFL has a quality assurance system in place that serves as a strategic tool to provide management with valuable information to support decision-making.

Criterion 2.1 is fulfilled.

Criterion 2.2

"The quality assurance system contributes in a systematic manner to the provision of relevant and current quantitative and qualitative information on which the university can base its strategic decisions (especially with respect to research, study programmes, the appointment and promotion of academic staff). "

Analysis

The central management at EPFL has established a robust system and methodology within the institutional quality assurance system to provide information in a systematic manner. This information is relevant in the support of decision making at different management levels. The institutional organisation and management structure provides different channels for the voice of students, alumni and employers. Furthermore, a strategic advisory board, consisting of external stakeholders, provides a voice for large projects and attracts funds, complementing the information of decision makers.

In the area of education, information is facilitated by a dedicated office at institutional level for educational statistics, which provides regular information to the schools in terms of follow-up of alumni and employer satisfaction surveys. This is a centralised system that needs to be complemented with other information at school and programme level; some schools complement it occasionally with ad-hoc surveys.

Schools also have advisory committees/boards where relevant industry (and in some cases academic) representatives provide input that can be useful for decision making (e.g. to analyse whether educational objectives match the needs of a variable job market). However, not all EPFL schools implement these mechanisms and they have very different approaches: although some schools have different advisory committees at programme level or include other stakeholders in the advisory board, such as venture capital representatives, there are also

cases where the advisory boards of some schools or programmes have not been active in years.

Alumni are considered an important source of information for EPFL schools and programmes; notably, those study programmes that were launched recently pay special attention to following up the careers of their alumni very closely by implementing measures at school or programme level. In the different schools, the relevance of alumni feedback is recognised, although in many programmes there are no formal mechanisms for this purpose and feedback is provided through informal channels.

Research activity and EPFL strategic actions are similarly monitored and a report is generated annually. Research excellence is the leading figure in promoting researchers independently from their research area. EPFL management analyses the performance of different research areas periodically and identifies potential new research areas where EPFL management might be interested in investing resources or recruiting new staff in the future.

The most relevant information from EPFL's QMS is reflected in a SWOC analysis at institutional and programme levels, providing a means for quality improvement and corrective actions if necessary. Systematic benchmarking versus potentially competing programmes could be included in the SWOC analysis.

The same type of analysis is also done at human resource level to support decision-making and align resources and logistics around the main missions of the institution. EPFL's 2012-2016 development plan is a good example of how this information system and the SWOC analysis serves their purpose at institutional decision making, identifying areas where EPFL is already strong and proposing alliances in other strategic areas. This plan covers key higher educational strategic areas in terms of teaching quality, research, knowledge transfer, internationalisation and regional engagement.

EPFL has a presidential governance system that gives the institution a large degree of autonomy in its strategy planning and implementation of the required measures to adapt to the environmental changes where EPFL operates.

However, it should be noted that EPFL does not have sufficient autonomy to make decisions on the admission of Swiss students (i.e. Swiss *maturité* students). This lack of autonomy is due to Swiss legislation and thus not attributable to EPFL, but is a challenge to the institution due to the high increase of bachelor students in recent years, which puts a strain on the quality of the institution's services. The maximum capacity of 10,000 students has not yet been reached at EPFL, but the dramatic increase in the number of students has already created some issues of concern. The institutional quality management system should follow up closely this issue, in order to support managers and anticipate potential problems.

Conclusion

EPFL's Quality Management System provides relevant information for informed decision making of managers.

It is recommended that existing forecast of space and personnel requirements for current and future numbers of students and young scientists be included in the QMS.

As another recommendation, all schools should ensure that they use their advisory boards and alumni surveys as a basis for their strategic decisions.

Criterion 2.2 is partially fulfilled.

Criterion 2.3

"The university shall promote and evaluate equal opportunities and gender equality."

Analysis

Concerning gender equality, EPFL promotes programmes encouraging girls to choose careers in engineering. Moreover, EPFL secures balanced career prospects and family support. Besides specific regulations (such as maternity leave support for tenure track assistant professors), the EPFL has an equal opportunities office, which has put in place various actions to ensure that EPFL is perceived as a family and women-friendly work environment. EPFL has defined a clear strategy, such as the proportion of women in science at EPFL at the different academic levels and the proportion of women executives at EPFL. Actually, 27 % of tenure track assistant professors are female, against 6 % in 2002. Specific mechanisms are proposed to balance career prospects and family support, and improve work conditions for women; day-care and children's holiday activities are among the most valuable actions for them.

Most of the reported measures can also be found in the mainstream of other European technical universities. The equal opportunities office could be further supported in order to put in place even more innovative approaches, so that EPFL becomes a role model in this field.

As for other equal opportunity actions, EPFL has in place services to support disabled students, such as the elimination of physical obstacles and changes in the format of examinations, which are handled on a case-by-case basis. As a social and financial support, EPFL can assign a number of grants to students whose financial resources are particularly limited.

Conclusion

EPFL has in place a strategy to promote equal opportunities with a main focus on gender equality. Despite the positive progress, continuous monitoring of gender indicators should be thoroughly pursued and support for the equal opportunities office maintained.

Criterion 2.3 is fulfilled.

Area 3: Teaching

Criterion 3.1

"The quality assurance system provides for the periodic evaluation of teaching and its related services. The quality assurance processes include the periodic review of courses, study levels and degree courses, as well as to the results of teaching."

Analysis

The regular evaluation of all courses is fully and efficiently implemented in all programmes and remedial actions are taken on that basis. The main requirements for the efficiency of the course evaluation system are the participation of students and the interest of teachers.

Beyond evaluation at the course level, the coherence of the degree curriculums and their ability to meet the aimed competences are part of the quality evaluation, although these descriptors are less formalised.

Each programme has a teaching committee (which includes students) and an academic committee, recently introduced. From the minutes of these committees, it can be said that quality issues are effectively addressed and discussed at the course and degree level.

In some instances, the assessment methods and consistency of the course programme are addressed. In the advisory committee, the expected profiles are discussed; however, in some programmes, advisory committees are not yet functioning or do not meet frequently enough.

The stakeholders of the periodic evaluation of teaching and its related services are identified: students, teachers, programme directors, employers and external experts, mainly through three committees (in some documents, these are referred to as commissions or boards) and evaluation by students. The central internship services are evaluated periodically, but not those provided by the schools.

Other, less frequent surveys contribute to measurement of teaching quality, such as Campus and ATMOS surveys. A survey of the services related to teaching (for example, mobility office, library, etc.) is organised annually.

The stakeholders who decide, implement and follow remedial actions concerning teaching *stricto sensu* are less well defined and distributed to very different commissions – from the professors themselves to recruitment commissions, for example. This also concerns issues where remedial actions need to come from several committees outside the evaluated programme, such as integration of SHS courses in the curricula or mathematics at bachelor level. The QMS does not contain an explicit mechanism to address this in an effective manner.

All teachers have access to a central coaching service (CAPE) that supports teachers willing to improve the quality of their courses and which helps to solve issues detected by the course evaluation system. This service is assessed systematically by the supported teachers and evaluated by the university. However, the subsequent processes are not formulated explicitly.

Conclusion

Criterion 3.1 is fulfilled without doubt at the individual course level, mainly through student evaluation. At the semester, year and programme level, the stakeholders of the periodic reviews are well defined and their observation fields overlap, but the scope of the reviews are less clear.

The full implementation of the academic committee, as defined in the SAR (ensure that courses meet the objectives of the intended training; study of the quality of the performed assessment tests, analysis of exam protocols, evaluation criteria used in the assessment, scale of rating of the exams and assessment of the quality of course materials; develop a set of recommendations to improve weaknesses found in the structure or teaching methods of the curriculum), is not executed in every programme. For most programmes, these missions are fulfilled only partially by the academic committee.

It is recommended that surveys similar to that implemented at the course level be also devised for other strategic curriculum structures (coherent groups of courses, branches, semesters, etc.)

As another recommendation, involvement of other stakeholders, namely potential employers, should be enhanced in programmes where this is still sub-critical.

Criterion 3.1 is partially fulfilled.

Criterion 3.2

"The methods used for assessing the performance of students are to be reviewed periodically."

Analysis

Various methods are used to evaluate student performance and changes occur from time to time. Until recently, no explicit, systematic or periodic assessment of these methods was formally organised. This is part of the newly created academic committees' responsibilities, which provides an annual report to the office of the Dean Ba/Ma.

With the effort made by EPFL to explicitly describe learning outcomes related to each course, it has the tools to define with more relevance the concept of student performance. For specific skills, such as transverse, soft or research skills, the teaching support center (CAPE) has the competence to propose alternatives for student performance evaluation.

This is already the case for a number of programmes in which the academic committee includes a member of CAPE.

The evaluation of internships is standardised across the different programmes through common criteria. It follows that assessment of internships is not included in the review by the academic committee.

On the other hand, general instructions, common to all programmes, on the evaluation of research skills or the master thesis, could be made available to and acquainted with all involved parties.

The skills related to research are developed according to the programmes and in close relation with the requirements of further PhD studies. They are developed mainly in lab projects, lab internships and master theses.

The related learning outcomes are described very clearly for all these activities. But the evaluation of students is not clearly detailed and seems to depend strongly on the activity and the associated teachers.

Conclusion

Criterion 3.2 is partially fulfilled

EPFL is on track to soon fulfil the criterion.

It is recommended that the academic committees rely strongly on the effort still under way towards clarification of learning outcomes and consistency with target skills and competencies. The teaching support center should be regularly involved in the analysis of student performance evaluation methods.

It is suggested that every academic committee includes a representative of CAPE.

As another suggestion, EPFL could work on explicit transverse skills, reflecting the identity of the EPFL engineer, architect or scientist to be assessed by harmonised criteria (and/or methods) across the programmes.

Criterion 3.3

"The university has sufficient and suitable resources and infrastructures to support the learning process of students. It re-evaluates such resources and infrastructures periodically."

Analysis

The periodic evaluation of resources and infrastructure has been conducted in Campus and ATMOS surveys every seven or eight years. No other periodic evaluation is explicitly mentioned. It is stated that the evaluation is not periodic, but constant.

Evaluation seems rather to be linked to strategic decisions related to the increase in student numbers. A forecast for the number of teachers and classrooms needed to meet an increase in the number of students to 10,000 was done recently (March and November 2013).

The global amount of resources (working spaces, number of teachers, overall cost) per student is well known and analysed. The suitability of working spaces is addressed mainly at the programme level, closer to the specific needs of the various teaching activities. The conference of the directors of programmes is the appropriate level for collection and establishment of priorities. As an example, the decision has been taken to give priority to teaching laboratories, rather than to increase auditorium capacity.

Conclusion

Although the cost per student cannot be precisely established, it can be said that the global level of resources per student is high and certainly sufficient.

Central services (library, career center, internal communication, support of student associations etc.) appear to be at a high level.

Nevertheless, due to rapid growth in the last decade, student representatives have reported a shortage of lecture halls, laboratory stations and study rooms. This leads to major challenges regarding the organisation of courses for teachers. In particular, practical courses in laboratories stand to lose in quality because of the higher student-teacher ratio. EPFL is aware of this issue and plans to increase the capacity of the university to an upper limit of 10,000 students.

Resources also include teaching staff and the research environment. Due to the excellent quality of its researchers, EPFL students have the opportunity to be in close contact with the best advances in research. In most programmes, students are in continuous contact with teaching assistants, who are mostly PhD students. They are involved in lab activities and projects in which they can work on up-to-date research equipment. As a result, in most programmes the students are well prepared and motivated for further PhD studies.

The teaching staff can rely on the teaching support center (CAPE) to enhance their pedagogical skills and better understand the mechanisms of the student learning process.

Criterion 3.3 is fulfilled

Area 4: Research

Criterion 4.1

"The university has quality assurance processes for its research activities and related services."

Analysis

Research excellence is clearly a major priority of the EPFL senior management and many processes are in place for this purpose. Several important aspects are considered, such as research activities, doctoral programmes, human resources involved in research and impact of research on education.

Excellence is the leading figure in hiring and promoting researchers independently from their research area. Strategic research areas of EPFL are incentivised by additional means.

The quality assurance is performed both internally and externally and is supported by the EPFL Research Office, in close cooperation with school and college management. Internal and external stakeholders participate at many levels, such as satisfaction surveys, advisory committees and strategic advice from faculty members to the EPFL management.

Different tools are available, including external evaluation of research (peer review), global evaluation of schools and colleges regarding research, a specific quality system for doctoral studies that ensure the quality of recruitment and research activities, a specific recruitment process for hiring faculty members at the highest level for research, and a continuous evaluation process of faculty members. The process is generally complete with communication, improvement and return of experience.

As for the impact of research on education, the quality assurance of the bachelor and master programmes deals with specific teaching activities (lab activities, projects, internships) and their roles in acquiring specific skills related to research. The related learning outcomes are well described; however, the student evaluation depends on the programmes, as pointed out in Criterion 3.2.

As another sign of its research quality, EPFL promotes an open innovation process for capitalisation of its research. A specific vice-presidency for innovation and transfer offers all the tools necessary for the transfer of knowledge and technology. The links with entrepreneurship and the partnerships with SMEs and large companies are strongly encouraged and evaluated on a yearly basis.

Conclusion

Research excellence is at the heart of EPFL's strategy. The EPFL senior management has at its disposal efficient tools for continuous progress, such as indicators of research excellence for hiring and promoting researchers, quality systems for doctoral programmes and surveys for innovation and entrepreneurship quality. The role of research in education is part of the quality system of teaching, with specific learning outcomes and evaluations.

Criterion 4.1 is fulfilled.

Criterion 4.2

"The quality assurance processes include the periodic evaluation of results in the field of research."

Analysis

Numerous periodic evaluations give useful indicators for management at different levels:

– Specific quality assurance of research regarding external indicators: number of papers in peer review journals, international ranking, funding by external agencies (international, European, national, etc.) on an annual basis

– Global periodic evaluation of the schools and colleges (every four to six years), including for research: mission and objectives, human and financial resources, collaborations (national, international, interdisciplinary), ranking in the international scientific community, doctoral studies

– Regular evaluation of PhD students during their doctoral studies; periodic surveys on PhD student satisfaction

– Periodic faculty member and employee satisfaction surveys

– Periodic faculty member evaluation

– Innovation and transfer: annual report of the vice-president; external evaluation in the near future

Evaluation of schools and colleges appears to be a very well planned process, conducted by internationally high-ranking peers.

Conclusion

The EPFL Research Office receives all the results on research quality and there is at least one discussion per year with senior management and school deans; however, the consequences of the evaluations are not clearly described in the Quality Management System.

It is suggested that the results gained from school evaluations (peer reviews, etc.) could also be provided to experts engaged in the institutional or teaching evaluations that follow, in order to ensure a comprehensive analysis during every evaluation process.

Criterion 4.2 is fulfilled.

Area 5: Recruitment and development of staff

Criterion 5.1

"The university has mechanisms which ensure the qualification of all employees in the areas of teaching and research (recruitment, promotion, training)."

Analysis

Staff recruitment and training policy is an integral aspect of the institutional improvement strategy. EPFL focuses on high-level staff not making a distinction between aspects such as nationality, which makes EPFL a very attractive institution for high quality professors and researchers. EPFL's recruitment policy of professors at the highest level is an important asset,

but its capacity to attract talent is also explained by its ability to adapt rapidly to a highly changeable international environment.

All employees are appointed on the basis of a specification through a competitive procedure. Theoretically, all EPFL employees have an annual qualification review in which their performance, competencies and training requirements to improve or gain skills are discussed. However, in reality this annual assessment is available only for permanent staff and even for those it is voluntary. The ATMOS staff survey showed that not all employees have an annual qualification review. An annual qualification review (setting annual goals) is implemented only in units where a trained person is available: 77% of respondents to the ATMOS survey had had such a review (85% in the central administrative services).

Scientists and faculty members participate in seminars, colloquium, conferences and symposia to update their knowledge in their areas of research.

The group of experts received testimonies from EPFL staff that reported that when a head of a research group leaves EPFL, the future of the rest of the group is compromised. Different outcomes of this type of experience were reported during the interview. The institutional policy should be clarified and communicated in an appropriate manner to EPFL staff.

Conclusion

EPFL has in place a highly competitive procedure to ensure the quality of recruitment and which has been proven in the selection of high quality professors.

Recommendation: EPFL should put in practice a formal procedure that provides all EPFL staff levels and categories with an annual review or with an equivalent academic review.

Recommendation: School deans and college directors should report regularly to EPFL senior management the outcomes of situations in which members of a research group remain after the departure of the head of the research group.

Criterion 5.1 is partially fulfilled

Criterion 5.2
"The quality assurance processes include the periodic evaluation of the teaching staff."

Analysis

Any promotion of an EPFL member of teaching staff takes into account an educational file including the list of given courses and their evaluation by students; this file is accompanied by a letter from the programme director giving their opinion on the candidate's contribution to educational quality. The faculty can benefit from the support of pedagogical courses and seminars organised by CAPE and personalised assistance in case of a sub-critical teaching assessment.

Teachers are well aware of the services offered by CAPE and the on-site visit evidenced that they are well appreciated by EPFL staff. Teaching support services are provided mainly to teachers on a voluntary basis; the training in cases of sub-critical teaching assessments is only a small part of the services provided by CAPE.

The institutional strategic approach is to gradually increase the importance of the teaching quality of staff for hiring purposes. However, the current procedure appears to be based on

research performance rather than on teaching quality. Experts suggest that a pedagogical expert should be included in the hiring process to enforce this policy.

Conclusion

EPFL's Quality Management System performs a periodic review of the performance of teaching staff.

The institutional strategic priority on enhancement of educational quality in recruitment processes has not yet resulted in a strengthening of the teacher support service.

Criterion 5.2 is fulfilled

Criterion 5.3

"The university promotes the career planning of young academics."

Analysis

EPFL has in place a tenure track system for young academics that is highly competitive and which aims to make permanent only those staff that demonstrates an excellent track record. In cases where young academics do not achieve expectations during this period, an extra year is granted to facilitate their search for external positions. In addition, EPFL promotes awards both for good teachers and good researchers.

According to the SAR, the principle of mobility starting with fixed terms contracts prevails, particularly for young researchers. Internal mobility remains limited as illustrated by the score of 3.3 out of 6 for prospects of promotion, mobility and dynamic and challenging careers: the position of "Maîtres d'enseignement et de recherche" is not a real evolution and the creation of teaching pools for senior scientists remains a delicate issue.

In specific situations, young academics (post-docs, etc.) could be encouraged to involve themselves in teaching activities in order to become better qualified for positions in or outside EPFL.

Conclusion

EPFL has a highly competitive tenure track system for young academics that has proven to be a good mechanism for academics who excel, although it should be strengthened by offering more facilities for mobility and more options for career development outside EPFL for those who do not succeed as expected.

In its statement on the preliminary experts' report, EPFL provided additional information on career opportunities offered to young academics. On this basis experts suggest that EPFL could consider reinforcing support for young academics who fail to achieve tenure track expectations. As another suggestion EPFL could provide more career development prospects to post-docs, for example by allowing them to obtain experience in teaching activities.

Criterion 5.3 is fulfilled

Area 6: Internal and external communication

Criterion 6.1

"The university ensures that the regulations of the quality assurance processes are known to the staff and the students."

Analysis

The quality assurance processes are communicated orally to all stakeholders on different occasions and can be found on the web.

All students know about the course evaluation system and most of them know which processes are put in motion after teaching evaluations, in particular the 'smoke detector'. The delegates have a good global vision of the whole process that they try to share with other students.

The university staffs has a comprehensive knowledge and culture of the quality assurance processes and appreciate the recommendations that accompany the evaluation results, stating that they contribute greatly to an improvement of their efficiency and quality of work.

AGEPoly representatives report that they have a good connection with students, allowing them to spread relevant information concerning the QMS. However, they are aware that some students are more difficult to integrate; for example, students entering at master level.

Conclusion

Quality Assurance processes are well communicated and known by all interested stakeholders.

Criterion 6.1 is fulfilled

Criterion 6.2

"The university shall ensure transparent reporting on the processes and results of quality assurance measures to the groups concerned within the university."

Analysis

Results of EPFL surveys are published in the monthly EPFL journal (Flash) and presented in many seminars. The results of the mid-semester teaching evaluations ('smoke detector' evaluation) are presented to the students. The publication of comments is optional; the decision remains with the teacher.

A small number of students state that the outcome of meetings with the faculties, schools and management (for example, school assemblies or teaching committees) are not always well communicated to the broader mass of students. It seems that delegates find it difficult to forward information concerning the quality assurance processes to their colleagues due to a lack of interest.

Conclusion

Transparent reporting on the processes and results.

Encouragement of the involved students and provision of time for them to distribute information about actions resulting from quality assurance processes more systematically could be a small additional improvement.

Criterion 6.2 is fulfilled

Criterion 6.3

"Periodically, the university publishes objective information about its study programmes and conferred academic degrees."

Analysis

All information about the study programmes are available on the respective school websites and brochures. A service called Study Promotion Service was created in 2012 in order to develop dedicated portals specifically for the public. The website gives access to video clips for some programmes, and career prospects are explained to potential future students.

Students know the learning outcomes of their programme, since these are made available in the course description files. However, this information has been added too recently to know how useful it is for students.

Conclusion

Objective information on study programmes and academic degrees is provided by various means in a very effective manner. All involved parties are asked to define promotional objectives for bachelor, master and doctoral programmes.

Criterion 6.3 is fulfilled

4.5 Conclusion: strength/weakness profile of EPFL

Based on the arguments resulting from the analysis conducted in Chapter 4.4, and recalling the excellent overall quality of EPFL, the expert group provided recommendations for further developments, listed here for better visibility:

Recommendations concerning governance:

– It is <u>recommended</u> that existing forecast of space and personnel requirements for current and future numbers of students and young scientists be included in the QMS.

– As another <u>recommendation</u>, all schools should ensure that they use their advisory boards and alumni surveys as a basis for their strategic decisions.

Recommendations concerning teaching:

– It is <u>recommended</u> that surveys similar to that implemented at the course level be also devised for other strategic curriculum structures (coherent groups of courses, branches, semesters, etc.)

– As another <u>recommendation</u>, involvement of other stakeholders, namely potential employers, should be enhanced in programmes where this is still sub-critical.

- It is <u>recommended</u> that the academic committees rely strongly on the effort still under way towards clarification of learning outcomes and consistency with target skills and competencies. The teaching support center should be regularly involved in the analysis of student performance evaluation methods.

Recommendations concerning recruitment and development of staff:

- EPFL should put in practice a formal procedure that provides all EPFL staff levels and categories with an annual review or with an equivalent academic review.

- School deans and college directors should report regularly to EPFL senior management the outcomes of situations in which members of a research group remain after the departure of the head of the research group.

To conclude this report, the expert group provides an overall judgement of EPFL with respect to quality assurance, presented as a strength and weakness profile of the institution.

The group of experts agreed on the excellent conditions offered by EPFL to its students, teachers, researchers and employees, as well as the very positive impact on external stakeholders, partners and society at large. They became aware that EPFL was constantly moving forward, addressing new challenges and adapting very rapidly to changing boundary conditions.

The experts gained insight through the excellent written documentation and the open attitude demonstrated by all interviewees during the on-site visit. These were ideal conditions in which to identify the strengths and weaknesses of EPFL as summarised in this chapter.

EPFL has a very good Quality Management System (QMS), which is well understood through all areas of the institution. The QMS is implemented with the full support of EPFL's senior management.

The institution has a visionary and strong leadership. The availability of resources, both financial and human, is very positive for the functioning and further development of EPFL. Even though communication was found to be very good, the experts felt that internal communication with all involved parties/stakeholders could be improved in some cases; for example, members of the intermediate body reported that they did not clearly understand how the priority given to educational excellence was to be implemented. Also, the process of internal allocation of resources could be made more transparent and related information could circulate earlier.

The experts recognised the presence of a general quality culture at EPFL, linked with a good involvement of all interest groups in the QMS. Excellent staff is employed at all levels, from faculty members to service units. A certain discrepancy between procedures and actual implementation of the regular evaluation of permanent staff was identified as a shortcoming; adequate information to concerned persons could help. Good implementation of projects that promote equal opportunities was noted. However, the experts found that EPFL could improve its commitment in order to become a role model in this field.

A very good evaluation system of research, consisting of regular peer reviews, is in place and strong initiatives in knowledge transfer were in evidence. Nonetheless, some overlap could probably be avoided in evaluation procedures by the provision of results gained from peer reviews to experts engaged in following institutional or teaching evaluations, in order to ensure a comprehensive analysis in every evaluation process.

EPFL is very strong in the construction and maintenance of external partnerships. The selectivity and quality of international and national academic partners is very positive. Nevertheless, outbound mobility of students still seems to be a weak point in some study

programmes.   Although there are some examples of very good industrial partnerships, a shortcoming was that some of the advisory committees of programmes or schools did not appear to work properly.

The course evaluation by students turned out to be one of the strong elements of the QMS. As in research evaluation, a complete quality circle with evaluation and improvement is in place. The openness of EPFL to new teaching methods and the quality of educational equipment were rated very positively, and a high quality and support of student life was recognised. On the other hand, there is uneven implementation and empowerment of learning outcomes when it comes to preparation and analysis of the study programme structure (coherent groups of courses, branches, semesters, etc.).

EPFL professors and external partners, mainly from the University of Lausanne, provide an extensive service in Humanities, considered one of EPFL's strengths, but their integration in scientific and technical learning activities could be improved.

The existing student selection process appears to be very efficient, particularly the admission policy at master level. Student admission at bachelor level, which is open for holders of an appropriate Swiss degree, remains a concern of which EPFL management is well aware. Students reported that in some cases they were not able to find enough study places or auditoria seats. As another concern, an increasing teaching load in basic sciences has been mentioned. Student services are also experiencing an increased workload; until now they have been able to cope by implementing more efficient processes.

The expert group found a generally good level of employment at master level, and it turned out that the EPFL doctorate is well received by industry. The counselling by the student services could be more programme-specific. The career prospects of young scientists are reported to be very positive. In some cases, a solid track record in teaching could improve the chances of progression for post-docs and other scientists.

5 Appendices

Equivalence table: Quality criteria of the Q-network – SUC quality standards

Quality criteria of the Q-network	Quality standard of the SUC
I. Quality assurance strategy	
1.1: fulfilled	Standard 1
1.2: fulfilled	Standard 2 (Part 1)
1.3: fulfilled	Standard 3 (Part 1+3)
II. Governance	
2.1: fulfilled	Standard 2 (Part 2)
2.2: partially fulfilled	Standard 6
2.3: fulfilled	Standard 4 (Equality part)
	Standard 5 (Part 3)
III. Teaching	
3.1: partially fulfilled	Standard 4
3.2: partially fulfilled	Standard 4
3.3: fulfilled	Standard 4
IV. Research	
4.1: fulfilled	Standard 4
4.2: fulfilled	Standard 4
V. Recruitment and development of staff	
5.1: partially fulfilled	Standard 5 (Part 1)
5.2: fulfilled	Standard 4
5.3: fulfilled	Standard 5 (Part 2)
VI. Internal and external communication	
6.1: fulfilled	Standard 3 (Part 2)
6.2: fulfilled	Standard 7 (Part 1)
6.3: fulfilled	Standard 7 (Part 2)

Quality standard of the SUC	Quality criteria of the Q-network
Standard 1	1.1
Standard 2	1.2, 2.1
Standard 3	1.3, 6.1
Standard 4	2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 5.2
Standard 5	2.3, 5.1, 5.3
Standard 6	2.2
Standard 7	6.2, 6.3

Statement of EPFL concerning the expert report

First of all, the general management of EPFL thanks the AAQ and the Cti accreditation agencies for their thorough examination of the quality assurance both at the institutional and teaching programs level during their visit in Lausanne last November. We are convinced that valuable points were raised by the expert panel. EPFL consider them as central in the elaboration of its strategy and action plan for its continuous improvement in quality necessary for its future development.

Here are our position and comments on the evaluations and conclusions appearing in the preliminary report transmitted to us by the AAQ:

Criterion 1.3 (page 10)

"The quality assurance processes are defined and provide for the participation of all members of the university and especially the students. The responsibilities for quality and quality assurance are assigned clearly and transparently."

• **Management decisions concerning corrective actions are communicated internally through meetings, committees, assemblies and newsletters. Student opinion is discussed, but not always taken into account. Intermediate bodies and students are not always included in discussion processes.**

The SMQ believes that this statement should be reformulated with a different perspective knowing the frequent contacts of students with the various bodies of the governance of the school (at the level of the sections, Schools Council, DAF, and VPAA). Moreover, the fact that students have a dialog with the direction of our School does not imply that its senior management must support its students for all their proposals. The same is true for the intermediate body that is represented in the School Assembly (AE) where all their questions of concern and related issues can be addressed in the presence of a representative of our senior management.

After analysis of this problem, we have noticed two aspects that may underlie such impression. The first one consists in the poor ability of the association representatives to communicate and spread the information to their peers. A second reason discussed recently with the student association has indicated that when the committee changes, there is a loss of information from the precedent committee to its successor. Actions on these topics might well be the way that we could pursue to efficiently improve this point raised by the committee (coaching of the associations for improving their communication skills).

Criterion 2.2 (page 12/22)

"The quality assurance system contributes in a systematic manner to the provision of relevant and current quantitative and qualitative information on which the university can base its strategic decisions (especially with respect to research, study programs, the appointment and promotion of academic staff)."

• **It is recommended that existing forecast of space and personnel requirements for current and future numbers of students and young scientists is included in the QMS.**

We are pleased to inform the review panel that those indicators not only exist in the quality assurance system of EPFL, but work as illustrated by different actions rapidly taken in 2011 in face of the sudden growth in the registration of students. Although this was unfortunately not mentioned in the communicated SAR, representatives of both VPRI and VPAA/DAF could have mentioned this during the interviews- Moreover, this could also have be found, at least in

part, in the « *Tableaux de Bord de la Formation*» made available during the visit, indicating that the monitoring of the teaching load per schools is also done on a yearly basis.

- **Concerning the teaching load per faculty**, in particular for the FSB school (Physics, Math), although this still remains a matter of concern, corrective actions have already been taken. We feel noteworthy for the review panel to consider that recently (in 2014), in order to improve the situation, EPFL general management has supported the promotion of 2 ME for math teaching; moreover one former adjunct professor in mathematic (Prof Kathryn Hess) was recently promoted as associate professor with a new affiliation to the Blue Brain Project, thereby transferring the pay role for her position to the SV school. Prof Hess will however still teach math; however her previous salary will be made available for the Math Institutes permitting a new recruitment and thereby re-enforcing their teaching capacity. A similar policy is already applied for the teaching of physics. Indeed physicists recruited in other schools *e.g.* in STI, are now encouraged to teach physics under the governance of the Physics section. This practice will at time permit to correct the unbalanced workload for teaching these disciplines since pursued in the future.

- *Concerning the indicators for the teaching infrastructures*, we are in a position to communicate to the heads of the AAQ/Cti review panel, the report on the "OCCUPATION DES SALLES DE L'EPFL RAPPORT DE DIAGNOSTIC INITIAL » Périodes de cours Bachelor / Master, done by an external review committee, Aye & Partenaires Conseil, analyzing the classrooms and auditorium occupancy done on a year basis by the SAC and VPRI. The goal of such audit was to gain information from an external committee on how to improve our efficiency in the utilization of the available teaching space. Such analysis and the audit panel recommendations have prompted our VPRI to adopt a strategic planning and actions taken since 2012. The related audit review and VPRI planning are now added in attachment as evidence for the AAQ/Cti panel. As a result, already in 2012, 704 supplementary work places for students were made available. An increase of 18.5% of the total work places, including auditorium and laboratories are foreseen for the beginning of the fall semester in 2016.

- **As another <u>recommendation</u>, all schools should ensure that they use their advisory boards and alumni surveys as a basis for their strategic decisions.**

Since this point is also treated in detail under point 3.1. and is, in the first place, an issue of concern particularly for <u>*the periodic evaluation of teaching and its related services*</u>, we propose to skip such recommendation under point 2.2 and to mention it where its scope would better fit, i.e. under point 3.1, avoiding thereby its repetition.

Due to the new pieces of information provided by the EPFL SMQ office, and the last proposal, we ask the review panel to reconsider the recommendations done under 2.2.

Criterion 3.1 (page 14)

"The quality assurance system provides for the periodic evaluation of teaching and its related services. The quality assurance processes include the periodic review of courses, study levels and degree courses, as well as to the results of teaching."

We thank the review panel for their very useful and specific comments that will help us to take the proper improvement measures immediately in order to implement our change in culture (assessment of learning outcomes) for the quality enhancement of our teaching programs.

Criterion 3.2 (page 15/23)

"The methods used for assessing the performance of students are to be reviewed periodically."

We thank the review panel for their useful comments. This topic is clearly the one where we are putting our best efforts to implement the learning outcomes for courses and programs. As stated in the SAR we are in the implementation phase. The remarks done by the committee will help the EPFL QMS office to move on into the right direction.

We have one small remark:

On the other hand, no general instructions, common to all programmes, exist on the evaluation of research skills or the master thesis.

We regret that this information was not transmitted neither in the report or obtained from the visited sections. Indeed the Dean Ba/Ma has transmitted to all sections a form to be used for all master thesis exams and that indicates also how to calculate the obtained score. This form clearly indicates how master candidates should be evaluated, including for their skills in research labs. This form is now added in the annex to our response. Although this point will still necessitates some more explicit formulation in the syllabus, we kindly ask the review panel to reconsider the formulation of this statement in the report.

Area 4: Research

Criterion 4.2 (page 18)

"The university has mechanisms which ensure the qualification of all employees in the areas of teaching and research (recruitment, promotion, training)."

It is suggested that the results gained from school evaluations (peer reviews, etc.) could also be provided to experts engaged in the institutional or teaching evaluations that follow, in order to ensure a comprehensive analysis during every evaluation process.

We thank the audit committee for raising this point since this will improve the internal consistency of the QMS at EPFL (both at the school and Institution level).

Area 5: Recruitment and development of staff

Criterion 5.1 (page 19/23)

"The university has mechanisms which ensure the qualification of all employees in the areas of teaching and research (recruitment, promotion, training)."

- <u>Recommendation</u>: **EPFL should put in practice a formal procedure that provides all EPFL staff levels and categories with an annual review.**
  Although EPFL has done significant progress on this issue (39% => 77%) , we agree that there is still room for improvement. Given the actual level of HR in the administration, achieving a formal control for 100% of our collaborators will remain a challenge. The only solution could be the introduction of an administrative control and workflow of those reviews; we believe that the resistance to such formal practices have to be expected in large part from

scientists: indeed it would be percieved by them to run counter to our academic culture, in particular for senior scientists, MER and Adjunct professors.

We will, however, continue both to sensitize heads of units to this issue and to provide them with both the information and the appropriate training favoring the accomplishment of this obligation to respect the right of their collaborators to benefit from such annual reviews.

- <u>Recommendation</u>: **it is necessary to clarify and communicate formally to EPFL staff the situation in which members of a research group remain after the departure of the head of the research group.**

In the internal regulations of EPFL, such situation is clearly addressed by two legal texts, Procédure d'état des lieux de sortie, and in Financial regulations at EPFL, LEX 5.1.1. art 82.

These texts and, e.g. the related process put in place by the ENAC School for such situations, have been added now in the annex to our answer. In brief, all administrative and lab stakeholders including the general services, the human ressources, the managers for finance-controlling, the school dean are normally informed and involved up to 3 years before the retirement of a faculty member. In case of sudden death of the unit head, sufficient time and facilities are given to the collaborators to find another solution. Although this might have been perceived as a serious problem by the reviewing committee, such issues, that can be sometimes highly emotional, were always solved within the respect of EPFL regulations. EPFL HR, supported by the concerned dean, have always done their maximum to find a the best possible agreement with the affected collaborators.

We consider that EPFL general policy fulfills the school regulations and central and School HR have, to our knowledge, always communicated to the concerned collaborators formally and ahead of time, which were the legal conditions forseen in such situation. Therefore this statement should be reconsidered in the report.

Criterion 5.3 (page 20)

"The university promotes the career planning of young academics."

- <u>Recommendation</u>: **EPFL needs to reinforce support for young academics who fail to achieve tenure track expectations.**

"EPFL's tenure-track system conforms entirely with usual, well-accepted, practice in the matter at top academic institutions, notably in the United States. That standards for the award of tenure are high at EPFL, and that failure to be granted tenure leads to a departure from the university for the faculty concerned, are standard features of the system, which are implicitly accepted by all who decide to pursue it.

EPFL furthermore gives in an organized way periodic feedback to tenure track assistant professors, and grants them an extra year to stay at EPFL in the event of a negative tenure decision. EPFL assistant professors who have not been doing well or who have been denied tenure (13% of them only were not promoted) thus have ample opportunity and time to relocate at another university. EPFL has collected data on the matter, to find that its former tenure track faculty generally relocates elsewhere in attractive positions, often in other high-level academic institutions. We therefore ask the auditing committee to reconsider their conclusions and evaluation on this point.

- <u>Recommendation</u>: **EPFL should provide more career development prospects to post-docs by allowing them to obtain experience in teaching activities.**

As said by the President of the EPFL during the debriefing, the signal given by the reported

testimony contrasts with those of the majority of young postdocs. Indeed, first of all, most postdocs want to publish good papers in a good lab, since they consider it as more promising than teaching for ensuring their future career. Therefore the reported case, as answered by EPFL general management, must be considered as an exception.

The issue to ask all postdocs to teach at EPFL was indeed submitted to discussion at the CDS and at the level of schools. Except in the school of basic science, where the obligation to teach for postdocs is already implemented, most of the other schools did not want the status of their postdocs to be changed with respect to teaching. An obligation to teach for all post-docs was considered by many faculty members as a direct interference with their autonomy for recruiting the post-docs they strategically need at a given time for running their research operation (ERC grant, contracts with industry, running a core facility).

All post-docs on a fixed-term contract are hired according to our HR rules for a period of 4 years, exceptionally prolonged to 6 years (see POLYLEX 4.4.2). Hence concerning the possibility for them to participate in teaching, it is important to mention that this must be clearly indicated in their contract according to art 3, al. 1 in accordance with Art. 16, of the "Ordonnance du Conseil des EPF sur le personnel du domaine des écoles polytechniques fédérales, (RS172.220.113): "In their employment contract, each employee is given a detailed job description outlining, among other things, their tasks and responsibilities", including if it is the case **for teaching**.

We are perfectly aware that a teaching experience can be a valuable asset for some post-docs when applying for a permanent position at EPFL or elsewhere. However, if this is not directly negotiated by postdocs with, or proposed by their hierarchical superior, and thereafter clearly indicated in their contract, then schools and sections are not allowed *to attribute them a teaching responsibility (see, POLYLEX 4.3.1, Art 5, Statuts de chargé de cours interne)*.

Indeed after looking closer to what happened, it appears that the reported testimony concerned a postdoc from a school where the burden put on faculty for teaching is low; it is understandable that in such case, EPFL prefers that faculty members perform their duties for education, and do not allow faculty to delegate it, as it is unfortunately the case in other universities, to young researchers, or simply to their doctoral students.

Therefore, we consider that the reviewing committee has based its opinion on one exceptional case that is not relevant to EPFL general policy.

Based on the above-mentioned arguments, EPFL general management considers that criterion 5.3 should be considered as fulfilled to satisfaction.