EXTERNAL EVALUATION REPORT OF THE

UNIVERSITY OF LUXEMBOURG

LUXEMBOURG - JANUARY 2009

BY THE
COMMITTEE OF EXTERNAL EVALUATION

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FOREWORD

This first external evaluation of the University of Luxembourg is the work of many contributors, and I would like to thank them all. First of all, speaking for the Committee, I would like to thank the University, its staff and its students, for their openness and diligence in communicating their views and experiences and making available the information required for this evaluation. I would especially like to thank those who wrote the self-evaluation reports that were essential for the assessment of the faculties, the priorities and the organization and management. This was a demanding task that certainly represented considerable extra work for many persons already heavily engaged in research, teaching and administration at the University. I would also like to thank those at the University who prepared and organized the site visits that took place in connection with the evaluation process. Without the cooperation of the University and its staff, this evaluation could not have been carried out.

There were altogether about thirty international experts and students who took part in the nine review panels that were established in connection with this evaluation. On behalf of the Committee, I want to thank them all for their genuine interest and their important contributions to this project. I would also like to thank the academic secretaries who provided most valuable assistance to the whole process. This project has been realized in the spirit of academic cooperation, wherein peer review and critical dialogue are the most important elements. I am convinced that the many discussions that the review experts had with their colleagues at the University have brought about positive results in advance of the publication of this report.

Speaking finally for myself, as President of the Committee, I would like to thank my fellow Committee members for the hard and conscientious work that has produced this evaluation. It has been a pleasure for me to work with this knowledgeable and perceptive group, and, as the Committee is meant to continue its work in monitoring the University, I look forward to my future work with these fine colleagues.

Evaluation has in recent years become an integral part of academic activity. The external evaluation documented in this report is perhaps the first of its kind: it is conceived as an attempt to make a synthesized evaluation of teaching, research, organization and management. It is carried out in the spirit of article 43 of the law of August, 2003, that established the University of Luxembourg; and also the framework established by the Ministry for Higher Education taking into account the fact that it is the first and only university of a small and special nation in the heart of Europe.

The Committee feels honoured and privileged to have been entrusted with this important and delicate task. Its overall conclusion is that the people and the government of Luxembourg can be proud of their University. It is a dynamic institution, full of life, ambition and promise. The University of Luxembourg will certainly play a key role in the future of Luxembourg contributing in important ways to its social, political and economic advancement.

Páll Skúlason
President of the Committee of External Evaluation

THE COMMITTEE OF EXTERNAL EVALUATION

The Committee of External Evaluation (further referred to as 'the Committee') has been appointed by the Minister of Culture, Higher Education and Research in Luxembourg (further referred to as 'the Ministry'), but acts independently.
 The Committee consists of:

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Páll SKULASON
Former Rector of the University of Iceland, Iceland

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Bruno CURVALE
Head of International Affairs, Evaluation Agency for Research and Higher Education, France

Jean-Marie HOMBERT
Laboratoire Dynamique du langage, Institut des Sciences de l'Homme, Université Lyon 2, France

Norman SHARP
Director, Quality Assurance Agency for Higher Education Scotland, Glasgow, Scotland

Dirk VAN DAMME
Head of the Centre for Educational Research and Innovation of OECD, Paris, France; former Head of Cabinet of Flemish Minister of Education, Belgium

Secretary:
Jo BREDA
Senior staff member, Flemish Interuniversity Council, Belgium

INTRODUCTION

General background

The University of Luxembourg was founded by the law of August 12, 2003, which also provided for the absorption of four pre-existing institutions – Centre Universitaire du Luxembourg, Institut Supérieur de Technologie, Institut Supérieur d'Etudes et de Recherche Pédagogiques and Institut d'Etudes Educatives et Sociales – into the new University. The idea was to create a national university with a clear profile and mission:

a specialized university of modest size, based upon on a symbiosis between teaching and research, striving for international status but at the same time adapted to the social and economic needs of Luxembourg. The University of Luxembourg was charged with the tasks of emphasizing interdisciplinarity, mobility and multilingualism. Three faculties were established – the Faculty of Sciences, Technology and Communication, the Faculty of Law, Economy and Finance and the Faculty of Language and Literature, Humanities, Arts and Education. Moreover, the University was given a mandate to create three Interdisciplinary Centres of teaching and research.

Besides these important characteristics, the University of Luxembourg is by law a public institution that is managed under private law, enjoying financial, administrative and educational independence. It is therefore more autonomous than most universities in continental Europe. It is free to set its own policies for student selection; it receives its funding in a lump sum, which it may distribute according to its own decisions; it is free to hire and compensate its staff according to its own rules; and it defines its own academic programmes.

There are four primary governing elements of the University. First, there is a Governing Board that authorizes the general policies and strategic decisions of the University and supervises its activities. Secondly, there is the Rectorate, which is the executive power of the University and is composed of the Rector, three Vice-rectors and an Administrative Director. These persons are appointed by the Grand Duke, who receives nominations from the Governing Board. The third important element of the University's governing structure is the University Council, which participates in planning the development of the University and deals with educational and scientific matters. The fourth and last element consists in the Decanate of each Faculty, composed of the Dean of the Faculty and the Faculty Council. The latter body proposes the programs of teaching and research within the Faculty that it serves.

To date, the University of Luxembourg relies for its organisation, its strategy and planning upon five main documents: the founding Law of the University of Luxembourg (2003), a mission statement agreed by the Governing Board (2005), a strategic framework paper written by the Rector (2005), a four-year plan (2005 to 2009), and a contract between the State and the University of Luxembourg valid until the end of the year 2009.

The functions and objectives described in these documents are ambitious, and the University has been striving in its initial stages of development to create the institutional means necessary for their realization. The present external evaluation has therefore concentrated upon providing recommendations that could help the University to improve itself as an organisational unity.

Thus this external evaluation is conceived as an attempt to make a synthesized evaluation of teaching, research and organization and management. The emphasis is thus upon the institution as a whole, respecting its different aspects and its various objectives.

The evaluation method

Prior to this evaluation of the University of Luxembourg, the Committee established the protocol for the evaluation in a handbook. The handbook was drafted in the spring and summer of 2007, in consultation with the University of Luxembourg and the Ministry.

The main objectives of this external evaluation of the University of Luxembourg are functional improvement and robust accountability. The whole process has been designed to provide feedback and recommendations to the University of Luxembourg in order to support its further development and also to provide information to the Government of Luxembourg, other stakeholders and the wider public about the quality of the services offered by the University of Luxembourg.

Three areas are evaluated: (1) Research and Innovation, (2) Teaching and Learning, and (3) Organisation and Management. In the areas of Research and Innovation six units have been individually evaluated (the six defined Priorities) by specific expert panels, composed by the Committee in consultation with the University. In the area of Teaching and Learning, three units have been individually evaluated (corresponding to the three Faculties) by expert Panels. For the area of Organisation and Management a single unit of evaluation is defined, namely the University of Luxembourg as an organisational entity. This latter element was evaluated by the Committee itself.

The panels for the units in Research and Innovation were composed of a Committee member (chairing the panel), two international experts and one PhD student, and supported by a Higher Education Quality Assurance professional functioning as an academic secretary (for the list of panel members, see annex XI). For this area, the external evaluation focuses on the six Priorities listed in article three of the *'Contrat d'établissement pluriannuel entre l'Etat et l'Université du Luxembourg'.* [1]

The panels for the units in Teaching and Learning were composed of a Committee member (chairing the panel), one expert per field of study and one student, and supported by a Higher Education Quality Assurance professional as an academic secretary (for the list of panel members, see annex XI). For this area, the evaluation focuses upon a sample of the study programmes of each of the three faculties of the University. The sample in each case was selected by the Committee in consultation with the University.

The area of Organisation and Management was evaluated by the Committee itself. The organisation and management functions within the faculties are considered within the context of the Organisation and Management function of the University as a whole. The evaluation of Organisation and Management takes into account aspects and conclusions of the research and teaching and learning evaluations.
In order to prepare for the evaluation, each unit was asked to perform a self-assessment. The self-assessment process had two main aims: to stimulate reflection and debate within the University and to provide

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[1] In the *'Contrat d'établissement pluriannuel entre l'Etat et l'Université du Luxembourg'* seven Priorities are mentioned. Since one Priority was not set up yet at the time of the development of this evaluation, it was not in the external evaluation.

information for the external evaluation. The Committee and its panels also asked for supplementary documentation and gathered information during in-situ visits in conversations with relevant people and groups (for the visit schedules see appendix X). In addition to the pre-arranged visit programmes, students, staff or others from the academic community involved in a unit, could ask to be heard in private meetings with the panel. The draft versions of the unit reports in each case were sent to the heads of the unit prior to publication for comments on factual errors and misunderstandings arising from a misinterpretation of the facts.

In this final version of the overall external evaluation report, the Committee integrates the findings of the different areas and panels. As agreed at the outset, the report also presents a grading on a four-point scale for each unit, except for 'Organisation and Management', where it was agreed at the outset that grading would not be appropriate. The grading relates to a concept of Quality Culture which is understood to have both an informal, or subjective, element and a formal, or objective, element.[2] The grading is based on the recommendations of the panels.

The Committee uses the following grading scale:

Table 1. Grading scale

Grade	Description
AA	The unit has an effective quality culture. The Committee has full confidence in its capacity to develop and manage its present and future quality.
A	The unit has a reasonably good quality culture. The Committee has confidence in its capacity to develop and manage its present and future quality.
B	The unit has an incomplete quality culture. The Committee has confidence in its capacity to develop and manage its present and future quality, provided that recommended adjustments are made.
C	The unit has no quality culture. The Committee has no confidence in its capacity to develop and manage its quality.

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[2] 'Quality Culture refers to an organisational culture that intends to enhance quality permanently and is characterised by two distinct elements: on the one hand, a cultural/psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural/managerial element with defined processes that enhance quality and aim at coordinating individual efforts.' (definition quoted in Sursock, A. (2006). *Quality culture in European Universities: A bottom-up approach.* EUA, www.eua.be).

EVALUATION OUTCOMES REGARDING TEACHING AND LEARNING

Teaching and learning the faculty level

The Teaching and Learning area was evaluated using a sample of study programmes within each Faculty of the University. The study programmes were selected by the Committee in consultation with the University. For each unit, a specific expert evaluation panel was composed. Following site visits in the spring of 2008, each panel reported its findings to the Committee in a unit report, which was also provided to the faculty for correction of factual errors. (For the full reports of the panels for the faculties, see annexes I, II and III)

For the Faculty of Language and Literature, Humanities, Arts and Education the professional Bachelor in Educational Sciences (BPSE), the academic Bachelor in Psychology (BAP) and the academic Master in Contemporary European History were selected as a sample base for the evaluation of Teaching and Learning in the Faculty. The evaluation panel for the Faculty of Language and Literature, Humanities, Arts and Education concluded that the staff is very committed to the quality of the programmes provided. Each programme director has a clear idea of the developmental objectives for the programme and takes initiatives to realise these objectives. The documents presented to the panel were of high quality and symptomatic of the work invested in programme development by the directors of studies. In the view of the panel however, quality assurance should now be formalised. The panel suggests that this matter should be taken up at the Faculty level. Currently, the Faculty Council is the only official body at the Faculty level, and this seems to be merely a platform to communicate decisions and where decisions are formalised, rather than a forum where a common identity, vision and strategy for the Faculty are built and debated. In addition, the panel suggests that it would be useful to involve all staff, as well as students, alumni and external stakeholders more directly in the quality assurance processes, through setting up programme committees which are linked clearly with a more formal Faculty level committee structure that could deal with teaching and learning quality issues at the Faculty level in a continuous and sustainable way.

For the Faculty of Law, Economics and Finance the Bachelor académique en Droit, Master of Science in Banking and Finance and Master in Entrepreneurship and Innovation were selected as a sample base for the evaluation of the Faculty. From its investigations, the panel concluded that a considerable amount of impressive work has taken place, and that the first results of that work are already clearly visible: student numbers are increasing; first indications are that overall student satisfaction is high; the staff interviewed by

the panel were committed, enthusiastic and proud to be involved in the programmes; and the external stakeholders expressed both high satisfaction and great expectations. The panel noted that what had been achieved was impressive, but also fragile. The panel concludes that it will be crucial for the further fruitful development of the Faculty to embed its achievements in more secure formal structures and operational principles. The report of the panel includes specific recommendations concerning input, process, output and quality assurance that will, in its view, help to generate such a secure environment. The panel is confident that the Faculty is moving in a promising direction and advises that one of the main challenges for the future will be to develop more systematic and formalized structures and procedures, particularly in the areas of communication, decision making, and quality assurance and enhancement. Such developments will assist the Faculty in the realisation of both its potential and ambitions.

For the Faculty of Sciences, Technology and Communication the academic Bachelor in Life Sciences (with an integrated first year for medicine and pharmacy), the academic Master in Information and Computer Sciences (MICS) and the academic Master in Integrated Systems Biology were selected. The evaluation panel for the Faculty of Sciences, Technology and Communication has concluded that staff is clearly committed to securing the quality of these programmes. Each programme management team has a clear vision of goals for its programme and undertakes appropriate initiatives to realise these goals. Formal and informal evaluation of the quality of the programmes by students has now started. This development is applauded by the panel. However, the panel also noted that regular meetings of the teaching staff to discuss the content and the consistency of the programme would be extremely valuable. This would help to transform the individual commitment to quality into more widely shared values, beliefs and expectations regarding quality. The panel suggests that this would also be an important development to take forward at faculty level. Up to now, the Faculty Council is the only official body at the faculty level and this appeared to be merely a place to communicate decisions and where decisions are formalised, rather than a place where a common identity, vision and strategy are built. In addition, the panel is of the view that the Faculty Council should have a key role to play in addressing the common problems and challenges facing the individual departments and programmes within the Faculty, that is, it should have an important role in quality assurance and enhancement. More generally, the panel was of the view that it would be useful to involve students, alumni and external stakeholders to a greater extent in quality assurance processes within the faculty.

Table 2. Grading of teaching and learning at faculty level

Unit of evaluation	Quality grading
Faculty of Language and Literature, Humanities, Arts and Education	B
Faculty of Law, Economics and Finance	B
Faculty of Sciences, Technology and Communication	B

Having considered the findings of the panels, the Committee concludes that, in relation to the quality of teaching and learning a good start has been made by this young university in a short period of time. It has achieved substantial growth in numbers of students and staff: its staff in general is highly committed and its students well served. The expert panels all indicate a satisfaction with the academic standards currently being achieved. The faculties are to be congratulated on these considerable accomplishments. However, the Committee also concludes that these achievements are fragile. In the view of the Committee, if the faculties are to sustain their activities and achieve their stated ambitions, there is now an urgent need to accelerate the development of more systemic and formalised approaches. This certainly applies to the arrangements for quality assurance and enhancement, including the arrangements for securing degree

standards. Underpinning these more systematized arrangements, will be the need for more formal structures for communication and decision making in relation to teaching, learning and assessment-policy development, implementation, monitoring and review. These arrangements should embrace both staff and students, both within and between faculties. In the Committee's view, developments in these areas are essential in order to form the secure foundations on which the University can realize its ambitions, building further on the considerable success it has achieved to date.

Further matters pertaining to teaching and learning

One of the founding principles of the University of Luxembourg is a commitment to a tutorial teaching scheme, based broadly on the model of leading British universities. The Committee found a lack of clarity concerning how this was to be interpreted. Indeed, the Committee found that, at the Programme, Faculty and University levels, there was an almost total lack of debate in relation to teaching, learning and assessment practices, and consequently a lack of clear understanding, policy or strategy. As regards tutorial teaching in particular, it is important that this commitment be re-examined. If it is to be retained and seriously pursued, it will be necessary to take into account that this form of teaching is both time-consuming and expensive. It would thus need to be clearly and transparently incorporated into budget projections and staff teaching schedules as well as into student program planning. A certain amount of special training in tutorial teaching would be needed for academic staff, particularly those who are unfamiliar with this teaching format. If these requirements cannot be straightforwardly met, it would perhaps be wise to abandon a tutorial system as a global commitment. The Committee appreciates the educational value of a tutorial system. However, if such a system is to be an integral part of instruction at the University of Luxembourg, a great deal of policy-formation and planning, academic and financial, needs to be done, and clear decisions about this matter reached in close consultation with the Faculties and Programmes. In the view of the Committee, this debate should occur without delay.

Another founding principle of the University of Luxembourg is a commitment to international education. For this to be effective, a strong, effective, flexible, well-staffed and user-friendly International Office is a necessity. This is required to support the mobility of students and teaching staff and the framing of international exchange agreements (in close cooperation with academic units and individual staff). Such an office should screen, inform, and otherwise assist (e.g. with visas and other bureaucratic procedures) incoming foreign students and instructors and would likewise assist and inform local students and instructors planning to study or teach abroad. In addition to an effective International Office, it might also be wise to have an International Liaison Officer within each Faculty, who would work with the International Office and with members of staff within the Faculty. An efficient, user-friendly International Office is a necessity for a university that has strong pretensions to international education and a policy of multilingualism. Many of the services that an International Office should provide are presently provided by the Mobility Unit of the Service des Etudes et de la Vie Etudiante (SEVE). The Committee discovered various problems indicating that this unit is not performing all of the necessary functions adequately. Whether this is because of under-staffing, a flawed conception of the necessary functions of an International Office, or for some other reason, the Committee cannot say. An International Office needs to deal with numerous matters that do not fall under the heading of student services or student life, and are not simply restricted to mobility. The services of an International Office should fall administratively under a single, identifiable unit with a clear mission. Such a unit could obviously function as a section of SEVE, as now, or could be made into a more independent unit. This again is not for the Committee to say. The important thing, from the standpoint of the emphasis given to teaching and learning in an international context, is to secure effective performance of the necessary services without delay.

A matter clearly affecting teaching and learning at the University of Luxembourg is student intake. The Committee finds that a clearer, more transparent, strategy for student intake is needed. Drop-out rates, and persistent problems connected with foreign student intake, indicate that these procedures are a matter for concern. Student admissions procedures differ between faculties and study programmes. The Committee

suggests that the coordinators of the master programmes should develop common solutions for better student selection, especially in the case of foreign students. An effective International Office would perhaps be able to deal with most of the latter problems, e.g. vetting of language mastery. University-wide consultation and consensus are necessary if these problems are to be effectively dealt with; the establishment of University-wide policy is much to be desired.

There are currently about 220 PhD students enrolled at the University of Luxembourg. Many of them have started their PhD studies elsewhere, and some of the students currently enrolled are likely to complete their degrees elsewhere, because they are allowed a maximum of only three years to finish their degrees in Luxembourg. This is a problem that needs to be addressed and the situation of doctoral students strengthened more generally. The Committee suggests providing incentives for completing PhD's at the University of Luxembourg and encourages the University to generalise these initiatives, for example, in collaboration within the 'Grande région'. The possibility to create doctorates jointly awarded with collaborating universities should be pursued. The establishment of a doctoral school might help with this and could strengthen the education of doctoral students in other ways.

EVALUATION OUTCOMES REGARDING RESEARCH

The Research and Innovation area was evaluated based on the assessment of the 6 Priorities listed in article three of the *'Contrat d'établissement pluriannuel entre l'Etat et l'Université du Luxembourg'*. For each unit, a specific expert evaluation panel was composed. After a site-visit in spring 2008, each panel reported their findings to the Committee in a Unit report (for the full reports of the Priorities, see annexes IV to IX)

For Priority 1, *Security and Reliability of Information Technology*, the panel concludes that staff members are individually committed to the quality of their research. People working in P1 have a standard and implicit way to deal with quality culture: they have a good publications record and good students. They clearly have the capacity to manage their present and future quality. The challenge for P1 is to transform the individual commitment to quality into shared values, beliefs and a commitment to quality at the overall level of Priority 1. This should result in an overarching vision and strategy, which are implemented and translated in specific mid-term objectives and output criteria. To accommodate this, a more explicit quality assurance framework is needed in the Computer Science and Communication research unit, linked to the Faculty and University level. The panel deems it important that an official forum is created to discuss these issues, as well as common problems and challenges. In addition to creating internal dialogue, these matters should also be benchmarked against other similar research groups. In general, it is important to increase the involvement of external stakeholders in quality assurance processes who could contribute significantly to the further improvement of the quality of the research and innovation within P1.

For Priority 3, *Life Sciences*, the panel finds that the Life Sciences Unit has a good quality culture. The panel has confidence in its capacity to develop and manage its present and future quality. The panel could clearly identify cultural and psychological elements of shared values, beliefs, expectations and a commitment to quality within the unit. The panel also found that structural and managerial elements, with well-defined processes to enhance quality and co-ordinate individual efforts, were being introduced. The procedures and structures, although mainly informal, are well tailored to the current size of the unit and have proven to be efficient and effective, resulting in high quality outputs from the unit in a relatively short period of time. The main challenge for the future will be to develop more solid and formalized structures and procedures to guide the unit's intended expansion. Good structures and procedures for planning, management and quality assurance will ensure that the LS Unit can move forward with confidence into the coming phase of expansion and can maintain the high quality of its resources, input and output.

For Priority 4, *European and Business Law*, the panel concludes that the cultural conditions for shared values, beliefs, expectations and a commitment to quality are present in the research unit. However, the structural and managerial elements aimed at coordinating individual efforts and at enhancing quality have not yet been fully laid down in defined processes, and are not yet fully implemented. The awareness of the necessity of such formal elements is much higher than was initially apparent from the self-assessment report. During the site visit, information was provided about ongoing internal discussions regarding

quality criteria and monitoring processes. Furthermore, it is apparent that steps have been taken towards devising more formal monitoring and feedback procedures, including the provision of some administrative support and organisational structures. The process of setting up new research programmes and strategic research planning has so far been closely linked to the recruitment of new staff. This is very understandable in the development phase of a new group. The recruitment process has followed the University's formal requirements, combined with informal consultations. However, for the future development of this priority, the continued development and implementation of more formal strategic and operational structures are urged.

For Priority 5, *Finance*, the panel concludes that the cultural conditions of shared values, beliefs, expectations and commitment towards quality are implicitly present in the research unit. However, some effort is needed to make them more explicit and stable. Structural and managerial elements aimed at coordinating individual efforts and at enhancing quality are not yet fully laid down in well-defined processes and are not yet fully implemented. The awareness of the necessity for and internal advantages of, such formal elements was not very high in either the self-assessment report or the interviews. The Faculty of Law, Economics and Finance had organised a working group on quality issues two years ago, with extensive discussions designed to develop a common understanding in the research units and in the Faculty. However, this process has not yet led to consolidated standards, criteria and procedures. The process of setting up new research programmes and strategic research planning has so far been closely linked to the recruitment of new staff, which in itself has suffered from considerable delay. This emphasis on recruitment is understandable in the development phase of a new group. However, the involvement of the Centre of Research in Finance group (CREFI) in strategic decisions has not been high, due to the complexity of the decision-making processes at the level of the Faculty, the Luxembourg School of Finance, the Luxembourg School of Finance Foundation (with strong stakeholder influence), the Rectorate and the Board of Governors. The adjustments that the panel finds most urgent, are related to the fact that the appointment of a new Director of the Luxembourg School of Finance is expected in the coming months, and to the fact that, at the time of the external evaluation, the current Director of Centre of Research in Finance announced that he would be leaving the University. This means that a re-direction of research will take place, in relation to the profile of the new leadership. In the opinion of the panel, the transition period should be used to prepare the way for making a transition from the very informal situation during the building-up phase of the group to the next phase in the development, which will require more explicit and stable rules, standards and procedures, established in the context of clear structures for strategic and operational planning. Since the management processes of other groups in the Faculty will require the same type of structuring and codification, it seems logical that the Faculty should take the initiative.

For Priority 6, *Educational Sciences*, the panel notes that staff members are committed to the quality of their research. A vision as to how to progress with Priority 6 is being developed, and everyone is aware of the need to focus the research to optimally use the available resources. The challenge for Priority 6 is to transform this general awareness into clear objectives, procedures and practices that will help to focus individual researchers and research units on quality. The panel considers it useful to discuss these issues, as well as common problems and challenges, in an official body at Faculty level. In order to involve staff in discussions on these issues, it would also be useful to benchmark their own practices to other similar research groups internationally, and to involve external stakeholders more within quality assurance processes so that they might contribute to the further improvement of the quality of the research and innovation within Priority 6 where appropriate.

For Priority 7, *Luxembourg Studies*, the assessment panel was impressed with the efforts of the P7 staff to create a local quality culture. The panel strongly advises P7 and its researchers to consolidate and formalize its informal quality assurance structures, discuss these internally and establish formal quality assurance structures for P7. This should include, importantly, the production of a strategic plan for P7 together with an associated action plan. In addition, the assessment panel strongly suggests that P7 be more proactive with respect to demonstrating the quality of P7 as a research unit and a research priority. P7 is, in the view

of the assessment panel, on the verge of establishing a formal quality culture, as the research priority is able and willing to consolidate the elements of its informal quality culture already established. The assessment panel is convinced that P7 furthermore can benefit from a more proactive approach to prove its value and to convincingly market their good quality research output. The panel is convinced that P7 has a bright future ahead.

Table 3. Grading of research at the priority level

Unit of evaluation	Quality culture grading
Priority 1: Security and Reliability of Information Technology	B
Priority 3: Life Sciences	A
Priority 4: European and Business law	A
Priority 5: Finance	B
Priority 6: Educational Science	A
Priority 7: Luxembourg Studies	A

Having considered the findings of the panels, the Committee concludes that, in general, the research activity within the University of Luxembourg is of satisfactory quality and quantity. The evaluation of the Priorities generated overall a positive result.

However, the Committee has noted that the crucial concept of Priority is unclear or at least ambiguous among interlocutors. It could mean either the areas toward which increased efforts should be directed, or the areas that the University wishes to excel in. According to the Committee, it is crucial for the development of the University that this concept is clarified, so that the evaluation of the Priorities can be made within a strategic framework, and the future options of both Prioritised and non-Prioritised research areas can be set. Currently, many Priorities consist of groups of research projects without strong common focus or shared strategy. For the next four-year plan a 'natural selection' process has been envisioned, wherein the 'best performing' Priorities would remain. As things stand, this is unsatisfactory as an element of strategic management. Consequently, the Committee strongly recommends defining explicitly what a Priority means, in relation to non-prioritised research areas and the University's mission. A set of clear criteria for the evaluation of the Priorities has also to be fixed. The Committee suggests that the University should stress a definition of Priorities that would promote interdisciplinarity and be flexible enough to be reactive to important internal and external changes. The Priorities should be benchmarked and evaluated regularly, especially during the early years. In addition, the Committee suggests an approach that leaves room for 'project blancs' in order to prepare for new priorities.

EVALUATION OUTCOMES REGARDING ORGANIZATION AND MANAGEMENT

Based on the unit reports, the University's self- assessment paper and policy documents, and the meetings and extra information acquired during the Organisation and Management site visit in September 2008 (for the site visits, see annex X), the Committee has produced a critical overview of the University of Luxembourg, aimed at generating suggestions for improvement in key areas.

Main achievements of the University of Luxembourg

Central and very salient to all the Committee's assessment activities was the awareness of the recent foundation of the University of Luxembourg. Parts of the University have longer traditions, as they were previously independent institutes, but, from the perspective of a single university structure, all is new. Given this initial stage of development, the Committee's most fundamental conclusion is one of respect for the rapid growth of the University and the extent of successful accomplishment. The decision to create the University of Luxembourg was not uncontested in Luxembourg society. Many interlocutors of the Committee stated that, although sceptical at the launch of the University of Luxembourg, they were now of the view that the University had already surpassed all expectations. In general, the Committee was convinced by the evidence of its meetings that the University of Luxembourg is now viewed as an essential and highly regarded feature of Luxembourgish society. This respect has been earned through achievements in research, teaching and learning. Student numbers are increasing significantly. The University of Luxembourg recruits both Luxembourgish students and foreign students. Both are recruited in a competitive environment, since many Luxembourgish students receive grants to study abroad.

The University of Luxembourg has also had early success in terms of research and development. Internally, the staff members that the Committee met are committed to, and generally enjoy, working for the University. The quality of the support, teaching and research staff, and of the PhD students, whom the team met, is generally high. The University brought together four pre-existing institutions, and this inevitably produces a transitional challenge for the University and for some of the staff of former institutes. In general, however, the integration of the constituent institutes seems to be progressing well, although residual elements of turbulence are still evident. The University has many international contacts and collaborations. This is in a large part due to the international recruitment of staff members, who bring in their own contacts, but also through central efforts at internationalization. The University is actively carving out its position in international networks, e.g. as a founding member of a Multilingual Universities Association, and in its plans for a doctoral school in 'la Grande région'.

The realization of the founding principles

A number of important objectives for the University were established in its founding legislation. These principles are interdisciplinarity, international character and extension of cooperation with other universities, student mobility, multilinguism, a symbiotic relationship between teaching and research, and a tutorial system to guide students.

The University is charged with the task of intertwining teaching and research in an interdisciplinary manner. The Committee has observed a balance between education, research and service, where the focus is most strongly on research, rather less on education, and only indirectly on service to society. Teaching is based on research, especially at the master level. The majority of teaching staff appeared to be actively engaged in research, although this was stronger in some areas than in others. The link between research and teaching is weaker in some 'vacataires', although in these areas there appeared to be strong links with professional practice and 'scholarship' of a different variety. Since research is emphasized for the purpose of recruitment, the research base of the University will strengthen further. The Committee observed only a very limited number of interdisciplinary initiatives. In particular, the links between faculties are limited, possibly because they are at different locations, making cross-faculty interdisciplinary work particularly difficult. The Committee did observe, however, some interesting examples of interdisciplinary research such as IPSE biotechnology and computer science. However, in general, interdisciplinary research or teaching appeared to the Committee not to be particularly encouraged or facilitated. The Committee is of course neutral on whether this should be a principle of development. If it is to remain, then the Committee urges the University to stimulate interdisciplinary cooperation, within and across Faculties. If it is not to remain, then the Committee suggests that it would be helpful to relieve the University of this obligation.

The University of Luxembourg strives to become an internationally connected, multilingual University. The Committee appreciates that the University recruits both students and staff on an international basis: 47% of students are non-Luxembourgish and of the 26 professors hired in 2006, only one was Luxembourgish. International mobility is obligatory for bachelor students. Student exchange agreements exist with neighbouring countries, Portugal, the United States of America and recently also China. This mobility is a success in general, but sometimes students come back from their study abroad with few meaningful academic credits. To be fully successful the University should integrate its mobility policy better with its program planning and ECTS with associated instruments such as diploma supplement. The need for an effective, user-friendly International Office is apparent.

The University of Luxembourg is a founding member of a Multilingual Universities Association and has a clear set of rules or objectives for implementing multilingualism. For example: Each of the three languages (French, German and English) must at least be evident in at least 20% of the courses., There is no action plan for the further implementation of multilingualism, although the existing objectives have not yet been reached. In day to day University life, everyone seems to adopt a pragmatic stance with respect to language, so that students and staff from different countries and mother tongues try to understand each other. No complaints about language exist, with the exception of foreign students, some of whom claimed to the Committee and expert Panels that they were not informed about the language prerequisites. The Committee would reinforce the necessity of making the language requirements of courses more explicit, would encourage language courses for all staff, and would support offering 'Luxembourgish as a foreign language' as an option available to staff and students. The Committee emphasizes the necessity of establishing a clear policy on language mastery with respect to the student selection processes, and on the provision of support for students who are weak in the necessary language skills.

In relation to tutoring, the Committee found a lack of clarity concerning how this was being interpreted. As stated above, the Committee found that at the programme, Faculty and University levels there was an almost total lack of debate in relation to teaching, learning and assessment practices, and consequently a lack of clear policy or strategy. And, as stressed earlier, the Committee is of the view that this requires urgent

attention, in order to secure the quality of the student experience. In addition to the creation of appropriate strategies and policies, requisite opportunities for staff development should also be provided. At present, the University's commitment to this principle is unclear.

In general it is the view of the Committee that there would be much to be gained by the University entering into a serious debate regarding its founding principles and their strategic and operational implications. Such a debate, led by the Governing Board, should involve the Rectorate, the University Council, Faculty and external stakeholders. In fact the whole academic community, staff and students, has to stand firmly together behind the next phase of development of the University.

General governance

The University of Luxembourg received its governance structure from the law. It is led by an appointed Rector who is responsible to an external Board of Governors. Although not common in Continental Europe, this governance model is well established elsewhere. In the view of the Committee, this model has every potential to be very effective. However, to achieve this potential and to get maximum benefit from this model, the Board must act as an effective independent forum for providing the Rector with well-defined strategic direction. The Rector in turn needs to have in place effective mechanisms for upward and downward communication with the rest of the University community. From the evidence available to the Committee, neither of these essential conditions are in place with sufficient strength to secure the future progress of the University. The Committee observes that the implementation of the current model in the University of Luxembourg has lead to ambiguous and somewhat ineffective arrangements in relation to policy-formulation, decision-making and policy-implementation. Much has nevertheless been achieved in the initial stages of development, but both the independence of the Board and the communication structures with the wider University community now require to be significantly strengthened in order to support the next stages of development. Progress in both areas is now required in order to enable effective strategic management and policy making underpinned by effective and secure operational planning and monitoring.

The Committee arrived at this strong conclusion following wide-ranging discussions with the Rector, President and members of the Governing Board, deans, professors and a wide range of academic and support staff. From these discussions, it was apparent to the Committee that, in the future, the Board needs to be relieved of time-consuming operational details to create space and energy for more open-ended discussion focussed on strategic planning. It is important that such discussion is supported by high quality papers provided through appropriate channels within the academic community, and externally. In this context, the Committee would recommend a general invigoration of the deliberative structures within the University. It is vital that the Deans be involved appropriately in advising and supporting the Rectorate, and that the Rectorate in turn engages in meaningful briefing of the Deans in relation to the ongoing strategic thinking of the Board of Governors.

The Committee is very strongly of the view that current arrangements in these areas are not sufficiently robust to support the next stage of development of the University. Similarly, it is essential that communication with the wider University community to be very significantly strengthened. In this context it is essential for the role of the University Council to be re-visited. The Council appeared to be virtually dormant. In the view of the Committee, the University Council should be of prime importance as a central forum for debate, operational policy making, monitoring and review. In the view of the Committee, the papers from the University Council (including specially requested papers) need to form a key resource to support the effective functioning of the independent Board of Governors. To further support its independence, the Board of Governors might also consider meeting from time to time, or for particular agenda items, without the presence of the Rector and/or the government represetative. Additionally, the Board might choose to meet on occasion with other members of the University Community in order to gain a deeper understanding of particular matters.

In general, the Committee is convinced that the governance model of the University is well-conceived. A great deal has been achieved in a short time, reflecting considerable credit on the leadership of the University. However, as the University moves into its next phase of development, change is essential. The Governing Board must be placed in a position where it can exercise strong and independent strategic leadership of the University, and the Board and the Rector must be linked more robustly to an engaged academic community through clear and effective channels of communication and effective deliberative structures. Among other developments in this context, the University Council should have an absolutely pivotal role.

Stakeholder relations

The University of Luxembourg receives input from external stakeholders through their presence in the Board of Governors. The University is also in contact with the Luxembourg Chamber of Commerce through the School of Finance. The University in general has good relationships with stakeholders, but these are not systematically organised. The Committee recommends developing an inventory of the University's stakeholders and a strategy for stakeholder involvement. The relationship between the stakeholders from the wider society, such as industry and trade, and academia can easily generate misunderstandings and mutual dissatisfaction if the specificities of academic research are not taken into account. A balance has to be found between the expectations of stakeholders, that often take the form of demands applied research, and the dedication of academics to basic research.

Central management

For its effective operation, the adopted model of governance is dependent upon an effective leadership and management structure. The broad range of responsibilities assigned to the position of Rector creates a demand for highly developed leadership, communication and consultative arrangements. A more open style of central management will be necessary to build on the successes of the initial phase of the University's development. It is clear to the Committee that significant groups of staff are feeling distanced and disconnected from decision-making processes. As indicated above, the University Council (and indeed the Scientific Advisory Committee) seems to be almost totally ineffective. While informal mechanisms have their place, they leave large groups of staff disenfranchised and frustrated, now that the University has grown. The dissatisfactions encountered by the Committee related both to the lack of opportunity for effective involvement in decision-making processes, and the lack of opportunity for providing evidence-based feedback that could inform policy development and general academic practice. These problems appeared to exist within faculties, among the faculties and between the faculties and the Rectorate. For example, the Rectorate's decisions are communicated to the Deans, who use the Faculty Councils to inform their faculty members. These communication lines appear to be mainly one-way; and for instance, Faculty Council reports are not sent to the Rectorate.

The self-assessment report states that the Scientific Advisory Committee has not found its role within the organisation yet. As mentioned above, the Committee urges the implementation of many more consultation procedures and the increased involvement of staff members in decision making and implementation. The Scientific Advisory Committee should play a crucial role, but needs empowerment in order to do so.

The Committee stresses that a robust internal dialogue is important for the decision-making processes. Effective internal dialogue is a key element of well-informed and effective decision making and policy implementation: it provides a better foundation for effective management than the addition of bureaucratic layers. The frustrations of some members of the academic community with regard to the lack of internal dialogue appeared to the Committee not to arise from a wish for more democracy per se, but rather from the communications gulf which they perceived as existing between the Rectorate and the rest of the academic community. This is fundamentally a communication problem: effective and vibrant communicative structures must be created. Through such structures, local initiatives can be supported, good practice

can be promulgated, policy can be effectively developed, implemented and monitored, and the strength of the academic community can be more effectively harnessed in support of the University's mission.

It appeared to the Committee that the link between the Faculties and Rectorate is crucial and needs immediate attention. The evidence available to the Committee indicated that the Deans were in many ways caught between two different types of structures in the current context. At one level, they represent a collegial, democratic structure given their elected position. On the other hand, the Deans had to relate directly to the managerial structures of the Board and Rectorate. The links between the Deans and the Rectorate, notwithstanding considerable individual strengths, are not working effectively.

The Faculty Councils are not able to fulfil their role as consultative bodies in relation to the Rectorate and Board of Governors because of the dominance of the one-way communication of the Rectorate's decisions and the limited opportunities for making faculty-specific policies. Deans cannot present their Faculties' views at the Dean-Rectorate meetings since there is not enough time to prepare for these meetings with a faculty-consultation round of discussion. In interviews with both the Deans and the Rectorate, it became obvious to the Committee that this is a well-recognised problem, and various solutions to it have been attempted. Recent initiatives have focussed on strengthening the link between the Deans and the Rectorate with more and longer meetings. Indeed, since 2006, decisions of the governing Board have been published on the intranet, and the minutes of Rectorate's and Rector–Deans meetings are communicated to the heads of the university services. However, the decisions are not supported with any discussion of context, reasons, implications or action plans, which makes them hard to interpret within the wider academic community.

The Committee was interested to note that, in developing the next four-year plan of the University, a consultation round is being organised where Faculties will be able to provide input. In each Faculty, a committee involving the three Vice-Rectors, the Deans, and 4 or 5 representatives will work on the next four-year plan based on a vision document produced by the Rector. At a later stage, it is intended that the outcomes of the Faculty considerations will be sent to the Board of Governors. The Committee was encouraged by these developments. However, it wishes to stress that further change is needed. As indicated in the previous section on governance, the 'top down' decision-making procedures have produced successful outcomes for the University in its start-up phase. There are circumstances in which a top-down approach is appropriate. But in the next phase of development, the whole academic community needs to be involved, directly or indirectly, in procedural and structural decision-making.

In general, it is the view of the Committee that the University now needs to reformulate its management culture in order to fulfil the considerable potential of its very successful early development. This will involve the more effective harnessing of the whole academic community in accessible and effective communication and deliberative structures. There need to be linked, effective structures at the Programme, Faculty and University levels: structures to which all staff feel they can meaningfully relate, and which provide effective and robust mechanisms both for contributing to policy making and for monitoring the implementation of policy. Elements of such a structure currently exist (e.g. the University Council and the Scientific Advisory Committee) but they appear to be in need of a radical overhaul. Further elements require to be put in place. When implemented, such a structure will in turn support the Rectorate in exercising its overall leadership role and will provide the independent Board of Governors with a secure and informed basis for setting strategic direction and assuring itself of continuing progress.

Central services and infrastructure

Central administration

In its short existence, the University of Luxembourg has managed to get a central administration up and running. The administrative and support staff is, for the most part, dynamic and professional. Individual staff members and students testify that they can get things done, although some procedures do not dovetail with expectations. Procedures can be rather long and can require multiple contacts, and, in addition, central services are not always in line with one another. In general, a rather large gulf is observed between the central services and the faculties. The Committee suggests the establishment of user committees, such as the library intends to create. In addition it might be helpful to consider the establishment of regular local and central support staff meetings to overcome common problems.

The quantity of local and central support staff is sub-optimal. This results in a heavy administrative workload for the academic staff. The current mismatch in growth of academic staff and support staff needs to be resolved by hiring more support staff. This would include more staff for the library, the central financial and HR-departments, and more administrative secretaries in the faculties to support research units and study programmes. Gains in efficiency and/or economy might be realized by organising some tasks centrally (e.g. arranging visas).

Library and library services

The Committee received complaints about the library of the University of Luxembourg. Students and staff are not satisfied with the variety in classification methods and locations. This sub-optimal situation is due to the recent merger of the libraries of the constituent institutes, the limited library staff and the attribution of some responsibilities that are not a library's core business, e.g. offering a publication service. The library is working towards solutions in connection with its new location in Belval and the adoption of a single classification method. A project to gather feedback from students and staff and to assemble a user committee is running. In the mean time, an exchange service between library locations, and most importantly an extended electronic library has been set up. The electronic library contains a large number of e-journals and databases and is due to the collaboration of the National Library of Luxembourg and the University of Luxembourg on an electronic library portal. In the view of the Committee, the e-portal is a very valuable asset for Luxembourg society as well as for the University.

Physical facilities

The office space available to the University of Luxembourg will soon be insufficient, considering the University's rate of growth. Some units already have housing problems. The current infrastructure is in generally good, although the spread over different campuses results in limited communication. The Government of Luxembourg will decide in 2009 whether two or three faculties will move into new premises in Belval. The new campus at Belval provides a great opportunity for improving and updating central infrastructure, like the library. The University of Luxembourg plans a working group that involves staff members to determine the necessary equipment for the site. The Committee stresses that faculty members and students need to be involved in all important decision-making regarding Belval. Public transport from Belval to Luxembourg city will be crucial.

Student services

At the moment the feeling of belonging to a student community is lacking, since facilities for student life are only starting up. The creation of a new campus at Belval offers a great opportunity for student housing and the support of student life.

Student services at the University of Luxembourg are provided through the SEVE, which deals with student

life (housing, culture and sport) career services and alumni and maintains a documentation centre and a health centre. The SEVE also deals with student registration and the administration of scholarships. And it likewise oversees student, researcher and staff international mobility.

The Committee finds that the SEVE is inadequately staffed and not well supplied with the statistical information needed for carrying out its various functions.

It appears that the functions of this unit are too diverse and may therefore be subject to dilution. In particular, while services to international students and staff are of necessity connected with matters of registration and student life, the functions best performed by an International Office appear to be diluted within the framework of SEVE. There should be separate, identifiable and effective offices for student life, for statistics and documentation, for registration, for housing and health services, and for international affairs (including, but not restricted to, student and staff mobility). All of these must be adequately and expertly staffed for the purposes of their separate functions, which appears not to be presently the case. An overarching administration that coordinates these units, as SEVE appears to be, may be the best form of organization, but each of the units must have separate strength.

International mobility for students and teaching staff

The University of Luxembourg provides support for student mobility through the mobility unit of the SEVE, but problems of information, screening, successful completion of exchanges and other difficulties have emerged. As international mobility of students, researchers and teaching staff is of such fundamental importance to the University of Luxembourg, the services of an International Office must be improved. The need for increased staffing is apparent.

IT services

The University provides up-to-date and in some cases, excellent IT resources, but more flexibility is needed in the use of computer equipment, especially for computer science.

Financial management

The financial reporting of the University is subject to the Luxembourgish accounting rules for the private sector, and is managed professionally. Recently a new system of accountancy has been introduced, but it is not yet fully operational. This new system is intended to be very flexible for all involved. The new system will also come with a stricter system of procedures for claiming expenses. At the same time, a purchasing service is being put into place. Current administrative procedures for budget management are time-consuming and do not provide local project managers with a current or complete overview of the state of the budget. This lack of a clear view, and the fact that personnel budget is handled at central University level, has the effect that local heads do not feel in control.

Research funding

A significant amount of research funding is gained externally and competitively. The University of Luxembourg does not deduct overhead from these funds: they are transmitted entirely to the applicants. The Luxembourg Fund for Scientific Research uses external and foreign evaluators in considering research proposals and treats the University the same as other Luxembourgish research institutes.

Human resources management

The University of Luxembourg has made a significant achievement in recruiting high-quality academics in a very short time. The hiring process has proven effective in the setting-up of a new University. Inevitably, these processes have not proven perfect, since the Committee has observed some problems in recruitment, including a protectionist reflex and minor conflicts of interest, and recruitment leading to reproduction of the profile and level of the selection panellists. The Committee advises that the selection panels be carefully chosen to reflect the future vision of the University. The selection process should be well documented and transparent, with clear criteria and written rules concerning conflicts of interest. For new positions as well as for replacement of leaving professor, the profiles should be described in much more detail. They should show how the required professor will contribute coherently to fill existing, and identified potential, gaps in teaching and research.

Heads of research units and study programmes currently have no influence upon recruitments or human resource management for their units. They need more transparent recruitment strategies and local involvement in order to align the human resources to their strategies.

The recruitment process has little flexibility and lengthy, complex procedures. The Committee heard complaints about lack of flexibility and cooperation from the HR-department.

Recruitment has rightfully focussed on research strength in building up the University. The Committee stresses that teaching skills should also be taken into account in future recruitment although it may indeed be difficult to get reliable information about this.

The rapid growth of the academic staff has not been accompanied by an equivalent growth in the number of assistants and support staff. For the moment too little administrative support is available. Current staff members have high teaching, developmental and administrative loads, and this could endanger research production.

The University of Luxembourg does not offer tenure track positions and has no career paths for young researchers. Non-tenured researchers can only be contracted twice for a period of one year, while projects last for 3 years. Young researchers with PhD's from the University of Luxembourg cannot stay within the institution and work as post-doctoral researchers. While the Committee appreciates the rationale for this approach, it suggests that the policy should be reformulated. The Committee suggests the creation of middle-layer positions and finding a balance between positions for external recruitment and internal promotion in order to maintain the motivation of young researchers.

Human Resource policies of the University of Luxembourg do not include assessments and targeting at the individual level, although some evaluation exists at the group level. Locally, task setting, assessment and coaching often happen informally. More criteria, monitoring and feedback on individual level is necessary, along with formalised ways of setting standards. The Committee supports plans to have individualised job descriptions and performance criteria.

Some study programmes are highly dependent on external staff. The Committee suggests that extra effort be invested in the integration of the external staff into the local teaching context.

Communication policy

Internal communication has not succeeded in creating a sense of a University community, with shared values, and common perceptions and definitions. The Committee suggests the enhancement of communication among staff, current students, alumni and stakeholders.

Communication between faculties and research groups can be improved in order to strengthen interdisciplinarity. At the same time, the Priorities need more external visibility.

Information for prospective students is proving effective since the University of Luxembourg attracts reasonable numbers of Luxembourgish and foreign students. Fact sheets of courses provide good information generally, but do not always specify the language prerequisites. For foreign students, more information about living costs in Luxembourg and the necessity of mastering at least two languages should be provided. The University's website could be more easily kept up to date through partial decentralisation of the website's content management. Heads of study programmes need considerably more marketing support.

Faculty management

As discussed above, the Faculty Councils should serve as the venue where a common identity is built, through debates aimed at creating and putting into operation a shared vision and strategy among staff, students, alumni and other stakeholders, as appropriate. While practice and progress in the Faculties varies in this regard, the Committee is of the view that there is need for an acceleration of progress now in these areas as the University and Faculties move into the next stage of development.

The Committee observed many examples of good and innovative practice involving committed staff and students. However, these tended to be based on ad hoc, informal arrangements. While these have served the faculties well in the initial phases, they are not capable of sustaining systematically secure quality, as the University moves into further stages of development. Roles and procedures need to be defined more explicitly in relation to both research and education strategies and operations. For example, the Committee could find little Faculty-level, or indeed Programme-level, discussion of teaching and assessment policies. The implications of research prioritisation also appeared to be a relatively unexplored area of formal deliberation at the Faculty level. The creation of effective discussion forums at the Faculty and Programme levels is an essential condition for sustaining a lively connection between the Faculty Council and the Rectorate. In the view of the Committee, development in these areas, together with the provision of related staff development opportunities will greatly assist the University in achieving its ambitions.

As mentioned above, strategic planning happens in a very top-down manner, with little consultation of faculty members, and too few commonly shared objectives and visions. This leads to small units and staff members setting their own objectives, and Faculties deciding their own priorities, independently of overall University policy. An action plan is needed to link the mission of the University to the daily reality.

The faculties are managed by the Deans with a bottom-up approach. As stated above, the Faculties need a clearer organisational structure. The rapid increase in the number of staff members has not been conductive to the necessary formalisation of informal practices. Responsibilities are taken up by individual persons and are not yet attributed to positions. Organisation at the Faculty level needs to be clarified and consolidated.

For some strategic choices there is no ownership in the Faculties, and therefore implementation of decisions is ineffective. As mentioned above, consultation is not common before decisions are taken by the Rectorate, and some decisions are made externally or are imposed on the University. For example new

master programmes will be created at the behest of the government, while a research project in Bio-technology is being pushed by the University's partners.

Quality assurance

Even though quality is regarded as important, the University of Luxembourg as a whole has no integrated quality assurance system: there is no management information system, no action plan that includes criteria and procedures of evaluation and of reporting to the Rectorate regarding the Priorities, no personnel assessments, no formalised student feedback on teaching, and no monitoring system for research applications.

Within the faculties, many local and informal quality assurance procedures exist. These may have worked well in the start-up phase of the University, but they require to be more formalised in the future. At the central level, general directives or guidelines and support for quality assurance procedures should be provided and formal interaction forums established that include students, support and academic staff. The Committee encourages initiatives like the Student Registry and Support Division's implementation of a system for deriving statistics about student populations and their study progress, and plans for using questionnaires to survey student needs. The Committee stresses that it is time for the University to formalise its quality assurance procedures including structures for systematized self-reflection at all levels. This is important for the transmission of its culture, especially in the context of the expected growth, and for the benefit of all members of the university community.

The University of Luxembourg does not have structures within which students and staff can communicate about quality and engage in improvement planning. The self-assessment report of the University was an individual exercise of the Rector, carried out without wide consultation. Now, the responsibility for quality lies first with the Deans, then the vice-Rectors, and finally the Rector, who can inform the Board of Governors. The Committee stresses the importance of reporting systematically, and stimulating collective reflection. The Committee suggests the establishment of a system of consultative bodies engaging in quality assessment and improvement at the level of study programmes and at Faculty level. A standing Committee on Quality should assume this role at the central level.

RECOMMENDATIONS

Introductory remarks

In this section of the report, the Committee formulates a number of recommendations that result from the preceding analysis. As stated in the Handbook and at the beginning of this report, the evaluation and the recommendations resulting from it are provided to the University as suggestions for further improvement of the functioning of the institution as a whole. Ultimately, the University itself has to decide on its further route of development. But the Committee requests the University to seriously consider and decide on the suggested recommendations.

Some recommendations can be implemented immediately; others can be integrated in the next four-year plan; still others have no specific timeline and can be implemented at any time. The Committee will not suggest the most appropriate timing for the implementation of the recommendations, since this depends on the overall strategic course of development the University may choose. However, the Committee considers the upcoming four-year plan to be an excellent opportunity for making strategic choices which might take into consideration the following recommendations.

To the critical reader some recommendations may appear as establishing new structures, formalizing current more or less informal arrangements and running the risk of leading to more bureaucracy. The Committee believes that a contemporary university is a specific kind of organisation where the level of bureaucracy should be kept as low as possible and as much space as possible should be given to the autonomous work of academics and researchers and to the development of a lively and shared quality culture. Nevertheless, such an academic culture cannot develop in a sustainable way if the governance and the organisational and managerial environment are weak or not collaborative enough. Many of the current problems and challenges that the University of Luxembourg faces will not be solved by maintaining current governance and management structures. The Committee has observed in its report that these may have been appropriate in the first years of development, but that change is now necessary. New structures, or the revitalisation of existing, dormant bodies, the formalisation of procedures and the determination of clear lines of communication and information are necessary to foster internal dialogue, to define responsibilities, to create proper conditions for change and to guarantee a more sustainable and harmonious future for the University of Luxembourg.

The following recommendations are not all totally new. For many of them there are already plans or ideas, which the Committee wants to support and expects to be implemented. Others will appear unexpectedly, but are deliberately submitted by the Committee for serious consideration.

Regarding governance, organisation and management of the university

1. The Governing Board should strengthen its role in developing its strategic leadership, independent from the University's management.

2. The University should make more effective use of the University Council and the Scientific Advisory-Committee.

3. Permanent committees for teaching, research and quality (and possibly also for finance and development) should be set up at the central level.

4. At Faculty level, formal consultative bodies should be established for the same matters.

5. The roles and responsibilities of major bodies within the University should be clearly defined and their activities should be made transparent.

6. The University will have to drastically improve its internal communication and to engage in consultative processes to elaborate and implement a strategic framework, most urgently in regard with the next four-year plan. The consultation processes should focus systematically on quality, stimulate collective reflection, and strive towards a common understanding of crucial ideas and issues

7. The implementation of decisions needs to be pursued more energetically. Action plans are needed to follow through implementation of decisions. Regular updates and stocktaking of the strategic framework have to be organised.

8. A centralised University-wide action plan is necessary to provide heads of research units and study programmes with the necessary management tools in coordinating study programmes and research initiatives. The relationships, tasks and communication lines between heads of research units and study programmes, Deans and the Rectorate have to be defined more explicitly.

9. The reports from the Rectorate and Rectorate-Deans meetings, including argumentation, implementation planning and envisioned consequences should be made available to the University staff. Circulation of a version of the minutes of the Board of Governors that preserves anonymity should also be considered. Faculty council reports should be available to the Rectorate. Deans should receive the agenda for the Rectorate-Deans meetings in time to organise a consultation round within their faculties.

10. External communication also needs improvement. The special character of the University of Luxembourg in terms of its founding principles and its unique features should be effectively publicized and marketed.

Regarding central services

11. User committees should be established that could evaluate the central services from a user perspective, and local and central support-staff meetings should be organized to overcome common problems.

12. The current problems regarding the library need to be solved urgently.

13. Local project managers need to have access to a complete overview of the state of their budgets at all time.

14. A framework for student life needs to be developed and implemented.

15. Services of the kind typically supplied by an International Office, a number of which are presently provided by the Mobility Unit of the Service des Etudes et de la Vie Etudiante (SEVE), must be considerably strengthened in order to adequately support the mobility of students and teaching staff and the framing of international exchange agreements. (Appointing an International Liaison Officer within each Faculty, who would work with the International Office and with members of staff within the Faculty, should be considered.)

16. In this fast growth phase of the University of Luxembourg, it is crucial to continue to attach extreme importance to the recruitment of high-quality faculty and graduate students.

17. Heads of research units and study programmes should be informed and involved in the human resources management pertaining to their units or programmes.

18. Teaching skills should be taken into account in the further recruitment procedures of academic staff.

19. More support staff should be hired, in particular senior staff for administration and policy preparation in support of the decision-makers at the Rectorate and Faculty levels, library staff, staff for the central financial and HR-departments, and more administrative secretaries in the faculties to support research units and study programmes.

20. Heads of study programmes require significantly more support in external communication and marketing.

21. The creation of middle layer staff positions should be considered.

22. Staff members should receive individualised task descriptions. Performance management has to be introduced for all staff members

Regarding research

23. The definition of what a research Priority is and of the criteria for evaluating and selecting Priorities is of utmost importance. The Priorities need to be focussed towards clear, measurable objectives and they need more visibility externally.

24. The achievements of the various research objectives should be regularly assessed by benchmarking with comparable research facilities

25. A strategic research plan needs to be developed and implemented, including objectives, options and tools for prioritised and non-prioritised research areas.

26. A strategic action plan is needed to enhance interdisciplinarity.

27. A doctoral school should be created in collaboration within the 'Grande région'.

Regarding teaching and learning

28. Teaching and assessment methods should be coordinated in study programmes, which will require extra effort for study programmes using external staff.

29. The University needs to develop and articulate the concept of tutoring, including a definition of the concept, and initiatives like teacher-training sessions to implement it. Any plan for a serious tutorial system should take into consideration that it is extremely work-intensive for teachers. Compensation and course loads would need to take that seriously into account.

30. A policy and an action plan are needed regarding languages and in particular for the further implementation of multilingualism. The language requirements should be made more explicit and the teaching of «Luxembourgish» as a foreign language should be reinforced.

31. The coordinators of the master programmes should formulate common procedures for student selection and admission, especially for foreign students. A University-wide procedure may be advisable, especially when this is judged necessary for checking the language proficiency.

32. Stronger and more comprehensive services need to be provided in support of teaching and learning in an international context. This recommendation relates to a recommendation made concerning central services and to the recommendation made just above.

33. Incentives should be provided for the completion of PhD's at the University of Luxembourg and the possibility of joint doctorates pursued. The establishment of a doctoral school should be considered.

Regarding quality assurance

33. Informal quality procedures should be formalised. At the central level, at least general directives or guidelines, and support for quality-assurance procedures in the Faculties should be provided. For-mal quality-assurance committees should be established within Faculties and at central level. These should include students, support and academic staff. Local and central quality-assurance committees should systematically assess, reflect upon and report about quality. These arrangements have to comply with the European Standards and Guidelines for quality assurance in Higher Education Institutions.

List of annexes

I.

TEACHING AND LEARNING UNIT REPORT

For the Faculty of Language and Literature, Humanities, Arts and Education

Preface

The University of Luxembourg was established on 12 August 2003 through a merger of several existing institutions into the University's three faculties. The Faculty of Language and Literature, Humanities, Arts and Education was formed by joining:

- The Humanities and Literature departments of the former Centre Universitaire, which had an autonomous legal status. Generally, the students could take programmes of two years at the Centre, after which they were expected to complete their studies abroad.
- L'Institut d'Etudes Educatives et Sociales (Institute for Educational and Social Studies) comprising study programmes for "éducateurs diplômés" (at the upper secondary education level) and for "éducateurs gradués" (involving 3 years of tertiary education).
- L'Institut Supérieur d'Etudes et de Recherche Pédagogique (Higher Institute for Pedagogic Studies and Research) in charge of teacher training and research in educational sciences.

The Faculty offers four Bachelor's programmes:

- Academic Bachelor in European Culture (BCE) – 180 credits, options
    - German Language and Literature
    - French Language and Literature
    - English Language and Literature
    - Philosophy
    - History
- Professional Bachelor in Educational Sciences (BPSE) – 240 credits
- Professional Bachelor in Social and Educational Sciences (BPSSE) – 240 credits
- Academic Bachelor in Psychology (BAP) – 180 credits

The former study programmesof shorter duration, "Certificat d'Etudes Pédagogiques" (CEP) and "Educateurs Gradués", had to be maintained until the BPSE was in place, but they will be discontinued as of 2008.

At the Master's level, the Faculty offers:

- Academic Master's in Psychology (focusing on evaluation) – 120 credits
- Academic Master's in Contemporary European History – 120 credits
- Academic Master's in Philosophy, linked with the Master Erasmus Mundus Euro-philosophie – 120 credits
- Professional Master's in Transborder Communication – 120 credits
- Professional Master's in Gerontology – 120 credits
- Professional Master's in Mediation – 120 credits
- Academic Master's in Spatial Management – 120 credits
- Academic Master's in Learning and Development in Multilingual and Multicultural Contexts (MA Multi-Learn) – 120 credits

As a part of the first external evaluation of the University of Luxembourg, the External Evaluation Committee selected three programmes to be evaluated in detail after consulting with the University: the Professional Bachelor in Educational Sciences (BPSE), the Academic Bachelor in Psychology (BAP) and the Academic Master in Contemporary European History. These programmes wrote separate self-evaluation reports which were the basis for the evaluation. In addition to these three reports, the Dean provided a self-evaluation report for the whole faculty. The evaluation panel visited the University of Luxembourg from the 4th to the 7th of May 2008. During the site-visit, the panel discussed the Faculty's teaching and learning policy with the Vice-Rector for Research and the Vice-Rector for Academic Affairs, the Dean of the Faculty, and the people responsible for the three selected teaching programmes. The panel also met students, alumni, teaching staff and support staff. Finally, a visit to the infrastructure and the library were organised and all stakeholders had the opportunity to meet the panel privately during a special counselling hour.

The panel found its visit to the Faculty of Language and Literature, Humanities, Arts, and Education very useful. It was interesting to see how this young university has matured in a positive manner. Students have, in general, very positive attitudes towards their programmes and the staff enjoys working at the University of Luxembourg. Academic staff can develop their own research groups and teaching programmes, and generally do this effectively. Funds are easily accessible and facilities are of high quality.

There are, however, areas for development. Thus, it is crucial to clearly define tasks, responsibilities, communication lines, and relations between the different bodies in the Faculty. Procedures need to be discussed and implemented and better coordination between University-policy from the Rector's office and what happens at the point of curriculum implementation is needed. For example, there is need for a system that allows interactive communications between different layers in the University's structure so that policy is also informed by the collective strategies and decisions of those involved in teaching programmes. In particular, an implicit Quality Culture already exists, but this should be made explicit and needs to be further developed.

In this report, the findings of the panel on teaching and learning in the Faculty of Languages and Literature, Humanities, Arts and Education will be discussed in detail. The report follows the grid of the Handbook for External Evaluation of the University of Luxembourg; it starts with Input, Process, and Output, then it discusses Quality Assurance and the current Quality Culture, and it concludes with some suggestions for improvement.

INPUT

1. Appropriateness of the teaching and support staff in quality and quantity, including time resources and the research experience of teaching staff in academic programmes

The quality of the teaching staff is in general high. In preparation for the external assessment, a few questionnaires had been distributed and filled out by students; but until now, no regular evaluations by students of the teaching quality were in place. The panel's evaluation is based on the information provided in the self-evaluation reports, and on the interviews with students and staff during the site visit. In general, the students commented quite positively on the didactic skills of the staff. Nevertheless, the panel advises that teaching skills need to be taken into account when hiring new staff. Furthermore, the panel supports the idea of developing a teacher training programme for the staff. The panel is convinced that such a programme, which should be in place by 2010, is essential for improving the quality of the teaching.

The research experience of the teaching staff varies. Originally, research was not a core activity in many of the units from which the Faculty was formed, though this began to change in the 1990s as research gained ground. Staff members who were appointed before that time do not always have research as a major interest.

In the BPSE, many of the staff members with long-standing experience as school teachers left the institution when teacher training was integrated into the University and the focus shifted to research. This shift is reflected in the way that positions are now advertised, taking into account the preferences of the research units, while the specific needs for teaching are not explicitly considered. As a consequence of this policy, newly hired members of the academic staff have, in general, a strong research profile, but not necessarily much, if any, experience as teachers. New staff members in the programme may even have limited knowledge of the education system in Luxembourg. This research-focused hiring system has lead to gaps in expertise in the programme, over which the programme director has no control.

There is some research done in different fields of psychology within the University of Luxembourg underpinning the Bachelor in Psychology (BAP). This research, however, only fits with the highest research priorities of the University from an interdisciplinary perspective (e.g. assessment); he panel doubts whether future investments in this field of research will be given the priority needed to keep up academic standards

though an Academic Bachelor's Programme in Psychology requires expertise in all the main fields of psychology.

The panel is impressed by the research quality of the full professors teaching in the Master in Contemporary European History Programme, and is convinced of the academic potential of the junior staff. As the number of staff for this Master's Programme is limited, there are obvious shortcomings in the teachers' expertise – the programme is weak, for example, in the fields of Early Modern History and Intellectual/ Cultural History.

The quantity of academic staff seems generally appropriate to the panel. The implementation of the planned Master's Programmes will, nevertheless, create a need for additional staff. As mentioned before, broad bachelor's programmes, such as the BAP, are challenging for a small university as a wide range of expertise is needed to implement them.

The workload for the staff is in general quite heavy and needs to be reduced through providing stronger administrative support for the academic staff. The number of administrative and technical support staff was, at the time of the visit, quite limited. The panel strongly recommends that additional support staff be hired. The support staff the panel spoke with are very motivated and willing to undertake a wide range of tasks, but their workload is becoming unsustainable.

2. Appropriateness of the support for the general well-being of the students, and the teaching and learning tasks

Students are very positive about the accessibility of teaching staff. Especially in the Master in Contemporary European History programme, students value the close informal relations with staff. They greatly appreciate the personal approach of the teachers, including the way they get support students in case of problems.

3. Appropriateness of material facilities

The panel is positive about the facilities provided for the students and teaching staff which it has been able to visit. Several of the laboratories are furnished with quite advanced equipment, which could clearly enrich the students' learning experiences. Operational budgets also seem to be quite satisfactory.

The recent regrouping of the Faculty on the Walferdange campus is seen, in general, as a positive step. Some issues are not yet resolved, however, causing difficulties for both staff and students. The very limited access to the library is the main point of complaint (a huge part of the collection is still located on the Limpertsberg Campus, and the planned shuttle service between the different campus libraries is not yet operational).

The fact that some of the most important archives of the European Union are stored in Luxembourg (the archives of the European Parliament and the European Investment Bank in particular) and that various important European institutions and research units are located there is a great asset to the Master's Programme in Contemporary European History.

For the Bachelor in Psychology Programme, the experimental infrastructure is not very extensive. One of the staff members indicated that she takes the interested students to Brussels to use specific equipment. This initiative is appreciated by the panel, but it is problematic that useful experimental infrastructure cannot be accessed by all students on their own campus.

The plan is to move the whole University to a new campus in Esch-Belval, where all three Faculties could be housed on one campus, and provide plenty of space for the growth. The panel sees this new campus as a great opportunity. It is understood that the main focus for investment will be on this new campus. Attention needs to be paid to the lack of office space in the meantime, as it could slow down the growth of the University of Luxembourg.

Currently, student housing and sports facilities do not meet the demands. Positive steps are being taken to alleviate this problem. The new campus should provide an excellent opportunity to create enough student housing and sports facilities.

4. Enriching links between research units and study programmes

At the Master's level, the links between research and teaching are strong. Most Master's Programmes in the Faculty are quite specialized, and are designed in accordance with the available research expertise. The panel supports this policy as it allows a strong interaction between research and teaching. For the Master in Contemporary European History, the relation between the research unit and Priority 7 (P7) seems to be strong and logical, as P7 is directed by one of the professors in the Programme and the staff are mostly located in the IPSE research unit.

Bachelor's level programmes have to be more comprehensive, which makes it challenging for a small university to offer all the necessary expertise. For BAP and BPSE, in the view of the panel, links between research and teaching could be stronger.. Since BPSE is very significant for the national education policy, it would make sense to have a research programme which focuses specifically on professional learning. This might operate across a number of professions, but would also provide a framework for the focused study of some aspects of the teacher education programme. Importantly, it may also help to ensure that staff appointments are based on interest and expertise in teacher education.

5. Clarity of the procedure for student selection and intake

Student selection and intake differ strongly between the programmes. For the BAP and the BPSE, entrance selection is in place. In the BPSE an admission test is organised every year in July, and of the approximately450 people who apply for the programme, around 130 pass the admissions test. This limit is necessary to ensure that active learning and teaching methods are feasible given the available staff. Retention rates among these students are very high (over 90%).

In the BAP programme, admission is based on an evaluation of the student's dossier, including a letter of motivation. In case of any doubt, an interview is organised with the student. In 2007-2008, 69 students were admitted to the first year programme, of whom 52 started. The panel is not completely convinced that this admission procedure is designed carefully enough to guarantee an objective and well-suited selection of students. The first year following the introduction of the stricter entrance procedure, drop-out rates remained quite high. The programme management claims that the situation has improved recently.

A description of the rational and transparent admission procedures for the Master in Contemporary European History are placed on the programme's website. Admission is mainly based on the dossier presented by the student. In case of doubts, an interview can be organised. There is no numerus clausus, as all qualified students who apply are admitted. In 2007-2008 the number of students was 32. About a quarter of the students admitted do not complete the programme.

The selection of foreign students, especially for the Master's course, is not always easy. The panel suggests discussing this problem with the coordinators of other Master's programmes, who may be struggling with similar issues, in order to find common methods for selecting good students.

The BAP focuses on attracting both local and international students, while the BPSE focuses mainly on local students. Students are informed about the teaching programmes by the central University service, SEVE (Service des Etudes et de la Vie Etudiante), which is present at student fairs and other such events.

The teachers for the Master's in Contemporary European History hope the programme will attract students majoring in History in the Bachelor in European Culture Programme, which will deliver its first graduates in

2008. So far the student group consists of local students, on the one hand, who have completed a Bachelor's in history in another country, or even studied in another Master's programme, and foreign students, on the other, who came mostly because of the specific profile of the programme. For foreign students, it is important that they receive detailed and accurate information about the costs of living in Luxembourg, which are very high. Some students indicated that they were not aware of the high living costs in Luxembourg before they enrolled in the programme.

6. Effectiveness of the procedure for student selection, recruitment and intake, in relation to the characteristics and the objectives of the study programme

See section 5.

PROCESS

7. Clarity of the objectives and learning outcomes, and the commitment of the University community to them

The 'directeurs d'études', who are in charge of the Programmes, have clear ideas about where they want to go and what they want to do, and have translated these general objectives into clear objectives for each course. For all Programmes, these objectives are quite ambitious.

8. Balance in the learning outcomes and the inclusion of up-to-date educational insights in the learning outcomes: lifelong learning skills, problem-solving skills, communication and other social skills, domain-specific competences, links to working life and academic research, including practical training as applicable

All assessed programmes dedicate considerable attention to lifelong learning and problem-solving skills. As indicated before, links with working life and academic research are also clearly present in all three programmes.

The most obvious characteristic of the University is its multi-lingual nature. The openness to teaching in different languages allows a really international recruitment of staff. In the case of international student recruitment, however, it is not clear to the panel whether the assessment of students' language proficiency is sufficient to ensure that they are able to participate actively in the courses. A University policy needs to be developed concerning the assistance of students who lack proficiency in any of the three teaching languages.

The panel is also in favour of the strong support given to international student mobility within the University. Nearly all students spend at least one mobility semester abroad, a situation which is really exceptional in European higher education.

The Bachelor's programmes are mainly organised in French and German, but students are also expected to master English and, for the Bachelor in Educational Sciences, Lëtzebuergesch.

The Master's in Contemporary European History is organised in French, German, and English. This issue was raised by some of the students: it needs to be absolutely clear to the students that they must be able to follow courses in German, French, and English, as this has not always been clear to foreign students.

9. Appropriateness of the curricula for the fulfilment of objectives and learning outcomes, and for the student intake, e.g. appropriate attention for academic competences in academic study programmes

The panel had a very positive impression of the innovative profile of the BPSE and the defined learning outcomes. These are based on sound theoretical principles about both pupil learning and teacher education which have been developed over time in pilot programmes in ISERP. Students indicate that considerable attention is paid to the development of their understanding of the learning processes of children, which they research and reflect upon from their first year in the Bachelor's programme.

When they are in the second or third year of the programme, however, students indicate that they would value more guidance on how to act on the basis of their analyses of pupils' learning experiences. The panel hopes that this aspect of the teaching programme will be addressed in the fourth year of the programme and has every confidence that this will be the case.

In relation to student concerns, the programme could focus more clearly on the school curriculum so that students and the teachers who advise them while they are doing their internships have more concrete ideas of pupil progression with which to work. The panel suggests that more attention should be paid to key curricular areas such as literacy and numeracy from early on in their studies as these are topics which need to be dealt with differently at different stages in children's learning. Thus, it would be useful for students not only to be made aware of these differences from the beginning of their programme, but also to acquire early on the teaching skills necessary for supporting children's learning in these areas.

Furthermore, students and representatives from the professional field with whom the panel spoke asked for a clearer focus on the development of professional teaching skills. They indicated that this is, at present, seen as something which has to be learnt completely during internships. The panel recognises that the development of professional teaching skills should be an important aspect of the internship, but it should not be left completely to the teachers in the schools to teach these skills, as this creates a dependency on the experience of these particular teachers and does not guarantee that the professional skills the students learn are in line with current scientific insights.

The Programme Director and the academic staff are clearly aware of these concerns and the panel anticipates that some aspects will be addressed in the fourth year of studies, which will run for the first time in the next academic year. The panel notes that the current management structure does not always make it easy for ideas from the teaching team to influence the development of the curriculum and, at the same time, all such initiatives contribute to creating a huge workload for the director of studies, who is already overworked. This aspect of the degree needs further development, and the management and governance of the programme should be thought through and probably revised.

The objectives of the BAP are quite ambitious, with a clear focus on methodology. The panel has, nevertheless, some doubts about whether the available expertise is broad enough to offer all sub-disciplines in psychology. An important handicap for the programme is the lack of a medical faculty at the University, as links between medicine and psychology are becoming stronger in many European countries. Solutions should be found to compensate for this lack of expertise as, in the opinion of the panel, an Academic Bachelor's Programme in Psychology needs to offer students an overview of the complete discipline.

In general, the panel advises making the objectives and learning outcomes more detailed, and the exact aims of the programme more explicit and clear.

The panel has also positive view of the profile of the Master's in Contemporary European History and the choice to study European Integration from a longer term perspective than is traditional to do in programmes of this sort. This view was clearly shared by the students who praised the profile of the programme, especially those in the later stages who clearly see the added value of this approach. The panel analysed the learning outcomes as they are defined in the self-assessment report. They are well formulated, but it seems that they have not been used actively as a tool for the design of the programme. The links between the learning outcomes and the curriculum could thus be improved.

10. Appropriateness of the curricula for the student intake, e.g. study load

BPSE students indicate that their workload is reasonable.

For the BAP, students indicated that the study load is not very demanding. In the opinion of the panel some assignments and group work could be added. Care is taken that students succeed within a reasonable time. As a consequence of university-wide policy, students are not allowed to continue their studies if they do not pass a minimum number of courses.

For the Master in Contemporary European History, few students obtain their diploma within the expected time. Nearly half the students spend more than the planned study time, and a quarter of the students do not obtain the diploma. These figures suggest that the study load is perhaps heavy in this programme.

11. Appropriateness of the teaching and learning methods for the specific student population

The teaching methods used in the programmes are, in general, in line with the objectives. Lectures, seminars, and practical workshops seem well organised; and students also have to complete many individual and group assignments. Interaction and active learning are stimulated in most courses in both the BPSE and the Master in Contemporary European History. In the BPSE, students are expected to do research in schools from the first year, and to reflect on the pupils' attainment of knowledge and skills . Students appreciate this focus, as they learn to regard each pupil as an individual learner. The BAP seems to focus more on lecture type classes. Students would appreciate more interactive teaching.

12. Alignment between the teaching and learning methods, the assessment methods and the learning outcomes

The panel found it remarkable that, to judge from its evaluation of the three programmes, there appeared to be little structured coordination between teaching and learning methods, assessment methods, and learning outcomes. Individual teachers seem to be solely responsible for course delivery, including assessment and grading methods, as no overarching guidelines are available. As was also indicated under Quality Assurance, the panel recommends improving staff consultation about the curriculum.

13. Appropriateness of support and counselling for students

Students have very positive opinions about the advice and ethical guidance they receive from the teaching staff. Good, informal follow-up exists and students have ample access to staff members. The students appreciate this. The close informal relations between students and staff reflect the strong commitment of the staff but also highlight the lack of assistance which is, in turn, provided to the academic staff. The research studies BPSE students undertake in schools require a high degree of staff support. In general they receive the support they need, but this puts a lot of pressure on the staff who are committed to this task. For many staff members, this work interrupts their research. As stated before, the panel advises that additional administrative support staff should be hired soon as possible.

14. Existence of a student community

It appears that developing a real student community is currently difficult. Student unions exist and activities are organised by and for students, but few students participate in these activities. The Master Programme in Contemporary European History organises two study tours, which clearly contribute to the creation of a student community within this programme.

15. Adequacy and quality of methods to evaluate student learning, e.g. by analysis of the distribution of grades, and the appropriateness of the procedures around evaluation, e.g. handling of objections and grade compensation

See section 12.

16. Flexibility of the curriculum, e.g. procedure for transfer of ECTS and options

The University and its programmes meet the Bologna requirements. Luxembourgish students can easily transfer ECTS credits from other Universities and use them as a part of their studies at the University of Luxembourg. The same applies for students from other countries who come to study at the University.

17. Link between education and research, especially for Master's programmes

As described under section 1., the Master in Contemporary European History is developed on the basis of the available research expertise and clearly benefits from the interaction of research and education.

For the Bachelor Programmes, interaction between education and research is less direct; but in the view of the panel, the link between research and education at University should be present, especially for academic bachelor programmes. The panel commented already on the rather limited number of staff members in Psychology, resulting in unfortunate gaps in expertise in some sub-disciplines. This also has its consequences on the Bachelor in Psychology.

For the BPSE, the panel found it interesting that the curriculum has a very strong academic profile, although it is a Professional Bachelor Programme. Research topics are, however, not always strictly linked with the content of the curriculum.

18. Procedures for approval of curriculum changes

The responsibility for programme approval and curriculum changes is attributed completely to the 'directeurs d'études'. In general they adapt informally to received feedback (see also under Quality Assurance) and do this mostly in a good way. As indicated before, the panel recommends formalising these procedures in order to continue guaranteeing the quality of the programmes as the number of staff and students grows.

OUTPUT

19. Realisation of objectives (outcomes of learning, employability, mobility), efficiency, student feedback on teaching quality

As these programmes are still quite young, it has been difficult for the panel to evaluate their output. Nevertheless, based on plans, current practice, and the few graduates of the Master in Contemporary European History, the panel has made some preliminary comments and suggestions.

The curriculum of the BPSE is very innovative with a clear focus on the development of academic skills and attitudes. Students appreciate this direction, but they would also like more emphasis on professional teaching skills and more attention to the school curriculum earlier in their course. They learn these aspects of the teacher's profession during their internships, but not in the most structured way which would, for example, allow them to experience teaching literacy across the elementary school age range. The panel supports the philosophy of the innovative curriculum, but it sees some room for further improvement in the curriculum by balancing the innovative ideas with professional teaching skills and understanding of the curriculum.

If the programme can be linked over time with a Master's programme, as is increasingly common across Europe, the programme would produce a stronger cadre of judicious teachers.

The panel values the focus on methodology in the BAP. This seems the best possible profile in a context where there is no Medical Faculty at hand. In addition, though, few links exist with the biology group and the social sciences group is not very extensive. It is difficult to offer a broad overview of the discipline to students as many related disciplines are absent, especially in the domain of applied psychology, including educational psychology, health psychology, and labour psychology. This will remain a challenge, and only when the first cohort of graduates begin their Master's education abroad or look for jobs will it become clear whether the present profile is regarded as sufficiently broad by the outside world.

 The Master in Contemporary European History is also a new programme. Judging from the comments of the alumni, employability does not seem to be of great concern to the graduates. Students made positive

remarks about the quality of the teaching. The panel has a very favourable impression of the Programme profile of the as it offers a broader perspective on European integration than do most programmes of this sort. The curriculum is strongly linked to the research undertaken by staff. The strengths it has and challenges it has to deal with are much the same as other small programmes. The interaction between staff and students is fairly intense, but the low number of staff creates some problems in covering all the issues needing coverage.

20. Relevance of diploma's and the (regional) impact of the study programme, the relation between the competencies of the graduates and the demands of the workforce, e.g. the careers and further education of alumni

The BPSE programme is crucial for the development of the Luxembourg educational system as it offers high status training for elementary-school teachers. As indicated before, the curriculum has a strong focus on academic skills. The panel recognises the work involved in communicating course intentions to teachers and that this work takes time. It would therefore like to encourage most strongly efforts to develop closer links with the teachers who receive students in their classrooms. In particular, it would be useful to communicate ideas behind the assignments and research students have to do to get more support for the renewed teacher training curriculum.

One of the main reasons for the development of the Bachelor's programme in Psychology was the need for well trained Psychologists in Luxembourg. Thus, the programme has the potential to contribute strongly to Luxembourg society.

The Master's degree in Contemporary European History has the potential to have a very positive impact regionally as it emphasizes the multicultural nature of Luxembourgish society and the multiple and multifarious relations Luxembourg has had with Europe through history.

21. Alignment of the outcomes with the Dublin descriptors and/or the European (or National) Qualifications Framework

The alignment of all three programmes is clearly in line with the Dublin descriptors. Knowledge, skills, and attitudes are, generally, addressed in a balanced way.

22. Efficiency and effectiveness of the study programmes

With respect to student retention, the efficiency and effectiveness of the study programmes seem to be quite uneven. In the BPSE, strict selection is done at the entrance to the programme, which has led to quite high passing rates (over 90%). The BAP is becoming stricter in its intake, but pass-rates are still quite low. The same is the case for the Master's in Contemporary European History, where about a quarter of the students do not complete the programme and about half of the students take more than the expected 2 years to graduate.

QUALITY ASSURANCE

23. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives for the study programmes and the Faculty

An implicit Quality Culture is clearly present within the University of Luxembourg and its programmes. The 'directeurs d'études' have invested considerable time in the development of their curriculum. Based on informal feedback, they also try to further improve its quality.

Explicit quality assurance procedures need, however, to be developed. During the initial starting-up phase of the University, various tasks could be undertaken by informal follow-up, but now it is clearly time for a consolidation phase, where structures are formalised. The staff members, with whom the panel spoke, share this concern. At the time of the site visit, a proposal for a new Faculty structure was presented to the panel. A Scientific Committee, an Education Committee, and a Quality Committee are planned at the Faculty level, alongside with the already established Faculty Council. The panel hopes that the Education and Quality Committees will contribute to a more structural approach to quality assurance of teaching and learning within the Faculty. Therefore it is also important to clearly define the distribution of tasks, channels of communication, and relations between the different bodies in the faculty. Up to now, the Faculty Council has been the only official body where teaching issues could be discussed within the faculty. The agenda papers and minutes of meetings indicate that the Faculty Council has been mainly a place where decisions taken by the Rector are communicated to the Faculty by the Dean. The panel noticed some tension between the clear top-down approach to policy that is defined at the central university government level, and a more bottom-up approach which would allow senior management to draw on the collective intelligence of its workforce to inform strategic developments. The lack of two-way communication in the University places the Dean in an important yet difficult position.

At the programme level, initiatives are taken to formalise more clearly the quality assurance processes. The BPSE programme is too complex to be held together in informal manner and the programme director has, at the present, a huge responsibility. He has indicated that he would like to share this responsibility with others. This initiative is strongly supported by the panel. The working groups on admissions, etc. currently report directly to the programme director. It may be advisable to strengthen the power and responsibility of the steering group by making the working groups report to it. Moreover, decision-making authority of the steering group could be increased, and thus it would, in effect, become a programme committee with shared responsibility. One topic that could be addressed quite effectively by a programme committee could be consistency of student experience while they are in school, and the relationship of their school experience to the curriculum in the University, to ensure that they acquire the required competences during the programme.

These structural improvements are meant to increase the involvement of the staff in quality assurance processes and to reduce the pressure on the Dean and programme directors of studies. The panel thinks it would be beneficial not only to formalise these structures and create a programme committee for every programme in the faculty, but also to assign some responsibilities to these bodies instead of concentrating all responsibilities within the individual director of studies. This could contribute to the commitment of the staff to the decisions taken.

In preparing for the external assessment students were asked for feedback on the Bachelor's programmes. To be able to monitor the quality of teaching, regular student questionnaires should be distributed at the end of each course. The panel suggests that electronic questionnaires should be designed centrally, which can be used for all courses in the whole university. Up to now, every 'directeur d'études' has independently developed evaluations of education.

In addition to student questionnaires, it would also be useful to involve students in programme committees and other advisory and decision-making bodies. This is already the case in some of the working groups within the BPSE. In the Master in Contemporary European History programme, the director asked students to select a student representative, but, at the time of the site visit, they had not done this.

To fill out assignment data from student evaluations, it would be useful to ask alumni for their comments on the programme and to monitor their employment opportunities after graduating. Also, representatives of the professional field can give useful feedback on their needs and recent experiences in practice. Within the BPSE, plans are made to create a Scientific Board which would include external experts. In the opinion of the panel, this is a good way to involve external stakeholders in the quality assurance of a programme.

24. Commitment of the University community and stakeholders of the Faculty to quality assurance

An implicit Quality Culture is clearly present within the University of Luxembourg and its programmes. The 'directeurs d'études' have invested a lot of time in the development of their curriculum. The panel has been convinced during its site visit that people are generally very open to formalising quality assurance processes within all three programmes evaluated.

25. Effectiveness of feedback in influencing positively the quality of the study programmes

As a result of the feedback on the programmes received informally, improvement measures are often taken. As mentioned already several times, the panel judges it essential to formalise the quality assurance processes.

General opinion about the teaching and learning in the Faculty in relation to the concept of Quality Culture

The panel is asked to indicate its general opinion about the teaching and learning in the Faculty, in relation to the concept of Quality Culture. In the handbook provided to the panel members 'Quality Culture' is defined as follows *'Quality Culture refers to an organisational culture that intends to enhance quality permanently and is characterised by two distinct elements: on the one hand, a cultural / psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural / managerial element with defined processes that enhance quality and aim at coordinating individual efforts.'*

The panel has noted that the staff is very committed to the quality of the programmes organised. Each programme director has a clear idea where he wants to go to with the programme and takes initiatives to realise these objectives. The paperwork presented to the panel was of high quality and evidence of the work put into programme development by the director of studies. Quality assurance should, however, be formalised. The panel suggests working on this also at the Faculty level. Up to now, the Faculty Council is the only official body at the Faculty level and this seems to be merely a platform for communicating and formalising decisions, rather than a forum where a common identity, vision, and strategy for the Faculty are built and debated. The panel suggests that it would be useful to involve all staff, as well as students, alumni and external stakeholders more directly in the quality assurance processes through setting up programme committees which are linked clearly with a more formal committee structure which could deal with teaching and learning quality issues at a Faculty level.

The combination of the above mentioned elements leads to a grade B *('The unit has a partial Quality Culture. The Committee has confidence in its capacity to develop and manage its present and future quality, insofar as the recommended adjustments are made.').*

Suggestions for improvement

Several suggestions the panel formulated apply (more or less) for all programmes evaluated. The panel suggests:

- defining clearly the distribution of tasks, responsibilities, communication lines, and relations between the different bodies in the faculty.
- taking teaching skills into account when hiring new staff and developing teacher training for University staff.
- providing – as planned — stronger administrative support for the academic staff.
- facilitating access to the library.
- paying attention to the lack of office space until the campus moves to Esch-Belval.
- introducing an ethical committee at the Faculty level which would be able to advise staff on expectations for student research.
- stimulating the construction of a student community.
- communicating clearly the language requirements to (foreign) students.
- developing a University policy on assistance to students who lack proficiency in one of the teaching languages.
- developing explicit quality assurance procedures.
- attributing some responsibilities to the programme committees instead of concentrating all responsibilities within the individual directors of study.
- implementing regular student questionnaires after each course.
- investigating at the University level the introduction of technology to organise easily electronic questionnaires.
- involving students in programme committees and other advisory and decision-taking bodies.
- involving alumni and representatives of the professional field in quality assurance procedures.

In relation to the individual study programmes that the panel evaluated, the panel suggests:
- *for the Bachelor in Educational Science (BPSE)*

- ensuring that enough of the teaching staff have prior experience as school teachers.
- strengthening links between research and teaching.
- building a research programme which focuses on professional learning.
- providing students with ideas on how to work with pupils in schools, at least in literacy and numeracy, from the early stages of their studies.
- introducing a stronger focus on the school curriculum.
- introducing a stronger focus on the development of professional teaching skills.
- strengthening the follow-up of what students do during internships and the consistency with the rest of the curriculum.
- improving communication with teachers in the schools about the ideas behind the assignments and the research that students have to do, to get more support for the renewed curriculum.
- strengthening the power and responsibility of the steering group by not only making the working groups report to it but also increasing the amount of decision-making undertaken by the steering group, making it in effect a programme committee with shared responsibility.

- *for the Bachelor in Psychology (BAP)*

- addressing the need for expertise in all sub-disciplines of psychology.
- strengthening links between research and teaching.
- taking care that the admission procedure is designed carefully enough to guarantee appropriate selection of students.
- making the objectives and learning outcomes more detailed and being more explicit and clear about the exact aims of the programme.
- focussing more on interactive teaching.
- adding some assignments and group projects as the study load seems not to be as high as it could be.

- for the Master's in Contemporary European History
- addressing the need for expertise in Early Modern History and Intellectual/Cultural History.
- discussing the problems of the selection of Master's students with the coordinators of other Master's programmes which are probably struggling with this too, and trying to find a common way to select good students.
- offering potential students a realistic insight into the costs they will face, as living costs in Luxembourg are high.
- improving the links between the learning outcomes and the curriculum.

II.
TEACHING AND LEARNING UNIT REPORT

For the Faculty of Law, Economy and Finance

This report contains the panel's conclusions regarding the evaluation of teaching and learning within the Faculty of Law, Economy and Finance (FLEF) of the University of Luxembourg (UL) and follows the evaluation grid of categories and criteria defined in the *Handbook for External Evaluation of the University of Luxembourg'*(Input / Process / Output / Quality assurance). The report begins with a general outline of the context of the FLEF and its programmes, and ends with a Conclusion on the Quality Culture, including a proposed grade to the Committee. This is followed by a short Summary Statement, and a recapitulation of the suggestions for improvement.

INTRODUCTION

The University of Luxembourg was established in August 2003 as a result of the integration of several existing institutions into three Faculties. The Faculty of Law, Economy, and Finance is the result of a merger of:

- the Law and Economy departments of the former "Centre Universitaire"
- three research units of the "Centre de Recherche Public Gabriel Lippmann": one in Economics – the "Cellule de Recherché en Economie Appliquée"; one in Law – the Laboratoire de Droit Economique; and one in Mathematics – the "Service de Mathématique appliqué"
- and the Luxembourg School of Finance (LSF).

In 2007/2008, the FLEF offered the following 3 Bachelor's programmes and 5 Master's programmes:
- Bachelor académique en Droit *[239]*[1]
- Bachelor académique en Sciences Economiques *[222]*
- Bachelor professionnel en Gestion *[302]*
- Master in European Law (120 ECTS) *[103]* with three distinct branches in the second year : European Litigation Law, European Banking and Financial Law, and European Economic and Financial Criminal Law
- Master in Financial Economics (120 ECTS) *[30]*
- Master of Science in Banking and Finance (60 ECTS) *[44]*
- Master in Innovation and Entrepreneurship (60 ECTS) *[21]*
- Master in Management of the Security of Information Systems (60 ECTS) *[27]*

In accordance with the *Handbook for External Evaluation of the University of Luxembourg*, the panel has based its findings on a sample of three of these study programmes of the FLEF, chosen by the committee after consultation with the FLEF management:

1. Bachelor académique en Droit (BaD)
The BaD has its roots in the former Law Study Programmes of the "Centre Universitaire". An introductory first year programme has been running for about 50 years, while the second year programme has been around for less than 10 years. All of the courses were taught by legal practitioners (mainly barristers) and students were principally Luxembourgian. After one or two years, students were obliged to leave Luxembourg to finish their studies in other Universities.

With the creation of the University, academic staff have been recruited and are still increasing in number. The programme has now been restructured into semesters and ECTS, and a new third year - completing the bachelor's programme - will be taught as of September 2008. Both content and structure of the programme have been changed to fit this new configuration. The new programme is based mainly on the model of French law studies with an additional strong focus on both comparative (European) law and financial law. The daily management of the programme is in the hands of a team of two 'Directeurs d'Etudes'. The BaD has its premises on the Limpertsberg Campus of the UL.

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[1] Number of registered students in 2007/2008

2. Master of Science in Banking and Finance (MBF)

The MBF was first set up within the Luxembourg School of Finance (LSF), which was created in 2002, and was then integrated into the FLEF in 2005 as its finance department. The MBF has been running since 2003, and is intended to provide specialized training in the various professions of the banking and finance fields. In distinction to a more general MBA it aims towards developing conceptualized expertise focused on these particular sectors. In addition, the programme is designed to develop leaders who are creative thinkers and team players. As part of the curriculum, students follow a five-day program at the Stern School of Business of the New York University. There is a tuition fee of 17.500 EUR. The programme is managed by an academic director (since 2003) and an academic co-director (since 2007). The professional corps of the MBF, including both directors, comprises 5 tenured professors, 27 visiting professors, and 3 'clinical' professors. After several changes of location, the MBF now shares its premises with the MEI on the K2 Campus in Kirchberg.

3. Master in Entrepreneurship and Innovation (MEI)

The MEI programme is the outcome of a partnership between the UL and the Chamber of Commerce of the Grand-Duchy of Luxembourg (CC). The objective of this collaboration is to stimulate the creation and development of innovative companies by providing students with an advanced education in the fields of entrepreneurship and management of technological and organizational change. This is achieved, in part, by immersing these students into daily business practices through intensive internships within mentor companies. The MEI programme began in October 2007 with 21 students and is managed by a team of two academic directors (each devoting 50% of their time to the programme). In addition, the programme is supported by 6 visiting professors. The MEI is located at the K2 Campus in Kirchberg.

To start the review, each of these three sample programmes drew up a self-assessment report. In addition, the panel was provided with a overarching self-evaluation report on the FLEF, written by the Dean of the Faculty. During the review visit, the panel interviewed not only academic, management, and support staff, but also students and external stakeholders associated with the three programmes, and the Dean of FLEF. In addition, the panel had a tour of the facilities (including IT support) during the site visit which took place from the 4th till 7th May 2008.

The panel wishes to stress that it has been very much aware of both the short history and the complexity of recent developments of this new Faculty within a very young University. The panel took full note of the fact that the three sample programmes are (each in their own way) still in a pioneering and developmental phase, and wishes first and foremost to express its admiration for what has been achieved in such a short time. Both on the level of the individual sample programmes and on the level of the Faculty, an impressive amount of excellent work has been done and the first results of that work are already clearly visible: student numbers are increasing and first indications are that overall student satisfaction is high; the staff with whom the panel talked are committed, enthusiastic, and proud to be involved in the programmes; and the external stakeholders expressed both high satisfaction and great expectations.

What has been achieved is impressive, but — as will be indicated in the report below — also fragile. The panel is of the opinion that it will be crucial for the further fruitful development of the Faculty to embed and ground its achievements in a more secure environment. The panel has thus taken its task as a supporting one, and has mainly tried to focus on highlighting those points that would benefit from further consideration — and consequently, on giving advice and recommendations that could help to support the Faculty in its further development.

INPUT

Human infrastructure

In the panel's opinion, the quality of both support staff and teaching staff of the three programmes the panel sampled is generally high and, in some cases, excellent. All staff interviewed seemed highly committed, enthusiastic, and proud to be involved in the programmes. The management of the programmes, in each case led by dynamic teams of two 'directeurs d'études' (a senior and a junior staff member) has a clear vision for the future, an awareness of the main challenges, and seems to provide stimulating leadership. No formal evaluations by students were available as yet, but all the students with whom the panel talked, with relatively few exceptions, showed great appreciation for the high quality of the teaching.

All three programmes offer a very good combination of practitioners and academic staff (further enriched by the innovative concept of mentor companies in the case of the MEI), a point which was stressed repeatedly by the students. CVs show that the research background of teaching staff is generally appropriate and is — for instance, in the case of the BaD which was formerly supported almost entirely by practitioners – in the process of being further developed. Recently hired academic teaching staff have rich and appropriate research experience, which indicates the Faculty is successful in attracting talented colleagues. Existing gaps in knowledge and experience (which — considering the youth of the programmes — are to be expected) are addressed through engaging high-profile visiting professors. The MBF programme is an extreme example of this practice as it has been able to attract a wide spectrum of international 'stars' in Finance and Banking as visiting professors.

Continuing with this last example, however, the panel also wishes to point out what it sees as the main fragility of the Faculty's current human infrastructure. As indicated in the introduction, the MBF comprises 5 tenured and 27 visiting professors. Apart from the quality and reputation of those individual teachers, it is evident that a very high dependence on a large number of external staff with different educational frameworks of reference is generally not beneficial for the coherence and the identity of the programme. In fact, indications were indeed given to the panel of the existence of variations in grading and teaching styles, some of which were not properly attuned to the particular circumstances and context of the programme with its concentrated teaching sessions of 3 or 4 consecutive days.

The panel also learned that the director of the MBF programme (the nexus of this impressive network of international peers) will retire soon, which leaves the question open whether, and if so how, this excellent input can be maintained in the future. Additionally, the LSF (now the finance department of the FLEF) has been without a director for quite some time. Both elements contribute to a growing uncertainty amongst the staff and students which could threaten not only their present motivation, but also the future stability of the programme. Regarding the MBF programme, the panel advises the decision makers to solve these pressing issues as soon as possible, taking into consideration the views and expertise of the full-time staff and the student body.

This current heavy reliance on external staff could also be detected in the BaD and the MEI programmes[2]; therefore, as a general point the panel advises the Faculty to encourage recruitment and involvement of permanent staff, whilst of course maintaining the valuable, but proportionate, input of excellent visiting staff. The panel was pleased to find the Dean clearly sharing this analysis and identifying this issue as one of the main challenges for the future.

As indicated above, the panel found commitment to quality in recruitment (of both internal and external academic staff) to be in evidence, as it is clearly taking place based upon shared (though mainly implicit) notions of strategy and quality in relation to teaching and learning. The panel would advise further explicit discussion of these aspects, however, in order to derive agreed approaches to teaching and learning, including, importantly, assessment. Further enhancing transparency and participation in discussions among

[2]The FLEF as a whole comprises 22 professors and 200 external staff.

colleagues could help sustain a consistent and co-ordinated approach within programmes which will be important in the maintenance of quality and standards in the face of the significant predicted growth rates in recruitment. In this context, the panel thinks it worth considering formalizing the contracts with external staff, and clearly identifying their teaching and assessment responsibilities.

The overall quantity of staff is acceptable but suboptimal.

On the one hand this is due to the aforementioned current imbalance between internal and external academic staff. The workload of the tenured professors appears to be very heavy, which was particularly noticeable in the labour-intensive MEI programme. Attracting mentor companies, selecting students and lecturers, arranging the matchmaking between students and mentor companies, teaching, evaluating, counselling, and taking care of the daily practical issues is now handled by two half-time professors and one half-time support staff member.

On the other hand, there seems to be a growing problem with the quantity of support staff. Their application is admirable and the panel was impressed with their commitment, but the growing workload appeared about to exceed their capacity:Student numbers for all bachelor's programmes are quickly increasing, and the BaD's self-assessment report mentions only 1 secretary for 851 students. The master programmes, now sharing 1.5 FTE, are also very demanding (this is due to a combination of factors including the nature of the student population, who are often professionals in high powered jobs, the use of innovative teaching methods such as working with mentor companies, and the academic week in New York). Several small but annoying bureaucratic malfunctions and administrative confusions were reported by the students resulting from an apparent lack of support-staff resources.

The panel advises the Faculty to reconsider some of the responsibilities currently allocated to 'local' support staff. For example, taking care of work permits or visas might be taken up by central services. In general, the panel is of the view that it would be worthwhile to investigate the need for additional staff resource in these areas, and to plan ahead for future infrastructural needs in the light of planned future growth. In addition, the panel suggests the organisation of regular common meetings for all support staff, thus creating a forum for sharing common problems and developing common procedures. This could also help to reduce the inconveniences of the Faculty's current dual location (see below). In view of the multilingual environment, language courses need to remain available for all staff.

Material infrastructure

Both the BaD, located at the Limpertsberg campus, and the two Master's programmes, located at Kirchberg campus, appear to be appropriately housed. After several moves (some of the past locations being described as completely inadequate), the MBF students are particularly pleased with their current facilities which offers 24/7 access, laptops, and ample electronic resources. Students, teachers, and external stakeholders also appreciated the geographical proximity of MBF and MEI to the financial and business centre of the city of Luxembourg.

Seen from the perspective of the Faculty's main location, which is Limpertsberg, the Kirchberg campus is, of course, rather remote, and this dual location proves to be detrimental to enriching links for staff and, especially, for students. The panel is of the opinion that a common geographical setting (taking into account the varying requirements of the programmes) would be beneficial if all programmes are to grow into one well-integrated Faculty.

The Law Library in Limpertsberg is beautifully housed but rather thin. Students did make some comments on deficiencies in the library. Also access to the Limpertsberg library seems to be a problem. The library closes at 5 pm and stays closed during weekends and holidays. Due to the recent moves, the MEI and MBF library in Kirchberg was reported to be still mainly in its removal boxes. This too provoked some comments from the students. The panel advises the Faculty to further investigate these issues and to seek efficient so-

lutions to the problems. Electronic access to relevant sources is, however, very good, and the panel also found most of the study material to be available on the Faculty's electronic 'Moodle' platform. This Moodle system is likely to be a very efficient communication and harmonization instrument when fully utilized by the vast   majority of students and teachers (internal and external).

Student intake
For the BaD, no specific selection (apart from the formal basic requirements of the baccalaureat) have been implemented up till now. The panel learned that the introduction of some form of student selection is under debate since the number of students continues to grow, and the course management desires to keep groups small in order to be able to deliver effective learning and guidance. The panel is of the opinion that some form of selection (e.g. interviewing applicants) might help remedy the significant dropout rate after the first year (roughly 1/3 succeeds fully, 1/3 succeeds partially, and 1/3 drops out), by informing potential students of the work load (see below), and discouraging unmotivated applicants.

Selection is being carried out in both Master's programmes and seems to be generally effective, though here appeared to be some concern with the mastery of English of some of the MEI students (leading to loss of effectiveness of learning during group sessions or projects). In the case of the MBF, the panel found admissions, up to now at least, being based primarily on individual assessment and a personal interview with the director. In general, the panel would advise the Faculty to continue managing applicant acceptance carefully, developing a clear strategy and transparent procedures for unbiased intake selection, based as explicitly as possible on the mission and goals of not only the programmes, but also the Faculty as a whole. It could be fruitful to specify general criteria at the Faculty level which could be applied in all recruitment processes, with different emphases as appropriate. It might also be helpful to discuss such criteria with the external stakeholders.

PROCESS

Appropriateness of objectives and curricula
A study of the different programmes — based upon information provided in the self-assessment reports, the additional information gathered by the panel from the Faculty's website, and the interviews with management, staff, and students — clearly evidenced the appropriateness of the curricula for the fulfil-ment of current objectives and learning outcomes. All three programmes have high standards and, in the opinion of the panel experts, are undeniably attuned to the prevailing (inter)national academic and professional demands. Some work is still needed to make objectives and learning outcomes more explicit and transparent ,as some of the formulations in the self-assessment reports and on the FLEF website remain rather vague.

The panel repeats its appreciation for the excellent work that has been done in a very short time and with a relatively small body of staff. Students explicitly attested to the attractiveness and the quality of the programmes. The panel has already pointed out that it considers programme delivery by the combination of professors with highly professional backgrounds in academia together with those with a background in industry a valuable asset of all of the programmes. The BaD has an interesting practice of tapping into the resources of the European legal institutions located in Luxembourg (through visiting staff and site visits), and this helps greatly to reinforce the country's international profile. The MBF can take advantage of many internationally acclaimed experts and professionals in the world of banking and finance. The MEI's innova-tive approach using mentor companies has (admittedly, after some initial difficulties with matchmaking) attracted well-known firms such as Deloitte, Arcellor Mittal, Nokia, Dexia, the European Investment Fund, and Luxinnovation. These are all good examples of the rich resources available to students in these programmes. Although not always formally articulated, the aims and objectives of all the programmes studied seem to the panel to emphasise the needs of Luxembourg society and economy, and the Dean confirmed this: the main strategy of the Faculty consists in building on the advantages offered by the Luxembourg environment as the capital of European law, with a strong international financial centre and host of major and highly

innovative industries. In relation to the links between research and teaching, the panel formed the view that further development is required in relation to the BaD, but that it is quite apparent in the Master's programmes. The MBF is closely related to the Centre of Research in Finance (which is the P5-priority of the University), and the MEI's courses are clearly fed by the research of the professors in charge.

All programmes are generally well structured and designed, fairly comprehensive, and testify to the strong motivation and commitment of the staff generally and the course managers in particular. A few separate comments on the programmes, however, could be made. The MEI programme seems to have a stronger focus on entrepreneurship than on innovation, and maybe this balance could be re-considered. As highlighted above, the MBF urgently needs clarity as to its future strategy and outlook after the retirement of its 'founding father', in order to avoid a discouraging lack of stability and, indeed, sustainability. Also, the BaD programme, as was reported by the students, is extremely demanding (combining a curriculum equivalent to a French Licence with bilingual courses, comparative law, and financial law). In the view of the panel, the study load may be too heavy in the first year which may be exacerbating the high first year drop-out rate. The panel advises following up on this issue, including the monitoring of the study load in the context of a comprehensive quality assurance system (see below).

Teaching and learning methods & assessment
In the opinion of the panel the enthusiasm and clear command of the staff are the beneficial effects of the leeway that has been given to (or was taken by) the initiators of these programmes. This is particularly true for the MEI and the MBF, which were both set up 'outside' the Faculty and are (as described by one of the interlocutors) 'hand-crafted'. The forerunner of the BaD programme has a long history already, but is also clearly getting new, inspiring (and inspired) stimulation from its young 'directeur d'études'.

This strength, however, contains a weakness that is further fuelled by the aforementioned imbalance between internal and external staff.

The panel, in its evaluation of the three sample programmes, found it remarkable that there appeared to be an almost total absence of any coherent internal (i.e. linked to the individual programmes) or overarching (i.e. linked to the Faculty as a whole) pedagogical philosophy underpinning these programmes. Individual management teams, and indeed individual teachers, seem to be solely responsible for programme development, as no prewritten directives, nor procedures for decision-making, are available. Individual teachers in their turn seem to be solely responsible for course delivery, including assessment, as no real guides for teaching nor for assessment and grading methods are available. Taking into consideration the relatively large dependence on external staff, coming from and bringing with them quite different pedagogical cultures, the panel is not convinced that either the quality or the standards attained today can be secured time and again in the future.

The panel stresses that this does not imply that it has found evidence of grave difficulties, nor does it imply that it has encountered a complete absence of a sense of direction. Indeed, evidence was given during the interviews (in several of which the panel explicitly addressed this issue) that there is a fair amount of informal harmonization. In the MEI, assessments and grades are jointly discussed. In the MBF, the academic director talks to all visiting staff about course content, delivery, and marking. Also, BaD staff attested to informal alignment on teaching and grading. Students were generally positive about not only course delivery but also teaching and grading methods, although some remarks were made concerning the appropriateness of some of the teaching styles to the BaD — with its predominantly ex cathedra delivery and the MBF, as discussed earlier. The panel also understands that the efficiency of informal processes may be high in a Faculty with only 22 staff members. The fact nevertheless remains that, as the Faculty grows in staff and students, more systematic efforts will be needed to harmonize teaching and learning strategies in order to sustain quality and assure standards. The current relatively informal arrangements appear too fragile to reliably support expected future growth.

When turning its attention to the Faculty, the panel found an altogether different reality. It was apparent that several important and encouraging initiatives have been taken at the Faculty level to enhance overall coherence, direction, and quality. For example, there is a 'Conseil du Faculté' (meeting once a month) which, the panel was informed, has the right of initiative and takes formal decisions concerning the research programmes. In addition, a 'Conseil de Directeurs d'Etudes', comprising the vice-rector of teaching and a delegation of the support staff, meets every six weeks with the explicit task of discussing teaching and learning issues. A Faculty-wide quality assurance system is being tested (see below) and all Faculty members go on a two-day retreat each year to discuss general strategy. There is a clear record of decisions taken in these formal bodies through minutes drawn up in terms of 'subject discussed'/'action to be taken'/'responsibility of'. These minutes are managed by the Lotus Notes program and are made accessible to all personnel.

It thus appears to the panel that, with respect to governance, there is, on the one hand, the reality within the programmes. These are moving forward, driven by their own impetus (and history) based mainly on informal structures and procedures. The outcome of this movement is impressive but fragile.

On the other hand, there is the development of formal procedures and processes on the Faculty level, clearly aiming at enhancing coherence in strategy and approaches. These initiatives are potentially extremely valuable but remain largely undetectable at the Programme level at present.

Speaking generally, the main challenge for the future will be to make these two movements meet, attuning them carefully in order to safeguard the beneficial effects of both approaches. The panel is convinced this can help secure the future development and quality of the Faculty, enabling it to continue to meet the high expectations of all stakeholders.

The panel thus advises further implementation of explicit structures and policies within which teaching and learning strategies will be located, but which will be capable of adapting to the needs of the individual programmes (e.g. course development and management / evaluation methods / general pedagogic concepts / quality assurance) and within which individual programmes can be systematically discussed, developed, monitored, and improved.

Enhancing internal communication between (and establishing feedback forums for) all staff and students, is needed to help to close the apparent 'void' between programmes and Faculty.

Support and counselling of students & student life:

Students are generally very positive about the counselling and assistance they receive from a highly committed and caring support and teaching staff. Students clearly appreciate the relatively small scale of the programmes which enables an almost personal approach. There seems to be an effective follow-up on problems, though this happens mainly through informal channels and operates principally on an individual level. The panel suggests documenting demands and actions taken to establish a more structured, and thus consistent, approach.

Additionally, dissemination of information could be further improved as most students met by the panel, for example, were not aware of the existence of SEVE (the 'Service des Etudes et de la Vie Etudiante'), nor of the existence of a student union, or of other formal bodies for student feedback or participation in decisions. In particular, MEI and MBF students, who were strongly committed to their programmes, appear to be somewhat detached from the general student body, a result no doubt of their physical separation (being located on the Kirchberg campus) from the rest of the Faculty, and the special characteristics of their population (i.e. professionals spending limited time on campus). Evidence of a real student life community within the Faculty could not be found.

OUTPUT

Given the fact that the three sample programmes are still at a very early phase of development, and (apart from the MBF) have no alumni as yet nor any systematic student feedback data available, it is difficult for the panel to comment on the output of the programmes on anything other than an impressionistic basis.

The panel has already pointed out repeatedly not only the quality but also the commitment, application, and animation of the staff supporting the programmes — and to the apparent quality of the curricula themselves – all of which are elements that should contribute very positively to an efficient and effective realisation of objectives and outcomes. Informal student feedback is generally very positive, albeit subject to some criticism of process (as discussed above). Students report high levels of satisfaction with the teaching they receive (again with some scattered exceptions), and MBF alumni described the learning opportunities they were provided with as both outstanding and in tune with the demands of their careers. The panel also clearly values the multilingual environment of the Faculty (and the University), which provides a stimulating learning experience in an international context. Curricula are carefully designed (with room for improvement as discussed above) and clearly aligned to Bologna-standards; however, an explicit and systematic linking between learning outcomes and Dublin descriptors or the EQF still needs to be executed.

The relevance, in particular, the regional impact of these programmes appears to be high. As indicated above, the three Programmes (and the Faculty as a whole) clearly focus on the identified needs of Luxembourg, and the Greater Region, and explicitly take their immediate environment into account. Clear examples are BaD's stress on Financial and European Law, and MEI's work with mentor companies and its involvement with the CC. External stakeholders the panel interviewed claimed the output of the Faculty was very valuable to the community, pointing out, for example, the importance of having 'home grown' lawyers, innovators, and financial experts. Both stakeholders and staff did attest, however, that expectations on both sides are not always crystal clear, which tends to hamper easy communication. The panel advises continuation and further structuring of consultations with stakeholders, and integrating them in quality assurance measures (see below), thus making them more jointly responsible for programmes (within, of course, the boundaries of academic freedom).

QUALITY ASSURANCE

Both on the Programme level and on the Faculty level, the panel could identify a very strong commitment to quality, an awareness of issues to be taken up, and a willingness to make adjustments. It was a pleasure for the panel to witness the energy with which the Programme and Faculty management are striving for quality in building up a strong curricula and a strong Faculty, in a very new environment and, in most cases, 'from scratch'.

On the individual programme level, quality assurance is taken up in a direct and informal way. Students of the three sample programmes reported that most of their complaints are heard by and solved with the teachers directly. Bottlenecks are generally identified and quickly remedied. For both Master's programmes (and to a lesser extent also for the BaD), the 'directeurs d'études' have ample contact with all students and function as the central contact persons between students and staff. In the BaD, first experiments with questionnaires are being tried, but up till now, arrangements for monitoring, feedback, and improvement have generally been informal. In the panel's opinion current practices have proven to be sufficiently well-tailored to the needs of the current phase of development.

But this individual approach to feedback and improvement has left some issues (mentioned throughout this report) unaddressed. And it also remains unclear to students (and to a certain extent also to support staff) whom to address if a problem extends beyond the scope of an individual teacher. Additionally, the aforementioned imbalance between internal and external staff and the absence of transparent guidelines

for teaching, guidance, and assessment is not beneficial to a coherent implementation of course delivery and improvements.

It is clear to the panel that, as the Faculty's student body and staff grows, this informal approach will be decreasingly effective. The panel was pleased to find most of its interlocutors agreeing with this analysis.

At the Faculty level, evidence of a willingness to develop a more formal and structured approach to quality assurance was already visible to the panel.

Apart from the valuable initiatives and forums for debate mentioned above (e.g. the 'Conseil du Faculté', the 'Conseil de Directeurs d'Etudes', and the yearly two day retreat with all staff), a 'Comité de Qualité' (a task force for quality and evaluation) has been established, with the aim of setting the goals for quality assurance and of developing the appropriate tools to achieve these goals. A student feedback system using an online questionnaire on Moodle (now piloted in BaD) is being developed, and the plan is to implement it as mandatory for all courses within the Faculty in the near future.

Other examples of the commitment to enhancing transparency and harmonization within the Faculty is the use of the Lotus Notes system for keeping track of decisions, and the fact that all self-assessment reports were put online, giving everybody within the Faculty a chance to become acquainted with or contribute to the analyses made.

A similar observation can be made on these valuable initiatives, however, as was made with regard to the processes for the alignment of teaching and learning above. The panel could not detect any fruits of these initiatives in the daily practices and reality of the programmes which were under evaluation. A telling example is the general confusion over whether there is, or whether there is to be, any systematic framework for student feedback. Students and staff seemed to have very little knowledge of the developments in quality assurance taking place at the Faculty level. Another example is the ambiguity (which was noticed in all programmes) about who is ultimately responsible for course development or for development of methods of delivery or assessment: It was sometimes claimed this is basically up to the individual programmes, with no interference of the Faculty; sometimes it was said these issues are to be discussed and agreed upon in the 'Conseil de Directeurs d'Etudes'. To the panel, this evidences at least the need for unequivocal and transparent communication.

The panel thus advises the Faculty to continue to develop a comprehensive quality assurance system and to get everybody involved in this exercise, making sure processes are not only broadly supported but also efficient, fit for the purpose, and tailored to the different needs (and sizes) of the programmes. As part of this, attention should be given to institutionalizing self-reflection (using internal and external input), to creating formal forums for interaction with stakeholders, students, and all staff, and to establishing more structured executive course committees for each programme, with clear reporting lines to faculty and other bodies as appropriate.

The panel has found the foundations and the willingness for such a development already well in place, and is confident that its further development will enable the Programmes and the Faculty to confidently grow stronger and to overcome the inadequacies endemic to this pioneering phase.

CONCLUSION

Considering its aforementioned findings and suggestions, the panel recommends that the Committee award a **grade 'B'** to the FLEF: *"The unit has a partial quality culture. The Committee has confidence in its capacity to develop and manage its present and future quality, in so far as the recommended adjustments are made"*.

The panel could clearly identify a *"cultural / psychological element of shared values, beliefs, expectations and commitment towards quality"* and (as has been evidenced above) has also found the first green shoots of *"the structural / managerial element with defined processes that enhance quality and aim at coordinating individual efforts"[3]*.

The Quality Culture will need to develop a more formal aspect as the Faculty grows in size and diversity, embedding and grounding its first and excellent achievements into a more secure environment. This is highly important in order to maintain and develop the international attraction and reputation of the Faculty and the Programmes in general, and, in particular, of those designed for professionals. The panel is confident the Faculty is moving in a promising direction on secure foundations.

SUMMARY STATEMENT

As the main challenge for the future will be to continue to pursue and improve the present course, it will be necessary to develop more systematic and formalized structures and procedures to guide and help realise the Faculty's intended ambitions.

SUGGESTIONS FOR IMPROVEMENT

The panel restates the following aforementioned suggestions for improvement:

Input
- Solve the pressing human infrastructure issues in the MBF/LSF, taking into consideration the views and expertise of the full-time staff.
- Reinforce recruitment and involvement of permanent staff, while maintaining the valuable input of excellent visiting staff.
- Formalize recruitment processes, basing them on clear and broadly discussed (and agreed upon) criteria.
- Consider formalizing the contracts with external staff and clearly stipulating their teaching and assessment assignments.
- Reconsider some of the support staff's responsibilities (e.g. taking care of working permits or visas could be taken up by central services), investigate the need for extra staff, and plan ahead future infrastructural needs based on prognoses of input and thorough consultation with present staff.
- Organise regular common meetings for all support staff, thus creating a forum to share common problems and to develop common procedures.
- Keep language courses available for all staff.
- Investigate and solve issues concerning library access.
- Inform potential BaD students of the work load and discourage unmotivated applicants.
- Keep managing input selection carefully by developing a clear strategy and transparent procedures for unbiased intake selection, based explicitly on the mission and goals not only of the programmes but the Faculty as a whole.
- Consider specifying general learning outcomes at the Faculty level which could be applied, with different priorities, in all student recruitment processes.
- Discuss the possibly of developing sets of criteria with the external stakeholders.

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[3]Extracts from the definition of Quality Culture as mentioned in the 'Handbook for External Evaluation of the University of Luxembourg'

Process

- Make objectives and learning outcomes more explicit and transparent for all programmes.
- Consider adjusting the balance between entrepreneurship and innovation for the MEI.
- Follow up on the issues of drop-outs and study load in the BaD, and include the monitoring of study load in the implementation of a comprehensive quality assurance system.
- Implement explicit structures and policies within which, and with which, teaching and learning strategies adapted to the needs of the individual programmes can be discussed, developed, monitored, and improved.
- Enhance internal communication between (and establish feedback forums for) all staff and students.
- Document demands from students and the actions taken, to establish a more structured and thus efficient approach in guidance and support.
- Improve dissemination of information.

Output

- Link learning outcomes and Dublin descriptors (or the EQF) explicitly and systematically.
- Continue and further structuralize consultations with stakeholders, integrating them in quality assurance and making them more jointly responsible for programmes.

Quality assurance

- Develop a comprehensive quality assurance system and get everybody involved in this exercise making sure processes are not only broadly supported but also efficient, fit for intended purposes, and tailored to the different needs (and sizes) of the programmes.
  Attention should be given to:

  o   institutionalizing self-reflection (using internal and external input).
  o   creating formal forums for interaction with stakeholders, students and all staff.
  o   establishing more structured executive course committees for each programme with clear reporting lines to existing formal bodies.

III.
TEACHING AND LEARNING UNIT REPORT

For the Faculty of Sciences, Technology and Communication

Preface

The University of Luxembourg was established on 12 August 2003. It is the result of an integration process of several existing institutions into the University's three faculties. The Faculty of Science, Technology, and Communication arises from a merger of:

- the Institut Supérieur de Technologie, founded in 1916, which underwent several transformations and offered, since 1997, a four-year degree in applied engineering sciences and computer sciences.
- the Département des Sciences of the Centre Universitaire du Luxembourg (biology, mathematics, physics), which offered first-year (and in some cases, second-year) courses in medicine, biology, chemistry, mathematics, and physics.

The Faculty offers four Bachelor Programmes:

- a Professional Bachelor in Engineering Sciences
- a Professional Bachelor in Computer Science
- an Academic Bachelor in Science and Engineering
- an Academic Bachelor in Life Sciences (with an integrated first year for medicine and pharmacy)

At the Master's level, the Faculty offers:

- an Academic Master in Information and Computer Sciences
- an Academic Master in Integrated Systems Biology (starting 9/2008)
- an Academic Master in Construction and Design (starting 9/2008)
- a Professional Master in Sustainable Energy and Resource Management (starting 9/2008)

As a part of the first external evaluation of the University of Luxembourg, the External Evaluation Committee has made a selection of three programmes to be evaluated in detail: the Academic Bachelor in Life Sciences (with an integrated first year for medicine and pharmacy), the Academic Master in Information and Computer Sciences (MICS) and the Academic Master in Integrated Systems Biology (MISB). These Programmes wrote a self-evaluation report which was the basis for the evaluation. In addition to these three reports, the Dean provided a self-evaluation report at the Faculty Level. The evaluation panel visited the University of Luxembourg from the 23rd till 25th of April 2008. During the site visit, the panel discussed the policy of the Faculty on teaching and learning with the Chief Financial Officer of the University, the Dean of the Faculty, and the people responsible for the three selected teaching programmes. The panel met also students, alumni, teaching staff, and educational support staff. Finally, a visit to the infrastructure and the library was organised and a counselling hour offered the opportunity to all stakeholders to speak with the panel privately.

The panel has very much appreciated its visit to the Faculty of Sciences, Technology, and Communication. It was very interesting to witness how this young university successfully grows. Students are very positive about their programmes and the staff seems to enjoy working at the University of Luxembourg. Academic staff are able to develop their research groups and teaching programmes, and to do this in a good way. Funds are easily accessible and facilities are of high quality.

On the other hand, many things need to be further developed. The Faculty of Sciences, Technology, and Communication itself seems to be primarily a formal structure, while nearly everything is organised at the research-unit level. Procedures need to be discussed and implemented, and better coordination is needed between the Rector's policy and the reality on the floor. Support from the central University administration is improving, but more support on marketing and financial reporting would be welcome. An implicit Quality Culture already exists, but this needs to be made explicit and further developed.

The University of Luxembourg has defined itself as a research-driven university. This is quite visible in the structure of the University which is based mainly on research rather than on teaching. The panel recognises this focus of the University, but it should also be taken into consideration that a teaching level of excellence is very important.

In this report, the findings of the panel concerning teaching and learning in the Faculty of Sciences, Technology, and Communication will be discussed in detail, following the grid provided by the Handbook for External Evaluation of the University of Luxembourg, starting with Input, Process, and Output, going on to the Panel's conclusions on the current Quality Culture, and ending the report with some major suggestions for improvement.

Input

Material and human infrastructure

The quality of the teaching staff is, in general, quite good. As no results of formal evaluations by students of the teaching quality were available to the panel, the panel's evaluation is based only on students' oral comments. In general the students are quite positive about the didactic skills of the staff, though they indicated there is some variability. The panel supports the idea of developing a teacher training programme for the staff and is convinced that offering good teacher training is essential to optimising teaching quality; such a programme could be in place by 2010. Though the panel believes it is fundamental to continue recruiting first on research capabilities, it suggests that teaching skills should also be taken into account when hiring new staff.

The research experience of the teaching staff also varies. The constituting institutions of the Faculty haven't always done research; in fact, it was only in the 1990s that the research program was launched. Staff members who were hired before this time don't always have a strong interest in research, thoughnewly hired academic staff do in general have a clear research profile. This development of a dual culture in the combined staff, those coming from the previous Institut Supérieur de Technologie, and those from more recent hirings, created some difficulties, most of which are now stabilizing.

The panel is convinced of the research quality of most of the full professors, and of the potential of the junior staff. All research groups contribute to teaching. The Master's Programmes are mostly developed based on the available research expertise. The panel appreciates this. As a specific suggestion for the Master in Integrated Systems Biology programme, the panel thinks hiring a chemist interested in metabolomics to further complete the fields of expertise would be a good thing.

The quantity of staff is excellent. The regular staff is further completed with a number of part-time, external staff members, so-called 'vacataires'. This offers education in relatively small groups and provides intensive guidance to the students. Several staff members, however, indicated that hiring procedures are quite complicated and use up a lot of time. Even when funds are available to hire junior staff members, a long procedure has to be followed. This sometimes results in losing out in the competition for top-level candidates. The panel therefore strongly suggests shortening the time span needed to complete hiring procedures.

The panel is impressed by the material facilities provided to the students and teaching staff. Also, teaching budgets are comfortable and growing.

Students treat the material facilities with a lot of respect, a fact which is strongly appreciated. numerous places to work alone or in groups are provided in the University buildings. The Library has attractive, modern accommodations. It doesn't offer an extensive print collection, but this is the standard orientation of most modern libraries given that electronic access to relevant sources is quite developed. The Library now closes at 5 pm, however, and the panel suggests extending opening hours till at least 8 pm, with this experiment lasting at least two years for the results to be significant.

Several people involved in the Master in Information and Computer Sciences raised the issue of flexibility in the use of computer facilities. Installing relevant software, or using Linux, is, for example, quite restricted.

Also the memory space offered to students is too limited. The panel suggests offering, at least to staff and Master's students in Information and Computer Sciences, much more flexibility in the use of the computer infrastructure and the information system.

The Master in Integrated Systems Biology programme needs expensive equipment, which is in the process of being acquired. But more investment needs to be made. For the use of expensive equipment, there is also increasing collaboration with relevant research institutes. This should be encouraged since it helps to keep efficient working relationships with these institutes.

The collection of anatomic models is quite valuable to students in the Bachelor in Life Sciences programme. The panel suggests discussing ways to give students easier access to these models, as some of them complained about the limited current access.

Another point needing attention concerns the fact that the Faculty is spread over two separate campuses, which hinders staff communication. Plans are underway to move to a new campus in Esch-Alzette/Belval, where all three Faculties could be housed on one campus. This new campus would provide plenty of space for the growing University of Luxembourg. The panel sees this new campus as a great opportunity, but is concerned about the public transport connection between Luxembourg City and the campus. There is presently a good connection to the city of Esch-Alzette, but this connection should be extended to nearby Belval where the new campus will be located. The panel sees good public transport as an important condition to further build on the link between the University and Luxembourgish society. The campus itself should meet very high environmental quality standards.

Currently, student housing and sports facilities do not meet the demand. The panel appreciates that investments are being made in this area to increase the available capacity. The new campus should be an excellent opportunity to create enough quality facilities to accommodate student housing and sports needs..

Students

Student selection and intake differs strongly between the various programmes. For the Bachelor's programme in life sciences and the first year of pharmacy studies, no specific additional – i.e. beyond the criteria fixed by the national regulations - selection criteria apply. For the first year of medical studies, a selection is made based on prior learning results and on language skills. As it is difficult to aggregate these criteria, an entrance exam is planned for the future.

In discussions with students it became clear to the panel that a certain percentage of students choose the University of Luxembourg because they have not yet decided on a course of study and so staying at home and studying in Luxembourg is more comfortable than going to a foreign university. This creates a group of not-very-motivated students who often fail.

The number of students is, except for the first year in medicine, still quite limited, and further efforts are needed to attract more students. The University should give more attention to marketing and publicity for recruiting motivated students.

The Masters' programmes in both Integrated Systems Biology and Information and Computer Sciences are working to market their studies: in the former case by investing in promotional materials, and in the latter byproducing an introductory film. Both use the website as their most important interface to potential students. The website should be further developed and should provide more information in all three languages. The panel sees the use of student testimonials — as are being used by the Master in Information and Computer Sciences programme — as a powerful promotional tool. This could be strengthened still further by adding the possibility of contacting students (or former students) directly, as the students the panel met were all very positive and could be the University of Luxembourg's best ambassadors.

Fact sheets about every course should be produced (where not yet available) and published on the website. To date, most fact sheets for the Bachelor in Life Sciences courses are lacking. As the University of Luxembourg is a multilingual university, it should also be clearly indicated in which language(s) individual courses are offered. A Bachelor's student indicated not having been aware of the fact that some courses are offered in German. The panel suggests discussing a partial decentralisation of the management the website content as this might allow faster integration of new information.

Furthermore, the panel suggests building stronger links with a number of Universities, or indeed, countries, to stimulate student exchanges and/orencourage the enrollment of good students from abroad at the University of Luxembourg. This could help to increase both the quantity and the quality of applying students. For the Master's programme in Information and Computer Sciences, one should consider links with Nancy and Paris-Ensam, while for that in Integrated Systems Biology, the already established contacts with Amsterdam and Buffalo could be useful in attracting students. But additional links with other European Universities need to be progressively established to increase the networking possibilities. These Programmes appreciate the initiatives taken at the central University level to promote institutional-collaboration agreements, such as the one with Shandong University. To increase the impact of such agreements, the panel suggests discussing with the different Master's programmes and research groups which Universities could be of strategic interest in the creation of new institutional collaboration agreements.

The selection of foreign students, especially for the Master's courses, is not always easy. The two Master's programmes are struggling with this and trying to find the best way to select good students. The panel suggests bringing representatives of the programmes together, at least at the faculty level, but better still, at the university level, to discuss this issue and seek out common solutions to the problem. The panel was told that the University administration has been slow in the past in contacting students accepted into the Master's programme in Information and Computer Sciences, and that as a result some of them may have enrolled in Master's programmes elsewhere. Steps should be taken to prevent this in the future.

Living costs in Luxembourg are high. It is important to offer potential students a good insight into the costs they will face. The University student housing is quite competitive, but students who need to find housing on the private market, are confronted with high prices. The low study fees compensate partially the high living costs. For Luxembourgish students, grants are offered. A smaller budget is also available for grants to students from outside the European Union. It would be good to increase the number of grants and to allow foreign students to apply prior to their arrival in Luxembourg in order to attract top-level foreign students. The number of jobs for students, especially within the university, is low. Offering more student jobs would be very useful for students who need to work to finance their studies. It is also provides a good opportunity for them to improve their skills.

Process

The 'directeurs d'études', who are in charge of these programmes, have a clear idea of what they want to accomplish, and have translated these general objectives into clear objectives per course. In the Master in Information and Computer Sciences programme, the implementation of the options is decided within the different research labs. The panel is positive about the chosen profiles and the defined learning outcomes, but is, however, a bit worried about the commitment to these objectives by the teaching staff. No formal consultation between the teaching staff is in place to discuss the objectives and learning outcomes of the programmes and the implementation of these objectives in the individual courses. The need for such a consultative body was indicated by most teaching staff, as they seemed not always very informed about the content of each other's courses and the relations between the courses. The panel noticed that the distribution of Master's thesis subjects is not coordinatedand every research group offers subjects to the students,trying to attract the best students. Some coordination, including a discussion on whether to integrate thesis subjects in the Research Priorities, seems useful to the panel.

Furthermore, the panel notices that a clear coordination of all the teaching programmes within the Faculty, and even within the whole University, seems to be lacking. Although procedures for starting a new programme are well defined (a proposal to the Faculty Council, which can submit the proposal to the Rector and the 'Conseil de gouvernance'), a Faculty-level educational coordination body would provide a place to discuss and coordinate such issues. To date at least, the Faculty Council doesn't seem to play this role. For example, the panel was clearly confronted with the desire to establish an Academic Bachelor Programme in Informatics, which would complete the offer of Academic Informatics teaching from the Bachelor to the PhD-level, and could help to attract good Luxembourgish students directly after secondary school. Such a proposal should be discussed on the Faculty level, before being proposed to the central University government; but the staff involved in the Master's programme in Information and Computer Sciences doesn't seem to know how to start such a discussion. Another example is the development of Bioinformatics education within the Faculty. Research Priority 3 on Life Sciences wants to develop this field, and P3 staff is already involved in offering courses in Bioinformatics within the Master's programme in Information and Computer Sciences; but up to now, this option doesn't seem to be promoted strongly within theprogramme, as no students have yet chosen this option.

The teaching methods used in the programmes are for the most part in line with the stated objectives. For the Bachelor in Life Sciences programme, lectures, seminars, and practical classes are organised. The balance between theory and practice is excellent with very good support. Perhaps the integration of these different matters in some dedicated course(s) should be envisioned. The panel appreciates the interactivity, especially in the second and third year. Practical classes organised in the third year offer students excellent preparation for Master's studies. Nevertheless, not all courses have quite such high quality, according to students, and some should be improved. In the Master's programmes, groups are kept small to guarantee student interaction, and teaching methods are adopted that foster academic and communication skills. As indicated before, the topics in the Master's programmes are based completely on the available research expertise. The panel also appreciates the openness to cooperation with industryshown by the Master's Programme in Information and Computer Sciences. Collaboration initiatives in the Life Sciences field have also been taken, a move which could benefit the teaching programmes (see further). No problems have been reported in relation to the assessment of student learning.

Students are very positive about the guidance they receive, especially from the teaching staff. Good informal follow-up exists and staff members, including part-time staff, are easily accessible to students. The students appreciate this. In the first year of the Bachelor's programme the guidance may even appear too close, leading to a lack of learning autonomy, although this could be appropriate for facilitating the secondary school–university transition.

Study load seems to be acceptable for all programmes. Care is taken to insure that students succeed or terminate their studies within a reasonable time period. When students do not pass a certain minimum number of courses, they are not allowed to continue their studies. For foreign students, grants are also based on study success.

Student unions exist and activities are organised for students. Free tickets for cultural happenings are provided to students. A real student-life community seems, however, still under construction.

The panel clearly values the multilingual nature of the university. Studies for the Bachelor in Life Sciences are organised in French and German. The different 'filières' which existed in medicine and pharmacy to specifically train students for continuing their studies in Germany, France, or Belgium, have been integrated. The panel appreciates this integration, but has noticed that not all students are in favour it. They complain of difficulties in studying in French and German at the same time, especially in connection with technical vocabulary. The panel recommends preventing such difficulties as arise when, for example, a German course builds on a French course by offering in every course an overview of the technical vocabulary in both languages and, where necessary, also in English and/or Latin.

Master's programmes are organised in English, allowing a really international recruitment of students and staff. Moreover, foreign students can expect to find better social acceptance in a society with such a pluri-lingual attitude.

The panel also appreciates the strong support to international student mobility within the University. Nearly all students spend at least one mobility semester abroad, a situation which is really exceptional in European higher education. The Bachelor in Life Sciences programme has been developed in agreement with the main partner universities for student exchange. This guarantees the consistency of the study programme during the mobility semester with the programme followed in Luxembourg.

Output

As most programmes are still quite young — and, in some cases, haven't even started yet — it has been difficult for the panel to evaluate the output. Nevertheless, based on plans, current practice, the results of the students in Biology, Medicine, and Pharmacy who have continued their studies abroad, and the few graduates of the Master in Information and Computer Sciences Programme, the panel has made some preliminary comments and suggestions.

The programmes, as they are designed, are clearly aligned with the Dublin descriptors. They are strongly linked to the current research taking place at the University of Luxembourg, which contributes to the up-to-date character of the programmes. Based on initial data, the efficiency and effectiveness of the study programmes seem to be quite high.

Graduates with degrees in life sciences or informatics are most often successful. For alumni of the Master's Programmes who want to continue their careers in academic research, lots of opportunities are available at the University of Luxembourg.

The objective for the Master's thesis in Integrated Systems Biology to be on the level of a peer-reviewed publication is appreciated. This is clearly in line with the aim for excellence of the Programme management. The normal continuation after a Master's degree is considered to be a PhD. The panel, nevertheless, is convinced that this goal is only achievable for a fraction of the students, and that this should be taken into account when grading Master's theses. The staff, however, need to also consider the less excellent students that may be part of the audience: some of the students will not have the ambition, and some will not have the possibility to make a PhD. For this reason, some cooperation with the private sector to monitor possible appointments at the level of the Master's degree should help these students.

It would be good to also implement a similar goal for the Master's thesis in the Master in Information and Computer Sciences, for example, participating in a publication of a conference or workshop paper directly related to their master's thesis.

Alumni with a Master's in Information and Computer Sciences who prefer a career in industry indicated to the panel that they easily found jobs and that their Master's degree is clearly seen as a plus. They feel that they are well prepared for abstract and conceptual thinking, and their impact on the economy will thus clearly be positive. As long as the number of students remains low, however, the number of well- trained graduates who enter the Luxembourg labour market will also remain low, especially as some of the students will definitely stay in academia and others will return to their home countries. For graduates with a Master's in Integrated Systems Biology, no direct labour market in Luxembourg industry seems to be present yet. The panel appreciates the initiatives which are being taken in cooperation with the Ministry of Economic Affairs to attract companies in this field, an enterprise which could have a strong impact on the Luxembourgish economy. The panel, nevertheless, suggests that the programme management of this Master's needs to further discuss the employment opportunities of its future graduates. Not all of them will be able to, nor will even be interested in staying in the academic community, and the panel sees it as a responsibility of the programme management to at least have some idea of the employment opportunities of its graduates.

Quality assurance

As indicated before, an implicit Quality Culture is clearly present within the University of Luxembourg and its programmes. The 'directeurs d'études' have invested a lot of time in the development of their curricula. Based on informal feedback, they have also tried to further improve its quality.

Explicit quality assurance procedures need, however, to still be developed. As recommended in particular in the June 2005 review document concerning the Master in Information and Computer Sciences, quality assurance should become an everyday concern. Up to now, this recommendation hasn't been implemented, neither for the concerned Master's programme, nor for the other evaluated programmes.

To help monitor the quality of teaching, a formal student evaluation had been undertaken in the Bachelor's in Life Sciences programme just before the panel's site visit. Also, in connection with studies for the Master's in Integrated Systems Biology, it is planned to introduce questionnaires after each course from the start of the programme in September 2008. For the Master's in Information and Computer Sciences, the number of students is still low and written questionnaires aren't considered very useful yet by the Programme management. A positive attitude to the introduction of questionnaires, as soon as the number of students grows, is clearly present. The panel suggests introducing meetings of small groups of students in which the students can discuss all aspects of their programme with a neutral mediator. This could be especially useful in quite new programmes, as it allows in-detail discussions of the programme, and finding out exactly which aspects need to be improved. The panel also suggests investigating at the university level the introduction of technology to organise easily electronic questionnaires. Up to now, all the 'directeurs d'études' have had to develop their own systems of evaluation..

In addition to student evaluations, it would be helpful to ask alumni for their comments about the Programmes, and to monitor which types of jobs they get after graduating. Also, representatives of the professional field can give useful feedback on their needs and recent experiences in practice.

Furthermore, inquiries among, and monitoring how, other universities with similar characteristics and programmes are evolving could provide constructive insights.

The input received from students, alumni, and representatives of the professional field could be discussed either at the programme level with all teaching staff, or within a programme committee with a delegation of the staff members. It is important that quality is not the concern only of the 'directeur d'études', but of all the teaching staff involved in a programme. Where comments apply to a specific course, it is essential, in the opinion of the panel, that the involved staff member be able to comment on the received input before this is discussed within a larger group.

Up to now, only informal feedback on the programmes has been gathered, and no procedures or consultative body existed to discuss this information. The 'directeur d'études' receives the informal feedback and, when he deems this relevant, tries to improve the programme. One example of this is that some overlap between courses of the MICS has been eliminated already.

As indicated before, offering teacher training programmes could be very useful for new teaching staff who don't meet expected standards in teaching.

The panel is of the opinion that the 'directeur d'études' needs to have the tools necessary for implementing a quality policy in relation to the teaching staff. Up to now, the directeur has had no say in connection with hiring policy and has been dependent on the goodwill of colleagues to teach in the programme.

Finally, the panel noticed some tension between the clear top-down approach to policy that is defined at the central University government level and the bottom-up approach which most academic staff prefers. Within the Faculty, this creates a very difficult situation. The Dean, who has to combine the two approaches, mostly softens both the top-down and the bottom-up approaches, thus weakening the impact of the centrally-defined priorities and blocking, sometimes, the ideas which grow bottom-up. This is an approach which is appreciated by the staff, but which doesn't seem to the panel very effective in managing a university.

Quality Culture

The panel is asked to indicate its general opinion about the teaching and learning in the Faculty, in relation to the concept of Quality Culture. In the handbook provided to the panel members 'Quality Culture' is defined as follows *'Quality Culture refers to an organisational culture that intends to enhance quality permanently and is characterised by two distinct elements: on the one hand, a cultural / psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural / managerial element with defined processes that enhance quality and aim at coordinating individual efforts.'*

The panel has noticed that staff is clearly committed to the quality of the programmes organised. Each programme management has a clear idea where they want to go to with the programme and takes initiatives to realise these objectives. Formal and informal evaluation of the quality of the programmes by students is rapidly growing. This is valued by the panel. Regular meetings with the teaching staff to discuss the content and the consistency of the programme would, nevertheless, be useful to transform the individual commitment to quality into really shared values, beliefs, and expectations concerning quality. The panel suggests working on this, also at the Faculty level. Up to now, the Faculty Council is the only official body at the faculty level and this seems to be merely a place for communicating and formalising decisions, rather than a place where a common identity, vision, and strategy are built. The panel deems it useful to discuss these issues, as well as common problems and challenges, in an official body. In addition to discussion among staff on these issues, it would also be useful to involve students, alumni and external stakeholders more in the quality assurance processes. They could clearly contribute to the further improvement of the quality of teaching and learning within the Faculty.

The combination of the above mentioned elements leads to a grade B (*'The unit has a partial Quality Culture. The Committee has confidence in its capacity to develop and manage its present and future quality, insofar as the recommended adjustments are made.'*).

Suggestions for improvement

Most suggestions the panel formulated, apply (more or less) for all programmes evaluated. The panel suggests:

- developing teacher training.
- taking teaching skills into account when hiring new staff, in addition to the salient research criteria.
- shortening the time span needed to complete hiring procedures.
- improving the central system to provide financial statements per project/research unit.
- extending opening hours of the library at least till 8 pm;
- offering at least to staff and students of the Master in Information and Computer Sciences more flexibility in the use of the computer infrastructure and information system.
- taking care for communication between the staff of the two campuses;
- providing excellent and attractive public transport connection between the new campus in Esch-Belval and Luxembourg City.
- further investing in student housing and sports accommodation;
- paying attention to marketing and publicity for recruiting motivated students, at University level.
- further developing the website and providing more information in its three languages;
- further strengthening the testimonials on the website by adding the possibility to contact (former) students directly.
- discussing a partial decentralisation of the management of the content of the website;
- discussing with the master programmes and the research groups which universities could be of strategic interest to create new institutional collaboration agreements.
- bringing representatives of the master programmes, at least at faculty level, or better, at university level, together to discuss the selection of students and to find common solutions to select foreign students;
- contacting students as fast as possible after decisions have been taken in the selection procedure.
- offering potential students a good insight in the living costs they will face;
- extending the number of grants and to allow foreign students to apply prior to their arrival in Luxembourg, to attract top-level foreign students.
- offering more student jobs for students who need to work to finance their studies.
- introducing a consultative body for formal consultation between the teaching staff to discuss the objectives and learning outcomes of the programme and the implementation of these objectives in the separate courses.
- discussing the introduction of a faculty level educational coordination body.
- further promoting the creation of a student life community.
- making quality assurance an every day concern.
- introducing hearings of small groups of students in which the students can discuss all aspects of their programme with a neutral mediator.
- investigating at the university level the introduction of technology to organise easily electronic questionnaires.
- asking alumni for their comments about the programme.
- monitoring which types of jobs alumni get after graduating.
- involving representatives of the professional field to get feedback on their needs and recent experiences in practice.
- choosing some universities with similar characteristics and monitoring how these are evolving.
- installing a Programme Committee to discuss the input received from students, alumni, and representatives of the professional field.
- allowing staff member to comment on the received input, before this is discussed within a larger group.
- giving the 'directeur d'études' tools to implement a quality policy in relation to the teaching staff.
- discussing the balance between a top-down and a bottom-up approach to policy making processes.
- transforming the individual commitment to quality into really shared values, beliefs, and expectations towards quality at Programme and at Faculty level.

In relation to the individual study programmes the panel evaluated, the panel suggests:

- for the Bachelor in Life Sciences
- discussing ways to give students easier access to anatomic models.
- producing, where not yet available, and publishing fact sheets about every course on the website.
- clearly indicating in which languages courses are offered.
- preventing difficulties when, for example, a German course builds on a French course, by offering in every course an overview of the technical vocabulary in the two languages, and where necessary, also in English and/or Latin.

- for the Master in Integrated Systems Biology
- hiring a chemist interested in metabolomics.
- continued investing in equipment.
- further discussing the employment opportunities of future graduates of the programme outside academia.
- establishing progressively additional links with other European Universities to increase the networking.

- for the Master in Information and Computer Sciences
- investing further to attract more students seems to be necessary.
- building stronger links with several universities and/or countries to encourage them to send more of their good students to the University of Luxembourg every year or stimulate student exchanges.
- introducing some coordination on the distribution of Master's thesis subjects, including a discussion on whether to integrate thesis subjects in the research priorities (e.g. P1).
- implementing a clear quality objective for the Master's thesis, as for example, participating in the publication of a conference or workshop paper, taking into account, though, that this is only achievable for a small fraction of the students.

IV.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 1:
Security and Reliability of Information Technology

Introductory remarks

In the University of Luxembourg's Four-year Plan 2006-2009, seven main Priorities for Research and Innovation were established. The first of these is 'Priority 1: Security and Reliability of Information Technology' (P1). The focus of P1 is broad in two dimensions. First, it covers a wide range of topics within the fields of security and reliability. Secondly, it supports different types of research, ranging from blue-sky research with long-term goals, to business-driven research having short term objectives.

The research within P1 has up to now been carried out completely by the Computer Science and Communication (CSC) Research Unit, one of the research units (RU) of the Faculty of Sciences, Technology and Communication (FSTC). This CSC research unit is organized in four separate research labs:

- COMSYS (Communicative Systems), which considers communication systems and network security.
- ILIAS (Intelligent & Adaptive Systems), which considers logic-based representation and inference models, multi-agent systems, knowledge discovery, uncertainty management, and optimization.
- LASSY (Advanced Software Systems), which considers the building of secure and reliable software systems.
- LACS (Number theory, Cryptology, Security), which is concerned with cryptology, a crucial tool for building secure systems, as well as technical and logical aspects of security.

In 2007, the Governing Board of the University of Luxembourg decided to undertake the the creation of an interdisciplinary center on security, dependability and trust (IC-SDT). At the time of P1's external review, a new director was hired who would be responsible for developing the strategy of the center. The objective of the Center is to foster and facilitate high quality interdisciplinary research and doctoral training in cooperation with other public or private institutions and entities, in particular with industrial companies and services, and with governmental agencies. The establishment of long-term partnerships is one of its missions, as it will warrant real knowledge transfer and continuous education benefiting all partners. The creation of start-ups and new services or products in the existing industrial or service companies is another of its missions. The CSC Research Unit will provide the Center's main academic anchorage to the University.

The panel greatly appreciated its visit to the Faculty of Sciences, Technology and Communication and its meetings with the people implementing the P1 research. It was very interesting to see how successfully the young university grows. The staff enjoys working at the University of Luxembourg, and research groups and teaching programmes are being developed, effectively and in a positive atmosphere. Funds are easily accessible and facilities are of high quality.

On the other hand, many things need to be further developed. The relations between the FSTC, the CSC Research Unit, P1 and the IC-SDT need clarification. It has been difficult for the panel to understand just how responsibilities are distributed and how interaction is organised. Procedures need to be discussed and implemented and better coordination between the rector's policy and the reality on the floor is needed. Support from the central university administration is improving, but better financial reporting and shorter hiring procedures, for example, would be welcome. An implicit quality culture already exists, but this should be made explicit and further developed, including clear objectives on research output.

In this report, the findings of the panel on research and innovation within Priority 1 will be discussed in detail, following the template of the Handbook for External Evaluation of the University of Luxembourg, starting with Input, Process and Output, following with Quality Assurance and an assessment of the current Quality Culture and finally, concluding the report with some major suggestions for improvement.

INPUT

1. Clarity, realism and detail of the objectives in the Priority

The panel has discussed the objectives of P1 with the director and academic staff of P1. The general management objectives of the Priority (research, teaching and service to the society in the area of information security and dependability) are very clear. The panel supports the general objective of developing a broad expertise in the fields of security and reliability, covering not only a wide range of computer science disciplines,   but also all types of research from blue-sky to business driven. It is clearly understood that there is strong support from the top level management of the University for this Priority. At the research level, the research objectives have been set primarily by the hiring of people in certain fields, with the aims then formulated at the level of the teams (a single professor and his collaborators), or, in some cases, at the level of the lab. At this stage there is no clear research agenda for the next 5 to 10 years set at the level of the Priority; such an agenda is also lacking for most of the labs. This bottom-up approach is recognised by the panel, but the panel believes that a clear common research strategy for P1, and a set of specific objectives could contribute to a more focused use of the available funds.

The key question that needs to be answered is: how can we benefit optimally from this large team of researchers who are all working in this broad interdisciplinary research area of information security and dependability? In the opinion of the panel, this will require a strategic research exercise in which choices are made about a number of lines of research for the next 3 to 6 years. While it would be impossible to focus all research on one theme, it would be very useful to choose two, maximally three, themes (e.g., security for embedded environments, large scale parallelism and grids, human factors in security) on which to work. It is also very important to take into account the implications these decisions have for funding by the University and perhaps by the FNR (National Research Foundation).

This does not mean that there should be no room left for so-called "blue-sky" research: giving bright researchers the opportunity to perform such curiosity-driven research without forcing them to "frame" this research into a broader research theme can be productive, and may also be very important for explorative research that forms the bases of the main research themes 5 to 10 years down the line.

2. Appropriateness and flexibility of the operational budget

The current budgets are quite comfortable and growing. The operational budget is definitely appropriate to creating a high quality research environment, and within the faculty, every research unit receives the funding it needs. Despite the ease of getting research money from the University of Luxembourg, the staff is also considerably involved in external funding programmes. This should be supported as it provides some return in the form of external evaluation.

Apart from the operational budget provided through the faculty, it seems that budgets are managed at the level of the lab team; since, however, P1 is not aligned with the department or the labs, no clear picture is available of P1 in budgetary terms. It was indicated that the following-up of budgets isn't always easy, as the central accounting system doesn't provide up-to-date financial statements per project/research unit. Although progress has been made in this field, it seems to the panel that this remains a point for the attention of the central administration. Especially in the case of EU projects, standards for financial reporting are high and good reporting is essential for participating in such projects, which in turn, is essential to building the international reputation of the University.

3. Appropriateness of the research and support staff in quality and quantity

The panel is impressed by the research quality of several of the full professors and is convinced of the potential of the junior staff. The CSC RU had 22 professors, 20 post-docs and 50 PhD students at the time of the external review. The number of positions explicitly attributed to P1 in the four-year plan are 3 professors,

7 post-docs, and 9 PhD students. This quantity of staff is clearly appropriate. In addition to the explicitly attributed staff, approximately half of the total staff of CSC is involved in P1, though mostly only with a part of its research. The support staff is well-organized and is at this moment adequate for the size of the Priority/department; if it grows, however, further support staff will be required.

It is rather easy to obtain additional funds for post-doctoral researchers and doctoral students, but there seem to be some problems related to various inflexibilities in the hiring process. This sometimes results in losing the competition for top-level candidates. The panel therefore suggests shortening the time span needed to complete hiring procedures.

4. Appropriateness of the human resources management

Formal human resources management is mainly limited to hiring policy. For senior staff positions, the aim is to attract complementary profiles to the present staff. When hiring a new full professor, a rather broad profile is defined in order to allow researchers in a number of fields to apply, providing a choice between several excellent applicants. The panel recognises that this policy allows for attracting very good staff. It is planned to hire several new professors for P1, and 4 profiles have been identified: each of these profiles looks fine, and if suitable candidates can be found, this would definitely strengthen P1. On the other hand, in the absence of a long-term research strategy forP1 and CSC, it is not possible to evaluate whether the professors hired for these positions would be able to contribute optimally.

In a very new research area (such as human factors in security), one may not find sufficiently senior qualified researchers; in that case it may be more strategic to hire a top quality post-doctoral researcher on a tenure track.

Human resources management for the present staff is mainly informal, except for the establishment of a supervision committee for each PhD student. No clear objectives on an individual or group level have yet been defined. The panel suggests defining a balanced set of criteria for research output which would better direct all staff to the common objectives of P1.

There are no tenure track positions, and there is no clear career path within the University. The panel suggests establishing clear procedures for the promotion of assistant professors to the level of professor (expected time, required achievements in terms of research projects and outputs, teaching). Also, the existence of only 2 levels of academics holding a PhD (i.e. assistant-professors and professors) may need to be revised.

If P1 grows further, there may develop a need for "middle layer" scientific staff who are not (assistant) professors. This may be necessary to provide specific expertise, in particular for applied research. The introduction of these career paths would need to be planned very carefully. One way of doing this could be to offer a continuing career for post-doctoral researchers.

5. Appropriateness of the material facilities

The panel hasn't visited the material facilities, but based on the comments made by staff members, the material facilities provided to the research staff seem to be excellent. Appropriate equipment and space are available.

Several people raised the issue of flexibility in the use of computer facilities. Installing relevant software, or using Linux, is, for example, quite restricted and/or without sufficient support. The panel suggests offering to staff of CSC, at least, more flexibility in the use of the computer infrastructure.

The panel also noticed that the location of research units of the Faculty on two different campuses hinders communication and collaboration between the research units.

PROCESS

6. Variety and focus of the research programmes (areas of research, types of funding, establishment of partnerships, international and local)

As the research is performed bottom-up, there is a great variety of research topics that are addressed within the broad topic of information security and dependability. The panel would, however, suggest further coordinating the variety of areas of research. The panel was surprised to find out that the director of P1 neither has to check the proposed research projects funded within P1, nor is he involved in their selection or evaluation. Formal involvement in the selection of projects would give the director more tools for managing Research Priority.

Up to now, most research has been funded by the structural funding of the CSC, with over 20 projects funded by the University of Luxembourg and 4 by the FNR (the National Research Foundation). In addition to this, externally funded projects are also attracted (European Union – FP6/FP7 Program, European Union – Leonardo Program, City of Luxembourg, Region, LIASIT projects with Industry).

Most of the international staff who have been hired have already had international collaborations before they came to the University of Luxembourg. Hence a good international network exists and there are clear efforts to maintain and expand this network.

The establishment of the Interdisciplinary Center should further support the development of local partnerships, especially with industry. Easy access to research funds within the University and at the FNR reduces the impact of incentives for researchers to obtain other, external funding. Also, it seems to the panel that within the University it is quite easy to obtain research funding outside the research priorities (although this impression may result in part at least from their late start), which reduces the impact of these priorities on the focussing of research initiatives within the University.

7. Effectiveness of the research processes, relating the scientific production to the investment

The research processes are very much organized at the team level and, for some labs, at the lab level. There is also clear evidence of collaboration efforts between labs that work on topics of common interest. For many of these research topics, the methodology of working in small research teams is effective. In the opinion of the panel, it is, nevertheless, important that the organizational structure is clarified and that more emphasis is put on strategic thinking and coordination: otherwise this research is at risk of becoming too fragmented (resulting in missed opportunities for international impact); also, that too many teams may claim to be part of P1, giving their research an information security "flavour", though they do not really reorient their research to contribute to the core topics of P1.

8. Flexibility of the procedures, enabling the research programmes and departments to reach or remain at international level and adapt to new research challenges or areas (encouragement of initiatives, support of research)

 P1 has hired excellent people and clearly has the potential to become an internationally leading research group. The professors have started to build their research teams and are exploring collaborations both internal and external. Some of these collaborations have already started up. During this initial stage of development of not only P1 but the University as a whole, however, few formal procedures on research processes have been defined, and research output is not yet monitored in detail. So it is difficult for the panel to measure the effectiveness of these research processes. Individual staff members and research labs themselves decide on their priorities, and no formal consultation procedures between the staff are in place to discuss the objectives of the Research Priority, and the implementation of these objectives in the separate research labs. There is no common agreement on the definition of P1.

A phase of consolidation is thus needed, where research processes are defined and formal consultation implemented. The panel also suggests establishing more activity around the Priority. One could consider organising seminars, inviting speakers, more common projects, hiring an extra engineer for the development of software and systems in P1, publicity aimed towards masters and PhD students and industrial partners, in cooperation with other research centers, common contacts with the ministry in charge of security of information systems, etc.

Little formal coordination between P1, CSC, the faculty, and the university administration is in place at this time The relations between P1, the CSC research unit and the organizational structures have been very loose and informal up until now. The panel sees a more formalised relationship between these organisational entities and better coordination as an important challenge for P1 and the Faculty of Sciences, Technology and Communication.

The establishment of the IC will bring another actor into the discussion, which will further increase the need for good coordination mechanisms. Some of the strategic planning is currently deferred until the hiring of the director for the Interdisciplinary Center for Security, Dependability and Trust. However, the panel has the impression that not all members of P1 may become part of this center; moreover, if this center develops such a strategy, but some members of P1 do not subscribe to it, a very complex situation could arise for the Priority. If one expects the director of such a center to develop the long-term strategy and to make strategic choices in collaboration with all the professors involved, it would be strongly recommended to hire an experienced scientist with experience in both academia and industry and a strong international profile, rather than a manager. Hiring such a person may not be easy, however, and may require some "head-hunting" in addition to publishing an open call.

Good coordination will also be supportive to the aims of both the director of P1 and the staff involved, to make it a really interdisciplinary Research Priority, covering, amongst other things, legal aspects of security and reliability such as privacy questions. Another example where coordination on a supra-priority level is needed is the development of bioinformatics research within the faculty. Research Priority 3 on Life Sciences wants to develop this field, but, up to now, little collaboration seems to exist between the CSC research unit and this emerging field of research. This situation may improve when experts in bioinformatics are hired within Priority 3. The panel recommends developing better coordination mechanisms to be able to benefit from interdisciplinary collaboration in fields which could link different research groups.

In addition to internal coordination within the University, the panel suggests organising a more formalised involvement of society and industry. An advisory board, could, for example, be established, where the definition of the research themes within the Priority could be reviewed. In this respect it would also be important to find a number of strategic international partners (both from academia and from industry) to help refine and implement the chosen research lines.

OUTPUT

9. Achievements of the research departments in relation to the objectives formulated for the Priority

As the Research Priority is still quite young and staff was still being hired at the time of the assessment visit, it has been difficult for the panel to make a detailed analysis of the quality of the output of the CSC research unit in relation to the objectives of the Priority. The measurement of output is currently limited to a list of international publications and to a not very detailed overview of external research funds. The introduction of bibliometric analysis (including citations) is under discussion, but has not yet been implemented. The panel has checked whether the topics of the papers are relevant to the broader area of information security. The research output of the four CSC labs shows a large variety in topics and is in terms of international journals and conferences of very good quality. The topics chosen in the teams seem to be relevant and in line with international developments. The professors are very active in international programme

committees and in the organization of international events. Within several sub areas of information security, high quality research is being performed.

Some of the researchers are quite committed to Priority 1. They develop national and international projects within the field of P1. The aim that roughly 50% of the research in CSC is directly or indirectly concerned with the Priority, is, however, not yet met. The panel appreciates the initiatives which are taken within P1, but it would like to see some more coordination of these individual initiatives. This could strengthen and focus the Research Priority, which would allow to further increase the scientific impact as a group. The panel suggests looking for a number of research groups (4-6) with a similar size and phase of development to benchmark against.

10. International recognition

The international academic reputation of P1 and its work is being built up, but the panel believes that it will take at least 5 years to reach a fully competitive level. The researchers have been active in international conferences, have a satisfactory number of academic publications in reputable international journals, and newly appointed staff members, in most cases, had already built up an academic research line which continues to bear fruit in the Luxembourg context.

11. Scientific impact

The impact of the research of P1 on the development of knowledge in the domain of Security and Reliability of Information Technology is, so far, mainly a matter of their actual existence, their participation in conferences, their plans, their potential, and a number of good quality publications.

The panel strongly encourages P1 to develop a measurement system for research output that is specific to the area of P1. This will allow for better evaluation of the scientific impact of this research and better focus of efforts. Such a system could be based on the following elements:

- in the area of bibliometrics, it would be a serious mistake to focus only on the SCI (even including impact factor): in many areas of computer science, and definitely in the area of information security, conferences and workshops are often the most appropriate and competitive venues for publication since they offer the highest visibility and impact. The problem of course is that – as for journals – there are many conferences and the quality is uneven. Moreover, there are several new journals that have not yet been listed in SCI. The Priority needs to establish a list (peer-reviewed by outsiders) of the very best conferences and journals in its field in which publications would be encouraged. This list could include journals such as the Journal of Cryptology, the Journal of Computer Security, IEEE Security and Privacy Magazine, and the conferences such as Esorics, IEEE Security and Privacy (Oakland), ACM CCS, Usenix Security, the IACR Conferences and Workshops etc. This list isn't meant to be exhaustive but only to give an indication of where to start.

- in the area of Computer Science, artefacts such as tools, software, and algorithms can have a major impact; developing and maintaining such artefacts can be much more time intensive than writing scientific articles about these artefacts, since one can typically publish only a limited number of articles about them. P1 should encourage staff members to develop such artefacts and to measure access to them (e.g. by counting downloads or real applications).

- interdisciplinary work (with law, sociology, psychology, economy, philosophy) should be evaluated based on separate criteria: the development of such research can take a long time (typically one year is needed just to develop a common understanding and terminology).

- other output that should be measured includes efforts for research valorisation such as industrial contracts and patents.

Perhaps the introduction of such qualitative measures can be seen as threatening to individual teams. In order to increase the consensus, one could agree to

- only make aggregate information from P1 available outside P1
- only make aggregate information from a lab available outside the lab

It is of course also very important in this context that contributions to teaching and management functions within the University are taken into account to avoid unfair comparisons.

Nevertheless, one can expect that at some stage the University of Luxembourg will introduce such a measurement system for all professors, though it is unclear whether a University-wide system would be capable of taking into account the specific characteristics of a field such as P1. Therefore the panel would encourage the members of P1 to agree on an effective system of evaluation that is suitable for the field.

12. Relevance of the research choices in relation to the developments in the international scientific community and the developments in society and economy

Security and Reliability of Information Technology is clearly of growing importance, both internationally and in Luxembourg. The Luxembourg context is characterised by the presence of a large number of banks and financial organisations, as well as media and communication organisations, which have a major interest in both the security and the reliability of Information Technology. This holds much potential for mutually beneficial exchanges between the non-academic and the academic world. Security and Reliability should, however, not be limited to the Computer Sciences and has obviously many relationships with other disciplines in which Luxembourg has a prominent role: specifically, national law, international law, and international strategy. The relationship with medical care and, in particular, the full handling of the digital medical file, is a very interesting question which could be elaborated by P1.

13. Innovative power, both the innovations realised and the innovative potential

As the Research Priority is still quite young, it is difficult to assess its innovative power. The work of several of the academic staff members clearly indicates innovative potential.

14. Impact on Luxembourg economy and society

Some of the research is being done in collaboration with Luxembourgish actors and so has impact on Luxembourg economy and society. And some of the labs, e.g. LIASIT and Tudor, have already established a good collaboration with the Luxembourg economy. It will take time for new professors to build up such a network, but this should definitely be further encouraged, as this interaction with economy and society are potentially very important. The IC will probably play an important role as a mediator in this regard, but some of the research staff have already shown the way and the panel suggests not waiting for the IC to further develop such collaboration projects.

15. Impact on teaching and learning

Finally, there is a good cross-fertilization between research and teaching. The research done within P1 has a clear impact on the Master's Programme in Information and Computer Sciences. This programme is built on the available expertise and links clearly with this research. The panel suggests making the Research Priority even more visible in the Master's programme and ensuring that a significant portion of the Master's theses can be made within the Research Priority.

QUALITY ASSURANCE

16. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives of the Priority (Monitoring of research processes and outputs, quality standards for research, ethical code)

The development of explicit quality assurance procedures is still in its infancy: the organization is still struggling to establish internal structures in which such procedures can be developed. A clear vision and strategy on the objectives for the next 5 to 10 years still needs to be developed, as well as specific intermediate objectives. No explicit output monitoring of research quantity and quality is in place either. As recommended in particular in the June 2005 review document on the Masters in Information and Computer Sciences, quality assurance should become an everyday concern. Up to now, this recommendation hasn't been formally implemented, neither for the concerned Masters Programme, nor for the Research Priority.

The panel noticed some tension between the clear top-down approach to policy that is defined at the central university government level and the bottom-up approach which most academic staff prefer. Within the faculty, this leads to a very difficult position for the dean, who has to mediate between the two approaches, mostly softening both the top-down and the bottom-up approaches, thus weakening the impact of the centrally defined priorities and blocking sometimes the ideas which grow from bottom-up.

Finally, as research in security can uncover weaknesses in widely deployed commercial systems, it would be useful to develop at the P1 level an ethical code for dealing with such discoveries.

17. Commitment of the University community and stakeholders of the research departments to quality assurance

Although processes and tools to monitor quality are still in an initial stage of development, an implicit quality culture is clearly present within Priority 1.

The research projects in the University and the FNR are evaluated based on peer review. One can assume that this process will become increasingly competitive and that in the future past achievements will be taken into account.

18. Effectiveness of feedback in influencing positively the research programmes and departments

As a result of the feedback on the research programmes received informally, improvement measures are often taken.

GENERAL OPINION ABOUT THE RESEARCH PRIORITY IN RELATION TO THE CONCEPT OF QUALITY CULTURE

The panel has noticed that staff of P1 is committed to the quality of their research, and that they have a common, implicit way of maintaining a quality culture: they have good publications and good students. They clearly have the capacity to manage their own present and future quality. The challenge for P1 is to transform this individual commitment to quality into really shared values, beliefs, and expectations towards quality at the level of Priority 1. This should result in an overarching vision and strategy which can be implemented and translated into specific mid-term objectives and output criteria. To accommodate this, a more explicit quality culture is needed on the CSC, the Faculty, and the University level.

The panel deems it useful to discuss these issues, as well as common problems and challenges, in an official body. In addition to discussion among staff on these issues, it would also be useful to benchmark these practices against those of other similar research groups, and to involve external stakeholders more in P1's quality assurance processes, where they could actively contribute to the further improvement in the quality of research and innovation.

The combination of the above mentioned elements leads to a grade of B ('*The unit has a partial quality culture. The Committee has confidence in its capacity to develop and manage its present and future quality, insofar as the recommended adjustments are made.*').

Appendix 1: Suggestions for improvement

As major points, the panel suggests:

- defining a clear research strategy common to P1 and a set of specific objectives;
- further coordinating the variety of the areas of research;
- choosing a number of prioritised research lines for the next 3 to 6 years;
- defining a balanced set of criteria for research output to better direct all the staff to common objectives;
- clarifying the organizational structure;
- defining research processes and implementing formal consultation;
- improving coordination between P1, CSC, IC, the Faculty, and the University;
- aligning the profiles for new recruitment to the above mentioned Priority research lines;
- linking the funding by the University and perhaps by the FNR to the chosen research lines;
- aligning P1 budgets with the department or the labs;
- developing explicit quality assurance procedures.

The panel has also identified some more specific opportunities for improvement. The panel suggests:
for the central administration, further improving financial reporting;

- offering at least to staff of CSC more flexibility in the use of the computer infrastructure;
- shortening the time span needed to complete hiring procedures;
- establishing clear procedures for the promotion of assistant professors to the level of professor (expectedtime, required achievements in terms of research projects and outputs, teaching);
- discussing the need for "middle layer" scientific staff, who are not (assistant) professors;
- involving the director of P1 in the selection of research projects funded by the University;
- taking care that not too many research teams claim to be part of P1, without contributing to the core topics of P1;
- establish more animation around P1;
- hiring an experienced scientist with a strong international visibility and with experience in both academia and industry as the director of the IC;
- organising involvement of society and industry in a more formalised way;

- searching a number of strategic international partners (both from academia and from industry) to help refine and implement the defined research lines;
- searching a number of research groups (4-6) with a similar size and phase of development to benchmark against;
- developing a balanced measurement system for research output that is specific for the area of P1;
- making the Research Priority more visible in the master's programme and taking care that a significant part of the master's theses are made within the Research Priority;
- developing at the P1 level an ethical code on how to deal with discoveries of weakness in widely deployed commercial systems.

V.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 3:
Life Sciences

This report contains the panel's conclusions regarding the evaluation of the Life Sciences Research Unit (LS Unit) and follows the evaluation grid of categories and criteria provided in the *'Handbook for External Evaluation of the University of Luxembourg'* (Input/Process/Output/Quality assurance). The report ends with a Conclusion on the quality culture, including the suggestion of a grade to the Committee, followed by a short Summary Statement and a recapitulation of the suggestions for improvement.

The panel has based its findings on the self-assessment report of the unit and on the meetings with the different stakeholders of the unit (including a tour of the facilities) during a site visit which took place during the 23rd to 25th of April, 2008.

The panel wishes to stress that it is very much aware of the short history of the unit, and that it has mainly tried to focus on identifying those points that need improvement, and on giving advice and recommendations that could help to support the unit in its further development.

INTRODUCTION

The Life Sciences Research Unit is one of five research units within the Faculty of Science, Technology and Communication (FSTC) of the University of Luxembourg (UL). Together with the Computer Sciences (P1) and Material Sciences (P2) research units, the LS Unit (P3) is one of the three Research Priorities of the present 4 year plan (2005-2009) of the UL within this Faculty.

The LS Unit was founded in 2006, replacing the Laboratoire de Biologie et Physiologie Intégrée (LBPI) and the Laboratoire de NeuroBiologie (LNB), originally created in 2003. The unit is set up as the core structure which supports the P3 Research Priorities "Molecular Medicine" and "Systems Biology", as acknowledged by the Board of Governance of the UL in Spring 2007.

The main objective of the LS Unit as stated in the self-assessment report is *the molecular understanding of the main aging-related diseases* (Cancer, Alzheimer's, Type II diabetes and Atherosclerosis) – or, in short: 'Molecular Medicine'. The aim set for all teams within the unit is to implement "omics" technologies and Systems Biology modelling approaches to their projects.

Presently (Spring 2008), the unit is divided into five research groups, each focusing on a different aspect of cell communication in relation to at least one of the aforementioned diseases:
Cytokine signalling / Cancer (Iris Behrmann)
Nuclear receptor signalling / Cancer, Alzheimer's, Type II diabetes, and Atherosclerosis (Carsten Carlberg)
Cytoskeleton / Cancer (Evelyne Friederich)
Neuroinflammation / Alzheimer's (Paul Heuschling / Eleonora Morga)
Calcium signalling / Atherosclerosis (Eric Tschirhart / Jean-Luc Bueb)
The LS Unit currently has a staff of 50 (24)[1] individuals: 7 (7) professors, 1 (1) assistant professor, 17 (7) PhD-level scientists, 11 (9) support staff personnel and 14 (-) PhD students.
The offices and wet-lab spaces of the unit are located at the Limpertsberg Campus.

In September 2008, the unit will start with a Master's programme in Integrated Systems Biology (120 ECTS), which is set up to follow the thematic lines of the Research Priorities. Students will be trained in the genomics, transcriptomics, proteomics, metabolomics and physiomics technologies, and the programme will focus on the understanding of systems biology approaches and an overview of the molecular mechanisms of major aging-related diseases.

Also two further research groups, headed by professors for Systems Biology (Thomas Sauter) and Bioinformatics (NN) will be created in the near future (2009 and 2010, respectively).

[1] Personnel on permanent contract between brackets

Long term plans (2011–2016) include the creation of 4 more research groups (Proteomics, Metabolomics, Stem Cell Biology, and Human Genetics) and the move to the new campus at Belval (2012). By 2016, the Unit should comprise 11 research groups, 13 professors, 36 PhD-level scientists, 20 support staff personnel, and 65 PhD & Master students. (Total: 134). Working to full capacity, the unit aims for 16 finished PhD's, 18 Masters, and 60 peer-reviewed original publications per year.

INPUT

Objectives

The main objectives of the LS Unit are clearly formulated in the self-evaluation report, and were mentioned and explained consistently and with great enthusiasm during the panel's meetings with the management of the unit. The panel is of the opinion that the overall focus (i.e. the use of omics approaches on major aging-related diseases) is realistically chosen and adequately defined. The panel believes this common theme provides the unit with a clear framework, which is determined unequivocally enough to act in a unifying way and is also broad enough to give the necessary leeway that allows for different approaches of the teams within the unit. All members of the five present research teams the panel had a chance to talk to, seemed to be generally committed to these objectives.

How current and future research groups (groups will more than double, to 11, in eight years time) will interact and find their places under this common umbrella is, of course, difficult to foresee. In light of this, the panel advises the unit to work further on clarifying and defining the specific objectives and goals of each (current and future) group, in relation to each other and in relation to the overarching mission of the unit as a whole. Clear and detailed goals for the future of each team were understandably lacking at this pioneering phase, but should be developed in the near future to safeguard a well managed growth along a shared strategy.

Budget

The yearly basic funding of the unit by UL sources was 600.000 € for the year 2007 and will be 625.000 € for the year 2008. In addition, in 2007 the research teams were supported on a competitive basis with 688.500 € from the UL, with 201.000 € from national Funds (FNR), and with 11.500 € in international grants (EU, Novartis). This operational budget is considered more than appropriate by the management of the unit. The panel fully agrees.

The unit would however benefit from an enhancement of flexibility in the management of the budget; some of the resources could be used more strategically. The panel suggests, for example, to use a small part of the budget within the Faculty for encouraging constructive joint projects between Faculty units (e.g. between Life Sciences and Mathematics or Computer Sciences). On the unit-level, a similar approach could be used in distributing funds towards the different research teams.

The panel greatly appreciates the efforts taken by the unit to secure a certain amount of external funding and encourages the unit to keep firmly to this path, as it will lead to the expansion of both visibility and respect in the international scientific community. This, and coming to the fore more strongly as one close-knit research unit (see below), will help to place the growing LS Unit more firmly on the international map.

Staff & HRM

The quality (and the quantity) of the current research and support staff — as could be inferred from the CV's and the meetings with all categories of staff — is more than adequate.

As mentioned before, the number of staff in the LS Unit is constantly growing, and should reach 134 staff members (i.e. 2,5-times the present number) in 8 years time. The panel was provided with a schematic but carefully considered and realistic 8-year plan of development, drawn up by one of the group leaders after

consulting all colleagues. The plan shows the unit is conscious of the main challenges for the future, and of the existing gaps in the technology and knowledge. The management has a clear idea of the profile and expertise needed and the recruitment of professors in systems biology and bioinformatics is underway. During the interviews the panel has been provided with sufficient evidence to conclude that recruitment is taking place based upon shared (though mainly implicit) notions of strategy and quality.

Taking into account the considerable future expansion of the unit, procedures for (and the underlying strategy of) the recruitment process will need to be made more formal, transparent, and explicit. Continuous attention will need to go to the further ensuring of an efficient quantitative balance between the different categories of personnel, based upon regularly organised feedback from all personnel.

The panel thus advises the unit to put in place a more comprehensive and formalised HRM-policy. This should at least include formal forums for consultation and deliberation, and structures for regular assessment of performance (and setting targets) for all personnel, based upon regular staff development interviews and on broadly discussed plans for future strategy. The management has expressed its awareness of this necessity and is clearly willing to take the lead in developing such a policy within the Faculty.

Facilities

Centralised core facilities — as are planned at the Belval-campus in Esch — will, in the panel's view, be crucial in fulfilling the aims and ambitions of the unit, and the panel was pleased to find the management of the unit fully aware of this. It was clear to the panel that housing and facilities are still adequate for the moment (with modern and high performing cytometry- and confocal microscopy equipment in place), but will become increasingly insufficient and inappropriate in the very near future. Considering the rapid growth of the unit, the move to the Belval-campus is more than pressing. The panel encourages the unit to stay involved in the planning (especially that of wet-lab space) of the Belval-site.

PROCESS

Variety and focus of research areas & funding

As mentioned above, the common theme (coined as 'Molecular Medicine') provides the unit with a clear framework, which is determined unequivocally enough to act in a unifying way and is also broad enough to give the necessary leeway that allows for different approaches of the teams. Descriptions of each research project given in an annex to the self-evaluation report showed a good variety of research programmes. The underpinning funding is robust and more than appropriate. Possible measures of improvement regarding objectives and funding were mentioned earlier.

Partnerships

A list of main collaboration partners was provided to the panel which shows that the LS Unit, in spite of its young history, has realized a reasonable number of collaborations with national and international research centres. According to the management these will be further enhanced via joint international grants, such as the Research Training Networks NucSys and ReceptEUR, Human Frontier Science programmes, and others. In addition, the decision of the University to invest in a Centre for Systems Biology as an interdisciplinary centre within the university, the creation of a diagnostic company and a national Biobank together with the Institute of Systems Biology in Seattle and the Biotech company TGen in Phoenix is forthcoming. Also, a small Biotech company, Axoglia, was founded recently by two members of the unit and their partners from the University of Strasbourg.

The panel strongly encourages these kinds of collaborations with industry and the further commercial exploitation of IP's, as these are great opportunities, next to high quality publications, to secure a second stream of scientific production.

Research processes & procedures

The panel learned that a doctoral school of Modern Biosciences is being established, following the example of similar organizations in Finland and the Netherlands, in order to standardize the education and requirements of the growing number of PhD students. The panel recognizes in this and fully supports what it sees as a clear willingness to formalize and standardize research and guidance procedures. According to the regulations for this school, at least two peer-reviewed publications (impact factor > 5 desirable) have to be first-authored by the PhD students before their theses are accepted, which reflects the very high ambitions of the unit.

Some uncertainty about these requirements (and about the consequences of not meeting them) was felt in the group of current PhD-students and the standardized guidelines indicated in the documents seemed not to be implemented in all the groups yet. The panel is confident that this will be remedied with the further development of the School, but also stresses the importance of transparency, student participation in decisions, and uniform and open communication.

As most of the teams are still setting up their own technical basics (e.g. standardization of data-processing), cooperation and interaction between research groups of the LS Unit is not yet fully visible. The panel was pleased to learn that a general seminar is already held every week at which all members of the unit meet and present their findings and problems to each other. Staff also attested that there is a good and easy interaction at the technical level. Fruitful cooperation on a scientific level is expected to grow naturally with the further development of the unit. At the management level, the group leaders meet once a month and, in addition, have ample informal contacts.

In general, the panel is of the opinion that the mainly informal procedural arrangements are well tailored to the current size of the unit and have proven to be efficient and effective, considering the high quality of the output (see below). As the number of staff and PhD's will be growing rapidly, attention will have to be given to the creation of a more formalized management committee, taking documented decisions on overall strategy, and on procedures for setting standards, monitoring, and feedback. Accordingly, the panel repeats its recommendation to establish more solid and formal forums for consultation with, and to gather input from, all categories of personnel. The panel is convinced that the intended growth into an international centre for Bioscience and System Biology will be supported strongly by implementing the appropriate management structures.

OUTPUT

Achievements

All research teams aim for publications in the most recognized international journals. Although the teams have their own individual thresholds for the impact factor of the chosen journals, it should, in general for original, peer-reviewed publications, be above 3.0. The panel was provided with a list of the best publications of the professors and PhD-level scientists, presented in a standardized way. Bibliometrical data shows that all research teams have published in the field of molecular and cellular analysis of aging-related diseases, and that the total number of peer-reviewed original publications ranges between 18 and 101 per team leader. Two patents were published, and several collaborations with national and international research centres and industry were established, as mentioned previously. Efforts have been taken by the unit to secure a certain amount of external funding.

These achievements of what is, after all, still a very young research unit are more than satisfactory and very promising for the future.

International recognition & impact

An important challenge will be to validate these first and individual results of teams and team members by building up a strong international reputation for the P3 unit as a whole. This means the unit will need to further consolidate a consistent and coherent scientific output, and profile itself consistently as the Luxembourg group of life sciences. The panel believes there are strong indications for future success: the clear conceptual framework and overall focus, the solid budget, the high quality of the output and, above all, the enthusiasm, shared vision, and care for quality on the part of the management. Future success could be further secured by enhancing the visibility of the unit within the University, Luxembourg society, and the international scientific scene. In this light, the panel believes it could be useful for the unit to develop a permanent meta-reflection on its own activities and to use the results of such an exercise in setting out future strategies for development. The creation of an external reflection panel or advisory board which could function as an interface between the unit and larger society might certainly be worth considering.

Relevance to Luxembourgish society

The relevance of the P3 research to the developments in society and economy is apparent: In developed countries, facing a more and more aging population, the major aging-related diseases such as cancer, Alzheimer's, atherosclerosis, and type II diabetes, are an important scientific question and, as such, being investigated in a multitude of research centres all over the world. Any advance in this field may have a large impact on the prediction, treatment, and prognosis of these diseases for the population. The forthcoming and already mentioned establishment of a diagnostic company and a Biobank will undoubtedly be of major economic importance. Research activity in these fields could also, in the long run, have a beneficial impact on the local clinical sector.

Impact on teaching & learning

A clear impact on teaching and learning will be realized with the Master's programme in Integrated Systems Biology, which will start in September 2008. The panel studied the plans for this programme and found that the concepts of the programme are following the same lines as those of the research themes. Each year, the unit plans to educate 18 students in the genomics, transcriptomics, proteomics, metabolomics and physiomics technologies and to provide them with an understanding of systems biology approaches. In addition, students will get an overview on the molecular mechanisms of major aging-related diseases. The Master's programme is focused on wet- and computer-lab education (45% of time). Most of the professors and some of the PhD-level scientists of the department will be directors of the, in total, 20 courses covering 120 ECTS. Moreover, the students are encouraged to perform their MSc thesis in one of the 5 teams of the Research Unit.

The panel is very pleased with the general set up of the programme and the direct and strong ties between teaching and research. Following up on a point mentioned earlier with regards to the flexibility of the budget, the panel is convinced also that this Master's programme would benefit greatly from further cooperation with other disciplines within the Faculty (e.g. with the Mathematics or Computer Sciences departments, for the development of a course and expertise in biostatistics).

As the research themes are embedded in a larger and ongoing debate in society on the possibilities and limits of curative and health improving techniques, the panel also advises the unit to consider adding a (bio)ethics course at some point in the MSc or PhD curriculum. This will also further strengthen the teaching of transferable skills.

QUALITY ASSURANCE

Arrangements for monitoring, feedback and improvement are mainly informal, but evidently based upon shared notions of quality. During its site visit and the interviews with the different parties involved, the panel got the impression most of the staff is very enthusiastic about the project and strongly committed to making it a success. The team leaders the panel has spoken with clearly have a shared vision on — and commitment to — quality and have ambitious — but well considered — plans for the future. The self assessment report of the unit was concise but critical and the management claimed explicitly to have learned a lot from this exercise of self reflection. The management intends to go on with this kind of self-monitoring and data collection on a regular basis and committed itself to continue developing unit-wide indicators. The panel also discussed its provisional findings and recommendations for improvement with the management in an open and very constructive atmosphere. From these elements (that are, admittedly, difficult to objectify), the panel can conclude with confidence that an informal but strong quality culture is present within the unit.

Additionally, some more formal or semi-formal arrangements and procedures have been made or are being developed. There are, for example, clear rules and regulations for the doctoral school (which, as was stated above, needs a more general implementation), a standardised way for presenting research output in CV's has been developed, and there is the weekly organised general seminar at which all members of the unit meet and present their findings and problems to each other. And, as was mentioned earlier, the group leaders meet once a month and have ample informal contact.

These present arrangements for monitoring and feedback are, to reiterate, well tailored to the current size of the unit and have certainly proven to be efficient and effective, considering the high quality of the output.

Taking into account the considerable future expansion of the unit, however, procedures for monitoring, feedback, and improvement will need to be made more formal, transparent, and explicit.
This transfer from an informal to a more formal commitment to quality should take place on three fronts:

1. The institutionalisation of self-reflection, including the setting of milestones, the evaluation of unit performance as a whole, and the evaluation of the performance of every staff member (e.g. via a two way interview with the direct superior) on a regular basis.
2. The creation of formal forums for interaction with students, support staff, and researchers, including documentation and transparent communication of the decisions taken.
3. The establishment of a management committee (possibly with an external advisory board as mentioned above) that formally discusses overall strategy, manages (part of) the budget, and steers the unit as a whole.

As was noted before, the panel has found most of these structures already present within the unit, albeit in a rather loose and informal shape. The panel is of the opinion that the suggested transfer can be executed efficiently, and should in no way add to the already heavy workload of the staff. The panel suggests using part of the budget to create 'central' administrative support within the unit itself (complementary to the current team-dependant support staff), to underpin this smooth transfer, and to communicate with administrative services on central (university) level.

The panel is convinced that the intended growth into an international centre for Bioscience and System Biology will be supported strongly by further implementing the appropriate structures.

CONCLUSION

Considering its aforementioned findings and advice, the panel suggests the Committee award a **grade 'A'** to the LS Unit: *"The unit has a reasonable quality culture. The Committee has confidence in its capacity to develop and manage its present and future quality"*.

The panel could clearly identify a *"cultural / psychological element of shared values, beliefs, expectations, and commitment towards quality"* within the unit and has found the first and promising tracks of *"the structural / managerial element with defined processes that enhance quality and aim at coordinating individual efforts"*[2]. The mainly informal procedures and structures are well tailored to the current size of the unit and have proven to be efficient and effective, considering the high quality of what the unit has managed to realize in a relatively short period of time. The main challenge for the future will be to develop more solid and formalized structures and procedures to guide and help realize the unit's intended expansion.

SUMMARY STATEMENT

Good structures and procedures for planning, management, and quality assurance will ensure that the LS Unit can move forward with confidence into the phase of expansion and can maintain the high quality of its resources, input, and output.

APPENDIX 1: SUGGESTIONS FOR IMPROVEMENT

The panel restates the following aforementioned suggestions for improvement:

Input
- Clarify and define the specific objectives and goals of each (current and future) group in relation to each other, and in relation to the overarching mission of the unit as a whole.
- Enhance flexibility in the management of the budget and use the resources more strategically (e.g. for encouraging constructive joint projects).
- Sustain the effort to secure external funding as it will lead to the expansion of both visibility and respect in the international scientific community.
- Formalize procedures for recruitment process, make them more transparent and explicit.
- Put in place a more comprehensive and formalised HRM-policy. This should at least include formal forums for consultation and deliberation, and structures for regular assessment of performance (and setting targets) for all personnel, based upon regular staff development interviews and on broadly discussed plans for future strategy.
- Stay involved in the planning (especially that of wet-lab space) of the Belval-site.

Process
- Strengthen collaborations with industry and the commercial exploitation of IP's
- Fully implement the plans for the doctoral school, keeping in mind the importance of transparency, student participation in decisions, and uniform and transparent communication.
- Create a more formalized management committee, taking documented decisions on overall strategy and on procedures for setting standards, monitoring, and feedback.
- Establish more solid and formal forums for consultation with, and gathering input from, all categories of personnel.

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[2] Extracts from the definition of Quality Culture as mentioned in the „Handbook for External Evaluation of the University of Luxembourg"

Output

- Consolidate a consistent and coherent scientific output, and profile yourself consistently as the Luxembourg Group of life sciences.
- Enhance the visibility of the unit within the University, Luxembourg society, and the international scientific scene.
- Develop a permanent meta-reflection on your own activities and use the results of such an exercise in setting out future strategies for development.
- Creating an external reflection panel or advisory board which could function as an interface between the unit and the larger society might certainly be worth considering.
- Consider adding a (bio)ethics course at some point in the MSc or PhD curriculum

Quality Assurance

- Make an efficient transition from an informal to a more formal commitment to quality by:
  - institutionalising self-reflection, including the setting of milestones, the evaluation of unit performance as a whole, and the evaluation of the performance of every staff member (e.g. via a two way interview with the direct superior) on a regular basis.
  - creating formal forums for interaction with students, support staff, and researchers, including documentation and transparent communication of the decisions taken.
  - establishing a management committee (possibly with an external advisory board as mentioned above) that formally discusses overall strategy, manages (part of) the budget, and steers the unit as a whole.
- Use part of the budget to create 'central' administrative support within the unit to underpin a smooth and efficient transfer to more formal structures and to communicate with administrative services on central (university) level.

VI.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 4:
European and Business Law

Introductory remarks

The Research Priority 4, 'European and Business Law', comprises the research carried out by the Research Unit in Law (*UR Droit*) at the University of Luxembourg. The UR Droit consists of two research groups:

- *Centre de Droit Européen* (CDE, founded in 2006), for the area of European law, including especially EU constitutional, regulatory, and administrative law.
- *Laboratoire de Droit Economique* (LDE, founded in 1996 as part of the *Centre de Recherche Public - Gabriel Lippmann* and integrated into the UL in 2005), for the area of Commercial law, including especially banking and finance law as well as company law.

The development of the UR Droit as such started in October 2004 when two professors were recruited into the newly created *Faculté de Droit, d'Economie et de Finance* (FDEF). In 2005/2006 the teaching programmes were re-formed into a Bachelor and Master in Law. Between 2004 and 2008, the team has grown from two to seven professors with a growing number of PhD-students.

The panel appreciates that the short history of the unit and the great efforts devoted to developing the teaching programmes and building up the team have to be taken into account in assessing the objectives, procedures, and results of the research unit. The panel is very much aware that the unit is still in its initial stage of development.

INPUT

1. Clarity, realism and detail of the objectives in the Priority

The objective of the UR Droit is to establish at the University of Luxembourg a centre of knowledge and networks of experts to critically review the often fast and evolutionary development of European and Business Law. The UR Droit contributes to a modern understanding of this field of law, its conditions of creation, and its implementation in a multi-level legal system. Research results are furthermore meant to contribute to the preparation of the necessary reforms and enrichments of Luxembourg Business Law, particularly in the fields of banking and finance, in order to strengthen its attractiveness.

In the opinion of the panel, the objectives of the Priority are clearly described and adequately detailed. The general areas of European Law and Business Law are well chosen in the Luxembourg context. The objectives are very ambitious but they do not contain phases of development; realising all goals to the full will normally require at least 5 to 10 years. Considering the size of the group, the area to be covered is very broad. The reason for this strategic choice is that in the initial stage of development, a wide range of topics gives a wide basis for recruitment and, in due time, collaborations and interactions will provide a sharper focus.

In comparison with law departments at other universities in Europe and elsewhere, the objective to contribute to reforming and improving Luxembourg Business law is formulated in an unusually direct way, which illustrates a particularly close relationship with the professional field and high expectations in terms of practical results.

2. Appropriateness and flexibility of the operational budget

The operational budget is regarded as adequate in the present stage of development. It is noted that no information was presented about the personnel budget, which is entirely in the hands of the University.

3. Appropriateness of the research and support staff in quality and quantity

The extra demands that the pioneering phase places on the academic staff, have been met with great resilience and enthusiasm, but it is a good thing that attention is now also being given to increasing the size of the support staff and optimising its organisational structure.

A special characteristic of the research staff is that each member has a background in more than one legal system. This is a deliberate criterion for selection, aimed at the research objectives of the unit.

4. Appropriateness of the human resources management

So far, priority has been given to the recruitment of academic staff, which is understandable because the academic demands are particularly high and both the reputation and the network of the group have to be built up. HRM-policy intentionally focused mainly on the group level, while criteria and feedback on the individual level were given low priority. In the period that lies ahead, this balance will have to change. The management has expressed its awareness of this necessity.

The panel has noted that in the present teaching and research team, everybody is more or less the same age. Future recruitments should perhaps take into account that it might be preferable to have a more balanced age structure. The same can be said about the percentage of women in the staff.

5. Appropriateness of the material facilities

The material facilities in terms of the buildings, rooms, equipment, and furnishings are of high quality. The library is not up to standard yet, although this is offset to some extent by excellent IT resources. In the fields of European and Business Law, contemporary primary sources are all usually available online; older source materials however requires access to either commercial databases or print copies.

The growing number of staff does pose housing problems that will have to be solved in the near future.

PROCESS

6. Variety and focus of the research programmes (areas of research, types of funding, establishment of partnerships international and local)

As mentioned in section 1, the area to be covered is very broad. The research of the UR Droit covers Constitutional law, administrative law, criminal law, private law, banking and finance law, all with a focus on the EU, with a comparative perspective, and with a focus on the Luxembourg laws in each of these areas. All these fields are represented in the bachelor and master programmes, except administrative law, and there are, additionally, a full PhD programme and training programmes for the further qualification of lawyers towards becoming advocates and magistrates. Methodologically, the research takes the economic, teleological, historic, and political contexts into account.

The research is funded from structural UL funds (€ 120 000 for the *Centre de Droit Européen* and the *Laboratoire de Droit Economique*, not including the personnel budgets that are centrally administrated and not known to the unit) and from competitive funds (UL projects € 110 775, FNR project Vivre II € 437 070 over 3 years). The LDE has also profited from some contract funds from the Ministry of Justice, such as the contract fund SOCOM3 at € 55 090 for 2007-2008.

International and local partnerships are being established on the basis of the networks of the members of the academic staff, who in most cases already have an academic background and connections in several other countries. Local partnerships can benefit from the proximity of the European Court of Justice, the banking and finance centre with their legal experts, and other European institutions such as the European Investment Bank and the European Investment Fund. The international contacts with universities include contacts with not only European but also Chinese and North-American universities, for purposes of teaching and, additionally, with a view to establishing a network of research centres. For instance in financial law, a network of academics from different continental European Universities (Frankfurt, Geneva, Gent, Strasbourg, Paris) has been established which e involves regular meetings and circulation of PhD students.

The panel has the impression that the financial resources are adequate. The panel regards the variety and focus of the research as appropriate in the present stage of development; in due time further collaborations and interactions will provide a sharper focus.

7. Effectiveness of the research processes, relating the scientific production to the investments

The quantity of the research output has reached a satisfactory level, in spite of the fact that the staff has faced very high teaching, development, and administrative duties. The panel attributes this to a high degree of efficiency in a close-knit research community with frequent informal interactions, and to the fact that the newly appointed staff members had, in most cases, already built up an academic research line which continues to bear fruit in the Luxembourg context.

The appointment policy, with its stress on the prior academic achievement of candidates, was an appropriate way to ensure quality at this early stage, but in the next phase of development consideration must also be given to the nurturing and development of junior colleagues beginning their careers in the Faculty.

Since the PhD-students are an important investment in research capacity, the PhD-training and supervision will also have to be subjected to some degree of formalisation and standardisation. An important issue in this respect is the definition of the level to be attained. The fact that the PhD-students come from different countries and that their career options are quite varied complicates this issue. The Faculty is aware of this and ideas are being developed. Ultimately, this is a matter of the University of Luxembourg as a whole.

Most of the PhD-students interviewed by the panel were quite advanced in their projects and some concerns were raised about a lack of career guidance in the unit. The panel believes that this aspect requires attention.

An important development is the initiative to establish an *école doctorale*, in collaboration with universities in the region. A list of optional courses and a common core of mandatory courses would enhance the structure of the PhD-training. The panel would be in favour of developing a structured PhD-programme with advanced courses. The PhD-students must come in contact with methodological and theoretical challenges in the field, at a more advanced level than a summer course or a Master's programme can generally provide. Such courses could also be beneficial for staff members. In collaboration with other universities, external experts can be invited to teach such courses in Luxembourg.

The teaching obligations of the PhD-students vary with their type of contract and with the type of projects in which they are involved. Generally speaking, they are expected to teach 1 to 3 hours a week, which can amount to a maximum of 50% of their time in the 3 year period. The PhD-students did not complain about their teaching duties at all, but there does seem to be a lack of clarity about the rules.

The same applies to some extent to the supervision of PhD-students. The staff explained that no teaching hours are officially allocated for PhD-supervision. The Faculty also does not get any extra money for a completed degree. The panel does not have the impression that the staff members do not spend sufficient time on PhD-supervision, but increasing the transparency of the rights and obligations of both the professors and the students could be helpful. The introduction of a *comité d'encadrement* to review the progress of the PhD-project after one year is already an important step in this respect.

The panel was informed that the possibility of limiting the number of PhD-students to six per professor is under consideration. The panel finds this a good idea that should be formalised.

The work space of the PhD-students requires attention, especially as their number further increases. The Faculty is aware of this.

8. Flexibility of the procedures, enabling the research programmes and departments to reach or remain at international level and adapt to new research challenges or areas (encouragement of initiatives, support of research)

The panel has specifically asked about the management tools for monitoring, feedback, improvement, staff training, methodology development, coherence between projects, and cumulative knowledge production. The answers given emphasised the specific demands of the present stage of development, which requires building up a team spirit and shared notions of quality. Each researcher contributes to several of the themes in order to achieve innovative intra- and inter-disciplinary legal research. The individual academic freedom is nourished whilst at the same time a research environment is being established which stimulates high class work. Projects benefit from different compositions of teams enabling the creative exchange of ideas and approaches from researchers with different backgrounds in various legal systems. Each project team works with external colleagues depending on the topic. At the level of the Faculty, the directors of the research units meet once every month to discuss the research achievements as well as the monitoring of research quality. These meetings also serve to promote interdisciplinary approaches.

The panel finds these procedural arrangements adequate in the present stage of development, but as the number of staff and PhD's is growing, attention will have to be given to documenting the quality concepts and approaches, and to formalizing some of the procedures for setting standards, monitoring, and feedback, including on the individual level.

OUTPUT

9. Achievements of the research departments in relation to the objectives formulated for the Priority

As mentioned in section 7, the research output has reached a satisfactory level, in spite of the fact that the staff has faced very high teaching, development and administrative duties. The unit seeks to be represented at the best and most highly regarded publication houses, journals, and conference venues. The unit has a list of reputable journals in which the researchers are encouraged to publish their contributions. The success rate in reaching these targeted publication media has, so far at least, surpassed the ambitious expectations of the unit. The panel agrees that the journals on this list are of recognized international standard in the fields of European and Business Law.

10. International recognition

The international academic reputation of the UR Droit and its work is growing. The researchers have been very active in international conferences, the number of academic publications in reputable international journals is considerable, and (again, as mentioned in section 7) newly appointed staff members in most cases had already established an academic research line, which has been carried over into the Luxembourg context.

It is encouraging that research links have been established with foreign law schools. One ambition in the next phase of development might be to seek externally funded collaboration with one or more of these law schools. In general, it would be beneficial to the unit's international standing if the Faculty could acquire competitive non-Luxembourg funding for one or more of its research projects.

11. Scientific impact

The impact of the research of the UR Droit on the development of knowledge in the domains of European Law and Business Law is, so far, mainly a matter of their factual existence, their plans, their potential, and a number of good quality publications, including dissertations.

Obviously, influential contributions within an academic field are primarily made in international journals with a high impact in that specific field, which means that those journals should be targeted in order to become an internationally renowned academic institution. For some specific objectives of the Priority, however, high-impact academic journals may not be the most logical outlet, as in the case of the objectives aimed at the Luxembourg context. For the unit, this is a matter of careful balance; the proportion of French and English language publications may need to be taken into consideration in this respect.

In the field of Law, the situation is peculiar in the sense that, in spite of the existence of the EU, legal systems remain essentially national phenomena, with national history, national sources, a national profession, and many essentially national issues and characteristics. For that reason, writing about national law for a mainly national audience is not in itself a second-class activity. The panel notes that the Faculty does in fact publish in journals of an international character in the sense that they are not, in most cases, tied to a specific national legal system.

12. Relevance of the research choices in relation to the developments in the international scientific community or the developments in society and economy

As stated in section 1, the general areas of European Law and Business Law are well chosen in the Luxembourg context. The choice of themes (outlined in section 6) reflects well the aim of establishing a centre of excellence in European and comparative law with a strong focus on the questions of Europeanization of law. The variety in nationalities and legal backgrounds of the team members is a unique feature in the landscape of law faculties in Europe and elsewhere.

The Luxembourg context is characterized by the presence of a large number of legal experts in a professional setting. This creates good opportunities for mutually beneficial exchanges between the non-academic and the academic world. The European Court of Justice is the highest legal institution in the European Union with a workforce of approximately 1500 expert lawyers, many of whom are taking a break from an academic career in law. The banking and finance centres with their legal experts are another element in the Luxembourg context, together with other institutions such as the European Investment Bank and European Investment Fund.

13. Innovative power, both innovations realized and innovative potential

The hiring requirements for new staff have necessarily been strongly influenced by the wide range of courses to be taught. The resulting diversity in the staff allows close cooperation in a network of researchers from different subdisciplines making it easy to cross traditional boundaries, unlock new fields of knowledge, and creatively define new research projects.

14. Impact on Luxembourg economy and society

The self-assessment report states that in the area of banking and finance law, day-to-day problems are pressing; consequently, the lawyers in this field are dealing with much more urgent and practical questions than academic researchers will want to concentrate on. Academic research is necessarily focused on taking a step back from the day-to-day involvement with very specific problems. It is more concerned with putting these elements into context and establishing a more coherent big picture. The panel agrees that the research staff must not adopt too detailed an advisory function.

The panel is also aware of the danger that when the work of the UR Droit is evaluated in Luxembourg society as a whole, the concrete contributions of University research to individual problems will play a role. The panel fully supports the approach of combining general background research with applied research, and letting the precise distribution depend on the topic at hand and the developmental stage of the research related to it.

One concrete example of the relevance for Luxembourg economy and society is that the team co-authored a draft of the new Luxembourg legislation on company law. This required an in-depth comparative

analysis of various problems in this field in other jurisdictions, a task that the Ministry of Justice does not have the staff or the expertise to carry out itself. This research led to various publications in peer-reviewed legal journals.

Another example is the ongoing and in-depth analysis of structures of administrative cooperation that underlie legal integration in Europe. This research requires developing new approaches to thinking about law in non-hierarchic legal networks. The research was undertaken in cooperation with King's College Law School in London and has led to the publication of a book on EU Administrative Governance.

15. Impact on teaching and learning

The three master specializations, European Litigation (A), European Banking and Finance Law (B), and Criminal Law (C), are related to the major research themes of the unit in several ways. A large external body of staff is employed in carrying out the teaching programmes, but the research staff welcomes the opportunity to discuss research related topics with those members of the extended staff who are interested in engaging in the academic side of their disciplines. The courses taught benefit both from the expertise and experience of the researchers, and from the concrete examples and ideas that stem from their individual and collective research activity.

QUALITY ASSURANCE

16. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives of the Priority (Monitoring of research processes and outputs, quality standards for research, ethical code)

As stated in section 8, the management tools for monitoring, feedback and improvement have so far been targeted towards building up a team spirit and shared notions of quality. This means that formal criteria and feedback on the individual level were not given high priority, and the codified quality standards for research consisted only in a list of output-categories and a list of targeted reputable academic journals. Ethical standards for university research have not been laid down, which is not to say that they are not present in the minds of the researchers both individually and as a group.

The number of students in the faculty is increasing very quickly, which means that new staff will have to be hired who will have both teaching and research duties. In the opinion of the panel, this growth makes it necessary to formalise the implicit rules that have evolved in the team about relationships within the staff. Otherwise, the nascent quality culture could soon be lost or diluted.

17. Commitment of the University community and stakeholders of the research departments to quality assurance

It became clear to the panel that the members of the unit and the stakeholders are committed to achieving the highest possible quality, though quality assurance as such has not received the highest priority in the initial stages of development of the unit, at least not in structural and formalized ways. To some degree this has been an understandable and deliberate choice, given the heavy task of building up the teaching and research activities with a small team, but the panel has the impression that quality assurance has also been regarded as an unattractive bureaucratic exercise which would emphasise quantitative and hierarchical elements. This means that the advantages of quality assurance in facilitating goal attainment, efficient task division, and accountability have perhaps been underestimated.

18. Effectiveness of feedback in influencing positively the research programmes and departments

As indicated in section 16, the quality criteria are not further specified in measurable targets, benchmarked against comparable units inside and outside the university. In the interviews, it became apparent that production of three academic publications per researcher per year is regarded as a reasonable standard.

The self-assessment report emphasises that quantitative criteria and bibliometrics are virtually non-existent in legal research.

As stated in section 4, feedback was focused intentionally on the group level, while criteria and feedback on the individual level were given low priority. In the period that lies ahead, this balance will have to change. The management acknowledges awareness of this necessity.

Feedback in terms of content from the point of view of the professional field seems to take place mainly in informal network contacts and in conferences and seminars. Feedback on academic work is also a matter of networks, co-operations, and conferences. The panel has the impression that the lack of formal feedback mechanisms (such as stakeholder surveys or a scientific council) is effectively compensated for by the eagerness and openness of the group in their efforts to build up their operation and reputation.

GENERAL OPINION ABOUT THE RESEARCH PRIORITY IN RELATION TO THE CONCEPT OF QUALITY CULTURE

In the opinion of the panel, the unit has a reasonable quality culture. This means that the panel has confidence in its capacity to develop and manage its present and future quality. (Score A).

In the opinion of the panel, the cultural conditions of shared values, beliefs, expectations, and commitment towards quality are present in the research unit; however, the structural and managerial elements aimed at coordinating individual efforts and at enhancing quality are neither fully laid down in defined processes, nor fully implemented. The awareness of the necessity of such formal elements is much higher than was initially apparent from the self-assessment report, and during the site-visit information was provided about concrete discussions on quality criteria and about monitoring processes that had been going on for quite some time. Furthermore, it became apparent that steps have been taken towards more formal monitoring and feedback procedures, including the provision of some administrative support and organisational structures.

The process of setting up new research programmes and strategic research planning has, so far, been closely linked to the recruitment of new staff. This is very understandable in the development phase of a new group, and the recruitment process has followed the usual formal requirements, combined with the informal consultations that are common in a small close-knit academic community.

Appendix 1: Summary of main conclusions, Panel 4 Finance

Quality assurance
In the opinion of the panel, the cultural conditions of shared values, beliefs, expectations and commitment towards quality are implicitly present in the research unit, but some effort is needed to make them more explicit and stable.

Setting explicit standards
Attention will have to be given to documenting the quality notions and approaches and to formalizing some of the procedures for setting standards, monitoring and feedback, also on the individual level. Since the management processes of other groups in the Faculty will require the same type of structuring and codification, it seems logical that the Faculty should take the initiative.

Research orientation
The current size of 6 permanent staff is not regarded as sufficient, which means that the current and future recruitments are of prime importance, especially since the research director has very recently announced that he will be leaving. This means that a re-orientation of research direction will have to take place, in line with the profile of the new leadership.

Communication with stakeholders
Creating a usable output for the Luxembourg financial sector requires a constructive dialogue between banks and CREFI-LSF. It is very important to gain trust and to explain what academic research can and cannot do. It is perhaps worth considering the appointment of a liaison officer, based on specified commitment from both sides.

Career development
The post-docs and assistant professors are in a difficult position with regard to their future careers. Post-docs do not receive priority above other applicants for positions in the University. They would welcome more clearly defined criteria and feedback in order to increase their chances of success. Assistant professors at the University cannot apply for a full professorship at LU. This legal rule is common in most universities to prevent inbreeding, but during the phase of building-up, it would be imaginable to make some exceptions.

PhD-training
The panel would be in favour of developing a structured PhD-programme with advanced courses. The PhD-students must come in contact with methodological and theoretical challenges in the field, at a more advanced level than a summer course or a Master's programme can generally provide. Such courses could also be beneficial for staff members. In collaboration with other universities, external experts can be invited to teach such courses in Luxembourg.
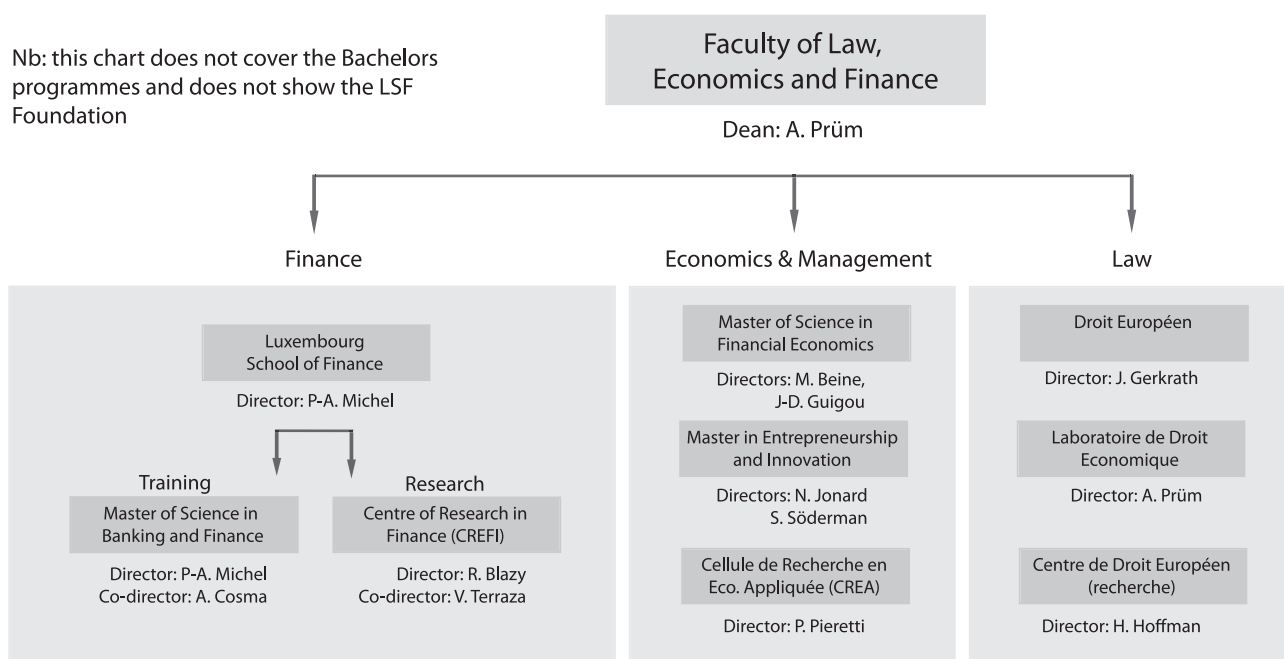
VII.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 5:
Finance

Introductory remarks

The object of this review, Research Priority 5 'Finance', comprises the research carried out by the Centre of Research in Finance (CREFI) within the Luxembourg School of Finance (LSF), the Finance Department of the Faculty of Law, Economics and Finance (FDEF) of the University of Luxembourg. At the end of 2005, LSF had established a permanent research programme concentrating on risk and financial markets, with activities in the fields of Financial Institutions, Risk Management, Fund Industry, and Quantitative Finance. By the end of 2006, these units had been integrated into a new research laboratory within LSF, which was named CREFI (Centre of Research in Finance).

The Luxembourg School of Finance also provides a teaching programme, the Master of Science in Banking and Finance, for professionals from the financial centre (mainly with external/international teachers). Several members of the staff of the CREFI have teaching duties in the Master in Financial Economics programme, organised by the Department of Economics & Management of the FDEF. Some members of the CREFI-staff are also employed in the *Cellule de Recherche en Economie Appliquée* (CREA) of the Department of Economics & Management of the FDEF, which is linked to Priority 10 'Economics and Entre-preneurship', a Level 2 Priority in the 4-year plan of the University.

Nb: this chart does not cover the Bachelors programmes and does not show the LSF Foundation

Faculty of Law, Economics and Finance

Dean: A. Prüm

Finance

Luxembourg School of Finance

Director: P-A. Michel

Training

Master of Science in Banking and Finance

Director: P-A. Michel
Co-director: A. Cosma

Research

Centre of Research in Finance (CREFI)

Director: R. Blazy
Co-director: V. Terraza

Economics & Management

Master of Science in Financial Economics

Directors: M. Beine, J-D. Guigou

Master in Entrepreneurship and Innovation

Directors: N. Jonard S. Söderman

Cellule de Recherche en Eco. Appliquée (CREA)

Director: P. Pieretti

Law

Droit Européen

Director: J. Gerkrath

Laboratoire de Droit Economique

Director: A. Prüm

Centre de Droit Européen (recherche)

Director: H. Hoffman

Although the research unit CREFI was formally created in November 2006, most staff members were recruited at the end of 2005 and the beginning of 2006. The permanent staff currently consists of 2 professors (1 since November 2007), 1 invited professor, and 3 assistant professors. According to the self-assessment document, the desirable size of the team would be 10 permanent professors and assistant professors.

The panel appreciates that the short history of the unit must be taken into account in assessing the objectives, procedures, and results of the Research Priority. The panel is very much aware that the unit is still in its initial stage of development.

INPUT

1. Clarity, realism and detail of the objectives in the Priority

The objectives of the Priority are
1. to create a research programme in finance with competitive international academic standards (international publications in finance).
2. to create a usable output for the Luxembourg financial sector.
3. to develop an international network with other universities.
4. to initiate and develop a PhD programme.

The core research areas are quantitative finance, law and finance, and managerial finance. A specific research programme in behavioural finance is also under development. The CREFI staff regards these areas as relevant to the financial sector, with potential applications in the fields of portfolio management; private banking; financial products; bank competition; law, tax and finance; comparative finance; risk management; and behavioural finance. These areas take into account the skills and the previous activities of the research staff (most of whom are financial economists and financial statisticians). CREFI wants to concentrate on 'niches' rather than spreading out into too many areas. The group aims at acquiring some academic visibility within the next 5 years.

In the opinion of the panel, the objectives of the Priority are clearly described and adequately detailed. The general areas of quantitative finance, law and finance, and managerial finance are well chosen in the Luxembourg context. Considering the current size of the group, the area to be covered is very broad. The possibilities of realising these objectives will be strongly influenced by both current and future recruitments.

The self-assessment report states that academic competition at an international level (goal 1) cannot be reasonably achieved within 5-10 years, given the ongoing recruitment process. The panel shares this view and finds that a simple step-by-step development path would lend realism to the objectives.

The panel also agrees with the self-assessment report that creating a usable output for Luxembourg's financial sector requires a constructive dialogue between banks and CREFI-LSF.

Significant progress has been made regarding the third goal, to develop an international network with other universities. Since most of the researchers come from abroad, in addition to the LSF having in place an international network with professionals and experts, CREFI has already realised this objective to a large extent. The quality and cohesiveness of the network, linked to a coherent research programme of the Priority, will require further effort however.

Initiatives to develop a real PhD programme have been taken, and four PhDs are presently working in the Priority. See section 8 below.

2. Appropriateness and flexibility of the operational budget

The operational budget is regarded as adequate in the present stage of development. It is noted that no information was presented about the personnel budget, which is entirely in the hands of the University.

3. Appropriateness of the research and support staff in quality and quantity

The extra demands that the pioneering phase places on the academic staff have been met with great resilience and enthusiasm. The official research time per staff member is 50%, but in practice, administration and teaching have taken up so much time that their actual time devoted to research is estimated at about 30%. The current permanent staff size of 6 is not regarded as sufficient, which means that current and future recruitments are of prime importance, especially since the research director has very recently announced that he will be leaving.

The recruitment of a new senior professor is currently in progress. This professor will succeed the current director of the LSF, who is retiring. A search committee composed of 3 members (the rector, the dean, and a banker teaching at the LSF) are in charge of this process. In light of this, all other recruitments (4 to 5, in total) have been blocked. This means that at this stage CREFI relies heavily on post-docs (at the end of 2007, three new post-docs joined the two already in the program), and external experts (Solvay Business School, HEC Liège). CREFI now has four PhD students.

The unit shares one secretary with other research units (part-time from 2006, but should become full-time in 2008). A new administrative secretary was recruited recently, to help in managing the budgets. At the level of the Faculty, attention is being given to increasing the size of the support staff and optimising its organisational structure.

4. Appropriateness of the human resources management

HRM-policy has so far been very limited because of the small size of the unit and the special circumstances of the start-up phase. Criteria and feedback on the individual level were given low priority, which has created a degree of uncertainty among the staff. The University, the Faculty, and the Unit will have to pay attention to this in the period that lies ahead. The recently announced departure of the director of the research centre adds to the uncertainty because he recruited most of the research staff according to the research orientation chosen by CREFI under his leadership.

In terms of HRM, the post-docs and assistant professors are in a difficult position with regard to their future careers. Post-docs do not receive priority above other applicants for positions at the University. They would welcome more clearly defined criteria and feedback in order to increase their chances of success. Assistant professors at the University cannot apply for a full professorship at LU. This legal rule is common in most universities to prevent inbreeding, but in the current building-up phase it might be desirable to make some exceptions.

5. Appropriateness of the material facilities

The material facilities in terms of the buildings, the rooms, the equipment, and furnishings are of high quality, but the space is rented and the location is isolated from the rest of the Faculty which is not an optimal situation. The library and the laboratory for behavioural finance are not up to standard yet. The researchers have access to the to the National Library e-reviews (EBSCO, Business premier, Elsevier) and to the Limpertsberg University Library and the LSF library.

The PhD's regard the work environment and the living conditions as very good.

The question of whether the Faculty and the research unit will move to the new University campus under construction in Esch, or whether they should stay in the close vicinity of the Luxembourg financial centre is being discussed.

PROCESS

6. Variety and focus of the research programmes (areas of research, types of funding, establishment of partnerships international and local)

As mentioned in section 1, the research area is very broad and covers:

- Quantitative Finance (risk estimation, value-at-risk models, risk classification of securities, asset pricing models, relative performance measuring, ARCH models, semi-parametric and non-parametric estimators).
- Law and Finance (LLSV indexes[1], game theory and financial contracts, institutional economics, corporate bankruptcy and financial distress, comparative financial law, legal incentives, causality between law and economic growth).
- Behavioural Finance (decision theory, bounded rationality, experiments, information markets, uncertainty, unexpected utilities, game theory, lotteries).
- Risk Management (Basel 2, ratings and performances, credit risk, portfolio management, hedge funds, banking organization and competition, banking economics, capital requirements, information disclosures, IFRS[2]).

The research is funded both from structural UL funds and from competitive funds. Start-up funds of €10 000 per researcher were given for newly recruited permanent staff in the year 2007.
The structural annual budget was 50 K€ for 2007. The contracts involve three FNR programmes financed for 3 years each (respectively, 880 K€, 850 K€, and 490 K€; some of them are shared with other units / institutions).

Personnel costs are not included in the CREFI budget, as they are provided by the University.

International and local partnerships are being established on the basis of the networks of the members of the academic staff, many of whom already have an academic track record in several other countries. Collaborations exist with the US, the UK, Germany, Italy, France, and Belgium. Local partnerships can benefit from the proximity of a large volume of experts and organisations in the Luxembourg financial centre. (About the cooperation with bankers, see sections 12 and 14.)

The panel has the impression that the financial resources are adequate, though they are low in comparison to other areas of study in the University. The panel regards the variety and focus of the research as appropriate in the present stage of development; in due time, further recruitments, collaborations, and interactions will provide a sharper focus. Increasing the number of seminars and conferences will then be important as well.

7. Effectiveness of the research processes, relating the scientific production to the investments

Research output has reached a satisfactory level, in spite of the fact that the staff has faced heavy development, teaching, and administrative duties. The group functions as a close-knit research community with frequent informal interactions; newly appointed staff members had already-existing academic research lines, which continue to bear fruit in the Luxembourg context.

As mentioned in section 4, post-docs do not receive priority above other applicants for positions in the University. This may negatively affect their motivation to invest in Luxembourg related topics during their two-year stay.

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[1] The LLSV index attempts to measure shareholder protection; it is named after the authors La Porta, Lopez-de-Silanes, Shleifer, and Vishny.
[2] International Financial Reporting Standards (IFRS) are standards and interpretations adopted by the International Accounting Standards Board (IASB).

8. Flexibility of the procedures, enabling the Research Programmes and Departments to reach or remain at international levels and to adapt to new research challenges or areas (encouragement of initiatives, support of research)

All directors of the FDEF's research units meet regularly to manage, assess, and discuss their current projects. Each research project is individually managed by 1 or 2 researcher(s): the management of these projects is decentralized because this is regarded as most flexible and efficient, but progress reports are studied by the director of CREFI, and the dean of the Faculty has access to CREFI's activity reports. Private-public partnerships are coordinated by external steering committees. The LSF Foundation[3] plays a role in this process.

Information about the progress of the research is shared through regular internal meetings. Some projects involve several research units, because they combine economics, finance, and/or law.

Apart from these mechanisms, the self-assessment report and the interviews did not show a fully developed structure of management tools for monitoring, feedback, improvement, staff training, methodology development, coherence between projects, and cumulative knowledge production. This is due to the specific demands of the present stage of development and the building up of the team. In 2007, both CREFI and CREA proposed several key indicators for measuring the productivity in research, but formalising rules and incentives for quality control depends on the University's *Règlement d'Ordre Intérieur*.

As the number of staff and PhD's grows, attention will have to be given to documenting quality notions and approaches, and to formalising some of the procedures for setting standards, monitoring, and feedback, both on the group and on the individual level.

Since the PhD-students are an important investment in research capacity, PhD-training and supervision will also have to be subjected to some degree of formalisation and standardisation. The doctoral school for PhD-training was created in 2006, and introductory doctoral seminars took place in 2007. The PhD-training programme that will start in 2008/2009 includes:
  (1) A general programme intended for all PhD-students and assistants (courses in bibliography and presentation techniques);
  (2) Specialized programmes, one for the PhD-students in Law, and one for the PhD-students in Finance and Economics (econometrics, data analysis, game theory).

The panel would be in favour of developing a structured PhD-programme with advanced courses. The PhD-students must come into contact with methodological and theoretical challenges in the field, at a more advanced level than a summer course or a Master's programme can generally provide. Such courses could also be beneficial for staff members. In collaboration with other universities, external experts can be invited to teach such courses in Luxembourg.

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[3]The LSF Foundation has financial resources from the banking sector and plays a role in the governance structure of CREFI. The banking sector is also represented in the steering committee of the LSF.

OUTPUT

9. Achievements of the research departments in relation to the objectives formulated for the Priority

As mentioned in section 7, research output has reached satisfactory levels, despite the heavy teaching, development, and administrative duties.

The research output was specified as follows:

- Books (edited): 2
- Academic articles (published or to be published): 17
- Book chapters and contributions to edited collections: 7
- Working papers: 30
- External communications (conferences, congresses, workshops): more than 20
- Supervision of PhD theses: 4
- PhD jury memberships: 7 (2006)

Articles have been or will be published in the following academic journals: *European Journal of Law and Economics, Economics Letters, Financial Management, Journal of the Japanese and International Economies, Journal of Economic Geography, Journal of Economic Theory, Journal of Financial Econometrics, Journal of International Financial Markets, Journal of Public Economic Theory, Institutions and Money, Journal of International Financial Markets, The Economic Journal, Revue d'Économie Politique, Bernouilli, Revue de l'OFCE, Applied Economics Letter, Derivatives Use, Trading and Regulation.*

The relatively high number of working papers (30) reflects the youth of CREFI. The panel does not consider this a weakness as many of these working papers are already in the process of being refereed by academic journals.

10. International recognition

The international academic reputation of CREFI and its work is growing, but CREFI believes that it will take at least 5 years to reach a fully competitive level. The researchers have been active in international conferences, have a satisfactory number of publications in reputable international academic journals, and (as mentioned in section 7) newly appointed staff members have, in most cases, existing academic research lines, which continue to bear fruit in the Luxembourg context. The last recruitment has given a strong impetus towards international recognition of CREFI which should be consolidated by future recruitments, especially in Quantitative Finance and Behavioural Finance. At the present stage, it should be noted that the international recognition of CREFI relies mainly on the newly recruited professor and on a post-doctoral assistant whose research has not focused on the core research areas of CREFI. Their high-quality contributions are currently on the margins of finance (experimental economics, auctions, and microeconomic theory) but with good potential for application to finance.

11. Scientific impact

The impact of CREFI's researchers on the development of knowledge in the domain of finance is, so far, mainly a matter of their factual existence, their participation in conferences, their plans, their potential, and a number of good quality publications, including publications from the PhD-students. Their publications in the Law and Finance 'niche' can be considered significant in the international academic context.

An effort is being made to concentrate on the publication of academic reviews (two to four stars in the CNRS ranking). Researchers are free in their choice of the most appropriate journals and are aware of the publication standards, but the panel suggests introducing formal incentives for publishing in the best and most relevant academic journals.

Obviously, influential contributions within an academic field are primarily made in international journals with a high impact in that specific field, which means that those journals should be targeted in order to become an internationally renowned academic institution. For some specific objectives of the Priority, however, high-impact academic journals may not be the most logical outlet. This can be the case for the objectives concerned with the Luxembourg context. For the unit, this is a matter of careful balance, with the relative proportion of French and English language publications also taken into consideration in this respect.

One or two workshops are organised each year to disseminate CREFI's work. CREFI worked for more than a year with the CNRS Research Group on Monetary and Financial Economics in order to organize the 25th Symposium on Money, Banking and Finance, which was held in June 2008 in Luxembourg, and hosted more than 120 international researchers. A joint workshop «Développements récents de la recherche en économie et gestion» was organized with the *Université Libre de Bruxelles* and the *Université de Strasbourg*. In September 2007, a joint presentation with DEXIA Bank was organised. And in April 2008, a workshop with 60 participants was organised in relation with Luxembourg financial practitioners, on recent advances in Financial Research. Internal seminars are organized (with CREA) twice a month, most with invited external (international) researchers.

12. Relevance of the research choices in relation to the developments in the international scientific community and developments in society and economy

As stated in section 1, the general areas of quantitative finance, law and finance, and managerial finance are well chosen in the Luxembourg context. The choice of themes (outlined in section 6) reflects the aim to create a research programme in finance with the international academic standards, and to create a usable output for Luxembourg's financial sector.

The Luxembourg context is characterised by the presence of a large number of financial experts in a professional setting. This holds much potential for mutually beneficial exchanges between the non-academic and the academic worlds. The panel has noticed that there are, at present, four main elements that complicate the relationship between these two worlds. One element is the fact that Luxembourg has a very short academic history. This means that academic researchers and the financial sector have yet to establish a full understanding of what they can expect from each other. A second element is the fact that there are rapid changes taking place in the financial sector, which create a sense of uncertainty and a demand for quick solutions. A third element is the fact that the new staff at CREFI have their academic research experience in other countries, and will need time to adjust to the specific situation and core business of the Luxembourg financial sector. Finally, the delays in the recruitment efforts and the building up of the research team have made it difficult to clearly communicate to the business world the objectives and potential of the centre's research.

The panel has noticed that both the academics and the professionals have realised that they will have to put considerable effort in improving communications. Recently, a specially organized seminar proved to be a helpful tool in these efforts. It is important that the research team, with the help of its stakeholders, finds a proper balance between applied research and more academic research, in order to gain international recognition for the centre and, by extension, for the Faculty and the University.

13. Innovative power, both innovations realised and innovative potential

The hiring requirements for new staff have, of necessity, been strongly influenced by the wide range of courses to be taught. The resulting staff diversity allows close cooperation with a network of researchers from different subdisciplines, making it easy to cross traditional boundaries, unlock new fields of knowledge and creatively define new research projects.

The Behavioural Finance Programme has a high innovative potential. Such a programme requires a substantive amount of funding, which seems to be available in the Luxembourg context. Equally, the Law and Finance Programme should be perceived as an innovative niche, in terms of both academic research and practical impact on the Luxembourg financial sector. In contrast, the innovative potential of Quantitative Finance and Risk Management are more dubious since these 'niches' are highly competitive at the international level. Innovative potential is contingent on high quality staff in these areas.

14. Impact on Luxembourg economy and society

As described in section 12, communication with the world of professional finance is complicated. Researchers will have to combine general background research with more applied research; the precise distribution must depend on the particular topic at hand and the stage of relevant research.

CREFI is currently collaborating with bankers to develop the more applied type of research. This process takes time, and the choice of good, reliable partners is crucial, since CREFI aims at developing well-balanced partnerships rather than a pure research delegation.

The panel agrees that it is very important to gain trust and to explain what academic research can and cannot do. Developing this mutual understanding is so important that it is perhaps worth considering the appointment of a liaison officer, based on specific commitment from both sides.

15. Impact on teaching and learning

External staff are involved in teaching many courses. Opportunities to discuss research-related topics with the external staff are welcomed. The courses taught by the CREFI staff benefit from the expertise and experience of the researchers, and from concrete examples and ideas that stem from both individual and collective research activities.

QUALITY ASSURANCE

16. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives of the Priority (Monitoring of research processes and outputs, quality standards for research, ethical code)

As stated in section 8, the management tools for monitoring, feedback, and improvement are not yet fully developed, because of the small size of the team and the fact that it is still in the process of being built up.

17. Commitment of the University community and stakeholders of the research departments to quality assurance

See sections 12, 14, and 16.

18. Effectiveness of feedback in influencing positively the Research Programmes and Departments

As mentioned in sections 8 and 16, the management tools for monitoring, feedback and improvement are not yet properly developed. Criteria of quality are not yet, at least, specified in measurable targets and benchmarked against comparable units inside and outside the University. In the interviews it became apparent that the production of three academic publications per researcher per year is regarded as a reasonable standard.

As stated in section 4, criteria and feedback on the individual level were given low priority, which has created a degree of uncertainty among the staff. The University, the Faculty and the Unit will have to pay attention to this in the period that lies ahead.

Feedback in terms of content, from the point of view of the professional field, seems to take place mainly in informal network contacts and in conferences and seminars. Feedback on academic work is also a matter of networks, cooperation, and conferences. The panel has the impression that the time has not yet come to introduce more formal feedback mechanisms (such as stakeholder surveys or a scientific council).

GENERAL OPINION ABOUT THE RESEARCH PRIORITY IN RELATION TO THE CONCEPT OF QUALITY CULTURE

In the opinion of the panel, the unit has a partial Quality Culture. This means that the panel has confidence in its capacity to develop and manage its present and future quality, insofar as the recommended adjustments are made. (Score B).

In the opinion of the panel, the cultural conditions of shared values, beliefs, expectations, and commitment towards quality are implicitly present in the research unit, but some effort is needed to make them more explicit and stable. Structural and managerial elements aimed at coordinating individual efforts and at enhancing quality are not yet fully laid down in defined processes and are not yet fully implemented. The awareness of the necessity for, and internal advantages of, such formal elements was not very high in the self-assessment report or in the interviews[4].

The Faculty organized a working group on quality issues two years ago, with extensive discussions on developing a common understanding in the Research Units and in the Faculty, but this process has not, so far, led to consolidated standards, criteria, and procedures.

The process of setting up new research programmes and strategic research planning has to date been closely linked to the recruitment of new staff, a process which has suffered considerable delays. This emphasis on recruitment is in itself understandable in the development phase of a new group; even so, the involvement of the CREFI-group in strategic decisions has not been high, due to the complexity of the decision-making processes at the level of the Faculty, the LSF, the LSF Foundation (with strong stakeholder influence), the Rectorate, and the Board of Governors.

The adjustments that the panel finds most urgent are related to the fact that the appointment of a new director of the LSF is expected in the coming months, and that the current director of CREFI has announced that he will leave the University. This means that a re-orientation of the research direction will have to take place, in relation to the profile of the new leadership. In the opinion of the panel, this period should be used to prepare the way for making a transition from the very informal situation which has existed during the building-up phase of the group to the next phase in its development, which will require more explicit and stable rules, standards, and procedures. Since the management processes of other groups in the Faculty will require the same type of structuring and codification, it seems logical that the Faculty should take the initiative.

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[4]As remarked in section 8, formalising rules and incentives for quality control is dependent on the University's Règlement d'Ordre Intérieur.

Appendix 1: Summary of main conclusions, Panel 5 European and Business Law

Quality assurance
The structural and managerial elements aimed at coordinating individual efforts and at enhancing quality are not yet fully laid down in defined processes, nor yet fully implemented. The awareness of the necessity for such formal elements is much higher than was initially apparent from the self-assessment report. Steps have been taken towards more formal monitoring and feedback procedures, including the provision of some administrative support and organisational structures.

Setting explicit standards
HRM-policy intentionally focused mainly on the group level, while criteria and feedback on the individual level were given low priority. In the period that lies ahead, this balance will have to change. The management has asserted its awareness of this necessity.

Research orientation
The panel regards the variety and focus of the research as appropriate in the present stage of development. In due time, further collaborations and interactions will provide a sharper focus.

Communication with stakeholders
The panel fully supports the approach of combining general background research with applied research, with the precise distribution depending on the particular topic and the stage of the research related to it.

Career development
The appointment policy with its stress on the prior academic achievement of candidates was an appropriate way of ensuring quality in the early stages of the program; but in the next phase, consideration must also be given to the nurturing and development of junior colleagues beginning their careers in the Faculty.

PhD-training
The PhD-training and supervision will have to be subjected to some degree of formalisation and standardisation. The fact that the PhD-students come from different countries, with quite varied career options, complicates this issue. The Faculty is aware of this, and ideas are being developed. Ultimately, this is a matter for the University of Luxembourg as a whole.

The panel would be in favour of developing a structured PhD-programme with advanced courses. The PhD-students must come in contact with methodological and theoretical challenges in the field, at a more advanced level than a summer course or a Master's programme can generally provide. Such courses could also be beneficial for staff members. In collaboration with other universities, external experts can be invited to teach such courses in Luxembourg.

VIII.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 6:
Educational Service

Introductory remarks

In the University of Luxembourg's Four-year Plan 2006-2009, seven main Priorities for Research and Innovation were established. One of these is 'Priority 6: Educational Science' (P6). The general objectives of this Research Priority are defined in the document "Building Excellence in Education" as follows:

- Redefining and understanding the concept and the nature of learning.
- Understanding and facing diversity in multilingual and multicultural contexts of learning.
- Increasing and managing knowledge building within school and work communities.
- Designing and understanding learning processes in the working life.
- Developing new forms of teachership: perspectives for a Luxembourg Centre of Education.
- Developing evaluation and assessment as a dynamic tool for improving the quality of learning.

The reseach of P6 is carried out within the Faculty of Language and Literature, Humanities, Arts and Education (FLSHASE). The research in the Faculty is organized into four research units:

- EMACS (Educational Measurement and Applied Cognitive Science): This unit works on bringing together elements to explain human cognition, notably by studying cognitive resolution strategies, but also by the development of more efficient, better performing, and more diversified evaluation tools for measuring human capital (Testing Assisté par Ordinateur (TAO) – Computer-based Testing).
- LCMI (Language, Culture, Media, Identity): this unit has its basis in multi- and pluri-lingual contexts, in particular, the analysis and development of practices and strategies in education and training, while at the same time promoting linguistic diversity.
- INSIDE (INtegrative research unit on Social and Individual DEvelopment) : this unit is essentially interested in the development of society, focusing on demographic evolution, inter-generational relations, youth policy, the process of social inclusion and exclusion, violent and aggressive behaviours, as well as early childhood development.
- IPSE (Identités, Politiques, Sociétés, Espaces) : the focus of the unit is the cultural future of society, including questions relating to the construction of identities, migration, and diversity. The unit is interested in the analysis of space and environment as well as Luxembourg studies, in particular its paradigmatic features.

P6 mainly involves the first two research units, but several researchers from the other two units are also involved (partially) in the programme.

The panel has very much valued its visit to the Faculty and its meetings with the people implementing the P6 research. The visit definitely helped the panel to understand the functioning of P6. It was very interesting to see how this young university successfully grows. Staff seems clearly to enjoy working at the University of Luxembourg, where research groups and teaching programmes are encouraged to develop, funds are easily accessible, and facilities are of high quality. On the other hand, there is clearly room for improvement. In particular, long-term vision and strategy need further discussion, and need to be translated into intermediate objectives and a balanced measurement system for research output. In general, the present implicit Quality Culture should be made more explicit and be further be developed.

In this report the findings of the panel relating to research and innovation within Priority 6 will be discussed in detail, following the outline of the Handbook for External Evaluation of the University of Luxembourg, starting with Input, Process, and Output, following with Quality Assurance, and an assessment of the current Quality Culture, and concluding the report with some suggestions for improvement.

INPUT

1. Clarity, realism and detail of the objectives in the Priority

The panel has discussed the objectives of P6 with the Director and academic staff of P6. The general objectives of the Priority are quite diverse and the panel is concerned that reaching excellence in all those fields is not feasible in the short or medium term. The panel thus appreciated learning during its visit that the need to focus efforts within the Research Priority is recognized among the staff. The decision to focus on pluri-lingual learning, in depth socio-cognitive studies, and applied research on learning assessment is supported by the panel. The context in Luxembourg offers interesting opportunities in these fields of research in addition to their being relevant internationally. The panel sees, nevertheless, a need for further discussion among the academic staff about these choices in order to come to a clear research agenda for the next 5 to 10 years at the P6 level. This agenda then needs to be further translated into specific objectives in order to arrive at a focused use of the available funds. The panel suggests it would be useful to discuss these issues, as well as common problems and challenges, in a structured way in an official body such as a Faculty Research Committee.

2. Appropriateness and flexibility of the operational budget

Budgets are comfortable and growing. The operational budget is definitely appropriate to creating a high-quality research environment. Within the Faculty, every research unit receives the budget it needs. Additional funds are obtainable within the University, based on research proposals. The calls for funding applications could, however, be communicated earlier, which could allow better planning within the research units. Quite a lot of centralized University regulations are in place, which sometimes leads to inflexibility in the use of available budgets.

3. Appropriateness of the research and support staff in quality and quantity

The quantity of staff is appropriate and the panel is convinced of the potential of the research staff. Greater flexibility in the execution of the four-year recruitment plans would, however, be helpful. The administrative and technical support staff was, at the time of the visit, quite limited. The panel appreciates that additional support staff are being hired. The support staff the panel spoke with are very motivated and willing to take up a variety of tasks, but their work load is becoming unsustainable.

It is comparatively easy to obtain additional funds for postdoctoral researchers and doctoral students, but there seem to be some problems related to the inflexibility of the hiring process of these personnel. This sometimes results in losing top-level candidates. The panel therefore suggests shortening the timescale needed to complete hiring procedures.

4. Appropriateness of the human resources management

Human resources management is mainly informal. No clear objectives on the individual or group level are yet defined. The panel suggests defining a balanced set of criteria for research output to better direct all the staff to these objectives. This should direct research efforts more towards peer-reviewed top level publications, which will contribute to the international recognition of P6.

PhD students like to work at the University of Luxembourg. They are mainly well-supported by their supervisors. Nevertheless, more structured guidance for PhD students, for example in the doctoral schools, would further strengthen the support system.

There are no tenure-track positions, and there is no clear career path within the University. The panel suggests establishing clear procedures for the promotion of assistant professors to the level of professor (expected time, required achievements in terms of research projects and outputs, teaching).

It is difficult to hire junior staff on a permanent basis with third-party funds. Staff retention and knowledge management is thus a serious issue. The panel suggests creating some permanent "middle layer" scientific staff positions. This seems necessary to keep specific expertise, in particular for applied research. The introduction of these career paths would need to be planned very carefully. One way of doing this would be to offer a continuing career for postdoctoral researchers.

5. Appropriateness of the material facilities

The panel is impressed by the quality of the material facilities which it has been able to visit. Several of the labs are equipped with state-of-the-art technology. The investment in research facilities is clearly in line with the above-formulated focuses in research. The fast growth of the research staff is, however, challenging. A new building had just come into use at the time of the visit, but available space is already becoming scarce again. This scarcity of office space reduces the incentive to attract additional research projects, as it is difficult to give new staff appropriate workspace.

The recent regrouping of the Faculty at the campus of Walferdange is seen, in general, as positive. It stimulates collaboration between the staff of the FLSHASE. Some challenges nevertheless remain. Difficult access to the library is one example, as part of the collection is still located at the Limpertsberg Campus and the promised shuttle service from other campus libraries isn't yet in place.

Plans are being made to move to a new campus in Esch-Belval, where all three Faculties could be housed on one campus. This new campus would provide plenty of space for the growing University of Luxembourg. The panel sees this new campus as a great opportunity, but is concerned about the space available until the new campus is ready. It is understood that the main focus for investment will be on this new campus, but the lack of office space could slow down the growth of the University of Luxembourg.

PROCESS

6. Variety and focus of the Research Programmes (areas of research, types of funding, establishment of partnerships, international and local)

As group research programmes are developed on the basis of staff strengths and interests, a great variety of research topics that are addressed fall within the broad field of educational science. Many requests are made by the Luxembourg government for a range of research in this field. The panel recognizes the value of this research and its contribution to Luxembourg society. Nevertheless, this project-driven, mainly applied research may become too dominant and dilute the focus of the research programmes. As said before, the panel is convinced that it is important to further coordinate and focus the work of research areas in order to develop research excellence. So far this responsiveness to project-driven requests has impeded the strategic development necessary to enable researchers to achieve the excellence of which they are no doubt capable.

The panel was also surprised to find out that the director of P6 neither has to check the proposed research projects funded within P6, nor is he involved in the selection or evaluation of the projects. Such a formal involvement in the selection of projects would give the director more tools to manage the research priority.
Most of the international staff who have been hired already had international collaborations before they came to the University of Luxembourg. Hence a good international network exists and there are clear efforts to maintain and expand this network.

7. Effectiveness of the research processes, relating the scientific production to the investments

The Priority, P6, has hired good people and clearly has the potential to become an internationally leading research group in 5 to 10 years. The frequent interdisciplinary collaboration and the multilingual nature of the University of Luxembourg will definitely contribute to this.

During this initial stage of development of P6 and the University as a whole, little in the way of formal procedures on research processes have been defined and research output is not yet monitored in detail. So it is difficult for the panel to measure the effectiveness of the research processes. Individual staff members and research units mainly decide themselves on their priorities, and no formal consultation among the staff is in place to discuss the objectives of the Research Priority and the implementation of these objectives in the separate research units. Now, however, a phase of consolidation is needed, where research processes are defined and formal consultation is implemented. Individual choices have led to good results, but in a situation where choices are not made in a deliberate process, implicit choices might have too much impact. To be able to use the available resources in an optimal way, this should be avoided.

There is also little formal coordination between the Research Units, P6, the Faculty, and the administrative level of the University. The organisational structures have been very loose and informal up to now. The panel sees a more formalized relationship between the organisational entities and a better coordination as an important challenge for P6 and the Faculty.

8. Flexibility of the procedures, enabling the Research Programmes and Departments to reach or remain at international level and adapt to new research challenges and areas (encouragement of initiatives, support of research)

Research is very much organized at the individual project level. A project leader is assigned among the scientific staff for each project. The project leaders have to manage the project, including e.g. recruitment, choice of material to be acquired, and budget provisions.
Research Units are internally quite diverse which can mean that projects are not managed consistently across research areas. It is important that the organizational structure is clarified and that more emphasis is put on strategic thinking to avoid research becoming too fragmented and missing opportunities for international impact. The panel is aware that efforts are made to ensure collaboration between Research Units to work on topics of common interest.

The management and staff of P6 indicated that the management of project budgets needs to be optimized. No clear full-cost models for the calculation of charges towards external partners are provided to the programme managers. Another important issue is that the administrative procedures for budget management are, on the one hand, quite time-consuming but, on the other hand, not detailed enough, e.g. they do not provide the project manager with an immediate and complete overview on the current financial situation of the project. This has led to a duplication of efforts as departments keep their own records of the project budgets. An online budgeting system enabling project managers to manage their budgets flexibly while being able to provide a complete financial overview at any time would mean a notable improvement in the working conditions of the project managers.

OUTPUT

9. Research achievement, scientific impact, and international recognition

As the Research Priority is still quite young and some of the staff were still being hired at the time of the assessment visit, it has been difficult for the panel to make a detailed analysis of the quality of the output of the research units involved in relation to the objectives of the Priority.

The measurement of output is currently limited to a list of international publications and to a not very detailed overview of obtained external research funds. Nevertheless, based on the available information, the panel is convinced that the chosen research topics are relevant and in line with international developments. The Professors are active in international organisations and scientific committees; it seems to the panel, however, that the existing research potential could be translated more into peer-reviewed publications, excellent software tools, and other research results. As indicated before, the panel strongly encourages P6 to develop a balanced measurement system for research output in order to direct the initiatives taken more towards international excellence.

Perhaps the introduction of such quantitative measures can be seen as threatening to individual researchers. In order to increase their acceptability, one could agree to
- only make aggregate information from P6 available outside P6.
- only make aggregate information from research units available outside the research units.
It is also very important in this context that contributions to teaching and management functions inside the university are taken into account to avoid unfair comparisons.

Nevertheless, one can expect that at some stage the University of Luxembourg will introduce such a measurement system for all Professors, though it is unlikely that a university-wide system will be capable of taking into account all the specific characteristics of the field of educational sciences. Therefore the panel would encourage the members of P6 to agree on an effective system for evaluation that is suitable for the area. In any case, it is very important that Educational Science is represented on the committees deciding on measurement criteria to ensure that appropriate criteria are selected for an applied science. Experience in other countries indicates that this is a crucial point for the development of excellence.

10. Relevance and impact

A large part of the research is done in collaboration with Luxembourgish actors, such as the Ministry of Education, and could clearly contribute to the debate on the educational system and practice in Luxembourg. This growing link between P6 and society is appreciated by the panel. Nevertheless, the panel warns against creating unrealistic expectations for the impact a research priority at the University of Luxembourg can have on the quality of the educational system. Excellent research can definitely contribute to the improvement of the quality of the Luxembourg school system, both own research of the University of Luxembourg and external research, but impact takes time.

Finally, although there is cross-fertilization between research and teaching (staff linking course content to research), it is not always clear to the panel how research choices are coordinated with choices about the education programmes at a Faculty level.

QUALITY ASSURANCE

11. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives of the priority (Monitoring of research processes and outputs, quality standards for research, ethical code)

As indicated before, an implicit Quality Culture is clearly present within Priority 6. Everyone is aware of the need to focus the research and to introduce specific and measurable objectives to be able to monitor its output. During the visit, the P6 director indicated some fields of research to focus on, and the investments made are in line with these options. Explicit quality assurance procedures need further development, however: internal structures for the coordination between researchers and research groups are still in a development phase. A clear vision of and strategy for the objectives of the next five to ten years are also being developed but need to be made explicit. Intermediate specific objectives also need to be developed. No explicit output monitoring of research quantity and quality is yet in place.

12. Commitment of the University community and stakeholders of the research departments to quality assurance

As indicated before, an implicit Quality Culture is clearly present within Priority 6 and individual staff members all strive for quality. But processes still need to be defined and formalized in this fast-growing University.

In relation to stakeholder participation at the University level, the panel suggests organising the involvement of society and industry in a more formalised way. An advisory board could, for example, be established, where the research themes within the Priority could be discussed. In this regard, it would also be important to find a number of strategic international partners from academia, social institutions, and industry to help refine and implement the chosen research lines.

13. Effectiveness of feedback in influencing positively the research programmes and departments

As a result of the feedback on the research programmes received informally, improvement measures are often taken.

GENERAL OPINION ABOUT THE RESEARCH PRIORITY IN RELATION TO THE CONCEPT OF QUALITY CULTURE

The panel is asked to indicate its general opinion about the research and innovation in Priority 6, in relation to the concept of Quality Culture. In the handbook provided to the panel members 'Quality Culture' is defined as follows *'Quality Culture refers to an organizational culture that intends to enhance quality permanently and is characterised by two distinct elements: on the one hand, a cultural / psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural / managerial element with defined processes that enhance quality and aim at coordinating individual efforts.'*

The panel notes that staff are committed to the quality of their research. A vision on how to progress with P6 is being developed and everyone is aware of the need to focus the research to optimally use the available resources. The challenge for P6 is to transform this general awareness into clear objectives, procedures, and practices of individual researchers and research units focused on quality.

The panel considers it useful to discuss these issues, as well as common problems and challenges, in an official body at the Faculty level. In order to involve staff in discussions on these issues, it would also be useful to benchmark their own practices to other similar research groups and to involve external

stakeholders more in the quality assurance processes so that they might contribute to the further improvement of the quality of research and innovation within P6 where appropriate.

The combination of the current stage of development of a vision for P6 and the implicit quality culture has given the panel confidence in the capacity of the staff to develop and manage the quality of research, which clearly leads to a grade A *('The unit has a reasonable Quality Culture. The Committee has confidence in its capacity to develop and manage its present and future quality.')*.

Appendix 1: Suggestions for improvement

With regard to quality improvement, the panel suggests:

- Proceeding with the process of focusing the efforts within the Research Priority.
- Further discussion among the academic staff on the options, to determine a clear research agenda for P6 for the next 5 to 10 years.
- Translating this agenda into specific objectives to come to a focused use of the available funds.
- Improving access to the library.
- Ensuring the provision of enough office space to keep pace with the growth of the University
- Communicating calls for research proposals within the University with a longer time frame.
- Creating greater flexibility in the execution of the four-year recruitment plans.
- Shortening the time span needed to complete hiring procedures.
- Defining a balanced set of criteria for research output to better direct all the staff to the programme objectives.
- Establishing more structured guidance for PhD students.
- Establishing clear procedures for the promotion of assistant professors to the level of professor (expected time, required achievements in terms of output and research projects, teaching).
- Creating some permanent "middle layer" scientific staff positions.
- Defining research processes and implementing formal consultation between staff members.
- Defining a more formalized relationship between the organisational entities and better coordination between P6 and the Faculty.
- Involving the Director of P6 in the selection and evaluation of projects.
- Possibly revising the composition of the research units to ensure consistency in project management.
- Optimizing the management of project budgets (including implementing full cost models for the calculation of charges to external partners)
- Improving the budgeting system by enabling project managers to manage their budgets flexibly while being able to provide a complete financial overview at any time.
- Ensuring that the expectations of society concerning the impact a Research Priority at the University of Luxembourg can have on the quality of the educational system are realistic.
- Designing and implementing explicit quality assurance procedures.
- Organizing the involvement of society and possibly industry in a more formalised way.
- Looking for a number of strategic international partners from academia, social institutions, and industry to help refining and implementing the chosen research lines.
- Benchmarking own practices to similar research groups.

IX.
RESEARCH AND INNOVATION UNIT REPORT

For Priority 7:
Luxembourg Studies
Research and Innovation

This report presents the findings of the assessment panel with respect to the evaluation of the Research Priority: 'Luxembourg Studies' or P7. The report is structured according to the grid for evaluation of research priorities outlined in the "Handbook for External Evaluation of the University of Luxembourg". The report outlines a short factual description, describes the assessment panel's findings, its opinions and conclusions as well as its suggestions and recommendations for further improvement with respect to the following aspects: 'Input', 'Process', 'Output' and 'Quality Assurance'. The assessment panel then expresses its opinion about the 'Quality Culture', apparent from the data, the interviews, and its investigation of the Research Priority, within the restrictions of its assignment. The major recommendations for further improvement proposed by the assessment panel and discussed with the research staff of the Research Priority are listed at the end. The list of recommendations comprises the suggestions for improvement which the assessment panel considers the most important conclusions of its assignment. These recommendations have been discussed with the staff and the Director of the Research Priority. Furthermore, the list may assist the assessment committee in keeping an overview of the various elements, while composing the overall report.

Introduction

Research Priority P7 'Luxembourg Studies' (shortened to P7) is part of the Research Unit UR IPSE '*Unité de Recherche: Identités. Politiques, Sociétés, Espaces*' (shortened to IPSE) which is one of the 4 research units within the '*Faculté des Lettres, des Sciences Humaines, des Arts et des Sciences de l' Education*' (shortened to 'the Faculty' in this report) of the University of Luxembourg. IPSE gathers all researchers within the Faculty active in at least one of the nine associated disciplines : '*Histoires des idées*', '*Histoire et mémoire*', '*Géographie et aménagement du territoire*', '*Linguistique et littérature françaises*', '*Linguistique et littérature allemandes*', '*Linguistique et littératures luxembourgeoises*', '*Sciences politiques*', '*Arts visuels*' et '*gender studies*'. P7 also comprises these 9 disciplines, with the exception of '*Histoires des idées*'. In addition, two researchers in musicology are associated with the research laboratory of History, not currently having their own research laboratory within P7.

IPSE has a trans-disciplinary perspective with a focus on Luxembourg and Europe. IPSE is directed by professor dr. Christian Schulz and has as a governance structure the '*Conseil Administratif et Scientifique*' (shortened to CAS). The 9 disciplines and the 2 Research Priorities of the Faculty are represented in CAS. With respect to P7, CAS functions as an advisory board, in which the researchers and staff are represented.

P7 – directed by professor dr. Michel Pauly – is not strictly a formally established unit, nor does it have a proper structure; it is rather to be thought of as a transversal approach towards research performed within IPSE. It exists as a result of the prioritisation of the research area by the Rector's 4-year strategic plan and, at the national level, by the '*Fonds National de la Recherche Luxembourg*' (shortened to FNR). All researchers associated with P7 also belong to IPSE. The research projects have in common an explicit focus on Luxembourg: its tradition, its history, its culture, its society, or its social construct and legacy. The research performed in P7 comprises :

some truly multi- and interdisciplinary projects such as IDENT '*Identités socio-culturelles et politiques identitaires au Luxembourg*' and Lux-ATLAS '*Atlas digital multidisciplinaire, interactif et dynamique du Luxembourg et de la Grande Région*'.

many interdisciplinary projects (incorporating at least 2 different disciplines within P7) as well as few projects that merely have a focus on Luxembourg.

P7 and IPSE have been established relatively recently as entities within the Faculty. The Faculty, however, has grown from three former entities, one being the '*Humanities and Literature Department*' of the former 'Centre Universitaire' in Luxembourg.

Most of P7 as well as parts of the Faculty moved to the campus at Walferdange in February 2008, which means that the new premises had only been in use for about two months at the time of the site visit by the assessment panel to P7.

As part of the first external evaluation of the University of Luxembourg, Research Priority P7: Luxembourg Studies was the subject of a peer review. To this end, a self-evaluation report for P7 was composed by its staff and director. Prior to the site visit, some additional information was requested by the assessment panel and delivered to them. The panel visited P7 from the 7th to the 8th of May 2008, *(see visit schedule in appendix 2)*. During the site visit, the assessment panel discussed the policy and functioning of Research Priority P7 with the Dean of the Faculty, with the directors of IPSE and P7, and with groups of employees and researchers of P7. The assessment panel also met Ph.D. students and a delegation of external stakeholders, as well as the researchers, teaching staff, assistants, and administrative and support staff associated with P7. Finally, a visit to the infrastructure and the library was organised at the campus of Walferdange, and a counselling hour was scheduled to give all stakeholders the opportunity to talk to the assessment panel in private. At the end of its visit, the assessment panel discussed and explained its findings with the director and the researchers of P7.

INPUT

1. Clarity, realism and detail of the objectives in the Priority

With respect to the objectives of the Research Priority, there are clearly two distinct views. On the one hand, in 2004 a programme and an organisational chart for a '*Centre for Interdisciplinary Research on Luxembourg*' were composed, in conformity with Article 16 of the University Law, (aspiring to establish a permanent structure), and in agreement with the request from the Government of Luxembourg to establish such an institute. On the other hand, in his 4-year strategic plan (issued in 2006), the Rector of the University of Luxembourg positioned Luxembourg Studies as a Priority Research strand of the University, essentially focusing on the study of the Luxembourgish language.

The assessment panel discussed the objectives for P7 with all parties involved during the site visit and is of the opinion that P7 currently has a very open structure with respect to Luxembourgish issues, and found additionally that the common vision of the researchers within P7 has an even wider scope, compared to the 8 currently associated research disciplines. Fo instance, sections of 'Law and Financing', 'Psychology' and 'Architecture' could also be included in Luxembourg Studies. The assessment panel finds that up till now, P7 has had a rather organic growth. This is due in large part to the success of Luxembourgish-relevant human science projects, but the current lack of formal authority delegated to the function of the director has prevented the proper steering of P7 towards one focal point: i.e. the Luxembourgish language. Apart from that, however, it is questionable and highly doubtful whether such an exclusive focus on the language would be beneficial for the diversity of research strands currently operational within P7. In addition, the assessment panel has seen some very promising first results of the multi- and trans-disciplinary research projects in P7 (i.e. IDENT and Lux-ATLAS), which – in the view of the assessment panel – demonstrate the high quality of the trans-disciplinary research performed within P7. The project Lux-ATLAS has, furthermore, been guaranteed a lasting commitment from the University of Luxembourg, with respect to continuous funding, once the FNR no longer supports this project financially. Taking these elements into account, the assessment panel finds that the research in P7 is more closely related to the vision of its researchers and director and very much in agreement with the governmental statement, compared to the position described in the Rector's 4-year strategic plan. The assessment panel suggests that P7 continues along this path and abandons the rather exclusive focus on the 'Luxembourgis language' as an objective. That being said, it goes without saying that research on Luxembourgish language should play a central role within P7, as it does.

With respect to further improvements, the assessment panel suggests that time should be invested in bringing focus to the diversity of research projects (in which, up till now, the director or management for P7 has had no say during the selection procedure) and that CAS, for instance, be used as a discussion board in this respect, to better associate the projects with the current 8 research disciplines of IPSE.

2. Appropriateness and flexibility of the operational budget

Currently, the funding of the individual projects has to follow very rigid rules; only research staff can be hired to work on a particular project and funding can by no means be spent on support or administrative staff. In addition, there is also very little money generally available for th research labs if not directly linked with a specific project. The assessment panel was informed that there is an accounting office at the central level of the University, not at the Faculty level. All demands and requests must therefore be processed by that office, which results in a considerable amount of time spent or even lost in communication between the projects and the central accounting office.

The assessment panel is of the opinion that time and efforts could be saved by establishing an accounting office at the faculty level and, in addition, that some 'economies of scale' could be   obtained from addressing certain aspects commonly. The assessment panel advises P7 to look into this matter. The assessment panel is, however, unable to form an opinion about the appropriateness of the operational budget, as there was no aggregated budget which the assessment panel could look at.

3. Appropriateness of the research and support staff in quality and quantity

There are a good number of research staff associated with P7, with a good age distribution, which is a favourable situation for flourishing research. Nevertheless, the assessment panel remarks that some human resource aspects require attention: e.g. the numerical shortage of mid-career researchers, and the regulations that prevent Ph.D. students from also acting as research assistants.

Currently there is only one administrative staff member, who has to cope with all practical and organisational issues (e.g. organising conferences, booking tickets, guiding students working for the projects, preparing the accounts to be sent to the university level accounting office, acting as webmaster, etc.), for 95 researchers. This is – in the view of the assessment panel – a very significant problem which ought to be resolved without any delay, before the harm done to P7 becomes irreversible.

4. Appropriateness of the human resources management

Currently, there is also no formal professional management authority attributed to the function of the director of P7, nor is there a management entity (which could function under its director). The assessment panel is of the opinion that this is absolutely necessary to put in place in order to manage, guide, and steer a Research Priority.

Considered from the perspective of P7, the human resource management policy, positioned at the university level, is not very well suited for the research performed at P7. The assessment panel understood from the interviews that non-tenured researchers can only be contracted twice for a period of two plus one year or one plus two years. This means that one needs at least two researchers (the second employee will lose time in coming to terms with the project) for projects lasting longer than three years (or renewable research contracts). The main problem seems to be the frequent changing of rules and a lack of transparency in their application by the Human resources office. The assessment panel is not convinced that the current mechanism is supportive for good research.

5. Appropriateness of the material facilities

The new building on the Walferdange campus, in use since February 2008, is impressive; but it is obvious from a visit to the research laboratories and to the office spaces that in the very near future, the accommodation will prove insufficient for all the researchers who will be associated with P7.

The assessment panel visited the library in building X and was concerned to find nothing but empty bookshelves. The faculty described the problems and informed the assessment panel that the books would only be moved to Walferdange once all of them had been catalogued but, additionally, the assessment panel

understood that there would be too little space at the library in building X and that there is strong resistance against moving the library at all to the new premises at Walferdange, although this was discussed and agreed beforehand. The assessment panel judges the library facilities clearly inadequate, problematic, and, in the long run, endangering the proper functioning of not only P7 but also the Faculty. The assessment panel is very concerned about this issue, moreover, because a good and well-equipped library, accessible and conveniently located near the researchers and Ph.D. students, is an absolute prerequisite for a good Quality Culture. The assessment panel therefore judges that this problem needs to be resolved without any further delay.

PROCESS

6. Variety and focus of the research programmes (areas of research, types of funding, establishment of partnerships, international and local)

There is a good coverage of the broad focus of P7, which is apparent from the inter- and multi-disciplinary research projects, and from the diversity of focal points in the numerous projects of P7 listed in the self-evaluation report and discussed during the interviews.

There is also a good variety of different mechanisms of funding:

- 'Luxembourg Studies' is one of the priorities for funding by the FNR (in accordance with the Foresight programme of the FNR). Some projects (e.g. Lux-ATLAS) are funded, with the guarantee that the University of Luxembourg commits itself to further funding the project after the FNR funding has expired.
- a second source of funding is through European Projects (e.g. 7th Framework Programme), cooperation, and partnerships with other universities.
- while a third approach is through three-year grants from the FNR to support Ph.D.'s on Luxembourg-related topics.

The assessment panel learnt that the research staff of P7 has various contacts with other (inter)-national projects and collaborates on numerous occasions with other universities (e.g. joint Ph.D. programmes). Many members of the research staff also teach at other universities (e.g. Universität Trier in Germany).

7. Effectiveness of the research processes, relating the scientific production to the investments

The assessment panel is of the opinion that, despite the short history of P7 within the University of Luxembourg, and perhaps partly due to its former history within the Centre Universitaire, the number of publications of individual researchers and the output of the various research projects is quite adequate (this includes the numerous contributions at international conferences, locally organised conferences by P7, papers presented, books, book chapters, articles in periodicals, etc). The assessment panel remarks that its opinion ought to be interpreted within the limits of its assignment, however, indicating that the assessment panel has not performed an in-depth analysis of the research itself. The assessment panel describes the Faculty as very research productive.

At the moment, it is still too early to have insight into the failure rate of the projects as this will only become apparent after some years of functioning of the Research Priority. At the time of the visit to P7 there were no indications whatsoever of projects failing.

All these issues contribute to a solid awareness of the research staff of (inter)-national developments and current evolutions in their disciplines, which – in the view of the assessment panel – contributes to the Quality Culture.

8. Flexibility of the procedures, enabling the research programmes and departments to reach or remain at international level and to adapt to new research challenges or areas (encouragement of initiatives, support of research)

There is ample flexibility in the mostly informal procedures with respect to the international standards of the research performed under the umbrella of P7. The numerous good quality contacts of the research staff with (foreign) colleagues and research institutions safeguards the high standard of the research programmes. On the downside, the management of P7 has no voice in the approval procedure of the research project proposals prior to these being either accepted or rejected at the university management level, a situation which – in the view of the panel – is a point of concern.

OUTPUT

9. Achievements of the research departments in relation to the objectives formulated for the Priority

As P7 has been operational within the University of Luxembourg for just a few years, there are as yet no final results, but there are some strong indications of flourishing projects and results.

The trans-disciplinary project Lux-ATLAS aims at developing a digital multi-disciplinary, interactive and dynamic atlas of Luxembourg and the Greater Region. The atlas will gather maps, analyse and visualise data from social, human, and natural sciences. The implementation of the atlas (allowing access to the underlying up to date datasets), requires development of new   data-displaying tools. The assessment panel is of the opinion that the Lux-ATLAS project is a promising example of a multi-disciplinary approach to making a great deal of relevant information about the Greater Region accessible for research and other purposes. The project IDENT (*'Identités socio-culturelles et politiques identitaires au Luxembourg'*) aims to explore specific facets of 'Luxembourgish identities' from a trans-disciplinary and a trans-national perspective: individual and collective identity patterns are considered constitutive elements of communities and contribute substantially to social cohesion. The assessment panel saw a demonstration of the project during the site visit and describes IDENT as an example of 'good practice', because of its trans-disciplinary approach, which combines the knowledge of almost all the different disciplines contributing to the very valuable output of the project.

In addition, the descriptions of the numerous other projects that are situated within the research disciplines of P7 (in most cases having a multi- or inter-disciplinary approach) look very promising as well.

10. International recognition

The assessment panel only has secondary information regarding the international recognition of the research performed in P7, but it is evident from the contributions of the researchers international congresses (e.g. as invited guest speakers) and the scope of conferences organised by P7 and IPSE themselves, that the staff is known in the international arena. Additionally, Lux-ATLAS realizes an international cooperation between France, Belgium, Germany and Luxembourg; it is thus clear to the assessment panel that the project has gained international recognition. Finally, many of the researchers are associated with other universities and with other research programmes as well. Consequently, there are quite a few strong signs of real international collaboration.

11. Scientific impact

The scientific impact of the research performed in P7 is – in the view of the assessment panel – not to be measured by the number of patents that result from the projects (although projects such as Lux-ATLAS might produce such an output), but should be measured by the improvement of understanding in society. The assessment panel is of the opinion that the research performed in P7 clearly has an impact on society, as became evident from not only the assessment panel's interview with the external stakeholders, but is

also very clear from the numerous books and articles published, which contribute to a better understanding of the identity of Luxembourgish society. In this light, 'Luxembourg studies' can be considered as an 'Area study' or as 'Cross-border studies' (e.g. the study for instance of the movement of people across the borders is an important parameter in understanding the economic development of a country).

12. Relevance of the research choices in relation to the developments in the international scientific community and developments in society and economy

The impact on Luxembourg's economy and society is achieved in an indirect manner, and is to be seen as the results of the research which contribute to a better understanding of Luxembourgish society. In addition, there are good examples of cooperation between P7 and, for instance, the National Library, the National Archives, the 'Centre de Documentation sur les Migrations Humaines', etc. The external stakeholders with whom the assessment panel spoke during the site visit represent fairly well the diverse fields in which P7 significantly contributes to a deeper understanding of Luxembourgish society (e.g. the research undertaken for exhibitions on documents contained in the National Archives).

13. Innovative power, both innovations realized and innovative potential

The approaches towards research, including inter-, multi- and, for some projects, trans-disciplinary methods, are innovative. Some of the research projects (e.g. Lux-ATLAS and IDENT) in P7 truly contribute to a better understanding of how trans-disciplinary research in the field of the human sciences can be achieved. The assessment panel describes the IDENT project as 'good practice' with respect to innovations in services. Moreover, the objectives for the research performed in P7 (i.e. the particular focus on the Luxembourgish context) and the shared vision between P7's director and staff are innovative. In particular, this may be the first time higher education research explores the nature of the mother tongue with such a multi- or trans-disciplinary approach. The assessment panel is of the opinion that the introduction of a course teaching the Luxembourgish language as a foreign language is a good initiative.

Impact on Luxembourg economy and society

See section 12.

14. Impact on teaching and learning

At the time of the site visit, the 'Master of Luxembourg Studies' mentioned in the 4-year strategic plan of the Rector of the University of Luxembourg had not yet been organised, and, consequently, there was at that time no direct influence of the research performed in P7 on a Master's programme. Nevertheless, many of the researchers in P7 were associated with the teacher training programme for Luxembourg language teachers. There is also a strong impact of Luxembourg studies on the Master's programmes in Contemporary European History, Spatial Development and Analysis, and Communication et Coopération Transfrontalières, as well as on the Formation Continue en Aménagement du Territoire which is dealing only with Luxembourg matters.

QUALITY ASSURANCE

16. Effectiveness of quality assurance in the enhancement of quality as defined in the objectives of the Priority (Monitoring of research processes and outputs, quality standards for research, ethical code)

Clearly established quality assurance issues are not, as such, defined in the objectives for P7, but these are apparent from the self-evaluation report and from the additional information requested by the assessment panel. The assessment panel concluded from its site visit and from the interviews with all parties involved that, for the moment at least, P7 has a significant number of elements in place which contribute to an informal quality assurance system.

Examples of such elements are:

- the internal peer review of papers and presentations before these are presented at conferences or handed in to publishers.
- the clear vision of the director of P7, shared among the researchers, that has been the starting point for the development of P7.
- the list of evaluation criteria for the functioning of P7, composed by its director at the request of the Rector of the University of Luxembourg, demonstrating the P7's awareness with respect to criteria for evaluating the quantity and/or quality of the research output.
- the establishment and functioning of CAS as an advisory board for P7, on which representatives of the assistants and researchers sit; this is – in the view of the assessment panel – a good initiative, and as far as the assessment panel knows, unique for the research units in the Faculty.

Very strong indications of the informal quality assurance system of P7 are:

- the strong dedication and high commitment of the staff.
- the good cooperation of the staff (research and support staff) in P7, resulting in a favourable group dynamic.
- the 'ethical code' operational at the university level.

Nevertheless, there is currently – in the view of the assessment panel – little evidence of a structured or formal approach towards the functioning of P7. For instance :

- there are no criteria for evaluating which projects are in agreement with the objectives of P7, though the assessment panel is not convinced that this is a serious problem given the broad focus within P7. Some projects have a rather loose connection to 'Luxembourg studies', although all projects link to this overarching research theme (which can be interpreted in a multitude of ways).
- there is no formal management authority or management structure associated with the function of the director of P7.

The assessment panel is convinced though that P7 definitely needs criteria for establishing a proper quality assurance system.
These should include:

- formal management structures for P7 (and CAS) should be established, and defined as such.
- formal representation of students (Master and Ph.D. students) and alumni in the decision making bodies of P7.
- a delegation of representatives of the external stakeholders in the steering or management bodies for P7 as well.
- examples of 'best practice', both at the research and the managerial levels; these ought to be implemented without any delay.
- a solution to the library issue, which is such an important aspect of a quality culture, and needs to be solved immediately. The library has to be relocated and installed at Walferdange without any further delay. The assessment panel emphasises that the malfunctioning of the library has a strong negative, external influence on the Faculty.

In addition, there is a strong need for an effective decision-making structure to prepare and monitor bids to the European Union research programmes either at the Faculty or at the University level.

Furthermore, the assessment panel recognises that P7 suffers from complicated, sometime ineffective or even nonexistent communication with the upper hierarchical levels of the University (e.g. there is no debate about newly-proposed projects and how these fit into the research objectives of P7, there is no communication with respect to the managerial authority or the function of the director for P7, etc.) It goes without saying that this is a serious issue which has a negative effect on the quality assurance of the University as a whole.

The assessment panel strongly suggests that P7, its researchers and its director, define quality criteria for research and research management, design a strategic plan and an action plan for P7, make an annual evaluation of its functioning as a Research Priority, its achievements and its challenges, and report this to the Rector of the University of Luxembourg. The assessment panel strongly advises P7 to conduct frequent analysis (SWOT or PDCA-cycle analysis) of its functioning and to set up a proper formal quality assurance system for P7. This formal quality assurance system is to be used as a tool to support P7, and to help prove the value of its research to the upper hierarchical levels of the University (i.e. the Faculty and University level), and to consolidate the link between teaching and learning. There is surely no need to implement a formal quality assurance structure in a bureaucratic manner. The assessment panel further advises P7 to establish a proper committee (or to use CAS) to discuss and debate the quality of the research done in P7.

The assessment panel advises P7 to develop a more proactive approach with respect to proving the effect and value of its research to the management of the University of Luxembourg, and to provide, for instance, an annual report of its functioning to the Rector. This could contribute significant evidence of the multi- and inter-disciplinary quality of the research in P7 and its contribution to the understanding and the development of Luxembourgish society as well.

17. Commitment of the University community and the stakeholders of the research departments to quality assurance

Though the University community and the stakeholders of P7 are surely committed to quality assurance, most actions take place in an informal manner and the assessment panel perceives that there is a strong need to formalize the quality assurance structures.

18. Effectiveness of feedback in influencing positively the research programmes and departments

As indicated in sections 16 and 17, a clear implicit Quality Culture is present and numerous initiatives have been taken to safeguard and improve the quality of the research performed at P7.

GENERAL OPINION ABOUT THE RESEARCH PRIORITY IN RELATION TO THE CONCEPT OF QUALITY CULTURE

The assessment panel has been asked to indicate its general opinion about Research Priority P7: Luxembourg Studies, in relation to the concept of Quality Culture. In the *'Handbook for External evaluation of the University of Luxembourg'* the concept 'Quality Culture' is defined: *'Quality Culture refers to an organizational culture that intends to enhance quality permanently and is characterized by two distinct elements: on the one hand, a cultural/psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural/managerial element with defined processes that enhance quality and aim at coordinating individual efforts.'*

The assessment panel repeats that P7 only has a short history within the University of Luxembourg; nevertheless, the assessment panel is convinced that P7 has already achieved a lot in terms of elements of an effective quality culture. In the view of the assessment panel, Research Priority P7 has established a significant series of informal elements demonstrating its awareness of the quality of its functioning: e.g. its vision and concept for the functioning of P7 in the future, a strong willingness to discuss and debate among its researchers the mission and the road ahead, the strong engagement of the staff, good cooperation and a prominent absence of tensions between the researchers, the favourable group culture that has been nurtured from the beginning of P7's operation, and the strong cooperation of researchers from various disciplines in the trans-disciplinary and multi-disciplinary research projects: IDENT, Lux-ATLAS, etc.

The assessment panel is convinced that P7 and its leaders have done what is within their power to establish a research unit within the given constraints (e.g. difficult communication with university-level authori-

ties, lack of substantial administrative support, lack of formal authority delegated to the director of P7, the library problem, etc.). P7 has established a system of peer review of presentations, articles, and books prior to being presented at international conferences or being edited for publication (e.g. through the guidance of Ph.D. students in the doctoral schools). Additionally, CAS is a body in which the functioning of P7 and its projects are discussed, and IPSE functions as the overarching research unit organisation in which all researchers contributing to the research in P7 are gathered to discuss the plans for the projects and the future. These aspects contribute to an implicit Quality Culture, testifying to the attention paid within P7 to quality assurance issues in respect to its research and its research management. Moreover, it is clear to the assessment panel that P7 has a clear mission : a plan for the functioning of P7 in the future, developed by its director and shared by the researchers associated with it.

On the downside, some issues with respect to a true Quality Culture are still unresolved: e.g. the shortage of administrative and support staff (1 person for 95 researchers) is totally inadequate, and the library issue, which is a negative element that affects the daily work of the researchers. The assessment panel stresses the seriousness of the situation with respect to good research and to the further functioning of the research unit at an international level. Also, the lack of adequate decision-making mechanisms (the function of the director of P7 is not linked to executive management authority) as well as the difficulties in communicating to the university level administration, together with the lack of discussion or debate about newly proposed projects and how these projects align with the philosophy of P7 (cf. its organic growth) are serious constraints on an effective Quality Culture.

In addition, at the university management level, formal as well as informal elements of an effective Quality Culture are clearly missing from the perspective of P7, as there are no standards imposed for measuring the research output of the research units: no requests for systematic reporting of aims, vision, future plans or achievements of the research unit. The assessment panel strongly suggests that P7 should be more proactive in this respect and prove to the university level authorities that they produce good quality research output.

Conclusion

The assessment panel was impressed with the efforts of the P7 staff to create a local Quality Culture and to compensate for the absence of quality enhancement procedures at the university level. It strongly advises P7 and its researchers to consolidate and formalise their informal quality assurance structures, discuss these internally, and establish formal quality assurance structures, including writing a strategic plan for P7, and consequently an action plan. In addition the assessment panel strongly suggests that P7 be more proactive with respect to proving the quality of P7 as a Research Unit and as a Research Priority.

Summary

P7 is – in the view of the assessment panel – on the edge of establishing a formal Quality Culture, as the Research Priority is both able and willing to consolidate the elements of its informal Quality Culture already established. The assessment panel is convinced, furthermore, not only that P7 can benefit from a more proactive approach to proving the value and marketability of their good quality research output but that P7 has a bright future ahead.

Suggestions for improvement

Input

- *consolidate the objectives for P7 in conformity with the path chosen, abandoning the focus on Luxembourgish language as an exclusive focal point;*
- *narrow down the wide focus on Luxembourg related multi- and inter-disciplinary research;*
- *investigate the opportunity of establishing an accounting office for IPSE or for the Faculty, in order to better manage and keep an overview on the budgets spent and to save time in communications between the individual projects and the accounting office at the central university level and possibly achieve 'economies of scale';*
- *timely solve the problem of too little office spaces and laboratory spaces for P7;*
- *promptly solve the scarcity of support and administrative staff for P7 and IPSE;*
- *discuss proper management and budgetary authorities to be associated with the function of the director and the establishment of a management unit of the research priority with the university management;*
- *address the human resource management for the researchers contracted for the projects;*
- *resolve other human resource difficulties that require attention, e.g. the numerical shortage of mid-career researchers, the regulation that prevents Ph.D. students from also acting as research assistants;*
- *find mechanisms and support for the library problem and have it solved without any delay or further excuse;*

Process

- *find ways to discuss the human resource management within the funding of the projects;*
- *seek ways of improving communication with senior university management, in order to ensure adequate consultation in the elaboration of strategic plans and the identification of new project opportunities;*
- *consolidate the federative structure built around IDENT and Lux-ATLAS, with more formal decision-making procedures, a clearer definition of internal boundaries and inter-disciplinary dimensions, a long-term strategic plan with short-term action plan;*
- *seek to develop professional project management infrastructure for handling external funding opportunities – bidding, monitoring, reporting, archiving, etc.;*
- *improve the administrative support for P7;*

Output

- *produce annual reports of the actions and accomplishments of the research priority P7 and be more proactive in communicating these to the university management level;*
- *maintain the existing high standard of external visibility;*

Quality assurance

- *involve students and alumni in the decision making bodies of P7;*
- *involve representatives of the external stakeholders in the management bodies for P7, for instance in CAS (for instance in its annual meeting);*
- *define quality criteria for the research and the management of the research;*
- *design a strategic plan and an action plan for P7;*
- *set up a functional (non-bureaucratic) formal quality assurance system for P7;*
- *use CAS or establish another organ to discuss and debate the issues of quality culture with all stakeholders (students, researchers, external stakeholders) of P7;*
- *consolidate the link between teaching and learning;*
- *develop a more proactive approach to proving the effect and the value of the research performed in P7 to the management of the University of Luxembourg;*
- *produce an annual report of the functioning and quality of P7;*

X.
SITE VISITS

The site visits of the nine Panels for the Priorities and the Faculties took place between April 21th and May 6th 2008

The site visit for the Organisation and Management of the University took place September 10th to the 12th 2008 and was followed by another visit October 29th to 30th.

Below is a prototype of a typical site visit

Prototypical schedule of meetings for an in-situ review visit

DAY X-1

12h - 13h30	lunch together with representatives of the University
13h30 -15h	preparatory meeting of the panel
15h -16h	meeting with the responsibles of the unit
16h- 16h30	meeting with the authors of the self-assessment report
16h30 - 18h30	visit of facilities (e.g. classrooms, laboratories, library) time to study available documents
19h	diner of the panel

DAY X

9h00-9h45	meeting with the management of study programme 1 (programme directors)
9h45 - 10h45	meeting with students of study programme 1
10h45-11h	break
11h- 12h	meeting with the teaching staff of study programme 1
12h-12h30	preliminary concluding meeting of panel
12h30-13h30	lunch
13h30-14h15	meeting with the management of study programme 2 (programme directors)
14h15 - 15h15	meeting with students of study programme 2
15h15-15h30	break
15h30-16h30	meeting with the teaching staff of study programme 2
16h30-17h	preliminary concluding meeting of panel
17h - 18h	Meeting with external stakeholders
18h - 19h	meeting with alumni *when applicable*
19h30	diner of the panel

DAY X+1

9h00-9h45	meeting with the management of study programme 3 (programme directors)
9h45 - 10h45	meeting with students of study programme 3
10h45-11h	break
11h- 12h	meeting with the teaching staff of study programme 3
12h-12h30	preliminary concluding meeting of panel
12h30-13h30	lunch
13h30- 14h	meeting with educational support staff of the faculty *when applicable*
14h-15h	possibility for members of academic community involved in the unit to be heard in a private meeting with the panel
15h-16h	second meeting with the management of the study programmes
16h - 16h30	meeting with the responsibles of the unit
16h30- 18h30	concluding meeting of the panel

XI.
LIST OF PANEL MEMBERS AND SECRETARIES

Faculty of Language and Litterature, Humanities, Arts and Education

Chair:
Tove Bull
Professor,
Former Rector of the University of Tromsö
Norway

Experts:
Dirk Van Damme

Head of the Centre for Educational Research and Innovation, OECD, Paris.
Former head of Cabinet of Flemish minister of Education, Belgium

Anne Edwards,
Professor of Educational Studies,
University of Oxford
UK

Gudmundur Hálfdanarson
Professor of History,
University of Iceland
Iceland

Herni Rasque, student,
Association des Cercles d'Etudiants
Luxembourgois

Academic Secretary:
Pieter-Jan Van De Velde
Staff member Quality Assurance,
VLIR,
Belgium

Faculty of Law, Economics and Finance

Chair:
Norman Sharp
Director,
Quality Assurance Agency for Higher Education,
Scotland

Experts:
Harald Dolles,
Professor,
Heilbronn Business School,
Germany

Jean-Bernard Chatelain,
Professor,
Europlace Institut of Finance,
l'Université Paris X, Nanterre
France

Hector McQueen,
Professor,
School of Law,
University of Edinburgh
Scotland

Roland Bieber,
Professor,
University of Lausanne,
Switzerland

Christophe Dopoortère,
student,
 PhD researcher, Université Paris 1,
France

Academic Secretary:
Steven Van Luchene
Staff member Quality Assurance,
VLIR,
Belgium

Faculty of Sciences, Technologie and Communication

Chair:
Jean-Marie Hombert,
Professor,
University Lyon 2
France

Experts:
Claude Remacle,
Professor,
Université Catholique de Louvain
Institut des Sciences de la Vie, Laboratory of Cell Biology,
Belgium

Claude Kirchner
Director,
Centre de recherche INRIA,
Bordeaux - Sud-Ouest
France

Sébastien Wagener, student,
Association des Cercles d'Etudiants Luxembourgois

Academic secretary:
Pieter-Jan Van De Velde,
Staff member Quality Assurance,
VLIR,
Belgium

Priority 1: Sécurité et fiabilité en informatique

Chair:
Jean-Marie Hombert,
Professor,
Université Lyon 2
France

Experts:
Bart Preneel,
Professor,
Katholieke Universiteit Leuven
Dept. Electrical Engineering-ESAT / COSIC
Belgium

Claude Kirchner
Director,
Centre de recherche INRIA,
Bordeaux - Sud-Ouest
France

Maxime Monnin, student,
PhD researcher, Université de Valenciennes
France

Academic secretary:
Pieter-Jan Van De Velde
Staff member Quality Assurance, VLIR,
Belgium

Priority 3: Science de la vie

Chair:
Páll Skúlason
Professor,
 former Rector, University of Iceland,
Iceland

Experts:
Alain Denise,
Professor,
Group leader, Molecular Bioinformatics,
Université Paris-Sud 11
France

Peter Goldfarb
Professor,
Molecular Biology,
University of Surrey
UK

Maren Wichmann, student,
Phd researcher, Leibniz Universität, Hannover
Germany

Academic secretary:
Steven Van Luchene
Staff member Quality Assurance, VLIR
Belgium

Priority 4: Droit européen et droit des affaires

Chair:
Bruno Curvale,
Head of International Affairs,
Evaluation Agency for Research and Higher Education
France

Experts:
Michèle Grégoire,
Professor,
Université libre de Bruxelles
Faculté de droit
Belgium

Hector McQueen,
Professor,
Faculty of Law, University of Edinbourgh
Scotland

Laura Tilindyté, student,
Phd researcher, University of Maastricht,
The Netherlands

Academic Secretary:
Roel Bennink
Staff member QANU
The Netherlands

Priority 5: Finance internationale

Priority 6: Sciences de l'éducation

Chair:
Bruno Curvale,
Head of International Affairs,
Evaluation Agency for Research and Higher
Education
France

Experts:
Anne Lavigne,
Professor,
Laboratoire d'Economie d'Orléans
France

Christian Saborowski,
student,
PhD researcher, University of Warwick
UK

Academic Secretary:
Roel Bennink,
Staff member QANU,
The Netherlands

Chair:
 Dirk Van Damme,
Head of the Centre for Educational Research
and Innovation,
OECD, Paris.
Former head of Cabinet of Flemish minister of
Education,
Belgium

Experts:
Anne Edwards, Professor of Educational Stud-
ies, University of Oxford
UK

Brita Rang, Professor, History of Education
Johann Wolfgang Goethe-University, Frankfurt,
Germany

Bert Creemers, Professor Emeritus, University of
Gröningen
The Netherlands

Catherine Sablé, student,
PhD researcher, Université Paris 7, Université de
Franche-Comté,
France

Academic Secretary:
Pieter-Jan Van De Velde,
Staff member Quality Assurance, VLIR,
Belgium

Priority 7: Études luxembourgeoises

Chair:
Tove Bull,
Professor,
former Rector of the University of Tromsö
Norway

Experts:
Walter Leimgruber,
Professor,
Department of Geosciences, Geography Unit
University of Fribourg
Switzerland

Howard Davies,
Senior Adviser,
EUA – European University Association ,
U.K.

Stefan Schmunk,
student,
PhD researcher, Technische Universität
Darmstadt,
Germany

Academic Secretary:
Els van Zele
Staff member Quality Assurance, VLIR,
Belgium