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THEMATIC REVIEW OF TERTIARY EDUCATION



CROATIA

COUNTRY NOTE

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This report is based on a study visit to Croatia in June 2006, and background documents prepared to support the visit. As a result, the report is based on the situation up to that period.

The views expressed are those of the authors and not necessarily those of Croatia, the OECD or its Member countries.

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CHAPTER 1: INTRODUCTION

Purposes of the OECD Review

1. This Country Note on Croatia forms part of the OECD Thematic Review of Tertiary Education. This is a collaborative project to assist the design and implementation of tertiary education policies which contribute to the realisation of social and economic objectives of countries.

2. The tertiary education systems of many OECD countries have experienced rapid growth over the last decade, and are experiencing new pressures as the result of a globalising economy and labour market. In this context, the OECD Education Committee agreed, in late 2003, to carry out a major thematic review of tertiary education. The principal objective of the review is to assist countries to understand how the organisation, management and delivery of tertiary education can help them to achieve their economic and social objectives. The focus of the review is upon tertiary education policies and systems, rather than upon the detailed management and operation of institutions, although clearly the effectiveness of the latter is influenced by the former.

3. The purposes, methodology and guidelines of the project are detailed in OECD (2004a).¹ The purposes of the review are:

- To synthesise research-based evidence on the impact of tertiary education policies and disseminate this knowledge among participating countries;
- To identify innovative and successful policy initiatives and practices;
- To facilitate exchanges of lessons and experiences among countries; and
- To identify policy options.

4. The review encompasses the full range of tertiary programmes and institutions. International statistical conventions define tertiary education in terms of programme levels: those programmes at ISCED² levels 5B, 5A and 6 are treated as tertiary education, and programmes below ISCED level 5B are not.³ In some countries the term higher education is used more commonly than tertiary education, at times

¹ Reports and updates are available from www.oecd.org/edu/tertiary/review

² The International Standard Classification of Education (ISCED) provides the foundation for internationally comparative education statistics and sets out the definitions and classifications that apply to educational programmes within it.

³ Programmes at level 5 must have a cumulative theoretical duration of at least 2 years from the beginning of level 5 and do not lead directly to the award of an advanced research qualification (those programmes are at level 6). Programmes are subdivided into 5A, programmes that are largely theoretically based and are intended to provide sufficient qualifications for gaining entry into advanced research programmes and professions with high skills requirements, and into 5B, programmes that are generally more practical/technical/occupationally specific than ISCED 5A programmes. Programmes at level 6 lead directly to the award of an advanced research qualification. The theoretical duration of these programmes

to refer to all programmes at levels 5B, 5A and 6, at times to refer only to those programmes at levels 5A and 6. An additional complication is presented by the practice, in some countries, of defining higher education or tertiary education in terms of the institution, rather than the programme. For example it is common to use higher education to refer to programmes offered by universities, and tertiary education to refer to programmes offered by institutions that extend beyond universities. The OECD thematic review follows standard international conventions in using tertiary education to refer to all programmes at ISCED levels 5B, 5A and 6, regardless of the institutions in which they are offered.

5. The project involves two complementary approaches: an *Analytical Review strand*; and a *Country Review strand*. The Analytical Review strand is using several means – country background reports, literature reviews, data analyses and commissioned papers – to analyse the factors that shape the outcomes in tertiary education systems, and possible policy responses. All of the 24 countries involved in the Review are taking part in this strand. In addition, 13 of the tertiary education systems have chosen to participate in a Country Review, which involves external review teams analysing tertiary education policies in those countries.

6. Croatia was one of the countries which opted to participate in the Country Reviews and hosted a review visit in June 2006. The reviewers comprised OECD Secretariat members, and academics and policy-makers from Australia, Canada, Germany, Ireland and the United Kingdom. The team is listed in Appendix 1.

The Participation of Croatia

7. Croatia's participation in the OECD Review was co-ordinated by Luka Crnjaković, Directorate for Higher Education, Ministry for Science Education and Sports (MSES). Croatia's Country Background Report (CBR) for the OECD Review was prepared by an Expert Committee, led by Željko Dujčić and Pero Lučin for the Ministry for Science Education and Sports, and was supported by various stakeholders of the tertiary education system.

8. The Review Team is very grateful to the authors of the CBR, and to all those who assisted them for providing an informative, analytical and policy-oriented document. The CBR covered themes such as the background and content of tertiary education reforms; the structure of the tertiary education system; the role of tertiary education in regional development, the research effort of the country, and the shaping of labour markets; the challenges faced in resourcing, governing, achieving equity in and assuring the quality of the tertiary education system. Some of the main issues identified by the Croatian CBR, and which are taken up in this Country Note, include:

- Uncertainty about the role of old and new institutions in the tertiary education system, differentiation between universities and polytechnics in a binary structure, and the balance of provision and opportunity between Zagreb and the regions;
- Managing the rapid rate of change on the approach to EU membership, and especially using the Bologna process as the driving force for change in higher education, including the functional integration of universities and to allow comparison and exchange of best practice with other European systems
- An incipient system of institutional monitoring, quality assurance and national accreditation;

is 3 years full-time in most countries (e.g. Doctoral programme), although the actual enrolment time is typically longer. These programmes are devoted to advanced study and original research. For further details see OECD (2004b).

- Whether the expansion in student numbers is financially sustainable and on what financial basis, having in mind also demographic and equity dimensions;
- How universities can come to engage more effectively with national and regional society and economy in Croatia, and vice versa;
- A lack of a comprehensive system of information and data about the outcomes of the tertiary education system which could assist the formulation of policies.

9. The Croatian CBR forms a valuable input to the overall OECD project, and the Review Team found it very useful in relation to its work. The analysis and points raised in the Background Report are cited frequently in this Country Note.⁴ In this sense, the documents complement each other and, for a more comprehensive view of tertiary education policy in Croatia, are best read in conjunction with each other.

10. The review visit took place from 8 to 16 June 2006. The detailed itinerary is provided in Appendix 3. The Review Team held discussions with a wide range of educational authorities and relevant agencies, and visited all institutions of tertiary education in three parts of the country. Discussions were held with national and local authorities; Minister Dragan Primorac, Zrinka Kovacevic, Assistant Minister for Higher Education, Drazen Vikic Topic, State Secretary for Science, Stanislava Rogic, Secretary of the Ministry, and Ivana Puljiz, Advisor to the Minister, Ministry for Science Education and Sports; tertiary education institutions; student organisations; representatives of academic staff; employers; the business and industrial community; agencies responsible for funding and quality assurance; and researchers with an interest in tertiary education policy. This allowed the Team to obtain a wide cross-section of perspectives from key stakeholders in the system on the strengths, weaknesses, and policy priorities regarding tertiary education in contemporary Croatian society.

11. This Country Note draws together the Review Team's observations and background materials. It will be an input into the final OECD report from the overall project. We trust that the Country Note will also contribute to discussions within Croatia, and inform the international education community about Croatian developments that may offer lessons for their own systems.

12. The Review Team wishes to record its grateful appreciation to the many people who gave time from their busy schedules to assist us in our work. A special word of thanks is due to the Croatian National Co-ordinator, Luka Crnjaković, for whom nothing was too difficult in ensuring that the Review Team was facilitated in every way possible. We are grateful to him for providing us with his unique knowledge and insight, expertise, kindness, and very pleasant company well beyond the call of duty. The openness to cooperation, comparison and external views provided ideal conditions to the Review Team for a successful review exercise. The Team appreciated the informative and frank meetings that were held during the visit, and the helpful documentation provided. The courtesy and hospitality extended to us throughout our stay in Croatia made our task as a Review Team as pleasant and enjoyable as it was stimulating and challenging.

13. This Country Note is of course the responsibility of the Review Team. While we benefited greatly from the Background Report and other documents, as well as the many discussions with a wide range of people in Croatia, any errors or misinterpretations in this Country Note are our responsibility.

⁴ Unless indicated otherwise, the data in this Country Note are taken from the Croatia Country Background Report.

Structure of the Country Note

14. The remainder of this report is organised into ten sections. In Chapter 2 the national context is outlined, and key issues high-lighted. The chapter briefly describes the key factors shaping tertiary education in Croatia, and seeks to assist international readers by identifying what is distinctive about its tertiary education circumstances and policy. The next eight chapters take in turn different themes important to the countries taking part in this review process generally, including in full measure Croatia. The themes selected have to do with Governance, Resources, Quality, Equity, Regionalism, Research and Innovation, the Labour Market, and Internationalisation. If the reader asks why the absolutely central tertiary education mission of Teaching and Learning appears to be missing, the answer is that this permeates the whole report, and is central to each of these chapters, other than Chapter 8.

15. Chapter 11 offers some concluding remarks, and draws together for the consideration of the Croatian authorities and institutions recommendations arising from the eight preceding chapters.

16. The Team's policy suggestions attempt to build on and strengthen reforms that are already underway in Croatia, and to reinforce the strong commitment to further improvement that was evident among all those whom we met. They are offered with due circumspection, recognising the difficulty facing any group of visitors, no matter how well briefed, in grasping, within little over a week's visit, the complexity of Croatia's fast-changing situation and of the multiple factors that need to be taken into account.

CHAPTER 2: THE NATIONAL CONTEXT – TOWARDS THE EUROPEAN UNION

17. Croatia is by European standards a small country on the western or Adriatic coastal edge of the Balkan region. Its history, reflecting its orientation both westward and to the central part of continental Europe, is deeply interwoven with the history and influenced by the culture of the Hapsburg Austro-Hungarian Empire and by Venice, and more recently by Austria, Germany and Hungary as well as Italy: the Italian influence is strongly evident in the north coast Istria region. As part of post-World War Two Yugoslavia, Croatia continued to look westward as well as towards Belgrade. Before and at this time many Croatians went overseas to create a diaspora in countries like Australia, as well as more locally within the region. Some are now returning, in the period following the break-up of Yugoslavia in the nineties and the accompanying war which did much damage to parts though not all of the country. An international orientation and flow of personnel allows in many western influences, most obviously manifested in the annual arrival of large numbers of tourists especially along the Adriatic coast with its beautiful islands.

18. Croatia's tertiary education system is similarly open to and a part of worldwide scholarly influences, although language limits the likelihood of large inflows especially of undergraduate students. The small but growing private sector leads the way in giving instruction in English as well as Croatian.

19. Not surprisingly, given this background, Croatia is extremely if not unanimously eager to become a part of enlarged Europe, with aspirations to join the Union, following Bulgaria and Romania but well ahead of Turkey, by the end of the present decade. In terms of tertiary education, this commitment and purpose takes the form of unqualified adoption of the Bologna changes and accord, to allow the nation to align with the common qualifications system and labour market to which the Bologna accord is moving EU members. The Croatian Government, through the Ministry of Science, Education and Sports (MSES), is not alone among European authorities in using Bologna to attempt reforms that are thought anyway to be necessary. However, the scale and rate of change implied and now being attempted by Croatia are very ambitious, and raise concerns even among keen supporters, as to how well they can be managed so quickly, and what unintended consequences and collateral damage may follow. On the other hand, some of these changes appear essential if the country is to achieve its aspiration to have a dynamic fit-for-purpose system integral to a modern knowledge society.

20. In many respects, and in relation to the state of the economy and the turmoil of recent history, Croatia may take pride in its tertiary education. The University of Zagreb is a very large institution with academic strength in many fields, and some of the several smaller regional universities – the Review Team visited universities at Rijeka and Split as well as in the capital – show innovative vigour, strength of purpose, and areas of distinctive academic expertise. Croatia opted in the early nineties for a binary system separating polytechnics from universities. Despite serious problems deriving mainly from lack of resources to create viable free-standing vocationally oriented polytechnic institutions, the decision to have a binary system remains, with ambition to contain the growth of universities, encouraging the enlargement of a small number of non-metropolitan institutions; and for polytechnics within a few years to contain half the tertiary student population. Thus the problematic polytechnic, the work of which was partly absorbed into the University of Split, is to take back that work in the near future.

21. It is clear that despite its large size relative to population and its age participation rate that has risen beyond 50%, the system is under-resourced to meet the expectations placed upon it in meeting the standards required to join the EU. As always, public funding for higher education competes with the needs

not only of the school system but of other social services and for economic regeneration. In particular, the old industrial base has largely collapsed, leaving high unemployment and problems about underemployment of graduates; there is a need to identify and invest in new 'knowledge-based' industries including an advanced services sector.

22. This implies a set of pressing demands for tertiary education institutions (TEIs). TEIs are now widely perceived worldwide as key engines for national and regional innovation and economic growth and competitiveness, requiring that they are strong across the full spectrum of pure and applied research, and well versed at industrial partnership for the exploitation and take-up of new knowledge. Croatia is only at the beginning of developing an effective knowledge creation and utilisation system to which TEIs are central; or of having an advanced industrial base in which investment in R&D including university partnership is significant. On the other hand it became clear to the OECD Review Team that the will is there on both sides to move in this direction. It falls on a government heavily committed to a many-faceted reform agenda also to identify and make known national priorities for research, development and innovation, and to identify means to nurture the conditions of development, including a significant private sector financial input.

23. The same need for innovation and growth, along with scarcity of resources, poses important, difficult and now urgent questions about the funding of tertiary education itself as distinct from research. As Chapters 4 and 6 explain, the system of support for study in terms of full fee remission and various kinds of living support, such as free meals, has several consequences that do not align well with national policy and socio-economic need. Assistance flows mainly to the more fortunate and consequently successful secondary school students from middle class families in urban areas, and especially in the capital Zagreb. This works to the disadvantage of poorer students, students from economically poorer and geographically more remote areas, and those who have not just left school to proceed straight on into tertiary education.

24. These problems are somewhat masked by high unemployment and a supply of school-leavers to compete for places in the more prestigious faculties, but the situation is inherently unstable and dysfunctional. As the Croatian economy picks up one can foresee both a shortage in the newer high skills areas and a more obviously divided society between the rich – educationally and otherwise - and the minimally educated poor unable to access the benefit of new prosperity. Although there is now a high average participation rate, there is virtually no opportunity for the largely non-graduate older population to catch up with their offspring through later-life formal tertiary education. As for many modern societies with low birth-rates and rising longevity, a demographic, economic and social time-bomb is ticking.

25. One response to scarcity of resources and unmet demand is the recent emergence and apparently steady growth of a private sector. This appears to be regarded favourably on all sides, but also appears unlikely to grow to anything like the scale that has been seen (with some accompanying problems) for example in various former Soviet and in other non-European countries. More pressing and problematic are the very low completion rates and the typically protracted years of undergraduate study that represent by conventional criteria inefficiency and high wastage. Fundamental changes to the student fee and subsidy system appears both unavoidable and conflictual; yet most parties with whom the Review Team met appeared to acknowledge the inevitability of early and significant change to address this systemic inefficiency and to direct more of the support available to the more needy, for both equity and other labour market reasons.

26. There is much less recognition of the gap between intention and provision in respect of the generational disadvantage of the mature age population, grown up before the era of mass higher education. Perhaps serious reform both to accelerate completion and to provide opportunities for adults will have to await the approach of full employment and a real skills shortage. Until then, protracted time as a student

may be felt to have social merits in holding down visible unemployment levels, outweighing the obvious inefficiency costs. On the other hand there appears to be less in the way of exploiting old as well as new information and communication technology to extend the distance education at quite low capital cost and reduce the inequalities of age, geography and other forms of immobility in this way.

27. In two other respects also Croatian tertiary education is distinctive, though not unique. First, there is the very heavy concentration of higher education and also of research institutes in the capital city, Zagreb, and of university resources, personnel and students at the University of Zagreb. This national imbalance, comparable for example with the economic and human resource domination of the Republic of Korea by greater Seoul, is now clearly recognised as unhelpful to the balanced growth and well-being of the whole country. Steps are in hand progressively to redress this. Judgement about rate of rebalancing is required: whether to concentrate new growth away from Zagreb, or more ambitiously to move and relocate existing resources. The growth of a modest private tertiary sector is unlikely to mitigate the imbalance, since its reliance on market forces naturally brings it to the city location, and indeed into subject areas, where *demand* is most evident but which are least attuned to national *need*. The Croatian authorities appear clear that while more private sector and individual investment in education and research are necessary, tertiary education will remain in the main a state responsibility and a public good.

28. The second distinctive feature is not uncommon in the European university tradition, and represents a challenge for many systems long or newly part of the European Union. This is the extreme weakness of the Croatian university as an entity. In the case of Croatia, faculties have legal autonomy and have been in the habit of dealing with and getting their funds direct from the Ministry. The university rector and central administration lack the authority, means and resources to lead or steer the institution, much less to carry through the radical changes that the new EU agenda and the global economy require.

29. Without this central steering capacity, entrepreneurial energies cannot be channelled and exploited effectively, and the essential conditions cannot be met for the 'entrepreneurial university' which Burton Clark (Burton Clark, 1998) has sketched, and that has been the subject of much subsequent policy debate, and also a basis for much emergent institutional practice. The Government of Croatia has displayed courage and strong purpose in making an immediate commitment to integrate universities, and to move the location of power and decision-making from faculty to university level. The speed at which this is being effected, and the lack of reliable data and of clear, let alone sophisticated, criteria for resource allocation, management and audit, may mean some quite serious difficulties in carrying through the necessary change.

30. Engagement of universities with their regions, co-investing to mutual benefit in regional social and economic development, has become a priority for many of the OECD and EU countries which Croatia aspires to join. These are not strong features of its tertiary education system today. Until universities can be effectively led and managed with strong central governance (see Chapter 3) they will be unable to enter into the stable lasting partnerships necessary for sustained engagement. We address this subject in Chapter 7, and we devote Chapter 6 to questions of quality assurance, which is also part of modern management. At various points in this Country Note we refer also to the need for reliable and longitudinal data about the tertiary education system. This too is so far lacking, and is essential for competent system and institutional management.

31. A third challenging policy issue for Croatia links the two distinctive features mentioned above. This is the future of the very large University of Zagreb that so dominates the higher education scene in this country. That this institution of 50,000 students and highly autonomous faculties is strictly speaking ungovernable was well illustrated at the time of the OECD review visit by the failure for a second time to elect a Rector, and the reluctant continuation in office for a limited term of the current incumbent. Such an electoral system is not uncommon in the European tradition, but it has no place in the (in a non-pejorative sense) more managerial university to which all modern countries are moving, at different rates. While the

immediate crisis will be resolved in another electoral round, the governance issues discussed in the next chapter obviously impact with the greatest force on this very large university. It will be for the Government in consultation to decide whether Zagreb can remain and operate effectively as a single and effectively integrated institution; whether it is better divided into several more manageable institutions, perhaps with some faculty groups transferring to enhance the specialised strengths of different regional universities; or whether possibly to take the form of some kind of federated university system. If all this appears too big and politically sensitive to tackle single-handed, now might be the time to call in a carefully selected international review group to provide guidance and advice on just this subject.

CHAPTER 3: GOVERNANCE, PLANNING AND REGULATION

Terms, concepts and functions

32. Chapter 2 of the Croatia Country Background Report provides a useful summary description of the governance arrangements at national level for tertiary education in Croatia. During the 1990s and continuing into the present decade, there was a considerable amount of legislative activity and a number of new bodies and organisations were established at national level. A schematic outline of the arrangements in place at national level is given in Figure 2.3 on page 20 of the Background Report.

33. The design and functioning of governance arrangements and processes for tertiary education at both national and institutional levels are vital determinants of the effectiveness of the tertiary education system and of its capacity to contribute to national development. The challenge is to put arrangements in place which are effective and efficient in addressing national economic and societal needs. They should also support the traditional and fundamental objectives of tertiary education in promoting scholarship through the protection, transmission and expansion of knowledge.

34. Before commenting on the arrangements for governance of tertiary education in Croatia, this chapter provides a discussion of the broad principles of governance of tertiary education systems and institutions. These are of general application and do apply not just to Croatia. They underpin the analysis and recommendations which follow.

35. **Governance** in tertiary education encompasses the structures, arrangements and processes through which, at both national and institutional levels, policies for tertiary education are formulated, implemented and reviewed. The processes of governance include formulating and approving broad policy goals and objectives, and devising and overseeing the implementation of strategies to implement these goals and objectives.

36. The strategic dimension of governance is extremely important. It involves paying attention through policy formulation and review to the medium (less than five years) and long term (more than five years) direction and goals – at both system and institutional level. Accordingly, the structures, arrangements and processes for review, monitoring and adjustment of goals, objectives and implementation strategies are an important part of governance.

37. Governance is different from **management**. This distinction underpins all of our analysis and recommendations. Effective management includes providing leadership, including the articulation of vision and goals. It is also concerned with implementation, within the framework of policies and strategies which have been approved at the governance level. Leaders and managers, including rectors and senior officers in tertiary education institutions (TEIs), are responsible, within a collegial framework, for the formulation of proposals providing strategic vision, and for enabling strategies, that should then be approved at the governance level. Vibrant systems are characterised by a vigorous and substantive dialogue between governors and managers.

38. The distinction between governance on the one hand, and leadership and management on the other, is vital. Where these functions become confused the consequences include reduced effectiveness, diminished capacity to deal successfully with changing circumstances, particularly in the external

environment, and increased tension and conflict. These difficulties arise both internally within the system and within institutions, and externally with stakeholders. The most common, and damaging, manifestations of confusion arise where the governance function becomes involved in the micro-management of implementation issues. Not only does this work against effective leadership and management. It is also generally at the cost of neglecting the policy formulation and approval, monitoring, review and appraisal functions which are vital characteristics of effective governance.

39. At national level, and particularly in a unitary state such as Croatia, the national government has a number of essential high level functions with respect to tertiary education. The formulation of national policies for tertiary education and of accompanying implementation strategies are functions of government. These are ultimately a government responsibility but should be carried out in consultation with the significant internal and external stakeholders in the system. By external stakeholders we mean those in society, such as the enterprise sector, which have a substantial interest in the outcomes of tertiary education.

40. National policy for tertiary education should be formulated in the context of national economic and social policies. Mechanisms and structures are required to ensure the effective integration of national tertiary education policy-making with policies in other relevant areas of public policy such as fiscal policy, labour market and employment policy, social policy (particularly in addressing economic and social disadvantage) and innovation policy. The government should also monitor and review the success or otherwise of national tertiary education policies and their implementation. This should be done with reference to a range of criteria, and where appropriate changes or adjustments should be made to policies and structures.

41. Key areas for the exercise of the governance and policy roles of government in respect of tertiary education include:

- Financing and investment (governments in most countries are essential sources of funding to institutions, to students and for research);
- National policies for research, technology transfer and innovation and the role of the tertiary education system and TEIs in the implementation of these policies;
- Devising and administering (at national level) the necessary financial policies, programmes and mechanisms;
- In systems where the tertiary institutions depend significantly on state funding, the determination of the appropriate financial policies to be followed by the institutions e.g. in relation to budget balance and borrowing and the review of these policies;
- The appropriate balance in the funding of the institutions between public and private funding;
- The appropriate distribution of academic disciplines and output of graduates in these disciplines at national and regional levels;
- Measures (including financial measures) to promote social cohesion and participation in tertiary education by students from under-represented groups in society, including those who are socially and economically disadvantaged and those with disabilities;
- Addressing regional needs and development policies through tertiary education;

- The numbers and different types of TEIs required nationally and the regional distribution of TEIs;
- Promoting and monitoring the quality of outcomes in tertiary education and research through the design and implementation of appropriate policy instruments and measures;
- Setting national objectives for participation, retention, and progression rates and providing the policy instruments (including finance) to achieve these;
- In many countries, promoting the move to a knowledge-based, innovation society;
- The promotion of linkages between tertiary institutions and business and enterprise; and
- The provision of appropriate tax incentives to encourage the development of tertiary education and research.

This list is not exhaustive. It depends on national circumstances, as does the relative importance at any given time of the different areas of policy concern.

42. The range of functions appropriate to government is formidable. It is also clear that tertiary education policy should not be formulated and implemented in isolation from other important areas of national policy. Effective linkages are required, both in policy terms and organisationally, with other areas of government. The provision of these linkages, and the creation of the desirable synergies, is often challenging for governments. Various approaches have been used in different countries, including the establishment of inter-ministerial committees and advisory councils involving stakeholders from within government, the tertiary sector and other relevant areas of society and the economy.

43. The effective implementation of these functions also poses considerable challenges for leadership and formulation in policy, and for management.

44. Government should have available to it the necessary policy-making, organisational, management and administrative capacities for carrying out these vital functions. The management functions relevant for government include the development and administration of financing instruments, that is to say the methods of financing tertiary education and research, and the review and monitoring of implementation and outcomes for the system as a whole. An effective policy-making role requires competencies in policy-making and review, and in financial management and control. Appropriately designed information systems are also essential in order to collect, collate and analyse relevant data.

45. In OECD countries where tertiary education is a national responsibility, some governments such as those of Australia and Finland carry out many of these functions directly through the relevant ministry, generally a ministry with responsibility for education and science. In this situation the ministries have the potential to provide effective policy leadership, but they often confront the difficulties of dealing with multiple objectives and demands in intensely political environments. Some of these demands may be urgent though not strategically important.

46. In other OECD countries such as Ireland and New Zealand, and within the UK in England, Scotland and Wales (tertiary education is devolved to national executives and parliaments in the latter two), governments have established so-called buffer or intermediate bodies such as funding councils to carry out many of these management functions. These bodies also play a major role in the provision of policy advice. This approach allows the buffer bodies to recruit, develop and retain staff with the relevant specialised skills and experience, and to provide a degree of organisational continuity which can be useful

in promoting change. Buffer bodies are also, and importantly, seen as means of enhancing the autonomy of TEIs.

The distribution of functions between national and institutional levels

47. We have drawn a clear distinction between governance and management. The distribution of these functions between national and institutional levels is also important.

48. Multiple policy objectives and pressures as well as the inherent complexity of the area itself make the governance of tertiary education and of TEIs a difficult and complex matter. Conflicting policy pressures and demands are a recurring feature. Their resolution and effective management require considerable flexibility and energy. This will not exist if attempts are made to manage, and particularly to micro-manage, institutions from a national level. Accordingly the OECD Review Team favours a system whereby the TEIs have high levels of operational autonomy within a well articulated national policy framework.

49. The principle of subsidiarity is useful for considering the appropriate distribution of governance functions between government, its agencies, and tertiary education institutions. Subsidiarity means that matters ought to be handled by the smallest - or lowest level of - competent authority. The idea is that a central authority should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level.

50. According to the subsidiarity principle, functions should be carried out at the level where it is most efficient and effective to do so. It is not appropriate, for example, for ministries to control the detailed allocation of staff numbers to TEIs. Institutions themselves are in the best position to assess staffing needs – but where they are dependent on state funding they should be required to do so within clear financial budgets, frameworks, constraints and rules. Our recommendations on finance in the next chapter have regard to the need for such a framework.

51. Neither are detailed national controls and regulations over staff qualifications appropriate. Central accreditation of individual courses, curricula and programmes is not the most appropriate approach for a society which has the ambition and capacity to be a full participant in the modern knowledge-based world economy. Autonomous institutions anxious to attract high quality students, and to establish reputations for high quality in teaching and learning, research and contributing to national development will themselves endeavour to recruit the best possible staff within their means to do so, and to provide the best regarded programmes and courses.

52. National controls, whether administered by governments or by national academic bodies, run the risk of creating inflexibilities and damaging the capacity for innovation. They tend to be ineffective in responding to the need to recruit staff in new academic disciplines, in promoting interdisciplinary studies and research, and in recruiting staff from overseas or with overseas qualifications. Many countries with well-regarded tertiary education systems do not have nationally administered controls of this type. Instead of administering such controls, governments have an important role to play in promoting the best high quality outcomes, by ensuring appropriate levels of competition between TEIs as a stimulus for better performance, and by ensuring that the tertiary education system is outward-looking, nationally and internationally.

53. Institutional autonomy is important, not just as a protection for academic freedom but also as a means of enhancing effectiveness and enhancing the contribution of TEIs to national goals and policy objectives. Such autonomy should be accompanied by appropriate mechanisms for accountability. Institutions should 'use their autonomy not as an excuse for isolation, indifference or advocacy but as a

means of making an independent contribution to society, providing an impartial voice and professional service to the public good' (The Glion Declaration 1999 – see www.glion.org).

Governance and management of TEIs

54. The distinction drawn earlier between the functions of **governance**, on the one hand, and **management** on the other, is also of vital importance at institutional level. Attempts by governing bodies, whether university or faculty councils or other types of bodies, to micro-manage the institutions do not result in effective outcomes. The consequences of such behaviour tend to include politicising the management function and disabling effective leadership. It is often accompanied by neglect of vital governance functions providing strategic frameworks and reviewing outcomes and management performance.

55. The essential distinction between the governance and management is not sufficiently reflected in the structures and practices of TEIs in Croatia. Some TEIs have very large governing bodies. We learned that micro-management is a feature in some institutions. Governance structures and practices do not in some instances draw a sufficient distinction between the high level activities of overall institutional governance and the governance of academic affairs. We address these issues in our recommendations.

56. We also noted that external stakeholders, such as people from the business and enterprise sector, were not generally included in the membership of governing bodies. At national level the National Council for Higher Education includes only two members out of a total of 13 from outside the system of science and tertiary education. In many OECD countries, substantial external membership is now a feature of governance systems for tertiary education. External representatives provide useful perspectives and insights, thereby enhancing the relevance of TEIs to their communities. They are also a valuable means of promoting accountability.

Recommendations

National level

57. *The Review Team recommends* that Croatia strengthens its structured arrangements to promote effective policy interfaces and working relationships between the tertiary education and other important policy areas, such as responding to labour market needs. *We recommend* that the authorities consider creating a powerful Inter-Ministerial Committee with external representation from key interests in society such as the Croatian Chamber of Economy. Alternatively, the National Council for Higher Education could perhaps be mandated with this role, but a substantial review and change to its membership would be required in that event.

58. Analysis of the need for effective governance and management suggests that a buffer or intermediate body would enhance the effectiveness of policy-making and delivery for tertiary education in Croatia. Whatever the mechanism, care needs to be taken in balancing the need for effective policy, oversight and quality assurance and shaping via resource allocation, against excessive bureaucratic centralisation and too detailed prescription. The Croatian system would benefit from having a statutory body or agency charged with advising the government on tertiary education policy, including developing a national strategic plan for higher education and research for consideration by the government. Such a body could be called the Tertiary Education (Funding) Council, or the Funding and Policy Council for Tertiary Education and Research. Its principal operational function would be with the financing of the system in accordance with a clear framework – an issue which is addressed in the chapter on finance. Accordingly *the Review Team recommends* that early thought be given to creation of such a body.

59. The establishment of such a body would also provide an opportunity to rationalise some of the existing governance structures. The executive nucleus of the new agency could be built around the existing Agency for Science and Higher Education. In our view it should have a relatively small governing body or council - no more than twelve members – appointed by the Minister for Science, Education and Sports after appropriate consultations. Five of the members should be appointed from within the tertiary education sector and five should be external. Some countries include a small number of non-national members in high level bodies, as a means of ensuring that policy-making benefits from an international outward looking perspective.

60. *We recommend* this innovation, and suggest that two external members be appointed from outside Croatia. Since this would be a body charged with important national functions, membership would be for fixed terms and on an individual, not representative, basis. Members should act on the basis of collective, not representational, responsibility. The chairperson should be a distinguished person in Croatia noted for his or her independence and contribution to society. With these arrangements in place we do not see the need to retain the Science and Higher Education Funding Council with its present mandate. The new agency would also be charged with putting in place new nation-wide arrangements for quality assurance, and would provide secretarial support for the two advisory bodies – the National Council for Higher Education and the National Council for Science.

61. As regards governance processes we doubt the appropriateness of the role currently occupied by the Rectors' Council and the Council of Polytechnics and Schools of Professional Higher Education, in relation to the annual operating budgets for TEIs. The funding mechanisms we recommend would remove the need for detailed annual budget negotiations between the central authorities and the TEIs. Nor do we consider it appropriate that representative and collective bodies such as these Councils should have a relationship with the central authorities in regard to the funding of individual TEIs.

Tertiary education institutions

62. Our recommendations address the need to put effective structures in place for **governance and management**. We draw a three-way distinction: institutional governance and the body responsible for this function; management, which is the function of the chief officer (rector or dean) and the senior management team subject to the review of the governing body; and academic affairs, particularly curriculum, teaching and learning, and research.

63. The key governance functions for a TEI are the approval of the institution's mission and goals, approval of its policies and procedures, and the exercise of important oversight functions in relation to programmes, financial well-being and the effective management of the resources of the institution. The governing body is also responsible for appointing the chief officer, as well as for all major new capital investments, new programmes and undertakings.

64. At institutional level it is important that the governing boards should be in a position to have regard to the public interest. The effectiveness of TEIs is based on an understanding whereby society (through the state and individually) provides support, particularly financial support, and allows substantial levels of autonomy to the institutions. This requires that governing boards exercise a trustee and oversight role on behalf of the public, as well as the fulfilling the core responsibility of advancing the interests of the institutions for which they are responsible. Essentially, the governing body is responsible for the mission, integrity and financial viability of the institution, including defending the autonomy of the institution and the promotion of its well-being (see Rhodes 2001, p.239).

65. This is a complex mandate requiring effective bodies with an experienced and broadly based membership, and because of their external trusteeship role, a small majority of external members. It is also

important that the number of members be sufficiently large to reflect a sufficiently broad number of perspectives, skills and interests but small enough to carry out its business effectively. A body with more than twelve members or less than seven is unlikely to meet these criteria. *We recommend that the composition of a twelve member body be as follows:*

- An independent chairperson, selected from outside their membership by the other members;
- The chief officer;
- Four members elected from within the institution; and
- Six external members selected according to procedures specified in the legislation or statutes of the TEI. These members ideally would be drawn from the economic and social interests relevant to the mission of the TEI.

66. The role of **management** involves responsibility for the effective operation of the institution, and the achievement of its goals, within the policies and procedures approved by the board; the effective use of resources; and support of the highest standards in teaching, learning, research and service to the community. The ultimate responsibility for this function is with the chief officer, who may without surrendering responsibility delegate some of these responsibilities to the senior management team of the institution. The members of this team should be appointed by the governing body on the nomination of the chief officer. The provision of institutional and academic leadership is a key responsibility of the chief officer. It includes formulating proposals for the vision, goals, strategic plans, financial budgets and other procedures and processes of the institution for approval by the governing board.

67. *We recommend that* governing boards pay particular attention to the appointment of the chief officers. It is important that appropriate search and selection procedures and processes be in place. These should be such as to attract applications from both external and internal candidates best equipped to meet these formidable challenges. It is unlikely that the direct election of chief officers by institutional communities would meet this requirement.

68. Responsibility for **academic affairs** should, subject to financial constraints determined by the governing body, and subject to review by the governing body, be a matter for an academic senate or council. It would be responsible for the design and development of programmes of study and research, making recommendations for the selection, admission, retention and academic discipline of students, the conduct of examinations, appeals and other key academic functions of the institution. A substantial majority of the members of the academic senate or council should be drawn from the academic staff of the TEI, with provision for minority membership of students, other staff, and possibly also external stakeholders such as employers. The senior member of staff having responsibility for each major academic discipline would have automatic entitlement of membership of this body.

CHAPTER 4: RESOURCES FOR TERTIARY EDUCATION

Key goals

69. The Croatian authorities recognise the need to develop Croatia as a knowledge-based society and economy, while preserving the fundamental values of Croatian society (Government of Croatia 2004, p.1). They have established four fundamental goals for improving the higher education system:

- Implementation of the Bologna process;
- Functional integration of the universities;
- Strengthening of professional (polytechnic) studies through binary system development; and
- Establishing a systematic monitoring and quality control system for higher education teaching and research work (Government of Croatia 2004, p. 32).

70. The achievement of these essential goals, and the continued development of tertiary education, require effective and efficient arrangements for finance and governance.

Levels and modes of financing tertiary education

71. In 2004, 0.867% of GDP was allocated directly for tertiary education from the State budget (Background report, Table 7.5). Although this does not represent the full amount of State expenditure on tertiary education, due to the inclusion of some tertiary education related items in other budget categories such as ICT and Science, UNESCO data suggest that the system is under-funded in comparison with other OECD countries. According to these data, annual expenditure in 2002/2003 from public sources on educational institutions per student as a percentage of GDP was 64% of the mean for OECD countries (UNESCO, 2005). The Croatian authorities have stated that ‘efforts will be made to increase total state budget provisions for higher education, based on affordability’ and that ‘a major effort will be made to increase financing from other sources, particularly the private sector’ (Government of Croatia 2004, p. 38).

72. These objectives are appropriate to the current stage of development of tertiary education in Croatia and its role in the development of Croatian society and the economy.

73. The functional integration of the universities should prove to be a major step forward in the development of tertiary education. This measure is necessary to ensure that the universities have the organisational capacity to realise their full potential contribution to the society and economy. The Review Team considers the allocation of lump sum financing an essential first step towards achieving this essential objective. We heard criticism that this fundamental change was being introduced without sufficient advance preparation, and that the necessary information and financial systems are not in place to ensure its success.

74. The Team acknowledges that this change, commencing in 2006, presents major challenges for all the stakeholders in tertiary education – particularly university and faculty leaders and managers, the Ministry and, of course, staff and students. But on balance we consider that the decision to press ahead

with implementation is right. It gives a clear and necessary signal of intent and resolve. The view was expressed to us by all the interests that we met, that it is essential that this transition should not be destabilising, and that it must not put the delivery of priority and relevant programmes at risk. On the other hand, it is equally necessary that the potential of this measure for improving the efficiency, effectiveness and quality of tertiary education be realised as soon as possible. In order for this to happen, urgent steps must be taken to move to a system of financial allocation for funds from the state budget, which is consistent with several essential and challenging criteria. These criteria include:

- Transparency;
- Appropriate differential funding in response to the different costs of providing programmes in the various disciplines;
- Even-handed determination of allocations for different institutions;
- Support for priority public policy objectives such as the introduction of the Bologna process, the promotion of measures of quality assurance and improvement, and the promotion of access from underrepresented groups in society and regional development; and
- Enhancing accountability, efficiency and excellence in teaching, learning, research and development, and contributing to society and the economy.

75. These are challenging criteria. Croatia is however well placed to benefit from experiences in a number of OECD countries in developing systems which endeavour to meet these criteria. Many of these systems adopt the principle of money following the student. That is to say, a substantial part of the allocations are determined by formulae in which the major element is a unit grant per enrolled student, with appropriate coefficients or multipliers applied to reflect the different costs of the principal broad disciplines or fields of study. *The Review Team recommends* the adoption of a small number of such bases for calculation. In some formula-based systems a small but significant element is also incorporated into the formulae and funding outcomes, with a view to rewarding institutions for progress in achieving desirable high priority outcomes such as reducing non-completion, which is clearly an important matter of concern for Croatia.

76. In some OECD countries, formula-based allocation systems are complemented by arrangements for development funding which may or may not have an inter-institutional competitive dimension. Under these arrangements, institutions apply and often compete for funds for programmes to promote policy objectives in areas such as strategic planning, quality assurance and improvement, curriculum design and reform, and promoting access from groups in society which are under-represented in tertiary education and regional development.

77. Across OECD countries the funding systems also generally provide both direct and indirect support for research and innovation activities, and indirect costs, often in the form of overheads.

78. Development and research funding streams are usually assigned to specific programmes and activities. However, one of the strengths of transparent formula-based unit cost systems which fund the core expenditures in TEIs is that they have the potential to shift the focus of financial policy, planning, control, and management away from input costs such as salaries, administration, and maintenance, to outputs and outcomes. This should improve efficiency and effectiveness, as expenditures are related more explicitly to outcomes. Within the overall financial envelopes provided by unit cost formulae mechanisms, decision-making on operational issues and resource allocation (staff and programmatic expenditures) can

be devolved from the centre, providing that this assignment of functions and responsibilities reflects both strategic and operational requirements within universities, polytechnics, faculties and their departments.

79. The development of reliable and transparent information systems producing data which are comparable, both between and within institutions, is an essential and obvious prerequisite for this to work effectively. We heard a number of criticisms of the inadequacy of essential information and data in respect of tertiary education in Croatia. *The Review Team recommends* that the development of appropriate information systems, and the regular publication and dissemination of the relevant data and information, be treated as an urgent requirement.

Different sources of finance

80. Private income is an important and growing part of the total income of tertiary education institutions in Croatia. Between 2001 and 2004 the 'own income' of institutions grew from 24.8% of the total to 31.7% (Background Report, p. 76 and Table 7.14). The non-State revenue of the institutions consists broadly of student tuition fees and income from the provision of consultancy and other services to business enterprises in the private and public sectors. As a general principle, diversity of financing sources is desirable for tertiary education institutions. It tends to enhance autonomy, to promote the engagement of TEIs with society and the economy, and to protect institutions from unexpected downturns in revenue from individual sources.

81. Student tuition fees account for a significant part of the non-state income of tertiary education institutions in Croatia. Total enrolments have increased substantially. The proportion of students who are fully supported by the state has fallen from 88% in 1993 to 44% in 2003 (Background Report p. 16 and Table 6.4). Students enrolled in publicly funded TEIs above the quotas prescribed by the MSES pay part of their tuition costs, as do part-time students, while students enrolled in private institutions pay the full economic costs of tuition.

82. We have noted concerns about the negative impact of this multi-tier system. Some of those whom we met commented unfavourably on the perceived quality of education received by students in faculties and institutions where, for revenue reasons, considerable numbers of students are enrolled over and above the quotas established by MSES. Concerns were expressed to us about crowded classes and low frequency of contacts between teachers and students. These circumstances have also been linked to the worryingly and unusually low graduation and completion rates for students enrolling in undergraduate courses and the excessively long periods of time spent before graduation by many of those students who do eventually graduate.

83. *The Review Team supports* the principle of a contribution by students and their families to the costs of their tertiary education, particularly in a country such as Croatia where there are major constraints on the state budget. However, in our view the contributions or fees:

- Should be proportionate to the expected returns, in terms of higher incomes, to students from having been involved in higher education. Such returns will be affected by labour market conditions, particularly the rate of unemployment; and
- Should not be structured in such a way or be of such an order of magnitude that they discourage participation, particularly by students from social groups under-represented in tertiary education, including those who from disadvantaged groups.

84. Some OECD countries have, when reintroducing student tuition fees, also put in place income-contingent loan schemes. These consist of schemes where students pay off the loans, usually through the

taxation system, after graduation and over extended periods of time, once their income exceeds a stated threshold.

Recommendations for future development of resourcing

85. A vigorous and internationally competitive tertiary education sector will be essential to the future social and economic development of Croatia. This will require additional resources, and their efficient allocation. *The Review Team recommends* that public policy should aim to increase the level of expenditures on tertiary education, from both public and private sources, to at least the mean prevailing in OECD countries.

86. For the state funding of TEIs through the lump sum mechanism, *the Review Team recommends* that the Croatian authorities commit to refining the lump sum allocation system to the universities through the full implementation over a three year period, of an allocation system incorporating a formula-based unit cost system, and a competitive development fund.

87. *The Review Team recommends* as a priority putting in place information systems within the institutions which will collect and report data in respect of the following:

- The direct cost per student of the provision of teaching and learning for undergraduate students in Croatian TEIs. Such data should be collected at departmental level, but published at a higher level of aggregation. The data will then allow for the determination of an appropriate unit cost sum per student which can provide the basis for lump sum allocations, as well as for calculating the appropriate coefficients to be applied to different fields of study, distinguishing between those involving classroom, tutorial and library work only, those involving experimental laboratory and workshop activities, and courses which include clinical education and training;
- Indirect costs – including the costs of institutional overheads, library facilities etc, to be measured and distributed across the unit cost categories in proportion to student numbers or according to estimated levels of usage;
- Maintenance costs; and
- Depreciation costs for equipment.

88. *The Review Team also recommends* that within the lump sum a small proportion (no more than 5%) of the unit cost element be set aside using a transparent formula-based method of allocation to encourage TEIs to reduce drop-out rates and shorten graduation periods.

89. Initially, the unit cost element should account for 90% of the total allocation, but after the initial three year implementation period this proportion should be reduced to between 80% and 85% of the lump sum, with the balance assigned to the competitive development fund. The objective of the development fund would be to enable institutions to fund programmes addressing challenges in priority areas such as the transition to the Bologna model, promotion of access from disadvantaged and other under-represented groups in society, reducing non-completion rates, and the promotion of quality assurance and improvement.

90. *The Review Team recommends* that allocations from a development fund be competed for by institutions on the basis of a call for proposals issued by the appropriate agency (see previous chapter for governance and structural issues). Allocations would ideally be made for a multi-annual (3-5 year) period. Proposals should be sought for institutional strategies and fully costed programmes in the policy areas

decided on by the Croatian authorities. The process should be transparent, with marking schemes published in advance. Ideally, and in order to engender confidence in the process as well as ensuring international benchmarking and adoption of good international practice, the decisions on allocations should, as in some other countries, be made by an independent assessment panel with a substantial international membership. By adjusting the marking system, a competitive mechanism along these lines would also provide a means of encouraging inter-institutional co-operation, with incentives for the preparation of joint proposals. Alternatively it could impose a requirement to do so.

91. The current multi-tier tuition fee system is complex, does not appear to be equitable, in the sense of directing support to those students with the greatest needs, and does not encourage efficiency. *The Review Team recommends* a rationalisation and simplification of the current arrangements along the following lines:

- Fees should be charged to all students enrolled in the system; the level of the fees should be such as to enhance the income of the TEIs but not so high as to discourage participation in tertiary education;
- Full and partial scholarships should be awarded, on an annual basis only, to those students achieving the top tier of scores in the TEI entrance examinations, and in the annual assessments for those students continuing their studies. So far as new entrants are concerned, equity considerations suggest that the scholarships should be awarded on the basis of scores in the annual school leaving Matura examination when this has been introduced at national level;
- Full and partial scholarships should be awarded on the basis of need to students with special needs (disability, family income circumstances, etc.)
- Consideration should be given, in the form of an independent expert study, to putting in place arrangements, perhaps in co-operation with private banks, to introducing an income contingent student loans system along the lines of the Higher Education Contributions Scheme (HECS) long since developed in Australia, which allows students to borrow funds for their tertiary education costs and to defer repayment until such time as they have the financial resources to do so. Care should be taken to develop a scheme which reflects conditions in Croatia
- The authorities should explore the possibility of giving targeted tax relief on tuition fee payments to employers, and to employees and self-employed persons pursuing tertiary education; and
- A process should be put in place to phase out the payment of subsidies for meals and student accommodation to institutions, replacing them with direct payments to needy students. At present all students, including those with higher incomes, benefit from these subsidies. Ideally, these subsidies should be directed to the students themselves in the form of direct payment support for living costs. They should be based on need rather than as an entitlement applying to all students. This will enable such funding to be focused on those students with the greatest need.

92. State support for capital investment in buildings has been increased during recent years and a new financial model has been developed, initially in the University of Rijeka, and then extended to other universities. Funds were borrowed from commercial banks by the University, which received an interest subsidy from the state. Financial innovation should be encouraged, but care needs to be taken, and rigorous risk assessments and financial projections carried out, so that the state or TEIs do not incur unexpected or imprudently assessed risks. Such risks could arise, for example, where repayment schedules were based on expected cash flow receipts from greater fee income from increased enrolments, without sufficient regard being paid to the higher costs which would also result from the increased enrolments.

93. *The Review Team recommends* that state support and contributions for major new capital expenditures should be allocated through competitive processes between the institutions, on the basis of well established criteria and with a transparent marking scheme and independent evaluation. Inter-institutional cooperation in preparing proposals and the securing of counterpart finance from the private sector could be encouraged or required by the design of the marking scheme, and the rules of the competitions.

CHAPTER 5: ASSURING AND IMPROVING THE QUALITY OF TERTIARY EDUCATION

94. This chapter describes the current situation in Croatia with regard to quality assurance in tertiary education, before analysing the principal challenges needed to improve the quality of tertiary education; it concludes with implications and recommendations that may be drawn from the analysis.

The present situation

95. As a general observation, there is full commitment in Croatia to the principles of the Bologna Process in respect of the improvement and assurance of quality in all aspects of tertiary education.

96. It is widely believed in the Croatian higher education policy community that European integration and the Bologna Process will lead progressively to higher quality teaching and learning, and this priority is being taken seriously. There is also awareness that, as students bear an increasing cost of studies, universities will need to demonstrate continuous improvement. In accordance with the Bologna Process, there is increased emphasis on dedication by faculty members of significant hours to good teaching. In particular, there is a belief that access for students to professors is improving, and that accountability of professors is also getting more attention.

97. With respect to research, there is awareness that the quality of research will be critical to economic and social development, and to the local engagement of regional institutions. There is optimism about recent improvement in both the quality and quantity of research, in a number of disciplines.

98. The effect of the Bologna Process on teaching and learning is observable on several levels: requiring and monitoring the attendance of students, which has improved; a better success rate at examinations; completion of regular and ongoing assignments by students in addition to fixed examinations; improved curricula in adjustment to the harmonised requirements of the Bologna Process; greater emphasis on service to students; and the establishment in some institutions of units for quality management, including occasional international evaluation of quality.

99. However, these positive general impressions are counter-balanced by the following less affirmative specific issues and problems.

- There is divergence between policy and practice in quality assurance

100. The Higher Education Laws of 1993, 1996 and 2000 introduced what would appear to be an adequate national system of quality assurance. It quite properly defined two separate aspects of national quality assurance as accreditation and quality assessment. Quality assessment included the necessary elements of self-assessment, peer review, site visits, external evaluation, and participation by experts from abroad.

101. However, this OECD review found little evidence in practice of these procedures. Also few examples of systematic policies to improve teaching and learning were found in Croatia's TEIs.

- There are only limited instances of review of quality and standards

102. Although there has not been national implementation of a quality assurance framework, there are instances of quality assessment. These have generally occurred at the discretion of individual units or professors, and focus on student surveys, not on learning outcomes. Some institutions have introduced ISO standards. The University of Rijeka has established a pan-university programme of quality review, including surveys and a quality promotion office.

- Constraints on the development of quality assurance

103. The following constraints on the development of quality assurance that were noted in the Country Background Report were also observed by the OECD Review Team:

- Absence of indicators of quality, at both institutional and national level;
 - Lack of awareness of concepts of accountability and self-assessment among academics;
 - Only vague awareness of quality as a collective responsibility of the institution;
 - Resistance to academic self-evaluation;
 - Quality reviews limited to student questionnaires, with little emphasis on measures or other evidence;
 - Little or no involvement of social and regional partners in assessment of either quality or relevance;
 - Scepticism at all levels of institutions regarding the usefulness and impact of current quality reviews, and of the national accountability body; and
 - Quality assurance does not appear to be at all central to the strategic planning process of institutions.
- ASHE and NZZ

104. Two new organisations have been established for the evaluation of quality, particularly in connection with scientific research: the Agency for Science and Higher Education (ASHE), and the National Foundation for Science Higher Education (NZZ). Both may help expedite the development and coordination of a national network and processes for quality assurance.

- Quality and the regional engagement of institutions

105. There are several links to be made between regional engagement and quality assurance. A positive impression from the universities in Split and Rijeka is that improving quality in those institutions – notably through smaller student numbers – may be drawing in students who might otherwise have chosen to study in Zagreb. If this becomes the case, then the enhanced quality of regional institutions may mitigate the historic and existing imbalance between the University of Zagreb and Croatia’s regional institutions (see also Chapter 7).

Issues identified by the Review Team

From absence of QA to over-ambitious central endeavour

106. The history and culture of tertiary education in Croatia appears to be centred on the art of teaching, and the perspective of the teacher, in contradistinction to the needs of the learner. This is reflected in the following issues of quality assurance identified by the OECD Review Team.

107. As to a methodology and processes for quality review, there is an absence of systematic and nation-wide methods to assess and ensure quality in teaching, research and community engagement. There have been sporadic and localised attempts in various institutions to monitor quality, particularly by the establishment of quality assurance boards, by international reviews, or by administering student satisfaction questionnaires. However, there is no complete quality assessment process now in place; isolated attempts at quality review have not focussed on learning outcomes; and results have not been widely disseminated, or formed the basis for reform and improvement.

108. There appears to be confusion regarding quality assessment, and an absence of systematic self-assessment of programmes, departments, faculties and institutions, which can become the basis for external review. Some TEI staff confuse the need for institutional self-assessment and external review on the one hand, with isolated studies of current quality at any particular point of time, on the other. It is essential in any adequate system of quality appraisal that reviews be periodic; that there be external reviewers; that self-assessment precede external review; and that quality assurance processes be validated by an external agency.

109. On the few occasions when an external or international review has been conducted, the results have not been broadly circulated or discussed. The most obvious example is found in the number of reviews that were conducted over 18 months as a means of initial accreditation of existing programmes. Some 815 programmes were accredited over a mere 18 months. Some involved external and international review. It is remarkable that such a number could be seriously undertaken in such a short space of time, given the limited resources for this function; and questionable whether any improvements suggested by such reviews would have been adequately discussed and taken into account in the assessed programmes. It is likely that any attempt by a central agency to review directly the quality of programmes, rather than insist on the integrity and completeness of a periodic quality review process, will be defeated by the magnitude of the task.

The relationship between student status, enrolment and quality

110. A large proportion of students in most branches of undergraduate study fail to complete each year. As a result, the majority fail to graduate in the prescribed time; and the average duration of study for undergraduates is 7.5 years.

111. As an example, at the faculty in the University of Split comprising physical and natural sciences and kinesiology, only 48% of first year students completed the academic year 2004-2005. The average number of years to graduate from that institution in selected disciplines was: Biology and Chemistry 6.7 years; Mathematics and Physics 8.8 years; Mathematics and Computer science 7.5 years; Kinesiology 7.4 years. Only a small minority graduate on time.

112. For Croatia as a whole, the Split experience is the norm. Only 10-15% of students graduate on time; annual graduation rates have never reached 50%; and the average time to graduation for 4-5 year programmes is 7.5 years. This represents a considerable waste of resources, is detrimental to the quality of teaching and learning, and undermines the morale of TEIs.

113. The reasons for high rates of non-completion or late completion appear to be linked to the social and especially the economic benefits of being a registered student. Any costs of student status may be outweighed by advantages. In a country with high unemployment, particularly among young people and outside Zagreb, remaining a student may be more beneficial than going on into unemployment. In addition to economic benefits, the social advantages include avoiding the stigma of unemployment not suffered with the long-term student status accepted by family and friends; and the advantage of not remaining at home, while allowing for the possibility of eventually obtaining higher qualifications.

114. Several interacting factors related to non-completion or late completion may lower quality. On the one hand, unmotivated students – with guaranteed continuation of studies even after failure – may attend classes less frequently and approach studies with less seriousness, thereby negatively affecting the learning experience of others. On the other hand, faculty members may be demoralised by low rates of student attendance and attention. Some professors may believe that teaching of high quality, as a result of these external factors, will in any case prove ineffectual. This perception will impair or prevent commitment to teaching excellence. The perception can itself evolve into a rationalisation by professors for the occasional poor behaviours noted by student groups: professors not attending to their lectures while working on contracts in other institutions (moonlighting); unmotivated faculty; and lack of professional behaviour; lack of responsibility towards students and the institution.

115. These negative influences are likely to be mutually reinforcing: unmotivated students and professors create a self-perpetuating dynamic which is inimical to the overall quality of tertiary education in Croatia. The negative dynamic is also reinforced by funding systems that support institutions in proportion to the number of enrolments, with a rigid remuneration system for professors, as civil servants, that has little propensity to reward excellence in teaching. There is no incentive for universities and polytechnics to graduate students on time, or, indeed, to graduate them at all.

Accreditation and quality review processes

116. There is a national body, accountable directly to Parliament, with the remit to assess and accredit individual programmes and degrees, while not yet accrediting entire institutions. This model raises several issues:

- a) Thoroughness and utility of the review process
Doubts cannot but be raised about the thoroughness of a national accountability body that accredits 815 programmes in 18 months. Although these reviews appear to have utilised foreign reviewers appropriately, given the relatively small size of the Croatian system it is not helpful that they are cited as proof of quality by units within institutions, thereby giving the appearance of absolving institutions from responsibility for quality.
- b) It is not clear that departments as well as programmes are accredited through external review.
- c) Industry and local community organisations do not appear to be involved in quality assurance processes, even though they are clearly relevant, especially to regional institutions.
- d) There does not appear to be systematic accreditation of institutions, which is a function more appropriately carried out by an apparatus of the State than is the review of programmes within institutions.
- e) In a context in which State reviews appear to absolve institutions of their responsibilities, there is no culture of self-assessment by programmes, departments and units. As noted above, there is conflation in many units of two distinct concepts or issues: the existence of quality; and the

existence of a systematic, statistical and methodology-based approach to the assessment of quality.

- f) In many components of the system, there is also insufficient understanding of the need for audit of the quality review processes that are created by institutions and their faculties and departments.

117. Another perhaps recent problem resulting from rapid growth and change with limited resources for tertiary education is the operation of faculties as profit centres. Because universities are fragmented, individual units, faculties and departments are able to raise additional funds by enrolling larger numbers of fee-paying students than they can adequately teach or train. In one example of such a profit centre, a programme in nursing was closed because students received diplomas even though they were not properly prepared for the profession.

118. The existence of profit centres may directly reduce the quality of teaching and learning. The negative impact on quality of profit centres may be mitigated by functional integration of faculties within the institution, and by the advent of systematic quality review.

How to manage quality effectively?

119. In the current environment, it is not clear whether positive or negative assessments of quality have any consequences. This is itself a factor diminishing interest and confidence in the importance, process and outcome of a review.

120. Disjunction of assessment from consequences can be felt at both individual and collective levels. At institutional or unit level there appears to be no connection between evaluation and financing. Instead, enrolment and fund-raising through commercial loans (which recognise an entrepreneurial spirit) continue to dictate levels of financial support, although they may both exercise in some cases the unintended or perverse consequences on quality which we have noted. Similarly, at the level of the individual, faculty staff, as State employees, have little incentive to demonstrate commitment and quality, especially in teaching. Instead, financial incentives lead naturally to over-commitment to various institutions, and therefore under-fulfilment of responsibilities to some departments and students.

121. In any tertiary education system the quality of management collectively and individually will impact on quality. In this regard, two issues present themselves in Croatia. First, academic administrators, although elected, appear to exercise authority with few constraints or oversight by appropriate committees and through other internal structures. Thus responsibility and accountability are not adequately shared. In addition, it is not clear that all academic administrators are adequately prepared and trained for a leadership function. Second, rectors continue to lack authority over fragmented faculties. This gives them only limited influence in relation to raising standards and quality.

122. To summarise the issues identified by the Review Team, there is a shared understanding of an imperative of quality, and a commitment in principle to European models and standards. But there remain many impediments to establishing the mechanisms that will enable quality to be established and maintained.

Implications and recommendations

What then should be done now to enhance the quality of tertiary education?

123. *The Review Team recommends* the continuing implementation of the Bologna Process. Although Croatia faces significant challenges in its attempt to ensure quality, the general commitment to implementing Bologna throughout all parts of the system is a source of continuing strength and a basis for

optimism. As an anchor for further progress and reform of the system, commitment to implementing the Bologna Process provides an essential focal and common reference point for both policy-makers and partners in higher education. As such, it merits continuous strong emphasis.

124. Creating *a culture of assessment and accountability* in Croatian tertiary education is a long-term, stepped process requiring vision, leadership and commitment over time. The creation of such a culture is the best guarantee of future quality.

125. *The Review Team recommends* the following measures with respect to evaluation frameworks:

- a) The national accountability body should be responsible for accrediting institutions, not programmes. Its primary role should be to ensure that both new and existing universities and polytechnics have the mission, mandate, relevance and quality required to ensure success and integration of both the national system and regional institutions. Accreditation of institutions will also facilitate functional integration.
- b) There should be a national body, at arm's length from government, with the remit to establish clear processes and methodologies for periodic review of programmes, departments and units within all institutions. This body will not assess quality; but it will audit the thoroughness and appropriateness of the evaluation of quality, and prepare a framework for periodic assessment. Alternatively, given the limited size on the Croatian public administration and its available human resources, there may be a case here for a unitary approach combining with the responsibility in (a) above.
- c) Each assessment of quality should commence with a self-assessment, conducted by the academic unit being evaluated. This process will over time engender a culture of assessment and quality within each institution, together with a sense of accountability and responsibility. Cyclical quality assessment should include modules, entire curricula, learning outcomes (including employability skills) and examinations.
- d) The self-assessment should be followed by an external review, involving peers both from within Croatia and from abroad.
- e) Industry and local community organisations should be involved in the assessment process. This will serve to enhance both relevance and quality, and will connect institutions better to their regions.
- f) Each review should entail recommendations for improvement. There should be audits of implementation of these recommendations.

126. The general thrust of these six recommendations is to strike a balance between the role of the State and that of social partners, in creating a sustainable and efficient model of quality assurance.

127. *The Review Team recommends* that there should be clear differentiation between quality review processes which are intended to be formative and those that are summative. Periodic reviews and self-assessments are generally intended to be formative and would not have financial consequences. Financial consequences or closure of programmes or modules may occur when recommended changes are not implemented after a reasonable period of time.

128. *The Review Team recommends* that Croatia should seek to reward good teaching, and fund teaching and learning. Croatia should examine systems in other countries for recognising and rewarding excellence in teaching, including provision for promotion and other incentives for teaching.

129. Croatian institutions should also explore different models of institutional centres for teaching and learning. These are common in many countries. The primary goal will be to shift from teacher to learner-centred provision of tertiary education. Government funding should recognise and substantially assist the establishment of such centres in all Croatian universities and polytechnics.

130. Conversely, sanctions should be introduced at institutional level for teachers who neglect their responsibilities or behave unprofessionally. These sanctions must be implemented systematically across the country; and, because professors are State employees, government will need to be involved in establishing and enabling this system.

131. As to the quality and financing of tertiary education, it is clear that current practice in financing TEIs and their students can detract from its quality (see also Chapter 4 on resourcing). We have identified as principal issues: incentives for students to continue in this role, rather than to complete; incentives for professors to disperse their teaching energies, rather than provide more high quality teaching in their home institution; and the existence of profit centres which inflate enrolment in domains that may not be priorities, and may not offer adequate quality.

132. *The Review Team recommends* that the Croatian authorities consider:

- a) Limiting the number of years that students may remain undergraduates. Reduction in the number of months and years permitted could be introduced progressively.
- b) Reducing progressively the financial incentives to remain a student.
- c) Introducing financial incentives to both students and institutions to graduate on time, in the context of an adequate system of quality assurance.
- d) Allowing professors to teach in other institutions only with the support of their institution of primary affiliation.
- e) Possibly integrating the remuneration of professors from various institutions in a single income stream, so as to reduce the propensity to disperse their teaching, or if more practicable, using individual employment contracts setting out the teaching, research, administrative and development requirements for all members of academic staff.
- f) Accelerate functional integration, so as to reduce incentives for the creation of autonomous profit centres; and provide that a substantial proportion of revenues generated by individual university units be taken into the central administration, to be integrated within the general budget.

133. *The Review Team recommends* that the national committee of rectors work with the Government of Croatia to generate recommendations for a participatory faculty and departmental structure for universities, which would facilitate the sharing of responsibility and accountability. These structures would be proposed to all institutions by their rectors, but not imposed by government.

CHAPTER 6: EQUITY AND TERTIARY EDUCATION

The present situation

134. The proportion of young people entering tertiary education has grown rapidly in Croatia, as in many other countries, in the transition from elite through mass and on towards universal tertiary education. A high percentage of school-leavers now enter tertiary education: 59% of 18 year olds are in tertiary education (Background Report p. 15). A very high proportion of those who complete school in gymnasias go on to tertiary education, whilst a much smaller percentage from vocational schools do so.

135. There are few data on the characteristics of those who enter tertiary education, and on whether some groups are under-represented in tertiary education. In particular, it is not known whether there is a significant differential access rate by social class, or income, or even, for certain, in relation to age. However, it appears that very few students enter at an age much beyond eighteen. Essentially, going to university to obtain a degree in Croatia is for young people leaving school, and not something seen as open to older people seeking a 'second chance'. In respect of gender, more women than men are in tertiary education. There is a marked gender bias in subject of study, with far fewer women studying engineering and computer science, and far fewer men studying education, humanities, social sciences and social services.

136. Formally speaking lifelong learning is a priority of the Croatian government (Republic of Croatia 2005, pp. 20-21). The interpretation of lifelong learning by the tertiary sector however appears to be limited to providing further education to professionals and graduates. Enabling those who have never received tertiary education to enter the system receives little consideration. Although students may enter university at any age, entry qualifications are essentially geared to school-leavers. The OECD Team was unable to identify any access courses, that is to say courses designed to enable people beyond school-leaving age to return to education and qualify to enter tertiary education.

137. The provision of tertiary education varies across the country. About 50% of all student places are in Zagreb. Most young people study locally, and this is encouraged by the funding system for individuals, and the limited availability of dormitory accommodation. The government has been working to improve the geographic spread of tertiary education, through the establishment of new universities and polytechnics. However, the range and extent of provision remains concentrated, with a strong bias towards the capital resulting in differential access and choice across areas of the country.

138. Lack of data meant that the size of the impact of this concentration could not be measured. It seems likely however to reduce choice for all students wishing to study outside Zagreb and to reduce participation in tertiary education particularly in the more remote rural areas and islands.

139. A small number of private tertiary institutions have recently been established. There is no information on the quality of education or the social mix at these institutions relative to the publicly-funded sector. As full fee institutions, it may reasonably be assumed that they cater mainly for the more wealthy middle class students.

140. In general, financial support for students is a mixture of the following:

- Universal support for all students, in particular subsidised transport, subsidised meals and income tax reductions;
- Universal support for students in the public sector via subsidised fees;
- Merit-based support via fee remission and dormitory allocation;
- Needs-based support for maintenance via grants; and
- Targeted support, as for the children of war veterans.

141. In the public sector, full-time students receive either 100% or zero fee remission. Remission is based on academic excellence in the university entry test and school performance. Fee remission is common, with 47% of students not paying fees (Background Report p. 153, Table 6.4). Part-time students pay lower fees, but receive no remission. Fewer than 10% of students receive maintenance grants.

142. We have noted already in this Report that the average period for degree completion is substantially longer than the required course length, and that many students fail to complete. As compliance with Bologna takes effect, these low completion rates are expected to rise. However, there is little information on how course time and dropout vary with student characteristics, in other words whether early or late completion, and withdrawal, carry a significant equity dimension.

Issues for policy consideration

143. A number of issues are prominent in respect of equity. The following six merit special attention.

- There is a strong weighting of tertiary education towards the young, and against mature age students;
- Funding is based largely on merit and not on need;
- There is a marked, if undefined, regional differential;
- There are gender differences in subjects of study;
- There is a growing private sector, with access based on ability to pay; and
- There is a general lack of key data on student characteristics as a basis for making policy.

Mature age students

144. The Croatian government has a commitment to the concept of lifelong learning. There is a range of provision in place to support learning amongst older age groups (Background Report, Chapter 6). However, provision tends to be concentrated on low-level skills (e.g. literacy) or on skills for employment, rather than on entry to tertiary education. Only 12% of the population have had tertiary education (Background Report p. 8), and tertiary education is substantially subsidised. Despite the large group of older people without tertiary education, and the need for reskilling, there appears to be little or no consideration that lifelong learning might extend to degree studies for older people. Moreover, the system of access and funding favours school-leavers, and there does not appear to be specialist support to assist mature students to enter tertiary education.

145. Entry is based on an entrance examination and school performance. Without specialist courses to prepare older people for the examination, older applicants will naturally be disadvantaged, compared with school students. Such courses (called access courses in the UK) do not appear to exist. Moreover, fees remission is based on performance in the entrance examination, thus reducing the likelihood of mature age students having their fees paid. Finally, mature age students may prefer and need to study part-time, combining work and family responsibilities with study. Despite the number of part-time students, the system of part-time study does not appear well adapted to this. Whilst some teaching is provided in the evening or at weekends, students are expected to pursue the same number of courses per year as full-time students. Moreover, part-time students receive no fee remission.

Funding based on merit, not need

146. The funding system is primarily based on merit judged by performance using tertiary education entry criteria. Only a small amount of funding is based on need in terms of family income and the need for dormitory accommodation. This approach is inequitable, although we lack the data to know the exact impact. Part of the funding will no doubt be going to students who do not need financial help to be in tertiary education, whilst others will be excluded from tertiary education because of the cost. Moreover, the award of fees remission through a single 'all or nothing' system seems fundamentally unfair: one higher or one lower in the ranking determines whether all or none of one's fees are paid. In addition, since school quality is almost certain to vary, those who went to less good schools will tend to be financially disadvantaged throughout their tertiary education.

The regional differential

147. Despite the expansion of tertiary education institutions already achieved, and the further expansion planned, tertiary provision seems likely to continue to be highly concentrated in Zagreb, and provision elsewhere to be much more limited. This will continue to restrict access to tertiary education for some of the population, and will restrict choice of type of course. In particular, the range of subjects offered outside Zagreb is limited, and access to both university and polytechnic courses will not always be available.

Gender differences in subject of study

148. In common with other countries, there are substantial differences in subjects of study by gender. The imbalance is extreme for engineering, computer science and education. Whilst this may arise from genuine differences in subject and career choice, it is likely also to stem from gender stereotyping, which it will serve to perpetuate. This will in turn have implications for gender differences in graduate employment and earnings, and so for gender inequity throughout life. Moreover, the subject differences may reflect differences by professional and academic study, with their own implications for employment and earnings. For these reasons, it is important that action be taken to reduce the gender differential in subject choice.

The growth of the private sector, with access based on ability to pay

149. Owing to their newness and the lack of data, the implications for equality of the establishment of private tertiary education institutions are difficult to assess. Certainly, they offer those who can afford it greater choice, and this alone has implications for equality. Whether they offer a higher quality of education or not is unclear. At least they might offer places to students who could not have gained a place in the public system. It seems unlikely, however, that this is their function. More likely, for the students that they take, they offer a better quality of education, and / or better access to jobs. This is not to say that private sector education is in general better than that in the public sector, rather that it is better for some students. Certainly, the Review Team learned during its visits that some private schools stress smaller

classes and more personal attention. Thus, whilst the growth of the private sector may be considered a means to bring more finance into tertiary education, it is also likely to have long term negative effects on equality, as children from wealthier families are able to access more suitable education.

Lack of data on characteristics

150. The Review Team found itself unable to comment on some aspects of equality because of lack of data. Notably, we have not commented at all on accessibility and provision for disabled people. However, there appears to be an almost complete lack of information to assess whether and how social background, notably family income, but also parental education, affects access and tertiary education achievement. This information is important to assess the extent to which the system of student support should be based on need, as well as or instead of on merit.

Implications and recommendations

151. In general, *the Review Team recommends* that the emphasis in funding be placed on need, not merit. That is to say, there should be means-testing for young students based on family income, and for mature students based on own income, together with additional consideration given where study takes place away from home. Although continued funding, based on need, might also take into account annual performance in tertiary education, this places unequal stress on poorer students, a stress not placed on their richer colleagues.

152. *The Review Team therefore recommends* that funding be based on need throughout the tertiary education, but that the institutions themselves no longer allow extensive repetition of failed courses. Consideration could be given to introducing re-sits for failed courses within one or more months of failure, rather than the whole course being repeated. Failure at re-sit could result in leaving the whole degree programme.

153. Should this recommendation not be implemented and funding continue to be awarded on merit, the *Review Team* recommends that the system of determining fee remission and other financial assistance for the whole tertiary education course on the basis of performance prior to entry be changed. Financial assistance should be reassessed annually, based on the previous year's educational performance. This would enable those who performed less well at school, but well at university or college, to receive funding. However, as we have already commented, this approach places poorer students under greater stress.

154. *The Review Team recommends* that provision be significantly improved for mature age students, to enable older people to gain degrees and improve their skills. In making this recommendation we are mindful of the calculation of lower return on investment in higher education with fewer years less to earn, but also of the wider economic and equity benefits that a change in this direction may be expected to yield.

155. In particular, the Review Team recommends that:

- Information, advice and guidance be provided about returning to learning and to take a degree;
- Access courses be provided, both to prepare older people for a return to study and to prepare them to meet tertiary education entrance requirements;
- Consideration be given to introducing an alternative entrance requirement for older applicants; this might be based on performance on an access course, for example, or on credits for experience;

- In respect of part-time modes of study, part-time and full-time study to be treated similarly in respect of funding support; and
- Changes be made to the study patterns to allow part-time students to take their course over a longer period, with teaching organised to better suit those who are employed or have caring responsibilities.

156. Should the Review Team's recommendation that funding be based on need not be implemented, and funding continue to be awarded on merit, *the Team recommends that* different funding criteria should be used for young and for mature students to reduce the disadvantage suffered by mature students in the present system; either other criteria, such as performance on access courses or previous experience, might be used for mature students, or the score required to gain funding might be lowered for mature students.

157. Addressing the regional differential is difficult (see also the next chapter). Not all courses can be provided locally. The establishment of new institutions is helping to address this. Consideration might also be given to the redistribution of some tertiary provision from Zagreb. This would be a major structural change, requiring the movement of academic staff. Another approach would be to increase student support, particularly through dormitory provision, to enable more students to study away from home. However, this approach is costly, and could have detrimental long term effects, by encouraging movement away from less developed areas.

158. Perhaps most effective, and without detrimental social and economic side effects, is to develop distance learning, so that students may access lectures and seminars remotely, and converse with their professors. This approach could be used to allow remote access to all courses which do not require practical work, and therefore reduce the need for such courses to be provided in institutions throughout Croatia. Local tertiary education provision might be more concentrated in subjects requiring practical work. Where local tertiary education facilities cannot be provided, and insofar as it is feasible, practical work might be provided in other local facilities, or through block periods at the tertiary education institution. The Review Team noted that distance learning approaches were being developed already by some faculties, and *recommends* that this be further developed and extended.

159. Addressing gender stereotyping in subject choice is difficult, and takes time. Primarily, work needs to be undertaken in schools to encourage girls to pursue the sciences and boys to pursue the more 'caring' professions and studies. Careers education is important. The Review Team was led to understand that this is at a rudimentary level in schools. Tertiary education institutions can also help, by liaising with schools to encourage both boys and girls to undertake less traditional subjects for their gender. Institutional approaches may be supported more widely through media campaigns showing women and men in non-traditional jobs. However, choice may also be governed by expected earnings, and may therefore not occur in the absence of changes in the pay structure. Here, as so often, links with the labour market can be crucial (see also Chapter 9).

160. The Review Team concluded that there is a need for better data to enable inequalities to be properly identified and addressed. We understand that a comprehensive tertiary education database is being developed, and that this will include data on student characteristics. *The Review Team recommends* that a system of regular monitoring and reporting be set up to analyse entry, subject, type of institution, dropout and completion by age, gender, home location and disability. Further, *the Team recommends* that entry rates (i.e. percentage of the relevant population entering tertiary education) be monitored by home location.

161. The Review Team concluded that there is an urgent need for better data, to enable an assessment of the effect of family income on participation and success in tertiary education, and *recommends that* this be treated as a high priority for policy research and development. This would assist in determining the

extent to which student support should be based more on need and less on merit, and also the structure of such funding. Consideration should also given to whether, in the longer term, relevant data could be collected and held on the tertiary education database, and form part of regular monitoring.

CHAPTER 7: THE REGIONAL ROLE OF TERTIARY EDUCATION

162. The contribution of universities to regional development has risen steadily on the agenda of national policy-makers and, both coincidentally and consequently, of many institutional leaders in recent years. It features strongly in OECD work in higher education, and has become a priority for some central governments which seek to alter or influence the work of TEIs. What is sometimes called third stream funding has been introduced in places to redirect some academic endeavour towards the exploitation of research, the more direct application of knowledge, and a better teaching response to changing labour market needs. These themes are considered in general ways in the two chapters following this one; here we focus on the region and its needs in Croatia.

163. This chapter therefore first describes the current situation with respect to the regional role of tertiary education in Croatia, before analysing the principal challenges needed to improve the quality of regional engagement; it concludes with implications and recommendations that may be drawn from the analysis.

The current situation

Regional imbalance

164. A significant historic imbalance between the large and long-established University of Zagreb and the country's regional universities and polytechnics continues to characterise Croatian higher education, even with the recent establishment or growth of several regional tertiary institutions.

165. Zagreb's preponderance is expressed in many ways. These include:

- Number of students - over 50% of all tertiary students in Croatia are enrolled in Zagreb institutions;
- Two thirds of Croatian higher education academic staff are employed in Zagreb, only a third outside; and
- Over 70% of early stage researchers are employed in Zagreb, only 28.5% at tertiary institutions outside; this restricts the pool of potentially fundable regional research. Indeed, only 20% of research funding is allocated outside Zagreb, both for basic research and for technology funds.

166. This is one of the most severe imbalances favouring the capital city to be found anywhere in the developed world.

New institutions of higher education in the regions

167. The recent and current periods are characterised by the establishment of new regional institutions – both universities and polytechnics – and also of Research Institutes. As is familiar elsewhere, a common pattern for the emergence of new institutions is that, after some uncertainty and tension over role, staffing, and funding, they begin as offshoots of existing institutions. Thus the universities in Rijeka, Split and Osijek were founded on initial extension of the University of Zagreb. Similarly, the Dalmatian role of the

University of Split is now tempered by the emergence of tertiary institutions in Zadar and Dubrovnik, while in Istria, Pula is struggling to establish some autonomy from the home institution in Rijeka.

The regional role of the new institutions

168. Regional institutions appear in response to one or more of three challenges:

- Pressure to enrol students from outside Zagreb in tertiary institutions closer to home, combined with the attractiveness of study for young people who, in a country of high unemployment – especially outside Zagreb – may not otherwise be gainfully employed;
- The need to produce graduates with skills required by a labour market transformed throughout Croatia by the decline or disappearance of heavy industry and of large, often state-supported, firms; and
- The imperative to link higher education more closely with regional economic development.

Differentiation of TEIs

169. Key goals for establishing or expanding regional institutions are related to skills acquisition in support of local economies. The adoption in 1993 of a binary system of tertiary was intended, in part, to strengthen regional capacity by clearly indicating polytechnic schools as the locus for vocational and certain types of professional education. In accordance with these goals, a system of seven polytechnics was established in the 1990s, of which five are located outside Zagreb.

170. However, the process of differentiation has produced considerable confusion and tension. Funding of institutions is related to enrolment, either through state funding per student or through tuition fees. The resulting incentive to increase enrolment in new regional institutions, in the absence of adequate quality controls, led in some cases to serious erosion in quality, and to conflict. In the example of Split, insufficient control over standards made it necessary to close the polytechnic, and to amalgamate it and its students with the University of Split. In Dubrovnik, instead of remaining a polytechnic with a vocational and professional remit, the vocational tertiary institution has moved towards more traditional university status. In general, the Review Team gained the impression that scarcity of funds for infrastructure, staffing and development has meant that the polytechnics tended to be virtual or shadow institutions, their teaching heavily reliant on moonlighting by university teachers. The binary period and policy have thus been blighted by scarce resources, unreliable quality, and other unintended and unwanted consequences.

171. Private institutions have recently been permitted, in a useful attempt to augment capacity, to differentiate among institutions, and support the building of capacity. However, it appears that these institutions, being of necessity competitive and market-driven, tend to locate in Zagreb and compete with the universities, enrolling students into programmes like economics and law that are already heavily subscribed in traditional public sector institutions.

Distance learning programmes

172. Many countries with widely dispersed populations which desire to limit the proliferation of TEIs have established systems of distance learning, both for traditional education and for lifelong and life wide learning. Distance learning can be particularly effective in a regional setting (see also the comments on distance education *vis-à-vis* equity in the previous chapter).

173. In Croatia, while the approach of distance learning is appreciated, it is not yet systematic. Distance programmes are offered in various cities, mainly from the universities in Zagreb and in Rijeka.

Funding for regional engagement

174. There appears to be no identifiable core funding specifically to support the regional engagement of tertiary institutions in applied research, in regional retention of local students, or in promoting partnership between institutions and communities, and between institutions and industry (third stream funding). Nor does there appear to be any incentive for cooperation and collaboration between TEIs. Only the University of Rijeka appears to have strong and formal collaboration with regional structures, with both government and civil society, which might involve research, technology transfer, or retention of local students, and thereby support regional engagement.

175. Other institutions offer isolated examples of university-industry collaboration, but this is neither systematic nor university-wide. For example, the University of Split works with SMS (a leading producer of Mediterranean food products in Croatia), which provides practical experience and placements for its students. For SMS, the University of Split may provide expertise in specific fields of study, for example language acquisition. This expertise may be important to the continuous learning model that is in place for employees at SMS. It is acknowledged at the University of Split, however, that the institution provides a theoretical base, but very little practical knowledge for the workplace – skills that might be provided by polytechnics responsive to regional requirements. The connection between the needs of the labour market and the university is not usually made.

176. Government has however recently allocated funds for new academic and teaching staff, most of whom are in regional institutions, in the context of an impressive financial and policy commitment to all phases of the educational cycle.

177. There has been considerable investment in physical infrastructure at institutions over the past four years, and this is continuing. Although the state-supported programme is also available to Zagreb institutions, the procedure was initiated at the University of Rijeka. It involves institutions taking long-term loans from commercial banks for the purpose of infrastructure development, two thirds of the interest of which is subsidised by the Government of Croatia. The resulting system of long-term subsidised loans has initiated a large expansion of capacity both in Zagreb and in the regions. This might suggest a more patient strategy for rebalancing Zagreb with the regions, through directing new growth to the latter, rather than shifting existing resources.

Regional engagement and university fragmentation

178. Croatia's new policy of functional integration of the universities recognises as a principal objective the need for intra-university co-ordination in establishing collaboration with industry and the community. This is essential if a university is to have a common shared strategy and purpose, and the capacity to engage effectively with the community and the region, redeploying resources between faculties where this is required, etc. The change has not yet been carried through, and it is not yet clear whether there will be sufficient local level leadership and courage to see it through fully in each institution, and sufficiently to support the regional dimension of tertiary education. This, the Review Team concluded, is a vital step in putting one's house in order.

179. Nevertheless, there are important examples of emergence of cross-disciplinary and intra-university cooperation supporting regional engagement. At the University of Rijeka, rapid expansion has induced a positive general atmosphere, within which there is now emphasis on research in particular domains of existing strength: a focus on biotechnology and medicine is predicated on previously existing

partnerships with biotech industries, including monoclonal antibodies and organ transplantation. At the same time, the University is present in the community, resulting in the establishment of a foundation to support student programmes and facilities, and a teaching emphasis on humanities and fine arts which may be attractive to local students.

180. In Split there are attempts to integrate the work of the Institute of Oceanography and Fisheries with that of the University of Split. In accordance with the Bologna Process, which indicates that researchers should take on teaching tasks, there is some tentative conjoining of university and research institute. This conjunction may be traditional at the Institute, but is innovative for Croatia.

181. An end user perspective is apparent in some of the applied research of the Institute and the University, for example fisheries research carried out in partnership with local fishermen's associations. Even in this example however, functional integration is only partially realised: the Institute and the University have separate budgets and administration; doctoral studies in Oceanography are carried out at the Institute in association with the dominating inland Zagreb University, and not with the local Adriatic-based University of Split; and the Adriatic Sea project as a national priority appears to be little known beyond the Institute of Oceanography.

Six key policy issues

- *Imbalance between Zagreb and the regions*

182. Croatia has made significant efforts to address the acknowledged impediment that the heavy Zagreb-regional imbalance represents, both for regional economic and social development and for the health of its tertiary education system. However, the figures cited above make clear that the imbalance strongly endures as a structural rigidity within the country's system. It will remain difficult to address regional issues whilst the principal link continues with research institutes and industry in Zagreb, rather than with local institutions. This is a big challenge, and a vital issue extending beyond the tertiary system alone.

- *Regional remit*

183. The overall remits of TEIs outside Zagreb, with the possible exception of Rijeka, do not appear to emphasise a role in regional engagement. Although the University of Split does not specifically articulate a regional mission, components of the institution have separately displayed intent and some record of a regional development approach. Instead, mission and mandate appear to be patterned after that of large and diverse institutions characterised and dominated by the University of Zagreb. Absence of a clearly expressed regional role for teaching, research, lifelong learning and technology transfer will hamper implementation of local cooperation. Again, this implies a major policy shift, perhaps following other countries that have pushed this up the agenda by means of targeted third stream funding to provide the necessary leverage.

- *Differentiation and the binary system*

184. Difficulty in implementing the binary system has impeded the regional engagement of TEIs. A principal role of polytechnics, generally more flexible than universities, is to be responsive to labour market demand by providing graduates with skills needed on a local and regional basis. Similarly, polytechnics usually relate more easily to local employers and economic conditions. At the same time, teaching and learning in those institutions should be of equivalent quality to universities; but not duplicate either university function or university programmes. Ideally they should be 'equal but different'.

185. The location of some polytechnics within universities is confusing, and may undermine the availability and quality of the skills development and vocational programmes that polytechnics usually offer. The relative underdevelopment of systematic inter-institutional collaboration also reduces the potential of Croatian institutions to engage regionally. Two prominent examples are the lack of inter-institutional collaboration on the Adriatic Sea national priority, and the paucity of cooperation on distance learning initiatives.

186. The Croatian authorities need to be clear and purposeful in pursuit of a binary structure if this remains the choice. Some countries have opted for a binary model, some favour an integrated but internally differentiated system, and some have moved back and forth between the two. The Review Team itself had different views about what might be best for Croatia, drawing on experience of different systems elsewhere; what is important is that a policy be clearly defined and purposely carried through, in which high quality and relevance are sustained, and the diverse needs of the regions and the whole country are met in complementary ways.

- *Regional engagement and university fragmentation*

187. In Croatia today, despite some scepticism about the ability to implement functional integration within the specified timelines as laid down, or even to achieve it eventually at all, there is a widespread understanding that such integration is fundamental to an enhanced regional role. There is less consensus as to the best solution to, but still equally clear recognition of, the challenge represented by the present structure and dominant role of the University of Zagreb.

188. The present fragmentation of institutions into autonomous faculties means that strategic planning for regional contributions faces many obstacles:

- Faculty and disciplinary autonomy make it difficult for the institution to address issues collectively. Current structures presume that each individual unit within the university would have the capacity, the resources and the will to work with the surrounding community: the fragmented structure of the institution therefore weakens the institutional ability to respond to regional concerns.
- Failure to pool resources intra-institutionally reduces the scope and impact of any effort made by individual units, while also diminishing the possibility of inter-institutional collaboration on national priorities with regional implications, such as Adriatic Sea initiatives.
- Many regional issues present as problems requiring a concerted inter and multi-disciplinary approach. A fragmented institutional structure impedes both critical mass and collaborative work to solve problems, whether they are economic, environmental, social, or technical.
- Fragmentation restricts institutional ability to attract funding from regional industry, government, civil society, and international organisations, since such funding will be attached to addressing the specific issues that Croatian institutions are not currently structured to appraise.

For all these reasons, institutional fragmentation does indeed represent a, perhaps *the*, principal impediment to enhanced regional engagement. Conversely, functional integration constitutes a necessary condition for systematically exploring such engagement.

- *Funding for regional engagement*

189. Compounding these impediments to regional engagement related to university fragmentation and to unclear differentiation between universities and polytechnics, is the lack of straightforward mechanisms to fund regional initiatives. Perhaps more important is the absence of shared information and perspectives on the definition and identification of regional and national priorities that might merit specific funding on a regional basis.

190. Thus various units within different institutions assured the Review Team that their particular areas of interest are ‘regional and national priorities’, but could provide no documentary evidence of such priorities. In a context in which direction is not clearly given it is obviously more difficult for institutions to develop a strategic plan for regional engagement requiring targeted funding, even if collective institutional will exists to do so. Also there are conventional pressures on the more prestigious universities to perform as ‘world class’ research institutions. This represents at least superficially a pull away from the region, against which countervailing policy forces are required.

191. The OECD team visit found many examples in tertiary institutions and research centres that suggested incoherence between perceived national and regional priorities and the funding of those priorities. An important example on the Adriatic coast is the ship-building industry: although several organisations claimed this to be a national/regional priority, they could point to no evidence of and support for this, in policy papers, in institutional missions, or in funding envelopes for this purpose.

- *State-supported regional investment*

192. We observed above that the state-subsidised system of commercial loans has resulted in a welcome expansion of capacity in regional tertiary institutions. On the other hand, the direction of expansion does not appear to be clearly related to any regional priorities or mission. Rather, expansion appears linked to the entrepreneurial spirit of particular departments or units. As an example, the Faculty of Economics at the University of Split has impressive new facilities on the basis of such expansion. As a natural outcome of its modern facilities and heightened visibility, the Faculty is attracting many students. Yet it is far from clear that this particular discipline represents a regional priority for skills and the labour market, or a national priority, in a country apparently saturated with graduates in Law and Economics.

193. If, as appears to be the case, expansion of regional institutions is a product and an artefact of entrepreneurialism and not a result of priorities, planning and regional responsiveness, this obviously represents a serious and central challenge for the Croatian authorities and the wider tertiary education policy community.

Implications and recommendations

Functional integration

194. *The Review Team recommends* that Croatia proceeds decisively with the rapid functional integration of tertiary education in Croatia, in accordance with established policy. This constitutes an essential step in enhancing regional engagement and favouring local economic and social development.

195. Integration should comprehend all units of TEIs, and carefully link TEIs to each research centre in their geographic areas.

196. The Team recognises that there remain significant barriers to such integration, stemming from historical and traditional structures and from individual perceptions of interest. Croatia is to be complemented on taking this significant and difficult policy decision, and encouraged to complete the process of integration.

The articulation of clear regional goals

197. We have observed that various institutions, and units within institutions, have very different perceptions of regional and national priorities. Widely differing perceptions make it difficult to set regional strategic goals for institutions.

198. *The Review Team recommends* that working with its institutions, with industry and with communities, Croatia clearly indicates a set of multi-year economic, social and other goals for the system in each region. These goals should be widely disseminated and understood by all partners in the system, so that they can become the basis for regional engagement and funding.

Institutional mission and mandate

199. *The Review Team recommends* that each regional institution be encouraged to articulate clearly in its mission and mandate the regional contribution that it intends to make

Funding for regional engagement

200. *The Review Team recommends* that Croatia considers establishing specific funding envelopes for regional engagement that relate to clearly articulated and widely disseminated priorities. These envelopes should be for research, for teaching and learning, and for community contribution or ‘third stream’ funding for regional engagement and entrepreneurship.

201. Financial support for research should emphasise trans-disciplinary approaches to local issues, and facilitate intra and inter-institutional collaboration among regional organisations. (see also Chapter 8).

Institutional Differentiation

202. Polytechnic institutions, clearly differentiated from universities according to Croatian policy, have an essential role in a number of ways. These include skills development, vocational training, lifelong and adult learning, and workplace training. They should be responsive to local employers, communities and labour markets. Healthy and independent polytechnics have a significant role in regional development and engagement.

203. *The Review Team recommends* that if Croatia favours a fully binary system, polytechnics should be disentangled from universities and charged with clear mission and mandate statements that differentiate them adequately from universities. There should be established transparent mechanisms for the quality control of polytechnics, as well as systems of university-polytechnic articulation that facilitate transfer from one system to the other. *The Team further recommends* that Croatia considers setting up a national governance body (perhaps the National Polytechnic Institute of Croatia) to support individual polytechnics, and ensure the development of cost-effective national programmes somewhat on the lines of the former UK Council for National Academic Awards (CNAA) or the Irish HETAC. Sustaining a binary system in no way absolves the universities from a regional as well as a national and universal mission.

Distance learning

204. Distance learning represents a flexible, potentially fruitful alternative in the provision of high quality teaching and learning in Croatia’s various regions. At present, the possibilities and technologies appear to be under-exploited, and not well organised.

205. *The Review Team recommends* that there be established a systematic approach to pooling resources for the development and delivery of tertiary education by distance methods. Such pooling will involve levels of government, universities, polytechnics and industry.

Regional imbalance and the creation of new institutions

206. The recent and ongoing creation of new tertiary institutions may serve to correct some of the observed imbalance. However, following the establishment of new universities now planned, it may be wise not to continue creating new, small, regional institutions in an attempt further to mitigate this problem. Other issues will arise from the creation of new institutions, further fragmenting existing establishments in the context of declining populations.

207. Instead of doing this *the Review Team recommends* implementing the six points set out above. This will serve to strengthen regional institutions organically, by augmenting their capacity, their quality, their regional relevance and their funding. In this event, further evolution towards lessening the imbalance may naturally occur, without the costly imperative to counter-balance Zagreb by the creation of more additional institutions.

CHAPTER 8: RESEARCH AND INNOVATION

Analysis of the current situation

208. The past few years have seen rapid growth and continuing development in the Croatian system of tertiary education and research. It has gained a comparatively good position in Europe, especially having in mind the difficult recent history. In institutional terms, however, it is still too inflexible. Nor is its contribution to the solution of problems in industry, society and politics yet satisfactory. Energetic reforms and financial support of a higher order than has currently proved possible are necessary in order to exploit the potential of the tertiary education and research system to the full, both for the present and at the same time to lay the foundation for further development.

209. In the publicly financed system of tertiary education and research in Croatia, the area of knowledge and application-oriented pure research is generally assigned to:

- a) Public, that is state-funded, Research Institutes;
- b) Institutes of tertiary education - universities and to a lesser extent polytechnics, and
- c) Other corporate bodies like the Croatian Academy of Sciences and health care institutions.

The private sector of R&D is formed by:

- a) Independent institutes and
- b) Corporate industrial institutes.

210. The largest sector in terms of the number of legal entities is the tertiary education sector, making up about 44% of all the R&D institutions. Together with the units that belong to the government sector these two sectors comprise 77% of all the research institutions in Croatia. The state sector is, then, the largely dominant sector in the Croatian R&D institutional system.

211. Tertiary education and government sectors combined thus employ the vast majority of researchers in Croatia, almost 85%. Accordingly, the business sector employs a modest 15% of the researchers, indicating a serious structural imbalance in the Croatian R&D system compared with most modern states. The Ministry of Science, Education and Sports is trying to rejuvenate the research staff in both universities and state institutes, while also supporting the initiation of more young researchers into the corporate private Institutes. It is regarded as encouraging that, despite modest resources for research at the national level, the number of young scientists is increasing each year. So also however is the imbalance between the public and the private sectors in R&D. Almost 70% of young researchers are located at universities and about 20% are at public institutes, while the remainder are affiliated with institutions like research units at hospitals, the Croatian Academy of Sciences and Arts, and private industrial institutes.

212. This imbalance need not be a competitive disadvantage *per se*. Pure research that has vitality and is well funded is the means by which science increases knowledge and discovery undertaken in an atmosphere of self-determination and responsibility. It is also a clear prerequisite for strengthening the

contribution that science can make to solving problems in the economy and in society. Croatian universities are deeply rooted in this European tradition of academic freedom and curiosity-driven academic research. The organisation of research projects, evaluation criteria and financial support mainly favour scientific excellence and fundamental research. Reinforcing the application orientation of research does not necessarily mean reducing pure research; rather the need is for better utilisation of its potential for solving economic and societal problems. The commercialisation of science through scientific cooperation (e.g. research contracts) or spin-off companies is still a very new practice in the Croatian academic community, and on a modest scale.

213. Co-operation between the state, industry and the academic community requires strong and equal partners in the research market. However, due to the decline of the manufacturing industry during the past decade, the demand of Croatian enterprises for R&D and innovation, and business interest in utilising technological achievements, have been substantially reduced. While promotion of application-related programmes is primarily a task of the state, the demand-pull from the private sector is an important factor for the volume and for the direction of research in the public sector. In the last six years the business share in financing R&D in tertiary education is almost constant, and amounts to approximately 7%. The Review Team found strong indications that the Croatian business sector is ready and anxious to cooperate. The institutions for tertiary education are not yet really used to it, but they did display to the Review Team quite keen interest in increased research cooperation with the private sector.

214. At this point another important element of the reform process in the Croatian tertiary education system comes into the picture - the introduction and implementation of the Bologna process. This seems to be one of the two most important political goals for the system of tertiary education, the other being the introduction of a binary system of universities and polytechnics. It is expected that the new polytechnics, to be set up to support regional development, will take 50% of all Croatia's tertiary students.

215. The role of research for this type of tertiary education is somewhat unclear. According to the law, polytechnics are not expected, and not even allowed, to carry out research. (The polytechnics and the binary policy and also considered in the previous chapter.) The increased teaching load which goes along with the implementation of Bologna directs attention, time and funds away from R&D. This may have a negative impact on the propensity of university and especially polytechnic professors to do research, hampering more active research cooperation with the private sector. This seems even more of a prospective problem, since the Review Team could find no explicit R&D strategy for the tertiary education system. Research activity initiated and carried out on an individual basis by professors, mainly because it is regarded as a source of income additional to their modest salaries.

216. Croatia is preparing for membership within the European Union. This is the rationale for the introduction of the Bologna process in teaching and examining. But it also shapes the goals of Croatian research policy. The Declarations of the European Council in Lisbon (2000) and in Barcelona (2002) set the strategic goals to transform Europe into a knowledge-based society. This assumes that 3% of the GDP will be spent on research by 2010. Two thirds of this will be spent by the business sector. Croatia is far from being the only country that is way behind these ambitious goals. But it has a long way to go when it comes to activating the synergistic potential in tertiary education, together with public research institutes and the private system. The link between tertiary education institutions and industry has become a crucial policy issue that goes beyond standard science policy, shifting the strategic focus from research policy to innovation policy. The Croatian Program for Innovative Technological Development provides this framework for cooperation between industry and Croatian tertiary education and research institutions.

217. The Croatia Country Background Report recognises that the role of tertiary education institutions in innovation and knowledge transfer has so far been limited. There seems to be agreement on the most important criteria in knowledge transfer. These are:

- Relevance: the question is whether the research results are of relevance for scientific progress in other disciplines beyond the confines of the research area concerned, and of practical relevance.
- Application in business: the application of relevant research results in new products or services is a crucial criterion for success, particularly in practice-oriented fields.
- Research-based consulting: in many research areas, research-based consulting services are a central source of knowledge transfer for private businesses and public authorities. Imparting scientific methods and findings to the public is an important type of knowledge transfer provided by tertiary education and public research institutes.

218. The Review Team found no reason to modify or soften the strong conclusion of the Country Background Report that the Croatian R&D sector suffers from serious structural problems due to the domination of the public R&D sector over research supported by a technologically weak private sector. Whereas in other developed countries the private sector largely overshadows the public sector in both research personnel and investment, in Croatia the situation is just the opposite. Bridging this gap will be the biggest challenge for Croatian R&D policy, and for balancing teaching and research at Croatian tertiary education institutions.

Conclusions and recommendations

219. The Country Background Report states that the vast majority of researchers in Croatia are employed in the tertiary education and other government sectors. This statement seems to be based on an assumption that the scientific personnel at public research institutes fully engage in research, and on the further assumption apparently implicit in terms of employment that university professors (that is to say all academic staff) allocate half of their working time to teaching and half to research, accordingly. The Review Team found, however - not surprisingly and by no means typical only for Croatia - that many university academic staff are mainly or exclusively teachers. This seemed to be true even for science departments where most professors were responsible for the education of high-school teachers. To calculate the research capacity on a 50% assumption may fairly be described as 'research by definition' not based on evidence and output.

220. Croatia is an open country and always has been, even when it was part of Yugoslavia. It has scientists and researchers that meet the highest international standards. Many of them went abroad and some of them are now coming back. Government policy, and the policy of individual universities, encourages this most welcome brain gain. But it seems to be a fact that the division of research labour between public research institutes and universities has resulted in assigning research to the public institutes and teaching to the universities. Perhaps this split was not as clear as in former Soviet countries, where research was almost exclusively a matter for the Academies and not for the universities.

221. But a split there still is. Government policy aims to change that. Public research institutes and universities are to be brought closer together – see for example Split University and the Institute for Oceanography, as described in the previous chapter. Researchers from institutes will have to engage in university teaching, a welcome contribution to sharing the present teaching overload due to the implementation of Bologna. And university professors are to be encouraged to do research, although it is not yet clear what incentives are to be given for this reorientation. It was obvious to the Review Team that the promotion of university academic personnel is not sufficiently based on research achievements. This, of course, is difficult in a relatively small country with a rigid salary structure valid for all five, soon to be six, universities.

222. The current weaknesses in the Croatian tertiary education system with regard to R&D may be summarised in three points:

- The tertiary education system is too inflexible from an institutional perspective. Institutional and regulatory barriers hamper the dynamic development of research.
- There is far too little interaction between the tertiary education system and society. The tertiary education system does not contribute enough to the solution of economic, social and political problems. The Background Report mentions a culture gap that separates academic and other societal sectors.
- Given the comparative weakness of the private research sector, the majority of R&D potential in Croatia depends on public budget resources. The budget allocated to the Croatian system of tertiary education and research must be evaluated against that of its competitors if the acknowledged relationship between academic development and economic prosperity is to be taken in account. It seems clear (see Chapter 4) that the Croatian system of tertiary education and research is under-funded in comparison to other systems in the European and OECD world.

223. Today, the degree to which the academic, social and political spheres are dependent upon the utilisation of research, knowledge and insight has reached a new level. The utilisation of scientific knowledge is no longer a matter of choice; it has become a necessity. This applies not just to such areas as engineering, where the link to practice is clearly evident. The Review Team found good examples of this awareness at each of the universities visited: Zagreb, Split and Rijeka. All areas of contemporary academic study rely on continual contact with practice.

224. To strengthen the role of research in the Croatian system of tertiary education *the Review Team recommends* the following:

- To speed the transformation of Croatia into a knowledge society, more importance and more funds should be given to the National Foundation for Science (NFS). Here research projects will be evaluated and accepted on the basis of excellence. Less than 20% of project proposals are expected to be accepted - the acceptance quota for research projects funded by the Ministry of Science, Education and Sports currently is around 80%. The projects should be evaluated against a background of research priorities given by the Ministry of Science, Education and Sports. Research projects should cover all fields of science and the humanities. This should include support for individual projects and research collaboration, awards for outstanding research achievements, and funding for scientific infrastructure and scientific cooperation.
- To encourage cooperation and inter-disciplinarity, new Research Units should bring together researchers working at one or more locations, to carry out a specific project. The programme should provide the staff and material resources required for intensive medium-term cooperation. These units could lead to establishing new research directions.
- To create core research foci at universities, Collaborative Research Centres should be set up. These should be long-term university research centres in which scientists and academics undertake ambitious joint interdisciplinary research.
- Consider changing the Law for Polytechnics (Fachhochschulen) to allow or even encourage research activities there, specifically of the kind referred to in Gibbons *et al* as Mode 2 knowledge production. Polytechnics – the second pillar in the binary Croatian system of tertiary education – often have a technical or engineering profile. This makes them good partners for

research cooperation with the business sector. The counter-argument is academic drift, but appropriate steering and incentives towards applied research in strong industry and community partnership might mitigate this.

- To bridge the cultural gap between academics and business, the central and the regional Chambers of Commerce should take an active role in communication between universities and the economic sphere. Universities should develop their research profiles and better publicise them.
- Differentiate university professors according to their research record. Good teachers are not necessarily good researchers, and *vice versa*. Differentiation of teaching load is a good incentive for undertaking more research.
- Allow for income differentiation between professors. This is most obvious and easy for consulting work. It should be possible also for applied research in cooperation with partners from the business community.
- The research record should be an important element in promoting university personnel.
- The evaluation process of public research institutes will discover personnel at research institutes who will do a better job as teachers at universities. This will give more room for research-active professors to increase their research engagement. The Minister for Education mentioned to the Research Team the Weizman- and Max-Planck-Institutes as possible authorities to invite to perform these evaluations.
- Set up bilateral exchange and research programmes between Croatia and other countries. These programmes should be co-funded, and bring together researchers and scientists from two countries, leading to a basis for long-term cooperation and understanding – compare the Minerva Programme by Max-Planck-Gesellschaft, now running for over forty years between Israel and Germany.
- Finally, and in view of the serious imbalance between public and private sector funding of research, Croatia should consider setting up a distinct research policy review exercise, the terms of reference explicitly include the commercialisation of research.

225. The Review Team noted strong efforts by the Croatian government, by the tertiary education system, and by the private sector, to develop research and innovation activities, particularly in the fields of Information and Communication technologies, biotechnology, new materials and new production processes, medicine, environment and sustainable development. We perceived a common goal - to give research in Croatia stronger support and greater international prominence.

226. The national science system of a middle-size country needs international cooperation and competition between researchers, particularly in Europe, and the development of critical mass across national borders. We found that in Croatia the strengthening of research activities at the tertiary education institutions is seen not only as a means to develop these institutions along European standards, but also as a means to achieving other long-term goals such as economic growth, cultural and social development, and the development of scientific and intellectual potential.

CHAPTER 9: THE LABOUR MARKET

The present labour market situation in Croatia

227. The Croatian economy has been subject to massive pressures in the past fifteen years due to independence, war and the transition from a planned to a market economy. Not surprisingly, the effect on the economy has been dramatic and destabilising. Recovery since the war has been substantial, but considerable uncertainty remains about the future direction of the economy. The transition to a market economy is not complete. Future plans for the major traditional industries, such as shipbuilding, have yet to be made, and it is unclear what the future growth industries will be. Moreover, Croatia is seeking entry to the European Union, with current and long-term implications for the economy. Thus, there is substantial uncertainty about the direction of growth and the future needs of the economy.

228. Unemployment in Croatia is high. As is common, unemployment rates are lower amongst the more highly educated. Nevertheless, unemployment is still high for graduates. Job prospects of graduates vary by subject, as indicated by some partial data, but it is difficult to form a comprehensive picture of which subjects currently offer the best job prospects.

229. The educational level of the general population is low relative to the rest of Europe. Although, as a consequence of rather recent expansion of tertiary education, almost one-third of a cohort is finishing tertiary education, only 12% of the population have had tertiary education (Background Report, p.8). While the basic education is universal and enrolment rate in secondary education is not particularly low, problems exist at lower levels of education, including with relatively low levels of literacy. The Government has introduced programmes to increase skills at lower levels, as well as to expand tertiary education. Lifelong learning has been accorded priority by the government, and there has been some progress in tertiary education institutions with this, through the provision of short courses for professional development. However, neither at a governmental level nor at institutional level does the concept of lifelong learning appear to encompass enabling older people to return to learning to do a degree (see Chapter 6).

230. While unemployment remains high there may be little pressure to offer second chance education. However, a declining birth-rate and smaller cohorts coming through school level into tertiary education constitute an early problem at least for TEIs, and ultimately for the whole society. Looking further ahead, the changing demography raises questions not just about employment levels but also about skill shortages, and about a low skills or a high skills economy, where all or only a minority take part in the benefits of growth. There is also the question of full EU membership and its possible impact on the migration of Croatians abroad, which is referred to in the next chapter.

231. A start has been made to address these problems. The establishment of new universities and polytechnics has been undertaken in some areas requiring economic development, such as those devastated by the war and areas of higher unemployment. This should have a beneficial economic effect on these areas. However, tertiary provision continues to be highly concentrated in Zagreb, and provision elsewhere continues to be limited.

232. The Review Team concluded that there is a lack of formal structures for addressing and strengthening relationships between tertiary education and the labour market. At government level there

did not appear to be strategic linking between employment needs and tertiary education. Formal structures for discussion between relevant ministries were not apparent, and within the Ministry of Science, Education and Sport there appeared to be a lack of labour market expertise. Involvement of the social partners at a national level in tertiary issues is at an early stage, but this development was welcomed by the employers' organisations. Similarly, social partners had some involvement with some tertiary institutions, for example in relation to discussing their needs, and providing placements for students. The ability of tertiary institutions to admit as many fee-paying students as they can attract seems likely to result in an imbalance between the skills needed in the economy and the skills of graduates.

233. Some employers made clear to the Review Team their view that graduates are not well-prepared for employment, lacking important basic skills. The extent to which these are skills that should be provided by tertiary education, and the extent to which they should be provided by further professional training, is not clear. It is a question that Croatia needs to address, both in its own right and in relation to the division of roles within the binary system that is current policy.

234. Careers advice for young people is not well-developed. At tertiary level formal systems are lacking to provide advice and information. This will exacerbate difficulties of transition from tertiary education to employment. A number of universities have been exploring ways to address this, notably through participation in an EU Tempus project. At primary and secondary levels, lack of careers advice will have implications for the tertiary sector, through students' possibly inappropriate choice of secondary school, of secondary school subjects, between continuing into tertiary education or not, and in choice of courses at tertiary level. Guidance at each of these stages is likely to improve the motivation, and possibly the competence, of students who enter tertiary education, and so reduce dropout.

What are the implications for tertiary education policy?

235. Whilst it might be widely accepted in Croatia that a major role of tertiary education is to provide labour market skills, there is no accepted approach as to how this should be achieved. At one end of the spectrum is the free market or student choice model, whereby tertiary education provision is determined by what students wish to study. The assumptions are that students will tend to choose courses that are in demand in the labour market, and that mismatches will be addressed through provision adjusting to student demand. It assumes that students are well-informed about future career opportunities, and that the system can adapt and respond effectively to clear signals. A major problem is that student choice is based on current (or past) and not future, labour market needs.

236. At the other end of the spectrum is the centrally planned model, whereby the government predicts, and partly determines, future employment needs, and designs tertiary provision accordingly. This assumes that such needs can be reasonably well predicted. The problem with both models is that both student and governmental knowledge of future skill needs is limited. This does not mean that no aspects of future demand can be identified. A combined approach, planning provision around more certain aspects of future needs, and ensuring that future students are well informed about probable needs, avoids the more extreme pitfalls of either model.

237. However, this approach is currently hampered in Croatia due to the paucity of labour market and skill needs analyses (and data). The Croatian Employment Service occasionally conducts employer surveys, which might be a starting point for further research. The OECD Review Team found itself unable to identify and confidently recommend broad structural changes in the focus of tertiary education subjects, and in the balance between academic and professional education. We can however point up some issues which might assist future development, and recommend that they be given urgent attention.

238. The structure of the tertiary education system needs to be flexible and able to adapt to changing labour market needs. The current structure of universities with independent faculties is relatively inflexible, and inhibits change across faculties. The change to integrated universities (see also Chapter 7) will be an essential element in enabling greater adaptability. It is essential that integrated universities have the power to effect change between, as well as within, faculties.

239. Whatever the model of provision, the more that study prepares students for adaptability and flexibility in the face of uncertainty and employment change, the more the system will be able to provide for unforeseen changes. This means educating people to be able to learn, and to adopt and adapt new ideas and approaches. The implementation of the Bologna process, through changing the pedagogy, should enhance this approach. Freeing up curricula and teaching-learning processes as well as breaking open faculty boundaries should enable more flexible combinations of subjects and modes of study that relate better to the country's changing needs.

240. Employers' organisations, employers and trade unions are useful partners in tertiary education. They can help in identifying labour market needs, in developing students' skills, and in the transition to employment. Employers are particularly well placed to identify generic skills required in different types of employment. They could be useful for assisting in modernising course content (see Chapter 3 on governance). More caution needs to be used in basing predictions of long-term needs on employers' expectations, as, in the main, these tend to be short term. Encompassing project work with employers and student placements either as part of the curriculum or as an addition to study would be useful in developing students' skills, in orientation towards employment, and in informing students about careers. These developments are already being undertaken by some universities and some faculties, but a more comprehensive approach would be beneficial.

Recommendations

241. *The Review Team recommends that* the future development of tertiary education should be better informed by labour market needs. *We recommend that* the Ministry introduces an approach which combines central direction and control of tertiary education provision with ability for institutions to respond to student demand. Thus the Ministry would decide not only the number of places it funded (for each institution and subject), but the maximum number of places to be provided. Institutions would be able to try to attract fee paying students to that maximum.

242. For this approach to be effective, the Ministry of Science, Education and Sport will need to develop its labour market information and analysis, and potential students should be better informed about career possibilities. *We recommend that* there be a concentrated effort to gather better information and undertake more analysis of labour market developments and skill needs. This should be undertaken at the macro-level, through better labour market surveys, through better provision of data on tertiary education and students and, possibly, through surveys of employers. Developments are already underway, for example through a greatly enhanced student database, but rapid further development focussing on labour demand is important. As part of this, *the Review Team recommends* the establishment of formal liaison structures between the Ministry of Science; Education and Sport and the Ministry of Economy, Labour and Entrepreneurship to facilitate analysis of how tertiary education may better meet future labour market needs. *The Team also recommends* that labour market expertise be developed in the Ministry of Science, Education and Sport; and the development of structures for liaison with employers at national and at institution level, in order to assist in identifying labour market needs.

243. Further, *the Review Team recommends* that careers advice, information and guidance for young people in secondary education be improved in order to enable student choice to be better informed by

expected employment needs, and improved career's advice, information and guidance to assist more effective entry to the labour market for graduates.

244. The expansion of tertiary education in less developed areas should be beneficial to the economy. However, the range courses available outside Zagreb will remain limited, and certain areas, for example the islands, will not have local provision. The development of distance learning to expand the range of courses available at institutions outside Zagreb, and to provide local learning for those in more remote areas, would be beneficial, not only in enhancing the local skills base but also in encouraging students to remain in their local areas.

CHAPTER 10: INTERNATIONALISATION

Situation and analysis

245. The academic world is committed to universal goals and has always had an international orientation. In reality however, academic matters have been carried out mostly within a context shaped by the cultural and political administration of the nation state. Croatia gained independence in 1991, and from then it could form its own policy for tertiary education. This policy builds on a long tradition of internationalisation. Being a relatively small country, open to the world with a long coastline and truly international history, Croatia, even in the times of Yugoslavia, a former non-aligned country, had strong links with the international tertiary education community, especially through sending students and academics abroad to gain qualifications and obtain new knowledge.

246. Today, internationalisation in Croatia is seen as a major instrument for improving the quality of tertiary education, both in its teaching and learning aspects and in its research function. It is seen also as an instrument for quality assessment: The quality of national tertiary education has to be measured by international standards, not by national standards alone. Degrees and credentials with international recognition are more and more attractive in a global economy, where firms produce for overseas markets and compete with foreign firms in their own domestic markets. This raises the demand for internationally recognised qualifications, not only in management-related fields.

247. A system of tertiary education and research based to a greater extent on differentiation according to profile and performance will demand a far greater measure of mobility among academics and students. Association with a certain institution will not automatically guarantee that a particular educational or career goal can be attained. It will be necessary for the individual, at different times in his or her studies, and for an academic career, to select the institution, national or international, that is best suited for a specific situation and programme.

248. An important contribution to international mobility has been the development of courses and qualifications with universally binding certification standards, tied in with the increased integration of Europe. Croatia signed the Bologna Declaration in 2001, established the legal framework for reform between 2003 and 2005 - Act on Scientific Activity and Higher Education, Act on Recognition of Foreign Educational Qualifications - and established higher education authorities for shaping and monitoring the reform process in the following years: in 2004 the National Council for Higher Education, in 2005 the National Council for Science, and the Agency for Science and Higher Education, which administered accreditation for the implementation of Bologna at the Croatian institutions for tertiary education.

249. Croatia accepted the goals of the Bologna Process for the Establishment of the European Higher Education Area by 2010, and the mobility and employability of European Union citizens anywhere in Europe. Though not yet a member of the European Union, Croatia is well prepared to join the Union particularly in the fields of tertiary education and internationalisation. The Bologna Process is regarded by the Croatian authorities as a tool for developing the tertiary education system on the principles of quality assurance, comparable study programmes, and easily readable and comparable degrees. The evaluation and accreditation of study programmes harmonised with the Bologna Declaration is without doubt the most remarkable achievement of Croatia in the field of internationalisation of its tertiary education system, despite questions raised (see Chapter 5) about sustaining quality at such a fast pace.

250. The Ministry of Science, Education and Sports *Education Sector Development Plan 2005 – 2010* explicitly states that:

- A system of easily recognisable and comparable academic and professional degrees and international recognition will be established;
- A unified three cycle system of studying (undergraduate, graduate and postgraduate) will be introduced together with the European Credit Transfer System, and
- The mobility of students and teachers will be encouraged.

251. Mobility for students and academics is achieved mainly through bilateral and multilateral inter-university agreements of co-operation in different fields. These exchanges are supported by EU programmes such as Tempus JEP (Joint European Projects) and Tempus IMG (Individual Mobility Grants), Erasmus Mundus, CEEPUS, DAAD and Fulbright. The Review Team found that the Tempus programme which supports the Croatian system of tertiary education reform in line with the Bologna Process and EU policies and guidelines is proving a success. Croatia will apply for full membership of Socrates and Leonardo in 2007. The fact that Tempus considerably intensified the mobility of university professors can be regarded as a good foundation for subsequent enhancement of mobility within the Socrates framework.

252. The development of instruments for the promotion of mobility such as the Diploma Supplement and Europass is under way. Whereas there is progress in the implementation of Europass CV, Europass Diploma Supplement, and Europass Language Portfolio, one cannot speak of a systematic organisation for implementing Europass with its five components. The internet pages of public institutions, educational organisations, the Croatian Chamber of Economy *et al* provide information on the components of Europass.

253. Internationalisation of research is another challenge for the Croatian tertiary education system. It is certainly not enough to state that good research is international by definition. The establishment of a European Research Area means that research is becoming increasingly integrated in international cooperation. Changes in the organisation of EU framework programmes will demand great efforts from the Croatian tertiary education institutions, to enhance their organisational capacity to be involved and in order to take an active part in the new networks created. We found awareness of these new challenges for the internationalisation of research in different places. It was, however, obvious that quality is varied across disciplinary areas, and that the establishment of a higher quality level is a prerequisite for internationalisation. On the other hand, the readiness to seek international cooperation in research and the explicitly stated goal in the *Educational Sector Development Plan 2005 – 2010* to enable the universities to emphasise the development of excellence centres may indicate that the tertiary education institutions see internationalisation as a means to improve the quality of education and research itself. It can also serve as a means to profiling the research institutions in the domestic higher education field, and to recruiting better qualified staff and students.

254. Certainly it is too early to say that Croatia institutions of tertiary education and research are players in the global market. The Ministry of Science, Education and Sports names less than 200 ongoing bilateral projects. All are of rather small scale, with three or four Croatian scientists per project. The internationalisation of research so far is rather a matter of individual exchanges of researchers and study programmes. The National Foundation for Science (NFS) has recently developed funding instruments in order to attract successful researchers to Croatian scientific institutions, a Brain Gain Programme.

255. Obviously, there are many encouraging signs and efforts for the further internationalisation of Croatian tertiary education and research institutions. The Review Team agrees with the statement in the Country Background Report that internationalisation is seen as a very important component of tertiary education regarding competitiveness, mobility, recognition of degrees and quality of programmes. The major weakness of the system, however, is recognised as the lack of a general strategy in this sector. National policy is perceived as a set of separate measures which do not stimulate sufficiently activities directed towards internationalisation. The weakness within the academic community is seen in the professional infrastructure to support student and teacher mobility, and to provide international services and facilities for foreign students and academics. So far, this is insufficient.

Conclusions and recommendations

256. Croatia signed the Bologna Declaration in 2001 at the Ministerial Conference in Prague, and so took on an obligation to harmonise its system of tertiary education with the Declaration's requirements by 2010. The aim of the Bologna Process is to create a common higher education area that will assure the mobility and employability of Europe's citizens. Not all of Croatia's population has a positive attitude towards joining the EU. The Review Team encountered some scepticism towards the implementation of Bologna, due to the strain it puts on institutions of tertiary education in terms of teachers, space and organisation. Some are afraid that the creation of a common higher education area in Europe may lead to a brain drain of exactly those people who are most needed in the country to enhance the economy and wealth. This, of course, can and will happen to some extent.

257. However, the vast majority of the people we talked to in government, in tertiary education and research institutions, and in business are determined to take this reform as a challenge, and to see internationalisation as a chance to orientate Croatia towards a society of knowledge and sustainable development.

258. The Review Team found enthusiasm for international co-operation, not only on the basis of bilateral agreements but also in multilateral projects under the umbrella of European programmes, at the level of universities, faculties, institutes and individual professors. We found that there is an exchange of international experience in governance of tertiary education institutions involving the University of Rijeka, and readiness to be a member of international organisations of tertiary education and research, and to participate actively in their work. We found the mobility and international exchange of students to be valued very high by teachers and students alike, though there seem to be certain barriers to the mobility of students within Croatia. We also found strong efforts to build the organisational infrastructure needed for internationalisation at all levels.

259. A fine example is the Foreign Languages Affiliation of the Business Education Centre of the Croatian Chamber of Economy. The Affiliation's efforts have resulted in the Croatian edition of the European Language Portfolio. Whether someone is planning to enrol in an education or training programme, looking for a job or getting experience abroad, it is important to be able to make others understand what skills and competences they have. This is the rationale of the Europass, which consists of five documents: Curriculum Vitae (CV), Language Passport, Certificate Supplement, Diploma Supplement and Europass Mobility. The Europass Language Passport is a part of the European Language Portfolio aimed at adopting common European standards on each learning and examination level. The standards are set according to the recommendation of the Council of Europe.

260. We refer to this example in order to show that there is a combined effort from government, tertiary education and research institutions and business to enhance the possibilities for internationalisation. Having this positive spirit in mind *the Review Team makes the following recommendations*, first that student mobility be further supported and enhanced.

261. Student mobility, that is to say going abroad to study, is only one form of internationalisation of education. Today there are new options, such as taking a degree or other post-secondary course without leaving the home country. Programme and institution mobility has grown, and is likely to meet a growing demand in the future. Programme mobility is the second most common form of cross-border tertiary education. Teaching is offered by a partner institution abroad, including e-learning but generally in the form of face-to-face teaching in local partner institutions. Students may carry out part of their education in their home country and complete or supplement it in the home country of the foreign institution. This form of cross-border education involves both student and programme mobility.

262. Institutional mobility is only in its beginning. It involves more entrepreneurial risk, and corresponds to foreign direct investment by educational institutions or companies. The typical form of institutional mobility is the opening of foreign campuses by universities or learning centres by other educational providers.

263. Croatia is so far focussing on student mobility. *The Review Team also recommends* the following:

- Bilateral and multilateral inter-university agreements should be encouraged, and special financial incentives given to increase the so far still modest numbers of Croatian exchange students.
- In order to increase the number of incoming foreign studies, more courses, particularly at the post-graduate level, should be offered in foreign languages, notably in English. There are few good examples as yet (e.g. medicine of the University of Zagreb). Also, Croatian language courses should be offered for foreign students.
- In Croatia, where tertiary education is predominantly public, a number of private schools have recently been established. Following the example of a growing number of similar institutions elsewhere programmes, or parts thereof, in these schools are taught in English. The students are encouraged or required to carry out part of their studies at international partner institutions. It is obvious that the financing of these studies abroad is important, and that this type of student mobility remains primarily self-financed by students and their families. Still, the experience and the results of these pioneering developments should be studied, and transferred to public tertiary education institutions.
- Openness to all forms of programme and institution mobility. The variety of tertiary education systems, and the lack of transparent information about and readability of those systems worldwide, leaves room for low quality and even rogue providers (degree mills) with unacceptably low or no quality assurance. This may be less dangerous for providers which operate under the principles of the Bologna Declaration. Still, it is the responsibility of the Agency for Science and Higher Education to monitor quality assurance, and to administer accreditation of their courses and degrees.

264. Mobility and internationalisation in the fields of research and innovation can be increased in two ways which *the Review Team recommends*:

- In the academic world, projects of different duration determine work patterns. Highly mobile academics are just as important to research institutions that are starting projects as to those that want to end projects. If there are already temporary employment contracts they are used to employ the new generation of researchers. Those contracts should be increased further, and at levels above that of the new generation of academics. The actual needs of research and teaching

should be the decisive factors when agreeing employment terms. Mobility, both national and international, must be rewarded and made individually worthwhile.

- Internationalisation, and in particular European Integration, which is rapidly gaining in momentum, demands above all that support be given to the mobility of the new generation of academics. Today it is already normal in many areas for young academics to spend part of their qualifying phase in a foreign institution of tertiary education and research. This should become a rule in all areas of science. Whenever possible, only academics with intensive work experience at recognised foreign academic facilities should be appointed to professorships and other leading positions.

265. Croatia is about to become a member of the European Union. The implementation of the Bologna Process is an important step towards growing internationalisation of the Croatian system of tertiary education and research. There is every reason to expect that international cooperation and mobility will be an important feature of Croatian society, and of its tertiary education and research system.

CHAPTER 11: CONCLUSIONS AND RECOMMENDATIONS

266. This Country Note has explained the context for the OECD review of tertiary education in Croatia, referring to the Country Background Report prepared prior to the visit of the OECD Review Team. In also sketching the national context in the first two chapters, it picked out six questions of particular importance to Croatia at this time. They are:

- Uncertainty about the role of old and new institutions in the tertiary education system, differentiation between universities and polytechnics in a binary structure, and the balance of provision and opportunity between Zagreb and the regions;
- Managing the rapid rate of change on the approach to EU membership, and especially using the Bologna process as the driving force for change in higher education, including the functional integration of universities and to allow comparison and exchange of best practice with other European systems;
- An incipient system of institutional monitoring, quality assurance and national accreditation;
- Whether the expansion in student numbers is financially sustainable and on what financial basis, having in mind also demographic and equity dimensions;
- How universities can come to engage more effectively with national and regional society and economy in Croatia, and vice versa; and
- A lack of a comprehensive system of information and data about the outcomes of the tertiary education system which could assist the formulation of policies.

267. The preceding eight chapters adopted the same themes as for other tertiary reviews. Between them they provide comment and advice on each of the six points above, as well as reviewing systematically what the Team was able to observe and otherwise learn about the current situation and prospects. Suggestions and recommendations are found towards the end of each of these chapters. Here they are summarised for the convenience of the reader, chapter by chapter. It is however advisable to refer back also to the context, since many are qualified and elaborated in the text.

Chapter 3 - Governance

268. Croatia should strengthen its structured arrangements to promote effective policy interfaces and working relationships between tertiary education and other important policy areas, such as responding to labour market needs. The authorities should consider creating a powerful Inter- Ministerial Committee with external representation from key interests in society such as the Croatian Chamber of Economy.

269. Early thought should be given to the creation of a body that could be called the Tertiary Education (Funding) Council, or the Funding and Policy Council for Tertiary Education and Research should be created. We suggest that two external members be appointed from outside Croatia.

270. For tertiary education institution governing bodies or councils the composition of a twelve member body might be:

- An independent chairperson, selected from outside their membership by the other members;
- The chief officer;
- Four members elected from within the institution; and
- Six external members selected according to procedures specified in the legislation or statutes of the TEI. These members ideally would be drawn from the economic and social interests relevant to the mission of the TEI.

271. Governing boards should pay particular attention to the appointment of the chief officer or rector. Appropriate search and selection procedures and processes should be used.

Chapter 4 - Finances

272. A funding formula using a small number of bases for calculation, such as multipliers applied to reflect the different costs of the principal broad disciplines or fields of study, should be adopted nationally.

273. The Review Team supports the principle of a contribution by students and their families to the costs of their tertiary education, particularly in view of the constraints and competition for the state budget.

274. Appropriate information systems should be developed, and the regular publication and dissemination of relevant data and information treated as an urgent requirement. The Review Team also recommends as a priority putting in place information systems within the institutions which will collect and report data in respect of:

- Direct cost per student;
- Indirect costs including the costs of institutional overheads, library facilities etc, to be measured and distributed across the unit cost categories in proportion to student numbers or according to estimated levels of usage;
- Maintenance costs; and
- Depreciation costs for equipment.

275. Within the lump sum a small proportion of the unit cost element should be set aside to encourage TEIs to reduce drop-out rates and shorten graduation periods.

276. Allocations from a development fund should be competed for by institutions on the basis of a call for proposals issued by the appropriate agency.

277. The Review Team recommends a rationalisation and simplification of the current arrangements as detailed in Chapter 4.

278. State support and contributions for major new capital expenditures should be allocated through competitive processes between the institutions.

Chapter 5 - Quality

279. Creating a culture of assessment and accountability in Croatian tertiary education is a long-term, stepped process requiring vision, leadership and commitment over time. The creation of such a culture is the best guarantee of future quality. Partly in support of this, Croatia should continue vigorously to pursue the implementation of the Bologna Process.

280. The Review Team recommends the following measures with respect to evaluation frameworks:

- The national accountability body should be responsible for accrediting institutions, not programmes;
- A national body, at arm's length from government, with the remit to establish clear processes and methodologies for periodic review of programmes, departments and units within all institutions. This body would not assess quality, but audit the thoroughness and appropriateness of the evaluation of quality, and prepare a framework for periodic assessment;
- Each assessment of quality should commence with a self-assessment, conducted by the academic unit being evaluated;
- The self-assessment should be followed by an external review, involving peers both from within Croatia and from abroad;
- Industry and local community organisations should be involved in the assessment process; and
- Each review should entail recommendations for improvement. There should be audits of implementation of these recommendations.

281. There should be clear differentiation between quality review processes which are intended to be formative and those that are summative. Financial consequences or closures may occur when recommended changes are not made.

282. Croatia should seek to reward good teaching, and fund teaching and learning, and examine systems in other countries for recognising and rewarding excellence in teaching, including provision for promotion and other incentives.

283. Croatian institutions should also explore different models of institutional centres for teaching and learning. Sanctions should be introduced by institutions for teachers who neglect their responsibilities or behave unprofessionally.

284. The Croatian authorities should consider:

- Limiting the number of years that students may remain undergraduates;
- Reducing progressively the financial incentives to remain a student;
- Introducing financial incentives to both students and institutions to graduate on time;
- Allowing professors to teach in other institutions only with the support of their institution of primary affiliation;

- Introducing an employment system that specifies and ensures the work to be done by academic staff; and
- Accelerating the functional integration of TEIs [see also from Chapter 7 Early thought be given to creation of such a body] and ensuring that a substantial proportion of revenues generated by individual university units be taken into central administration and integrated within the general budget.

285. The national committee of rectors should work with the Government of Croatia to generate recommendations for a participatory faculty and departmental structure for universities.

Chapter 6 - Equity

286. The emphasis in funding should be placed on need rather than on merit, and institutions themselves should no longer allow extensive repetition of failed courses. Failure at re-sit could result in leaving the whole degree programme.

287. Meanwhile, financial assistance should be reassessed annually, based on the previous year's educational performance, and different funding criteria should be used for young and for mature students.

288. Provision should be significantly improved for mature age students, to enable older people to gain degrees and improve their skills:

- Information, advice and guidance should be provided about returning to learning and to take a degree;
- Access courses should be provided, both to prepare older people for a return to study and to prepare them to meet tertiary education entrance requirements;
- Consideration should be given to introducing an alternative entrance requirement for older applicants;
- Part-time and full-time study should be treated similarly in respect of funding support, and
- Changes should be made to the study patterns to allow part-time students to take their course over a longer period, with teaching organised to better suit those who are employed or have caring responsibilities.

289. Distance learning approaches should be further developed and extended.

290. A system of regular monitoring and reporting should be set up to analyse entry, subject, type of institution, dropout and completion by age, gender, home location and disability. Entry rates should be monitored by home location.

291. The effect of family income on participation and success in tertiary education should be treated as a high priority for policy research and development. Consideration should also be given to collecting and holding relevant data on the tertiary education database, to form part of regular monitoring.

Chapter 7 – Regional Role

292. Croatia should proceed decisively with the rapid functional integration of tertiary education in Croatia, in accordance with established policy.

293. Working with its institutions, with industry and with communities, Croatia should clearly indicate and widely disseminate sets of multi-year economic, social and other goals for the system and for each region.

294. Each regional institution should be encouraged to articulate clearly in its mission and mandate the regional contribution that it intends to make.

295. Croatia should consider establishing specific funding envelopes for regional engagement that relate to clearly articulated and widely disseminated priorities.

296. If Croatia favours a fully binary system, polytechnics should be disentangled from universities and charged with clear mission and mandate statements that differentiate them adequately from universities. Croatia should also consider setting up a national governance body (perhaps the National Polytechnic Institute of Croatia) to support individual polytechnics, and ensure the development of cost-effective national programmes somewhat on the lines of the former UK Council for National Academic Awards (CNAAs), or Ireland's HETAC.

297. A systematic approach should be adopted to pooling resources for the development and delivery of tertiary education by distance methods.

Chapter 8 – Research and Innovation

298. More importance and more funds should be given to the National Foundation for Science (NFS). Research projects should cover all fields of science and the humanities. This should include support for individual projects and research collaboration, awards for outstanding research achievements, and funding for scientific infrastructure and scientific cooperation.

299. New Research Units should bring together researchers working at one or more locations, to carry out a specific project.

300. Collaborative Research Centres should be set up. These should be long-term university research centres in which scientists and academics undertake ambitious joint interdisciplinary research.

301. Croatia should consider further policy relating to research in polytechnics, with a view to encouraging and supporting specifically Mode 2 approaches that concentrate on the collaborative development and application of knowledge.

302. The central and the regional Chambers of Commerce should take an active role in communication between universities and the economic sphere. Universities should develop their research profiles and better publicise them.

303. University professors should be differentiated according to their research record, and income differentiation between professors should be allowed.

304. The research record should be an important element in promoting university personnel.

305. The evaluation process of public research institutes will discover personnel at research institutes who will do a better job as teachers at universities and these should be redeployed.

306. Bilateral exchange and research programmes should be set up between Croatia and other countries.

307. Croatia should consider setting up a distinct research policy review exercise, the terms of reference explicitly to include the commercialisation of research.

Chapter 9 – Labour Market

308. The future development of tertiary education should be better informed by labour market needs. The Ministry of Science, Education and Sport should introduce combine central direction and control of tertiary education provision with ability for institutions to respond to student demand.

309. The Ministry should develop its labour market information and analysis, and potential students should be better informed about career possibilities.

310. There should be a concentrated effort to gather better information and undertake more analysis of labour market developments and skill needs.

311. There should be established formal liaison structures between the Ministry of Science, Education and Sport and the Ministry of Economy, Labour and Entrepreneurship to facilitate analysis of how tertiary education may better meet future labour market needs.

312. Labour market expertise should be developed in the Ministry of Science, Education and Sport; and structures for liaison with employers at national and at institution level developed in order to assist in identifying labour market needs.

313. Careers advice, information and guidance for young people in secondary education should be improved to enable student choice to be better informed by expected employment needs, and improved career advice, information and guidance to assist more effective entry to the labour market for graduates.

Chapter 10 – Internationalisation

314. Student mobility should be further supported and enhanced.

315. Bilateral and multilateral inter-university agreements should be encouraged, and special financial incentives given to increase the numbers of Croatian exchange students.

316. More courses, particularly at the post-graduate level, should be offered in foreign languages, notably English.

317. The experience and results of pioneering developments in private schools should be studied, and transferred to public tertiary education institutions.

318. There should be openness to all forms of programme and institution mobility.

319. The temporary employment contract system should be used to employ the new generation of researchers, and increased further and at levels above that of the new generation of academics. Both national and international mobility should be rewarded

320. It should become a rule in all areas of science for young academics to spend part of their qualifying phase in a foreign institution of tertiary education and research. Whenever possible, only academics with intensive work experience at recognised foreign academic facilities should be appointed to professorships and other leading positions.

REFERENCES

- Burton Clark, R.** (1998), *Creating Entrepreneurial Universities*, Oxford: Pergamon.
- Gibbons, M. and others** (1994), *The New Production of Knowledge*, London. Sage
- The Glion Declaration* (1999), www.glion.org
- Government of Croatia, Ministry of Science, Education and Sports** (2004), *Education Sector Development Plan 2005-2010*.
- Ministry of Science, Education and Sport** (2006), *Higher Education in Croatia, the Croatia Country Background Report*
- OECD** (2004a), *OECD Thematic Review of Tertiary Education: Guidelines for Country Participation in the Review*, OECD, Paris (available from www.oecd.org/edu/tertiary/review).
- OECD** (2004b), *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications*, OECD, Paris.
- OECD** (2004c), *Education at a Glance: OECD Indicators 2004*, OECD, Paris (see www.oecd.org/edu/eag2004).
- OECD Tertiary Education Reports** and updates are available from www.oecd.org/edu/tertiary/review
- Rhodes, Frank R.T.** (2001), *Creation of the Future*, Cornell University Press
- UNESCO** (2005), *Global Education Digest 2005*, UNESCO, Paris.

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APPENDIX 3: PROGRAMME OF THE REVIEW VISIT

Thursday, June 8, Zagreb

18:00 Meeting with the authors of Croatia Country Report

Friday, June 9, Zagreb

9:00 – 10:30 Meeting at the Ministry of Science, Education and Sports.

10:30 – 12:30 Visit to the Faculty of Electrical Engineering and Computing, University of Zagreb. Meeting with faculty management.

14:00 – 15:30 Meeting with representatives of the secondary school system. President of the Union of Headmasters, director of the National Centre for External Evaluation of Education, and representatives of three high schools from Zagreb.

15:30 – 17:00 Visit to Libertas – a private school of professional higher education. Meeting with school management.

17:30 – 19:30 Meeting with the management of University of Zagreb.

Saturday, June 10, Zagreb

9:00 – 10:30 Meeting with representatives of the Agency for Science and Higher Education.

11:00 – 12:30 Meeting with representatives of the Croatian Chamber of Economy and Croatian Employers' Association.

12:30 – 14:00 Visit to the Institute for Development of Education (an NGO).

15:30 – 17:00 Meeting with leaders of the Croatian Students' Council.

Sunday, June 11, Rijeka

18:30 Presentation of the work of the National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia.

Monday, June 12, Rijeka

8:30 – 12:30 Visit to the University of Rijeka. Meeting with University management and visit to the Centre for Quality Assurance of University of Rijeka.

14:30 – 16:00 Visit to the Technical Faculty, meeting with faculty management.

Tuesday, June 13, Split

13:00 – 15:00 Visit to the Institute of Oceanography and Fisheries.

Wednesday, June 14, Split

- 9:00 – 10:00 Visit to the University of Split. Meeting with University management.
- 10:30 – 13:30 Meeting with representatives of the Faculty of Science and Faculty of Economics.
- 16:00 – 17:30 Meeting with representatives of the private sector – SMS d.o.o., a leading producer of Mediterranean food products in Croatia.

Thursday, June 15, Zagreb

- 16:00 – 18:00 Meeting with representatives of the Independent Union of Research and Higher Education Employees.

Friday, June 16, Zagreb

- 9:00 – 10:30 Visit to Zagreb School of Economy and Management – a private school of professional higher education. Meeting with school management.
- 11:00 – 12:30 Meeting at the Ministry of Economy, Labour and Entrepreneurship.
- 14:00 – 15:30 Visit to the Polytechnic of Health Studies and meeting with the Chairman of the Council of Polytechnics and Schools of Professional Higher Education.
- 16:00 – 17:00 Final meeting at the Ministry of Science, Education and Sports.

APPENDIX 4: COMPARATIVE INDICATORS ON TERTIARY EDUCATION

	Croatia	OECD mean ¹	Croatia's rank ²	Croatia as % of OECD mean ³
PARTICIPATION				
Gross enrolment ratio into tertiary education, total tertiary programmes⁴				
2002/2003				
Male +Female	39.4	57.9	25/30	68
Male	36.1	52.5	25/30	69
Female	42.8	63.5	25/30	67
1998/1999				
Male +Female	31.9	49.1	26/30	65
Male	29.6	45.6	26/30	65
Female	34.2	52.7	25/30	65
Distribution of students, by type of programmes				
2002/2003				
Tertiary-type 5A programmes	65.5	80.1	24/30	82
Tertiary-type 5B programmes	34.3	17.4	5/29	197
Tertiary type 6 programmes	-	3.3	-	-
1998/1999				
Tertiary-type 5A programmes	75.6	77.7	15/28	97
Tertiary-type 5B programmes	24.4	20.2	12/27	121
Tertiary type 6 programmes	-	3.2	-	-
Gender distribution of students (2002/2003)				
Females as a per cent of students in total tertiary programmes	53.2	53.2	18/30	100
Females as a per cent of students in tertiary type-5A programmes	55.2	53.2	13/30	104
Females as a per cent of students in tertiary type-5B programmes	49.5	55.0	22/30	90
Females as a per cent of students in tertiary type-6 programmes	36.5	44.0	26/29	83
School life expectancy⁵ (2002/2003)				
ISCED 1 – 6	13.1	16.1	27/29	81
ISCED 5 and 6	2.0	2.8	25/30	71
Tertiary graduates by field of study⁶ (2002/2003)				
Education	8.2	12.6	20/26	65
Humanities and arts	11.2	10.2	11/26	110
Social sciences, business and law	30.8	30.6	11/26	101
Science	7.5	9.2	18/26	82
Engineering, manufacturing and construction	14.0	14.2	14/26	99
Agriculture	3.5	2.2	5/25	159
Health and welfare	9.3	14.4	21/26	65
Services	15.4	4.5	1/25	342
Not known or unspecified	-	-	-	-

	Croatia	OECD mean	Croatia's rank ¹	Croatia as % of OECD mean
Unemployment ratio and educational attainmentⁱ (2003)				
Number of 25 to 59 year-olds who are unemployed as a percentage of the population aged 25 to 59				
Lower secondary education				
Total	14.8	-	-	
Males	-	9.8	-	
Females	-	11.0	-	
Upper secondary education (ISCED 3A)				
Total	12.1	-	-	
Males	-	7.1	-	
Females	-	10.6	-	
Post-secondary non-tertiary education				
Total	-	-	-	
Males	-	5.9	-	
Females	-	6.9	-	
Tertiary education, type B				
Total	-	-	-	
Males	-	3.9	-	
Females	-	4.4	-	
Tertiary education, type A and advanced research programmes				
Total	6.8	-	-	
Males	-	3.6	-	
Females	-	4.1	-	
EXPENDITURE				
Annual expenditure on tertiary education institutions per student relative to GDP per capita, public and private institutions (2002/2003)				
	31.4	33.9	13/24	93
Expenditure on educational institutions and educational administrations as a % of GDP, public sources (2002/2003)				
All levels of education	4.3	5.3	20/24	81
Tertiary education	0.7	1.1	23/24	64
Educational expenditure in tertiary as a percentage of total educational expenditure (2002/2003)				
	19.1	23.0	19/24	83
Expenditure on tertiary education institutions by nature of spending (2002/2003)				
Distribution of total and current expenditure				
Current	91.3	87.5	7/21	104
Capital	8.7	12.5	15/21	70
Current expenditure as a percentage of total expenditure				
Salaries	61.1	60.4	9/21	101
Other Current	30.2	27.1	9/21	111
PATTERNS of PROVISION				
Ratio of students to teaching staff in tertiary education (2002/2003)				
Based on full-time equivalents, Public and private institutions.				
Type B	-	14.4	-	
Type A and advanced research programmes	-	15.7	-	
Tertiary education all	15	14.9	-	101

	Croatia	OECD mean	Croatia's rank ¹	Croatia as % of OECD mean
Foreign students as a percent of tertiary enrolment (2002/2003)	2.3	6.6	21/26	35
RESEARCH AND DEVELOPMENT				
Gross domestic expenditure on Research and Development (R&D) as a percentage of GDP Source: Eurostat (2005)				
2003	1.14	2.24	-	196
1997	0.39	1.61	-	24
Higher education expenditure on R&D as a percentage of GDP Source: Eurostat (2005)				
2003	0.45	0.42	-	107
1991	-	0.36	-	-
Percentage of gross domestic expenditure on R&D by sector of performance (2003) Source: Eurostat (2005)				
higher education	39.1	18.7	-	209
(higher education in 1991)	-	16.3	-	-
business enterprise	39.1	67.3	-	58
government	21.7	10.9	-	199
private non-profit sector	-	3.1	-	-
Percentage of higher education expenditure on R&D financed by industry				
2003	-	5.6	-	-
1991	-	5.5	-	-
Total researchers per thousand total employment				
2003	-	7.4	-	-
1993	-	5.9	-	-
Researchers as a percentage of national total (full time equivalent) (2003) Source: Eurostat (2005)				
higher education	47.6	50.9	-	94
(higher education in 1993)	-	23.8	-	-
business enterprise	15.6	29.0	-	54
government	47.6	17.1	-	278
Researchers per million inhabitants, Full time equivalent				
2002	1920	2683	10/17	72
1998	1071	2410	21/23	44

Notes for the Tables

Sources:

All data are from the UNESCO "Global Education Digest 2005" and "Statistics on research and development", UNESCO Institute for Statistics, <http://www.uis.unesco.org>, unless indicated otherwise in the table.

Eurostat <http://epp.eurostat.cec.eu.int/>

Notes:

1. "OECD mean" is calculated as the unweighted mean of the data values of all OECD countries for which data are available from the UNESCO Global Education Digest 2005 and UNESCO Statistics on research and development. Croatia is not included in the calculation. Calculation is done by the OECD Secretariat.
2. "Croatia's rank" indicates the position of Croatia among OECD countries when countries are ranked in descending order from the highest to lowest value on the indicator concerned. For example, on the first indicator "*Gross enrolment ratio into tertiary education, total tertiary programmes, 2002/2003, Male+Female*", the rank "25/30" indicates that Croatia recorded the 25th highest value of the 30 OECD countries and Croatia that reported relevant data.
3. "% to OECD mean" indicates Croatia's value as a per cent of the OECD value. For example, on the first indicator "*Gross enrolment ratio into tertiary education, total tertiary programmes, 2002/2003, Male+Female*", the percentage "68" indicates that Croatia's value is equivalent to 68% of the OECD mean.
4. Gross enrolment ratio means number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the population in the theoretical age group for the same level of education. For tertiary level, the population used is the five-year age group following on from the secondary school leaving age.
5. School life expectancy is the number of years a person of school entrance age can expect to spend within the specified levels. To compensate the lack of reliable data by age for tertiary the gross enrolment ratio for tertiary is multiplied by 5 and used as a proxy for the age-specific enrolment rates. At all other ISCED levels enrolment that is not distributed by age is divided by the school-age population and multiplied by the duration of the given level before being added to the sum of the age-specific enrolments rates.
6. These indicators show the ratio of graduates as a proportion to all fields of studies. The fields of education used follow the revised ISCED classification by field of education.

Country specific notes:

- i Age range is different; OECD mean is based on 25 to 65 year olds
- Indicators by Gender are not available
- Post secondary non-tertiary education is included in upper secondary education
- Tertiary education type B included in Tertiary education type A and advanced research programmes.