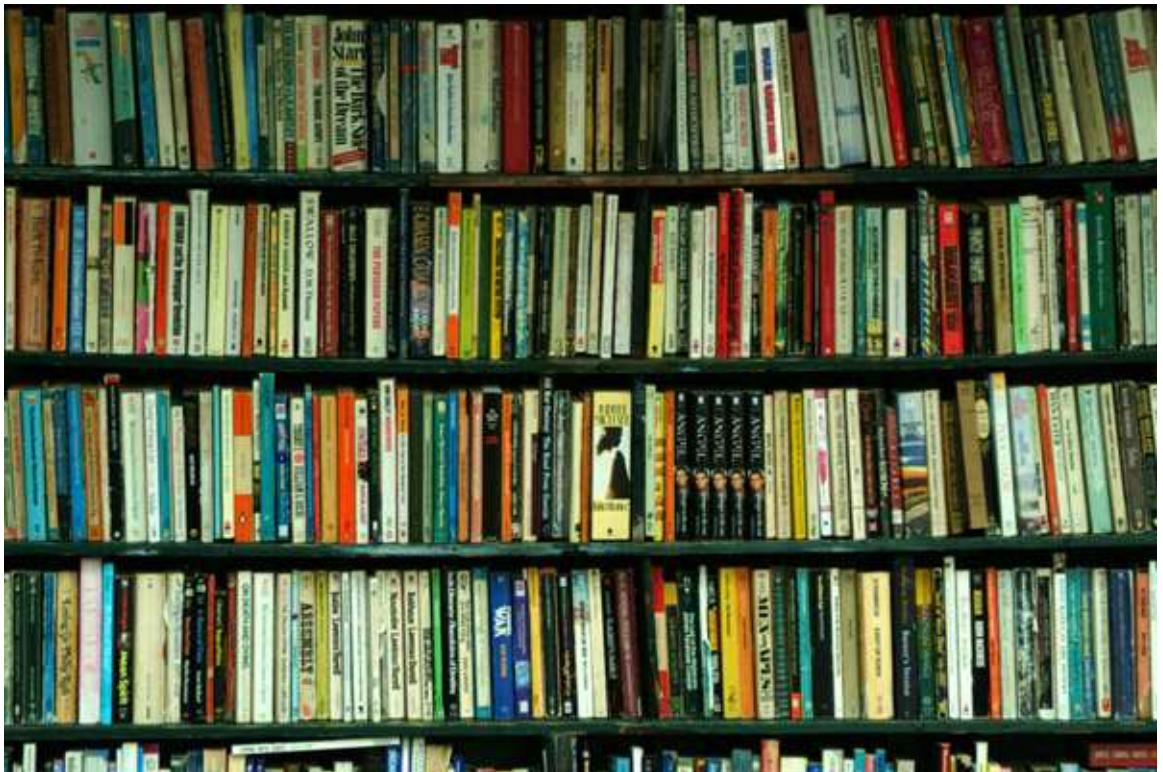


EDUCATION & TRAINING 2010



The Development of Education Policy in Iceland in the context of Europe



MENNTAMÁLARÁÐUNEYTIÐ



Education and Culture
Education and Training 2010

CONTENTS

| | |
|---|----|
| OPENING ADDRESS OF THE MINISTER OF EDUCATION | 4 |
| INTRODUCTION..... | 7 |
| Education & Training 2010 | 8 |
| - The Work Programme of the European Union in Education and Training to the year 2010 | 8 |
| Iceland's participation in "Education and Training 2010" | 11 |
| 2006: Iceland's national debate on "Education and Training 2010"..... | 12 |
| 1. Discussion Groups..... | 12 |
| 2. Conference..... | 13 |
| 3. Post conference work and promotional material | 14 |
| I. MODERNISATION OF HIGHER EDUCATION..... | 15 |
| Discussion Group A Report..... | 15 |
| 1. Introduction | 15 |
| 2. The current situation in Iceland..... | 15 |
| Development of higher education | 15 |
| International cooperation..... | 17 |
| 3. The main recent policy initiatives | 18 |
| A homogenous university operating environment, independence and responsibility | 18 |
| 4. The main challenges and future tasks | 20 |
| Management and governance..... | 20 |
| Funding..... | 20 |
| Curriculum development..... | 21 |
| 5. What next?..... | 22 |
| Addenda to the report of the discussion group on MODERNISATION OF HIGHER EDUCATION | 23 |
| - Feedback from expert and from conference delegates | 23 |
| II. TEACHERS AND TRAINERS | 25 |
| Discussion Group B Report..... | 25 |
| 1. Introduction | 25 |
| 2. The current situation in Iceland..... | 26 |
| 3. The main recent policy initiatives | 29 |
| 4. What are the main unresolved issues in teachers' education and their working conditions?..... | 30 |
| 5. Possible development, preferable solutions in the opinion of the discussion group | 35 |
| 6. What next?..... | 36 |
| Addenda to the report of the discussion group on TEACHERS AND TRAINING | 37 |
| - Feedback from expert and from conference delegates | 37 |
| III. INCREASING PARTICIPATION IN MATHS, SCIENCE AND TECHNOLOGY | 40 |
| Discussion Group C Report..... | 40 |
| 1. Introduction | 40 |
| 2. The current situation in Iceland..... | 41 |
| The current situation in Europe regarding students in maths, science and technology (MST) | 41 |
| 3. The main recent policy initiatives | 43 |
| 4. Main challenges as seen by the discussion group..... | 44 |
| 5. Possible ways to improvements | 45 |
| 5.1 Improve teaching | 46 |
| 5.2 Education and training of teachers | 46 |
| 5.3 Science knowledge and science literacy..... | 46 |
| 5.4 Evaluation..... | 47 |
| 5.5 The image of science and scientists | 47 |
| 6. What next?..... | 48 |
| Addenda to the report of the discussion group on INCREASING PARTICIPATION IN MATHS, SCIENCE AND TECHNOLOGY..... | 49 |
| - Feedback from expert and from conference delegates | 49 |

| | |
|--|----|
| IV. ICT IN EDUCATION | 52 |
| Discussion Group D Report..... | 52 |
| 1. Introduction | 52 |
| 2. The current situation in Iceland..... | 52 |
| 3. The main recent policy initiatives | 55 |
| 4. Main challenges | 56 |
| 5. Possible ways to improvements | 58 |
| 6. What next?..... | 59 |
| Addenda to the report of the discussion group on ICT IN EDUCATION..... | 61 |
| - Feedback from expert and from conference delegates | 61 |
| | |
| V. RECOGNITION OF LEARNING OUTCOMES..... | 62 |
| Discussion Group E Report | 62 |
| From the Minister of Education, Science and Culture’s opening address | 62 |
| 1. Introduction | 62 |
| 2. The current situation in Iceland..... | 62 |
| 3. The main recent policy initiatives | 64 |
| 4. The main challenges and possible improvements | 65 |
| Preparation and design..... | 66 |
| Introduction and adaptation period | 66 |
| Implementation and review | 67 |
| 5. What next?..... | 67 |
| Addenda to the report of the discussion group on RECOGNITION OF LEARNING OUTCOMES..... | 69 |
| - Feedback from expert and from conference delegates | 69 |
| | |
| References and main information sources of the discussion groups | 72 |
| | |
| APPENDIX I : Conference Agenda | 74 |
| | |
| APPENDIX II : | 76 |
| Presentation slides Sebastian Volkers, representative of the European Commission..... | 76 |
| Presentation slides Professor Marijk van der Wende | 80 |
| | |
| APPENDIX III : List of conference participants | 86 |

OPENING ADDRESS OF THE MINISTER OF EDUCATION



The contents of this report confirm that Iceland, like other countries in our continent, aims to realise a European Education Area, while underlining the need for all to preserve their individuality. The main gain from cooperation among the nations of Europe in the domain of education is that they learn from each other, adopting best practice and avoiding the need for each and every one to reinvent the wheel.

In common with other European countries, developments in Iceland's education system are accelerating, which is essential if it is to keep pace with changes in technology and economics. The importance of innovation becomes increasingly clearer in a globalised environment, where everything is built on education. This was clear to Europe's leaders in the year 2000, when at their summit in Lisbon they set the aim for the European Union to make its economy the foremost and strongest in the world by the year 2010. The economy was to be based on knowledge, with emphasis on sustainable development, attractive employment opportunities and equality.

Following the Lisbon Declaration the ministers instructed the Commission to develop a work programme for the implementation of the education policy till 2010 in which the member states could participate on a voluntary basis. The European Union does not have legal jurisdiction in education. This is in the hands of the individual countries. The EEA/EFTA countries, Iceland, Liechtenstein and Norway have taken part in European Union cooperation on education since about 1990. They were invited to participate in the work on education that commenced with the Lisbon Declaration.

The publishing of this report and the conference *Education & Training 2010 – The Development of Education Policy in Iceland in the context of Europe*, held in Reykjavik 26 October 2006, are part of this work. Many of the points emphasised by the European Union echo the work being done here, so it is essential for us to participate in dialogue in Europe and to make comparisons between our status and that of other countries.

In Iceland, as with our European neighbours, the key issue is to adapt our education system to today's demands for education for all citizens, where a concern is to meet the varying needs of a wide range of students as well as possible in order to improve their education and their results. In order to achieve this the decision was taken to review the laws governing all levels of education. A central objective of the review is to achieve continuity in transitions between levels of education, flexibility both within and between school levels and to enhance education for all age groups, both within formal and informal education.

It is clear that such a wide-reaching review, as is currently taking place in the Icelandic school system, takes into account current international developments in education, not least those taking place in Europe. An example of this is that the new Icelandic laws governing higher education from July 2006 are adapted to the Bologna Process.

We currently have representatives in five European Union working groups dealing with education in the Lisbon Process. The tasks of the working groups are: Modernisation of Higher Education; Teachers and Trainers; Increasing participation in Maths, Science and Technology; ICT in Education, and Recognition of Learning Outcomes. Those who have followed public debate in Iceland in recent years will see that all of the issues listed above have been high on the agenda in this country.

In order to prepare this report and the conference "Education and Training 2010 - *The Development of Education Policy in Iceland in the context of Europe*", both supported by the European Commission, five discussion groups were formed to deliberate the issues mentioned above. The groups comprised representatives from the Ministry of Education, Science and Culture, from stakeholders and from other parties with an interest in education.

Reading the report of the group dealing with modernisation of higher education, one observes that it concludes by presenting a number of points for discussion on governance, management and funding. The group considers that universities should increasingly model their operations on management practices from industry and should ensure third party access to their operations.

The group points out that in discussions on higher education in Europe the question of funding is a key issue. All are convinced that more funds are needed if the Lisbon objectives are to be achieved. The group presents a number of possibilities: direct contributions from companies should be tax-deductible; institutions or companies could establish funds to support university activities and regional government should become active in funding universities. The group also feels that discussions on the introduction of tuition fees for university attendance are inevitable.

The teachers and trainers group considers that teachers need more autonomy and responsibility in their jobs. To achieve this, teacher education has to be extended as planned and in-service education should also be increased. More extensive use of ICT in schools is important so that teaching does not lag behind the current developments in technology that many students experience out of school. It is also noted that teaching and education that encourages independent thinking and unshackled opinion is becoming increasingly important in the context of rapid changes in society.

The discussion group that dealt with increasing participation in maths, science and technology presents many thought-provoking proposals as to how improvements can be achieved. This group considers that it is of primary importance to give teachers the opportunity to improve their competence in science teaching based on simple experiments and observations, field work and trips and on the use of ICT. Emphasis must be placed on extending the flora of teaching methods at the expense of the narrow book-learning approach. The teaching environment should become more flexible and ways found to encourage teachers to take up science teaching. The group also feels it important to improve the scientist's image in the eyes of young people, by for example having scientists visit schools to show students the work they do.

In the conclusions of the group dealing with the use of ICT in education, the main emphasis is placed on offering courses to practising teachers that introduce new methods that employ ICT. The group also emphasises better access to the technology and more development activities in schools. These proposals harmonise well with the proposals from the maths, science and technology group.

In the laws on higher education that took force 1 July 2006, there is a provision that the Minister of Education should publish framework standards for higher education and for degrees. The framework for universities has now been completed. This reference framework is a structured description of degrees and final examinations where the emphasis is placed on specifying the knowledge, skills and competence that students should have on completion of their studies. This is known in Europe as the "Qualifications Framework" and most European nations are now making comparable frameworks, which is in line with the Bologna Process call for enhancement of European cooperation on university education.

The group dealing with recognition of learning outcomes points out that the European Commission has published a framework for education after completion of statutory education, also for non-formal education and recommends that this framework be adopted in Iceland in phases. This system is designed to bridge the gap between formal and non-formal education. Work has already been done in Iceland on developing evaluation techniques for non-formal education and for real competence, which will be useful input for the task in hand. By developing a framework that is compatible with those of other European countries we make it

easier for Icelandic students and employees to have their qualifications and job experience recognised abroad.

These were some of the particularly interesting points in the conclusions of the discussion groups. All proposals from their reports and other ideas that were aired at the conference *Education and Training 2010 – The Development of Education Policy in Iceland in the context of Europe* during discussions on the groups' conclusions, will contribute to the work now being done in the Ministry of Education, Science and Culture. This work will benefit all levels of education and is in line with the best that is being done in the countries we are cooperating with. But in the cooperation there is also an element of competition where we all strive to offer the best education we can, for the benefit of individual citizens and for society as a whole.

Þorgerður Katrín Gunnarsdóttir, Minister of Education, Science and Culture

INTRODUCTION

Most Icelanders are familiar with the European Union's cooperation programmes for education and training, as thousands of Icelanders have enjoyed the benefits of participation in teacher or student exchange or in some other European co-operation project under the Socrates or Leonardo da Vinci programmes. Fewer know of the efforts of the European Union in which Iceland takes part that are geared towards improvements of Europe's education systems. This report aims to present some main aspects of this endeavour.

A short overview of European Union policy work on education and training follows this introduction and includes information about the participation of Icelandic representatives in this work in recent years. Then there are five chapters that deal with the five themes on which the Ministry of Education, Science and Culture is currently focusing, in connection with its participation in the theme work in cooperation with other European countries. These themes are:

- Modernisation of Higher Education
- Teachers and Trainers
- Increasing participation in Maths, Science and Technology
- ICT in Education
- Recognition of Learning Outcomes

At the European Union level, there is currently wide-reaching discussion and assessment of status and of future prospects in education and training, in which Iceland participates.¹ Comparison between European countries and with countries in other continents seeks to define changes in the environment, to assess the effect they have on education systems, to disseminate knowledge and experience between countries and regions and thus find the most effective ways to meet changing times. It is clear that local circumstances in each country must be taken into account, but many of the problems facing the Icelandic government regarding development of the education system are the same as those confronting our neighbours in Europe. We can learn from them and they from us.

The conclusions of the discussion groups that deliberated the above-mentioned themes and of the conference *Education & Training 2010 – The Development of Education Policy in Iceland in the context of Europe*, which was held in Reykjavik in October 2006, are published in this report, which is both in Icelandic and English. The report is on the one hand intended to give a general overview of Iceland's participation in European Union policy work in education and training till 2010, and on the other hand to give a more detailed assessment of the situation in those areas that have been specifically deliberated. The report is structured in such a way that for each subject matter the current situation is detailed and the main government policy initiatives are described. Then the most salient threats perceived by the discussion groups are detailed along with suggestions of how to deal with them. At the end of each chapter there is a short summary of comments and ideas that were aired at the conference in October.

It should be pointed out that although the five discussion groups have, in their work, referred to a variety of reports and other sources², the intention is not to produce a detailed scientific assessment, but rather to discuss the conclusions reached in open discussions and brainstorming. The aim with the report is the same as the aim of the discussion groups and of the conference *Education & Training 2010 – The Development of Education Policy in Iceland in the context of Europe*, that is to try to cast new light on the current situation and to encourage open, objective and ongoing discussion on education in Iceland.

¹ More issues are on the agenda in this theme work which is taking place within "peer learning clusters of countries". Countries select a limited set of themes to discuss in each instance.

² See list of working documentation for the Discussion groups

Education & Training 2010

- The Work Programme of the European Union in Education and Training to the year 2010

The European Union summit at Lisbon in 2000 marked a watershed in EU debate and actions in matters relating to Education and Research. These matters were given priority as it was clear that Education and Research are the key to European Union future policy as published in the Lisbon Declaration – which set the aim of making Europe the most competitive economy and the best equipped knowledge society in the world by the year 2010³.

To ensure that the Lisbon objectives became more than a noble declaration, it was clear that considerable action had to be taken in various matters where the European Union had little or no jurisdiction to instruct the member states. This applies, e.g. to education, where each country has full autonomy in its own policies. In the light of these facts the Lisbon summit agreed on new work procedures for the European Commission that are called *open method of co-ordination*⁴. This means that the method is based on voluntary cooperation between countries to achieve the defined objectives. Agreements are reached on definitions and implementation of political goals, and benchmarks are set where applicable. Statistical indicators are found that enable assessment of the current situation, and actions and the effects of these actions are monitored regularly.

This method recognises the fact that countries have diverse education systems, with varying emphases and solutions, and that they are situated at varying points on the development continuum. The guiding light is the principle of building on what exists in each country, on exchange of information on successful solutions and their dissemination. In the spirit of the *open method of co-ordination*, the EEA/EFTA states were invited to take part on an equal footing in the task of strengthening Europe's education systems.

Following the summit of 2000, the European Union ministers of education formed policy in their domain and agreed on common aims and improvements to the year 2010 in the member states. The policy was to aim at improving *quality and efficiency* of education systems, to *open lifelong learning for everyone* and to *open the education systems for increased cooperation with non-European parties*. The ministers then requested that the Commission elaborate their general objectives and make proposals for improvements. This work resulted in a plan of work that was agreed at the 2002 European Union summit in Barcelona. In the work plan, the three main objectives were divided into 13 sub-objectives which are further divided into key issues⁵. Policy is being elaborated in many areas to achieve the objectives, so for the sake of simplicity it has been given the umbrella title "**Education and Training 2010**"⁶

During the period 2002-2004 the work was initially at European level in working groups, where each group deliberated one or more of the sub-objectives. A standing group was also formed, "*Standing Group on Indicators and Benchmarks*", that has the function of considering

³ "The European Union must become the most competitive and dynamic knowledge-based economy in the world capable of sustained economic growth with more and better jobs and greater social cohesion. (European Council, Lisbon, March 2000)"

⁴ See: http://ec.europa.eu/education/policies/pol/policy_en.html#methode.

⁵ **Objective 1:** Increasing the quality and effectiveness of education and training systems in the European Union
Sub-objectives: Improving education and training for teachers and trainers - Developing skills for the knowledge society - Ensuring access to ICTs for everyone - Increasing the recruitment to scientific and technical studies - Making the best use of resources.

Objective 2: Facilitating the access of all to education and training systems
Sub-objectives: Open learning environment - Making learning more attractive - Supporting active citizenship, equal opportunities and social cohesion

Objective 3: Opening up education and training systems to the wider world
Sub-objectives: Strengthening the links with working life and research, and society at large - Developing the spirit of enterprise - Improving foreign language learning - Increasing mobility and exchanges - Strengthening European co-operation.

⁶ See: http://ec.europa.eu/education/policies/2010/et_2010_en.html.

methodological aspects of the use and development of statistical indicators. The work of the groups was aimed at getting an overview of the status of education in Europe, at elaborating the European Union's broad objectives and at proposing action for improvement. An important part of the work was to identify comparative statistical information in available sources and to make a draft framework for collection of such statistics in a structured manner where they are needed. This work is done in close cooperation with Eurostat, OECD, UNESCO and others.

In 2003 the ministers of education of the European Union countries agreed to set the following practical benchmarks for the EU till the year 2010⁷:

- **The dropout rate from schools should not exceed 10%.** The base for this calculation is the ratio of population 18-24 years which has only completed statutory education or lower.⁸
- **The total number of students in maths, science and technology courses should increase** by about 15% on the figure for 2000 and **the gender distribution in this group should be more balanced**⁹.
- **At least 85% of the population should have completed further education by the age of twenty two**¹⁰.
- **Improved reading skills:** The percentage of those scoring low on the PISA scale should drop to 13.7%¹¹.
- **At least 12.5% of adults (age 25-64) should participate in adult education.**

With the current status it is very unlikely that the European Union will achieve its five benchmarks, with the exception of the increase of students in maths, science and technology.¹²

Barriers to progress

The publishing of the European Commission's first report on progress towards the objectives in education and training in 2003 made it clear that there were obstacles to be surmounted. The Commission drew the attention of the European Council of Ministers to the following obstacles¹³ :

- Insufficient funding for education
- Shortage of competent teachers
- Too few citizens complete further education
- Too few citizens complete university education
- There is a brain drain from European universities and they do not succeed in attracting the most able students
- Too few citizens complete an education in maths, science and technology subjects, particularly women
- About 20% of Europeans do not achieve the basic skills
- Too few citizens participate in adult education

The message from the Commission and from the Council of Ministers to the 2004 summit¹⁴ was that it was essential for Europe to immediately invest more, and in a more efficient manner, in education, primarily at university level and in vocational education and in adult education. Furthermore the message was that each of the member states must define a clear

⁷ N.B. Benchmarking is against the average for member states and not proportionately for each country.

⁸ In 2005 the average for EU countries was 14.9% against 26.3% in Iceland.

⁹ It should be noted that the proportion of Icelandic students in these subjects was low in 2003, 17.2%, while the corresponding EU average was 25.9%.

¹⁰ In 2005 the average for EU countries was 77.3% against 53% in Iceland.

¹¹ In 2003 the average for EU countries was 19.8% against 18.5% in Iceland.

¹² The statistics quoted above are from the EU report, "Detailed analysis of progress towards the Lisbon objectives in education and training." 2006 Report Analysis based on indicators and benchmarks".

¹³ See: "Implementation of the Education and Training 2010 Work Programme" Commission staff working document (COM/2003) 685 final)

¹⁴ See: "Joint Interim Report of the Council and the Commission: Education & Training 2010: the Success of the Lisbon strategy hinges on urgent reforms".
http://europa.eu.int/comm/education/policies/2010/doc/jir_council_final.pdf

policy on lifelong learning. A *European Qualifications Framework* would also have to be developed that would be a reference for a *National Qualifications Framework* in each country.

A high level group of experts chaired by Wim Kok, former Prime Minister of The Netherlands, delivered a report on their evaluation of the status of the Lisbon Process in 2004¹⁵. This report was seen as a severe criticism of all the aspects of the work being done to achieve the objectives. The conclusions of the report were that the work had produced little or nothing and that the objectives were just as distant as they had been in the year 2000. Europe's competitive position *vis à vis* the USA and Asia had in fact worsened, and Kok accused governments in European Union member states of not having taken seriously the objectives and measures to achieve them. The authors of the report believed that the main reasons why the Lisbon Process had not produced the desired results were that efforts were diluted by being applied in too many places simultaneously, coordination was poor and there was a lack of political commitment at national level. There was a plethora of activities for which no one bore responsibility.

Wim Kok's group described the actions in research and education as fumbling and inadequate. It was particularly disappointing to discover that only two European Union countries had achieved the objective of allocating 3% of GDP to research. The report attributed the failure to a lack of cohesive policy and to the fact that ways had not been found to capitalise on research results. It was also pointed out that the productivity of the European knowledge industry was low. The message from the group was that the following were necessary:

- invest more in human capital and use the investment more efficiently
- improve the education and education systems of member states
- increase citizens' level of education across the board, lower the dropout rate from schools so that by 2010 it will be half that of 2004
- offer education opportunities for all, not least for older people so that they can maintain their position on the employment market for a longer period.
- European Union countries should each form a clear overall lifelong learning strategy, without delay.

The Lisbon Process reviewed

In the light of the above-mentioned report, the Commission presented a mid-term review¹⁶ to the European Union summit in 2005, with proposals for changed working methods and emphases in the Lisbon process to 2010. It was proposed to sharpen the focus and prioritising of projects, to simplify and coordinate the work and to instill a sense of responsibility in the member states and encourage them to participate more actively. Regarding education, the challenge posed by Wim Kok's report was accepted and emphasis placed on the importance of increased and more efficient investment in education systems, not least at university level. At the summit it was agreed that European Union member states should report on their overall lifelong learning strategy no later than in 2006.

Changed methodology in "Education and Training 2010"

The work in Education and Training 2010 has been affected by the review of the Lisbon Process. When planning the work, the Commission was guided by three principles: have the member states shoulder more responsibility and participate more actively, coordinate the activities and make them more visible.

¹⁵ See: "Facing the Challenge: the Lisbon strategy for growth and employment. Report from the High Level Group chaired by Wim Kok": http://europa.eu.int/comm/lisbon_strategy/pdf/2004-1866-EN-complet.pdf.

¹⁶ See: Communication to the Spring European Council - Working together for growth and jobs. A new start for the Lisbon Strategy. (COM/2005) 24) Also: Council conclusions on Education and Training in the framework of the Mid-Term Review of the Lisbon Strategy. Council of the European Union 6604/05 EDUC29 SOC76.

The participating countries should now set the course and say what issues they wish to emphasise most. It was decided to divide the countries into groups each focusing on specific themes where the "peer-learning" methodology would be used within "peer-learning clusters of countries". The groups agree on the most appropriate working method, e.g. with meetings, peer assessment, study visits, networks or pilot projects. Efforts are made to get active representation from both government and stakeholders in the groups. The main emphasis is then on ensuring effective dissemination of the results of the work to those responsible for relevant strategy in the participating countries.¹⁷

Dissemination of the extensive work being done under the auspices of *Education and Training 2010* is thought to have been inadequate, which also applies to stakeholder participation. It was therefore decided to launch a promotional campaign and this report and the work that lies behind it are part of this campaign. In 2007 the promotional campaign will be specifically targeted at overall strategy for lifelong learning as European Union member states have agreed to present their strategies for this issue before the end of 2006.

In order to monitor progress in the Lisbon Process and as a catalyst for real action at national level, there is a review of status every second year. The evaluation is based in part on reports from the participating countries on actions taken and on statistical comparisons between Europe and other continents, using available statistical data. The first review of this kind was presented to the European Union summit in 2006.¹⁸

Iceland's participation in "Education and Training 2010"

Iceland has participated in *Education and Training 2010* since the end of 2002. The Ministry of Education, Science and Culture appointed representatives to all working groups that were then active. The groups deliberated the following:

- Teachers and trainers
- Basic skills, foreign language teaching and enhancing entrepreneurship
- ICT in education
- Increasing participation in maths, science and technology
- Better use of resources
- Mobility and European cooperation
- Open learning environment, greater citizen involvement and social cohesion
- Increased attractiveness of education and stronger ties between education, the employment sector and society.

In 2003, the brochure "*Menntun í Evrópu*" (*Education in Europe, varying systems and common goals to the year 2010*) was published with funding from the European Commission and a conference was held entitled "An environment to encourage study". The "Organisation and Funding of Lifelong Learning" conference, held a year later, was also supported by the European Union. Finally the report: "*Progress towards the Lisbon Objectives in Education and Training*" was delivered to the Commission in mid 2005. This report was used in the 2006 European Commission review report to the Council of Ministers and European Parliament, on the progress of the work towards the Lisbon objectives. As previously indicated, these review reports are delivered every other year. They are based in part on status reports from the countries taking part in "Education and Training 2010". The Ministry of Education, Science and Culture will deliver its next status report in 2007.

As previously noted, work is now in progress on the second phase of the Education and Training 2010 work programme where the emphasis is placed on actions at national level. New working groups (referred to as "peer-learning clusters of countries") were formed to cover

¹⁸ See: Modernising education and training: a vital contribution to social cohesion in Europe. 2006 Joint interim report of the Council and of the Commission on progress under the "Education & Training 2010" work programme". http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/c_079/c_07920060401en00010019.pdf. Also the Commission report, "Detailed analysis of progress towards the Lisbon objectives in education and education." 2006 Report Analysis based on indicators and benchmarks".

some important themes. The Ministry of Education, Science and Culture decided to take part in five "clusters": (1) on modernisation of higher education, (2) on teachers and trainers (3) on ways to make maths, science and technology more attractive, (4) on improved use of ICT in education, and (5) on recognition of learning outcomes.

2006: Iceland's national debate on "Education and Training 2010"

In order to increase transparency in *Education and Training 2010* and to encourage stakeholder participation, the European Union offered support to the governments of participating countries for the task of organising debate and work on the home front related to relevant European Union policy under the banner *Education and Training 2010: National Debate Action Plan 2006*". The funding offered was used to maximise results from Icelandic participation in this action in relation to the current review of the education system in Iceland.

The Ministry of Education, Science and Culture received a grant to form discussion groups, hold a conference and publish promotional material. The Ministry delegated the implementation of the tasks to the University of Iceland Research Liaison Office (RLO). The RLO provided staff to support the work of the discussion groups, to organise the conference and to edit this final report. Overall responsibility and management was in the hands of the Ministry, which provided the chairpersons for the discussion groups.

1. Discussion Groups

Since the spring of 2006 the five discussion groups deliberated the same issues as the country clusters in which the Ministry participates at EU level (as detailed above). The work of the groups was to discuss the current situation in education in Iceland comparative to elsewhere in Europe. They were to focus on various issues that are not yet in public debate and to present suggestions for policy action and change in these matters, where relevant.

The purpose of the discussion groups was to maximise participation in policy-making discussions in order to generate broad consensus on government policy. The groups were also seen as support for Icelandic participation in European Union working groups, where Icelandic representatives could use the home discussion groups as a platform to disseminate information about methods being used elsewhere in Europe. Conversely, the groups would provide the Icelandic representatives at EU level with material and support that could be further disseminated through the European cooperation. Participants were not representatives of specific interest groups, but rather individuals that could be expected to initiate discussion by introducing interesting ideas.

Participants in the discussion groups were:

Group A – Modernisation of Higher Education

Hellen M. Gunnarsdóttir Ministry of Education, Science and Culture, chairperson
Eyrún Jónsdóttir Icelandic Student Association
Guðmundur Hálfðanarson Faculty of Humanities, University of Iceland
Guðmundur Hálfðanarson Faculty of Humanities, University of Iceland
Guðrún Nordal Faculty of Humanities, University of Iceland
Guðrún Pétursdóttir Sæmundur fróði Institute, University of Iceland
Hjálmar H. Ragnarsson Iceland Academy of Arts
Ingjaldur Hannibalsson Faculty of Business and Economics University of Iceland
Magnús Árni Magnússon Bifröst University
Rósa Gunnarsdóttir Ministry of Education, Science and Culture

Group B - Teachers and Trainers

Þurgrímur Þorvaldur Ministry of Education, Science and Culture, chairperson
Ársæll Guðmundsson Borgarfjörður College
Bragi Guðmundsson University of Akureyri
Elna Katrín Jónsdóttir Teachers Union of Iceland
Hafþís Ingvarsdóttir Faculty of Social Sciences, University of Iceland

Ólafur Proppé Iceland University of Education
Rósa Gunnarsdóttir Ministry of Education, Science and Culture
Svandís Ingimundardóttir Union of Icelandic Local Governments

Group C - Increasing participation in Maths, Science and Technology

Edda Lilja Sveinsdóttir Ministry of Education, Science and Culture, chairperson
Allyson Macdonald Iceland University of Education
Ari Ólafsson Faculty of Science, University of Iceland
Ingi Bogi Bogason Confederation of Industries
Jónína Ágústsdóttir Akurskóli, Reykjanesbær

Group D - ICT in Education

Jóna Pálsdóttir Ministry of Education, Science and Culture, chairperson
Ásrún Matthíasdóttir Reykjavík University
Einar Bergmundur Arnbjörnsson Iceland Academy of Arts
Hannes Högni Vilhjálmsson Reykjavík University
Ingibjörg Jónasdóttir KB Bank
Sigrún Eva Ármannsdóttir Hugji/Ax

Group E - Recognition of learning outcomes

Ólafur Grétar Kristjánsson Ministry of Education, Science and Culuture, chairperson
Hafsteinn Eggertsson Education in the building trade
Heimir Jón Guðjónsson Breiðholt College
Ingibjörg Elsa Guðmundsdóttir Education and Training Service Centre
Sigurður Albert Ármannsson Association of Bank Employees
Sigurður Sigursveinsson South Iceland College

Supporting staff for the groups were Sigurður Guðmundsson from the Research Liaison Office and Thora Magnúsdóttir, freelance expert and former education and culture counsellor at the Icelandic Mission to the EU in Brussels.

2. Conference

The aims of the conference *Education and Training 2010 - The Development of Education Policy in Iceland in the context of Europe*¹⁹ were to promote "Education and Training 2010" and Iceland's involvement in the work programme, and to invite reactions and views of varying stakeholders to the conclusions of the five discussion groups.

Sebastian Volkers, representative of the European Commission, presented "Education and Training 2010", giving a detailed overview both of progress made and of the problems that faced European countries and that needed to be systematically solved during the coming years.²⁰ In this context Sebastian drew particular attention to the fact that the European Union member states had agreed to formally publish their master strategy for lifelong learning no later than the end of 2006. Sebastian underlined the fact that lifelong learning was more than just adult education. The lifelong learning policy was in fact a master strategy for all learning, formal and non-formal, from cradle to grave.

The conference keynote speaker was Dr. Marijk van der Wende professor at the University of Twente and at Vrije Universiteit Amsterdam in The Netherlands and president of IMHE (*Programme on Institutional Management in Higher Education*) at OECD.

Marijk van der Wende specialises in comparative higher education studies with special reference to the impact of globalisation and network technologies. She has considerable experience of both through participation in European cooperation and in her research on the subject as such. Marijk is also a qualified teacher, worked as a teacher for a number of years where she participated in school and curriculum development. This background and expert knowledge provided a particularly useful input for the conference. In her presentation she

¹⁹ See the conference programme in appendices

²⁰ See slides in appendices

focused on the role of the university in a knowledge society, dealing with the subject in a broad manner to relate to the aspects of education dealt with by the discussion groups.²¹

Delegates were sent draft reports from the five discussion groups prior to the conference. At the conference itself, the chairmen of the discussion groups made short presentations of the main conclusions and specially selected commentators were brought in to present their considered reactions to the groups' conclusions. Conference delegates²² were then given the opportunity to participate in the discussions, both through comments from the floor in the main auditorium and in organised discussions during the extended coffee break. The final version of this report takes into account the comments and additional ideas that came up at the conference.

3. Post conference work and promotional material

This report is part of the work supported by the European Commission for promotion and debate on the subject of *Education and Training 2010*. The report is based on interim reports of the five discussion groups, but has undergone some changes in this final version. This chapter has been added to give an overview of the *Education and Training 2010 work programme* and of Iceland's participation. At the end of each chapter from the discussion groups, a short text on "next steps" has been added. In addition, the main comments voiced at the conference *Education and Training 2010 - The Development of Education Policy in Iceland in the context of Europe* have been recorded and are published as an appendix to the reports of the five discussion groups. The report is published in both Icelandic and English.

It should be noted, as stated in the introduction, that the object of this report was neither to make a detailed nor scientific study of the issues deliberated by the discussion groups, but to publish the results of open discussion and brainstorming on those subjects. The aim of the report is the same as the aim of the discussion groups and of the conference *Education & Training 2010 - National Debate in Iceland 2006*, to try to cast new light on the current situation and to encourage open, objective and ongoing discussion on education in Iceland.

²¹ See slides in appendices.

²² See list of conference guests in appendices.

I. MODERNISATION OF HIGHER EDUCATION

Discussion Group A Report

"The group considers that universities should increasingly model their operations on management practices from industry."

The group points out that in discussions on higher education in Europe the question of finance is a key issue. All are convinced that more funds are needed if the Lisbon objectives are to be achieved. The group presents a number of possibilities: Direct contributions from companies should be tax-deductible; institutions or companies could establish funds that will support university activities and regional government should become active in funding universities. The group also feels that discussions on the introduction of tuition fees for university attendance are inevitable.

From the opening address of the Minister of Education, Science and Culture

1. Introduction

The importance of universities has grown across the board in recent years. They are centres of knowledge and innovation for all the main sectors of society and are part of the international education and scientific community of nations. In a recent OECD report on the assessment of nations' competitiveness, the main emphasis is placed on the importance of education and on progress in research and innovation. Attention is drawn to the fact that education, research and innovation are engines for economic growth in societies that base their existence on gaining and exploiting new knowledge.

2. The current situation in Iceland

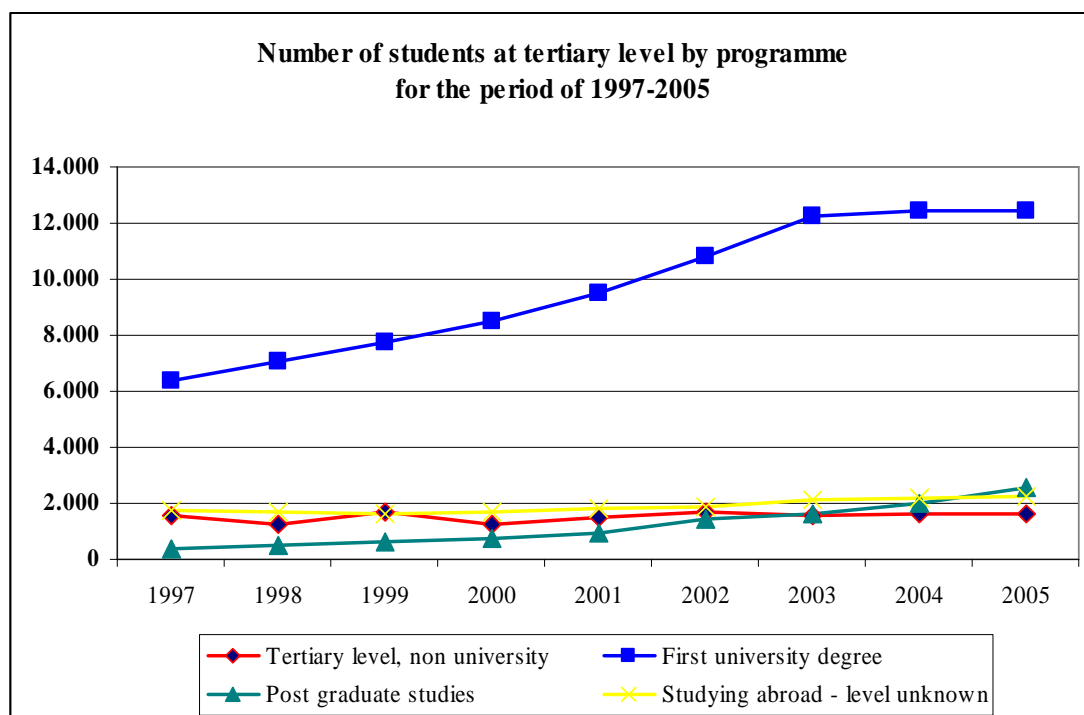
Higher education in Iceland has undergone great changes in recent years. The University of Iceland, founded in 1911, was long the only higher education institution in the country that offered qualifications at university level. In 1971, The Teachers College of Iceland was changed by law to become The Iceland University of Education by laws nr. 137/1997. The colleges for Pediatric Therapy, Pre-School Teaching and for Sport were incorporated into the University of Education. The University of Akureyri was founded in 1987 and the Iceland Technical College, founded 1962, formally became the Iceland Technical University, by law nr. 53/2002. In 2005 the Iceland Technical University was incorporated into Reykjavík University which had commenced university teaching in 1989. The Commercial University at Bifröst was built on foundations provided by the Cooperative College of the same name, and commenced teaching at university level in 1989. Then the Iceland Academy of the Arts was founded in 1998, also built on a college with a long history, the Icelandic School of Art and Crafts. In addition to this the Colleges operating at university level under the auspices of the Ministry of Agriculture have also increased their operations in recent years. They are the agricultural universities at Hvanneyri and at Hólar.

Development of higher education

On 1 January 1998 the new framework laws for higher education nr: 136/1997 came into force. Their main objective was to cement the structure of higher education and to summarise the main conditions higher education institutions had to fulfill in order to be able to use the name "university" and award degrees on completion of courses. The laws prescribed that

operations in each university would be specified in more detail in laws, regulations, operating procedures and organisation specification for each institution. The laws were set with a view to providing a simple overview of the main rules governing university operations.

It is fair to say that the existing legal framework for universities has created an environment for increased variety and competition at university level which has included the licensing of private sector provision of university teaching. Parallel to this development, the offer of courses at university level has increased considerably during recent years. During the period 1999-2004, degrees on offer increased by 112, or by 55%, with the majority being for post-graduate studies. The student population of Icelandic universities has doubled, from 8,100 to more than 18,000 for the same period.



Number of university students for the period 1997-2005²³

Government funding for universities in proportion to GNP has increased steadily in Iceland and has followed the increase in the number of students. In 2005 it was 1.59% of GNP.

| Public expenditure on universities | | |
|------------------------------------|-------------|--|
| | as % of GNP | ISK per capita as per price index 2005 |
| 2000 | 1.30 | 41.600 |
| 2001 | 1.35 | 44.400 |
| 2002 | 1.45 | 46.000 |
| 2003 | 1.62 | 50.700 |
| 2004 | 1.53 | 50.200 |
| 2005 | 1.59 | 54.300 |

The EU objective for 2010 is for 2% of GNP to go to universities.

²³ Source: Statistics Iceland. The data are compiled from a database comprising regular students enrolled in an educational establishment. They cover all students at tertiary level, including both university and non-university level. Only those students outside Iceland who apply for assistance to the Students Loan Fund are included. Each student is counted once.

International cooperation

The Ministry of Education, Science and Culture represents Iceland in cooperation on higher education in several fields. Such cooperation offers a variety of opportunities that must be used by universities if Iceland is to maintain its strong position in an environment of increasing competition in university education, research and innovation.

Nordic cooperation

The Nordic Council of Ministers has issued numerous statements about cooperation in the fields of higher education and research. The policy since 2002 has been to remove official barriers between the Nordic countries and this has also applied to activities in the higher education sector. In 2004 the Nordic ministers of education signed a declaration on the recognition of certificates of higher education, called the *Reykjavík Declaration*. It states that the Nordic countries commit themselves to equal recognition of comparable education between their countries. Cooperation between governments and universities in the Nordic countries has a long history, including projects to introduce common degrees and for cross-border recognition of studies. In this way, teachers and students have the option of completing part of their studies in one of the other Nordic countries through the NORDPLUS programme run by the Nordic Council of Ministers.

Nordic cooperation in research and innovation has recently been reorganised with enhanced cooperation and new objectives in these fields. The purpose of this major reorganisation is to achieve better productivity by combining financial resources on the Nordic market, to enhance the competitiveness of companies and institutions and to place the Nordic countries in the vanguard of knowledge societies.

European cooperation

In 1999, 29 European countries signed the *Bologna Declaration* on increased cooperation in the field of higher education in Europe. Since then, more countries have joined the initiative and they now total 45. Cooperation under the auspices of this agreement is said to be according to the Bologna Process. The aim of the cooperation under the auspices of the Bologna Declaration is to make it easier for students, teachers and academics to study or work in countries other than their own. The process places great emphasis on the quality of university education and on ensuring that students can be sure that the qualifications they are awarded will fulfill international quality requirements, both for continuing education and on the employment market.

As the policy is to make Europe a single education area by the year 2010 according to EC objectives defined in the Lisbon Declaration, it is very important to facilitate cross border comparisons in higher education. Mobility of students and teachers is a prerequisite for the realisation of the European Education Area. This is why remaining barriers to Mobility should be removed. Considerable effort has recently been put into achieving these objectives, for example with participation in peer learning activities under the auspices of the EU.

Both government and universities in Iceland emphasise the need for ease of comparison of education between institutions, so that students can enjoy reciprocity of qualifications between institutions and cross-border. In accordance with the *Bologna Declaration*, the aim is that university education should be structured as a three-tier system, BA/BSc, MA/MSc and Doctorate. All students graduating from university should, in addition to their degree certificate, receive a Diploma Supplement that shows the courses they took. Students' work is defined with ECTS units (European Credit Transfer System), which has been used as a metric for university studies in Iceland for many years, as is the case in many European countries.

In addition to facility of comparison of courses, emphasis is also placed on quality control.

3. The main recent policy initiatives

The Icelandic Science and Technology Council has emphasised the role of universities in research and education and has included in its policy statement the view that universities are leaders in disseminating knowledge and that they play a growing role in the application of research findings and in innovation. The Science and Technology Council policy statement from 19 December 2005 stresses the importance of augmenting doctoral studies in Iceland. The Minister of Education, Science and Culture is encouraged to provide a policy for doctoral studies and universities are encouraged to form a clear policy on research and graduate studies. In the Science and Technology policy statement for 2006-2009, one of the aims is to make the education and scientific infrastructure among the best in the world. Attention is drawn to the fact that in important sectors, education policy is also employment policy, as the Icelandic nation is changing from a production society to a knowledge and services society that participates actively and purposefully in international competition. Particular emphasis is placed on developing the university sector and on strengthening quality criteria for teaching and research.

A newly published OECD report about the university system in Iceland covers the major changes that have been made at university level during the past decade and concludes that on the whole they have been successful. Institutions have been upgraded to university level, privately run universities have been founded, funding has been reviewed and changed and both competition and cooperation have taken on a new aspect. The Icelandic university system shows a resilience that indicates great ability to adapt. The authors of the OECD report find this remarkable given the short period during which this variety has developed, following the adoption of Parliament's policy in the laws on universities from 1997. The authors also note that the relationship between universities and government is characterised by freedom for the universities to set objectives for their operations. This has caused some friction as institutions' objectives as reflected in their offers of courses, in research and in development, are not always fully in step with political emphasis at any given time. The report's conclusions also criticise methods for accrediting new degrees, which are thought not to ensure quality of courses, particularly when one considers the number of new courses that have been introduced in recent years.

The report's authors draw particular attention to the size of the Icelandic university system and to the small operational units. Despite the fact that the system is very small they consider that it has shown great flexibility and that competition between universities has led to a response to increasing demand. Iceland has the 4th highest demand for university education in OECD. Attention is also drawn to the fact that access to university education in Iceland has been seen rather as a right than an opportunity and that current policy allows for institutions competing for students rather than students competing for university places. Finally the authors point out that there has been considerable economic growth in recent years which has allowed government to greatly increase funding for university education thus supporting change, yet the institutions still have problems making ends meet and feel they need even more government support. Finally the authors say that increasing funding for higher education and identifying new ways of funding will be the main policy tasks for this sector in Iceland in the near future. These are matters that must be discussed.

A new legal framework was agreed for higher education in July 2006. The passing of this legislation reflects government policy for higher education and is to a certain extent a reaction to recent developments in this sector, to international standards and to the conclusions of recent studies (OECD, EUA, Icelandic National Audit Office and others).

A homogenous university operating environment, independence and responsibility

The new laws on universities apply to institutions that provide higher education that leads to degrees at university level. They reiterate the independence of universities and say that universities should enjoy autonomy to decide their own affairs. The purpose of reiterating the autonomy is to ensure that government does not interfere with academic work within universities and that it should respect freedom of research and academic independence. It is however the universities' duty to set conditions and be responsible for the activities that take place under their aegis.

University management and governance

The new laws on universities state that university governance is the responsibility of the university council and of the rector in accordance with provisions in regulations for administration, in its charter or in other university foundation documents. There are no provisions in the framework laws that prescribe how the university board is comprised. There are however provisions on access for staff and students to university meetings, which shall be held by all universities at least once a year. The objective is to ensure that interested parties, teachers, students and other staff have a say in the schools' academic policy making.

Recognition of university status and parity

The previous laws on universities gave the Minister of Education, Science and Culture the power to licence the operations of privately funded universities. State funded universities operated according to special laws for each institution. The new framework laws cover all universities operating according to the laws' definitions, regardless of their operational form, and it is proposed that the Minister licence these institutions given that they fulfill certain conditions. A university's recognition is linked to a given set of fields of knowledge or subsets of these fields. The universities are then free to decide what courses they offer within the fields of knowledge for which they are recognised.

Qualification framework for higher education and degrees

The laws state that the Ministry of Education, Science and Culture shall issue a National Qualification Framework. Qualification frameworks for higher education and degrees are a description of the structure for studies and degrees, where emphasis is placed on a description of a student's knowledge and competence at the end of a course of study. The Qualification Framework has clear guidelines for the structure of courses of studies and for the degrees the universities will award. This is one of the steps taken to facilitate reciprocal recognition of qualifications, while at the same time creating a better environment for student mobility and increasing opportunities for cooperation between universities both at home and abroad. While enhancing reciprocal recognition of qualifications, provisions are also to be made that will increase flexibility within institutions in the offer of courses.

Monitoring quality of research and teaching

One of the main innovations in the new laws is that the monitoring of quality of research and teaching is now required by law. The objective is to ensure that the conditions for being recognised as a university are fulfilled, that the Qualification Framework is fulfilled, that teaching and research is improved in a structured manner, that the universities take more responsibility for their own operations and that the competitiveness of Icelandic universities be ensured at an international level.

Offer of courses

The new laws define offers of courses in a new way. The main rule is that universities decide how teaching, research, courses and assessment are organised. Discussions on development and organisation of university education in Iceland are in the context of a three-tier system. Although Icelandic universities have been adapting their education offer to this system during recent years, the government felt it important to establish a legal basis for this structure of university education. The amount of study effort required for each degree level is defined in standard units (ECTS). All students in Icelandic universities are to receive a Diploma Supplement with their degrees. It is to give objective information on the content of the course of study they have completed and its position within the university system. The provision of the supplement and the ECTS system are aimed at enhancing international transparency and at providing fair recognition of qualifications for educational institutions and for the employment market.

4. The main challenges and future tasks

In the group that dealt with modernisation of higher education, it was decided at the outset to limit the discussion to those aspects receiving most attention at EU level regarding the current situation at the university level, i.e. management, funding and curricula.

Management and governance

The university operating environment is in a state of constant flux. Universities need to grapple with changing societies, globalisation and increasing demands from employers. The result is that universities have become complex institutions that are not as easy to manage as before. This applies equally to internal management and relations with government. Changes need to be made to internal management if new and complex tasks in the knowledge society are to be solved.

European Union policy emphasises that universities in Europe be independent institutions, while at the same time shouldering increased responsibility for their own operations. The discussion group feels that universities in Iceland enjoy a high degree of independence and that the new laws grant them certain autonomy in their own affairs, such as the organisation and content of courses. While recognising this it is also emphasised that they bear the responsibility that the independence implies. Particular reference is made to responsibility in presenting learning materials and study options, to quality in teaching and research and to students' rights.

Points emphasised for management and governance

- Universities should increasingly model their operations on management practices from industry
- Outside access to university management processes should be assured
- Universities should show more efficiency in their operations

Deliberations and reasoning

"The group considers it important that universities increase efficiency in their operations. One way is to model their management on practices from industry." Management or the Board should concern itself with the running of the institution in the widest sense, while academic policy should be debated at university meetings at which all staff have representation, as is prescribed in the new laws on universities. It is for this reason that the group feels it preferable that a majority of the Board, or of the managers of a university, should be non-faculty.

Increased efficiency in universities means that they should place more emphasis on students completing their studies at a normal pace, in line with the definition of "full-time study". In order to increase efficiency it is noted that it would be desirable that each student had a study schedule (objectives) when he commences his studies. This will enable the university to demand results. There should be room for exceptions given exceptional circumstances, but the main objective should be that a student will complete his studies within the time framework defined in the course catalogue. The main obstacle to achieving this objective is that a large number of university students are non-typical, i.e. they are older and in many instances are also working, so their education takes longer than is planned. It is also necessary to address the problem of preparing students better for their choice of subjects, and to enhance curriculum advice and support mechanisms for students so that they see sooner whether a particular course of studies suits them, and that they get the help necessary to be able to complete their studies within the recommended framework.

Funding

The most important discussion on university education in Europe is the one on funding. The Council of Europe has pointed out that a review of funding of university education systems must also examine the quality of such systems, both their efficiency and their equality. The EU has opened the debate on university funding in connection with the Lisbon Objectives and has

pointed out the necessity of increasing public funding, while at the same time aiming for higher contributions from other sources – from individuals and companies. In its policy the EU draws attention to the fact that investment in education and training provides a demonstrable return on investment that clearly benefits citizens, the employment sector and society as a whole. It is therefore necessary to make up the financial deficit with which most European universities are grappling, if they are to fulfill their role of being hubs for the knowledge society of the future. The EU aims at 2% of GDP being allocated to the university sector, while at the same time universities are encouraged to seek funding from parties other than the state,

Points emphasised for university funding:

- Direct contributions from enterprises should be to some degree tax-deductible.
- Pros and cons of tuition fees should be examined.
- Funds. Institutions and enterprises should establish funds to support university operations.
- School share portfolios. Enterprises should support universities by donating shares in profitable companies.
- Public funding should increase and regional government should be encouraged to participate.

Deliberations and reasoning:

One of the main challenges now facing universities is the increased costs that result from development and expansion of the system. *The group considers that direct contributions from enterprises should be tax-deductible.* The importance of such a measure has long been debated, with minimal results. It is proposed that authorisation for universities to charge tuition fees to some extent, should be considered. At the same time, loans should be made available for the fees, as is the case with those private sector universities that currently charge fees.

The group emphasises on the other hand that the employment sector should contribute more to the university system, with direct contributions, by establishing funds and with contributions in the form of shares.

Curriculum development

Universities in Europe need to change their offer of courses such that they attract students from all over the world. In order to do this, universities need to review their offer of courses and make it more modern and flexible, in such a way that it become more relevant to the needs of the employment sector and of society in general.

Great progress has been made in adapting the countries to the Bologna Process but the universities still have to review their offer of courses from the student's standpoint, to change their teaching methods, use ICT, offer greater access to their operations and offer varied curricula. People need to be taught cooperation, initiative and creativity. The European Union has recently emphasised the above-mentioned aspects. With the advent of new legislation governing universities, Iceland has achieved most of the objectives of the Bologna Process and it is assumed that curricula will be reviewed as a matter of course when universities adapt to the new framework set by the laws.

Points emphasised for course development in universities:

- More varied teaching methods
- Independent study and practical applications for education
- That students should gain speaking/presentation skills, learn to work with people and to show initiative
- Critical appraisal and creativity should be features of studies in all disciplines
- Prepare university teachers for adoption of more varied teaching methods

Deliberations and reasoning

Universities need to adopt greater variety in teaching methods. The emphasis should be moved away from lectures and more towards independent work and assignment-based study.

Active participation of individuals in a knowledge society is based on the ability to use knowledge, an ability that is in turn based on critical and creative thinking and on communication skills. The review of teaching methods must follow the changes that have been made to the teaching system, and to the demands that are made on the basic skill set graduates should have. To prepare students for participation in the labour market and in society as a whole, it is important that the objectives of curricula should emphasise group work and cooperation. Skills in self expression need to be developed, both oral and written. The ability to use the knowledge and skills provided by a university education must be given parity with the knowledge itself, and the curriculum objectives should reflect this.

This change highlights the need for further preparation for university teaching. This increased emphasis on more efficient and more assignment-oriented curricula, which requires the teachers to spend more time communicating with the students, calls for a review of teachers' input in time and of their training. Experience, e.g. from Norway, shows that even changes limited to the form of presentation of courses can lead to teachers having to spend increased time on teaching, which is usually at the expense of time spent on research.

5. What next?

Proposals for ways to improve the university system affect many people, and there are doubtless differing opinions on the conclusions of the group. The group has made every effort to disseminate its conclusions, including presentation at the conference "EDUCATION & TRAINING 2010 The Development of Education Policy in Iceland in the context of Europe".

New legislation heralds the next steps in university education in Iceland. By adopting a system of recognised university institutions, a great step forward has been taken in monitoring the quality of teaching and research. By defining the recognition in terms of a university's academic disciplines, it is expected that improvements in curricula and in the curricula offer will be made at the same time. It is also assumed that the curricula review will affect teaching methods.

In the weeks to come after the publication of the report there will be a review of the special laws governing state universities in the context of the new legal framework, where issues like organisation of curricula, management and authority to charge tuition fees are to be considered. At the same time the organisational charters and statutes and regulations of private universities are to be reviewed. It is expected that this group's report would be used as input in this work.

Addenda to the report of the discussion group on MODERNISATION OF HIGHER EDUCATION

- Feedback from expert and from conference delegates

At the conference *Education and Training 2010 - The Development of Education Policy in Iceland in the context of Europe*²⁴ the group's report was presented and debated. After the chairpersons of the discussion groups had made their presentations, experts gave their reactions in short, but prepared presentations. The floor was then opened to conference delegates, who variously made comments or asked questions, both in the main auditorium and in the discussion groups that were convened in the extended coffee breaks. The following are some of the comments and questions raised in the discussions.

1. Expert reaction

The guest speaker, Dr. Marijk van der Wende, professor and director of IMHE (Programme on Institutional Management and Governance in Higher Education) at OECD, was the expert commentator on the Group A report. In Marijk van der Wende's lecture, presented earlier in the day, she dealt with the role of universities under the heading: "Shaping the Future – The role of higher education in the knowledge society". The speaker's lecture clearly touched on many aspects covered in Group A's discussions. Here, the intention is not to repeat the content of Marijk van der Wende's lecture, but simply to highlight her specific reactions to the conclusions of the discussion group.

Management and governance:

- Running a university involves more than "management". We should rather talk about "leadership". We need well-trained leaders who understand the content of what is going on in the institutions they direct.
- There is not much to be found when looking for a university education that prepares people to be leaders of university institutions. Though, there are exceptions, e.g. in Germany, the UK, Ireland and Sweden. In The Netherlands e.g. there is no curriculum designed for future leaders of university institutions, while far too many "managers" have been brought in from industry.

Funding:

- Regarding tuition fees. Even though the cost of education, after the introduction of tuition fees, would eventually be borne by the State in the form of grants or loans, tuition fees would nevertheless increase the students' sense of responsibility for their own education.
- If there is to be more participation from the private sector, there has to be a quid pro quo. The tax system is important here, as is transparency of the source of the funding.
- Be wary of ideas regarding shares in universities!

Curricula:

- It is not easy to find balance in the quest for equality in knowledge and skills. It is not the role of universities to go too far in the direction of VET.

2. Comments and questions from conference delegates

Governance:

- What is meant by modelling operations on management practices from industry?
- It is no doubt possible to get agreement on the necessity to change management practices but clearer wording has to be used than the wording used in the report; progressive/leadership/innovation. One has to use the best of elements of peer management on the one hand and leadership on the other.
- It is important to introduce management concepts into the university environment.
- It is redundant to refer to management practices that the employment sector no longer uses. Peer management is precisely the most effective way to devolve responsibility to the relevant units in any given instance. This view can be supported by referring to the "subsidiarity principle" in managing universities in the EUA manual on the Bologna Process "University governance, leadership and management in a rapidly changing environment" by Luc E Weber (see <http://www.bologna-handbook.com/>).
- *Peer management* is as much an undefined concept as is company management – who exactly is responsible for what?
- It is healthy to get representatives from external parties into the university board. The way in which such representatives are appointed and the responsibilities they are entrusted with are crucial elements. It is not realistic to imagine that there will be much benefit from bringing in outsiders if they have no real say in decision-making.
- We must start discussing how university teachers are appointed. It has to be possible to hire and fire in universities just like elsewhere.

Funding:

- Funding of universities in Iceland is under the OECD average. Public funding of universities has to increase.
- It is not realistic to imagine that the private sector will make significant contributions to university funding.
- The existing system of funding universities is severely flawed and these flaws should have been examined in this report.
- It is not clear how we want to handle the issue of tuition fees so it is necessary to look carefully at the pros and cons in this issue.
- The pharmaceutical company ACTAVIS is examining the question of how it can more effectively leverage support for research.
- Costing professorships is a good way to meet the needs of both universities and companies.

Other issues:

- Regarding size, are we not biting off more than we can chew, do we not have to define a policy on the number of universities?
- The new legislation on universities will to a certain extent address the problem of size. The new legal framework will call for more cooperation as a result of increased division of tasks.
- The university managers at the Agricultural University at Hólar do not have the feeling that the university is too small, nor that it is out of touch with the employment sector. To the contrary, the university has received support from regional government *because* it is small and because of its location.
- Division of tasks does not mean that regional universities should be disabled.
- The competition between universities for students described in the report is greatly exaggerated.

II. TEACHERS AND TRAINERS

Discussion Group B Report

The teacher education group considers that teachers need more autonomy and responsibility in their jobs. To achieve this, teacher education has to be extended as planned and in-service training should also be increased. More extensive use of ICT in schools is important so that teaching does not lag behind the current developments in technology that students experience out of school. It is also noted that teaching and training that encourages independent thinking and unshackled opinion is becoming increasingly important in the context of rapid changes in society.

From the Minister of Education, Science and Culture's opening address

1. Introduction

Teachers and their education have long been an important part of discussions on Education. As education has to become more multifaceted and as demands on schools and teachers have grown with increased awareness of the value of good education, the value of the teaching profession has become more apparent. It is generally accepted that a well-educated and motivated teaching force is a prerequisite for an efficient school system and for quality education in a knowledge society. Nations that wish to make their mark on the emerging knowledge society of this new century must form policy for teaching and teacher education.

Towards the end of the 20th century and the beginning of the 21st there were radical changes in Icelandic society that had direct and indirect influence on the education system and on teaching. Whether one looks at the economy and employment, social affairs and demographic migration, technology and communications, one can find a melting pot and changes that influence not only culture and processing of knowledge but also education and upbringing. One can safely contend that the rapidity of changes in Icelandic society in recent years has increased demands on the education system to help society appreciate the changes and come to terms with new reality. All this increases demands on teachers, both to identify changes in society and to resolve them and to adapt the educational system to these changes.

Iceland is becoming an increasingly multicultural society. What was once a homogenous society is now becoming heterogeneous. This development will spread increasingly and reach most or all regions in the coming years or decades. This development will be felt within the school system. The nation's age structure is changing as are definitions of phases of life and their characteristics. Icelanders' level of education is rising by the year, which leads to changes in opinion and demands relating to the education of children and young people. Because there are now fewer children in each family, each child is more "precious" in the eyes of their parents. More and more children attend pre-school, up to 9 hours a day, 5 days a week. Almost all children in the 2-6 age group attend pre-school. Most children continue into upper secondary education, but there is a high dropout rate. The demand for university education and for various kinds of further education has grown steadily. Young people stay longer in school than before and a growing number of middle aged people seek education later in life.

Both parents normally work, in most cases full time, or more. Then there are social and leisure activities in addition. Society's institutions, independent associations, various sports and leisure offers are playing an increasingly larger role in upbringing and education, from the cradle to adulthood. There are all kinds of offers available to children throughout the day and

parents increasingly play the role of service provider rather than that of bringing the children up and playing an active part in their lives.

The country's broadband and fibre optic cable network is well-developed. Most of the country's younger generation, at statutory and upper secondary school level has been brought up in a world of multimedia and networks. Teaching is adapting increasingly to their world. The speed of delivery and volume of information have increased dramatically. Teaching and learning are breaking out of the physical confines of the classroom and out of the traditional school framework. There has been an awakening about quality in teaching, about the need for communication and cooperation between different school levels, about flexibility and variety in curricula to serve the varied needs of the individual, about adults seeking education and about the multicultural society.

The OECD 2006 report on Iceland's economy criticises the lack of communication and cooperation between schools and the employment sector, which is a fair assessment. The report also discusses the need at statutory school level to emphasise the quality of teachers rather than the quantity, and to increase the proportion of trained teachers in rural areas.

2. The current situation in Iceland

In September 2006 Statistics Iceland published a report²⁵. The report shows that during the period 2000–2005 qualified teachers in pre-school, statutory school and upper secondary school have increased in Iceland. There was a total of about 10800 teaching staff at these school levels in about 10100 positions in the autumn of 2005.

In the school year 2005-2006 there were about 1801 teachers in **upper secondary schools** according to the figures from Statistics Iceland. Of this number there were 1432 qualified teachers (79.5%) which represents a rapid increase over recent years. It is more difficult to predict the trend in numbers of upper secondary school teachers than those of statutory schools. Such estimates have more unknown variables than are in those for statutory schools or pre-school. The current number of pupils in each school year indicates that there will be a growing need for teachers at the upper secondary school level until 2010-2012. But one also has to consider unknown quantities like the number of pupils who will choose to continue after completion of statutory education, the number of older students who return to education after a break, uncertainty about the division of students between subjects and other unknown factors. Then there is the additional uncertainty about possible pending organisational changes at the upper secondary level. One could say that it is likely that most posts in upper secondary schools will be filled by trained teachers in the coming decade.²⁶

According to sources from Statistics Iceland there were 4841 teaching staff in schools at the **statutory schools level** in 2005-2006. This figure comprised 4197 qualified teachers (87.6%) and 644 non-qualified staff (13.3%). There has long been a significant number of instructors teaching at statutory school level in Iceland. There is a sufficient number of qualified teachers in Iceland to fill all posts at the statutory schools level, but for various reasons many of them look for jobs in other sectors. During past years the proportion of qualified teachers has increased steadily. The situation today is that most posts in urban areas are filled by qualified teachers. Instructors are mostly found working in rural areas. According to the Icelandic National Audit Office assessment from 2003²⁷ it was projected that the number of teachers at statutory schools level would decrease a little, at least until 2010, because of the declining birth rate. Then there is the assumption that working conditions for schools and teachers will not change greatly. The Icelandic National Audit Office projects that by 2008-2009 it should be possible to fill all teaching posts at statutory schools level with

²⁵ *Teaching staff in pre-school, statutory and upper secondary schools 2000-2005* (Hagtíðindi 91. year # 45. issue: september 2006.)

²⁶ Changed structure of studies to university entry level – more seamless transitions between school levels (Ministry of Education, Science and Culture August 2004)

²⁷ Qualified teachers at the statutory school level Number and Education – Official Government Assessment (Icelandic National Audit Office, September 2003)

qualified teachers and even have a surplus. The Icelandic National Audit Office 2006 supports this projection.)

In the school year 2005-2006 there were 4155 staff working in **pre-school** according to data from the Icelandic National Audit Office. This included 1637 (39.4%) qualified pre-school teachers and 2518 (60.6%) unqualified staff working with child care and other tasks. The number of staff working at pre-school level is growing steadily and the proportion of qualified staff has not changed much in recent years. There is a clear need for pre-school teachers and it is also clear that there are too few pre-school teachers joining the profession (Icelandic National Audit Office, 2003).

Key statistics from Statistics Iceland (National Bureau of Statistics) are shown in the following selected tables:

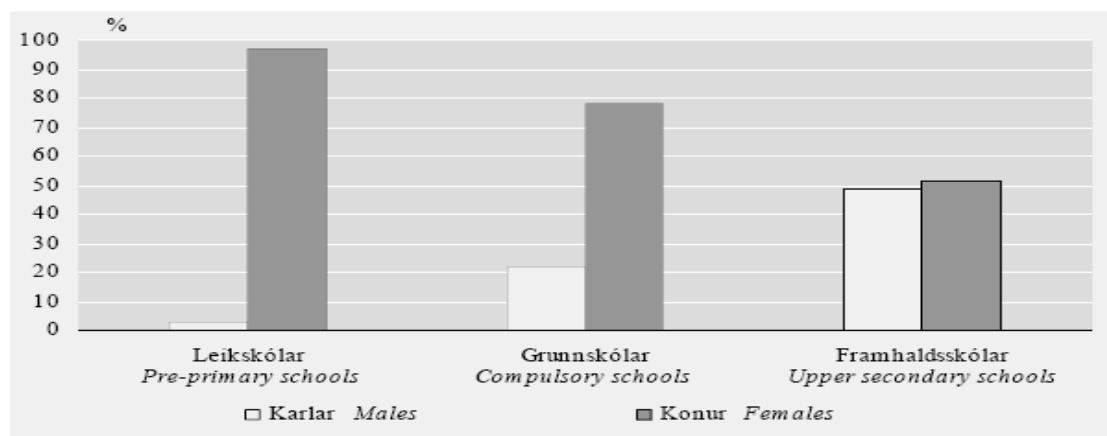
Tafla 1. Lykiltölur um leikskóla, grunnskóla og framhaldsskóla 2000–2005

Table 1. Key figures on pre-primary, compulsory and upper secondary schools 2000–2005

| | Leikskólar <i>Pre-primary schools</i> | | Grunnskólar <i>Compulsory schools</i> | | Framhaldsskólar <i>Upper secondary schools</i> | |
|--|--|--------|--|--------|---|--------|
| | 2000 | 2005 | 2000 | 2005 | 2000 | 2005 |
| Fjöldi kennara <i>Number of teachers</i> | 3.274 | 4.155 | 4.229 | 4.841 | 1.534 | 1.801 |
| Stöðugildi kennara <i>Teachers FTE</i> | 2.618 | 3.535 | 3.784 | 4.697 | 1.608 | 1.901 |
| Aðrir starfsmenn <i>Number of other personnel</i> | 558 | 580 | 2.342 | 2.583 | 583 | 613 |
| Stöðugildi annarra starfsmanna <i>Other personnel FTE</i> | 355 | 400 | 1.680 | 2.103 | 494 | 534 |
| Fjöldi nemenda <i>Number of students</i> | 14.574 | 16.864 | 43.644 | 44.336 | 20.332 | 23.345 |
| Fjöldi stofnana <i>Number of schools</i> | 253 | 262 | 190 | 177 | 35 | 36 |

Mynd 2. Skipting kennara eftir kyni og skólastigi haustið 2005, %

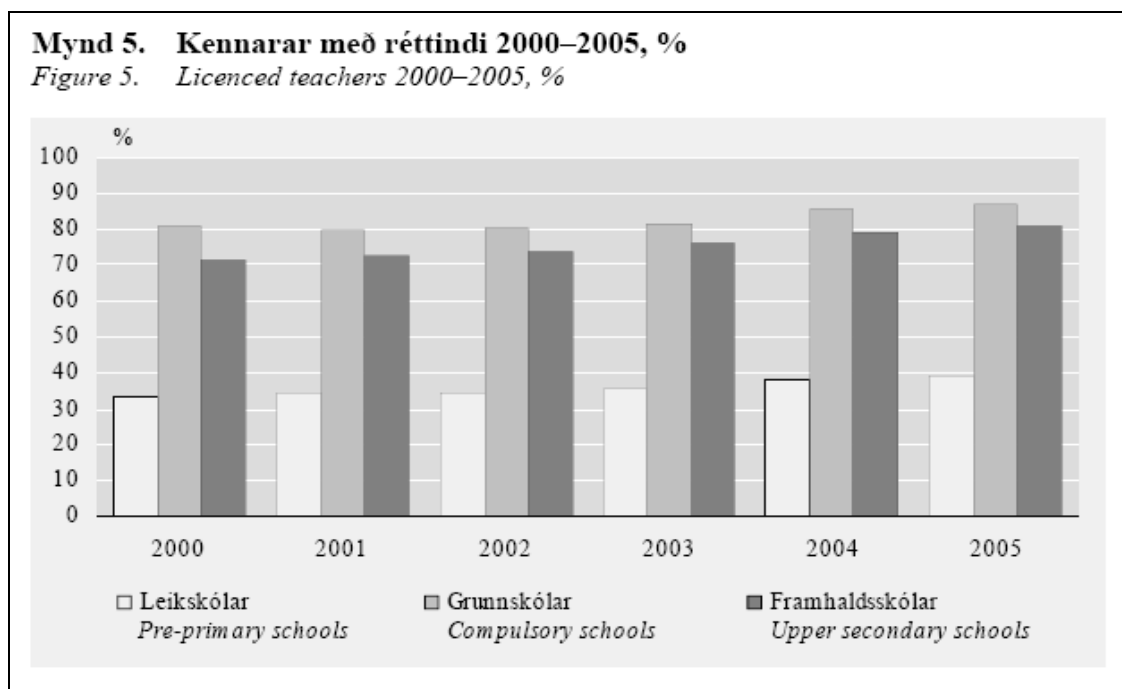
Figure 2. Teachers by sex and school level in autumn 2005, %



Women have long been the vast majority of teachers at pre-school and statutory school level. During the school year 2005–2006 women became, for the first time, the majority of teachers at upper secondary school level.

The mean age of teachers is also growing at all school levels, with approximately 50% of teachers in upper secondary schools being over 50 years of age.

The proportion of graduate teachers increased during this period and there are more qualified teachers in autumn 2005 than in autumn 2000, at all school levels. The highest proportion of qualified teachers is in statutory level schools where 87% are qualified. The proportion is higher in Reykjavík and Akureyri than in rural regions.



Tafla 6. Starfsmenn við kennslu eftir stöðugildum, %

Table 6. Teachers by full-time equivalents, %

| | | Stöðugildi Full-time equivalents | | | | | |
|---|-----------|----------------------------------|-----------|-----------|----------|-----------|-------|
| | | <0,50 | 0,50–0,74 | 0,75–0,99 | 1,0–1,24 | 1,25–1,49 | ≥1,50 |
| Leikskólar Pre-primary schools | 2000–2001 | 3,8 | 31,6 | 19,5 | 45,1 | .. | .. |
| | 2001–2002 | 3,7 | 26,9 | 22,3 | 47,1 | .. | .. |
| | 2002–2003 | 3,1 | 25,1 | 22,7 | 48,9 | 0,2 | 0,0 |
| | 2003–2004 | 3,2 | 23,1 | 23,5 | 49,8 | 0,3 | 0,0 |
| | 2004–2005 | 3,2 | 21,2 | 23,5 | 51,7 | 0,3 | 0,0 |
| | 2005–2006 | 3,9 | 18,9 | 24,8 | 52,1 | 0,2 | 0,1 |
| Grunnskólar Compulsory schools | 2000–2001 | 4,8 | 16,3 | 2,9 | 74,4 | 1,0 | 0,6 |
| | 2001–2002 | 6,5 | 8,9 | 9,8 | 71,2 | 2,9 | 0,5 |
| | 2002–2003 | 6,6 | 9,8 | 10,8 | 69,2 | 3,3 | 0,3 |
| | 2003–2004 | 6,6 | 10,0 | 14,0 | 66,2 | 3,0 | 0,2 |
| | 2004–2005 | 5,1 | 10,1 | 12,2 | 70,2 | 2,3 | 0,1 |
| | 2005–2006 | 5,2 | 8,7 | 10,1 | 69,5 | 5,9 | 0,6 |
| Framhaldsskólar Upper secondary schools | 2000–2001 | 2,8 | 3,6 | 3,5 | 36,8 | 35,4 | 17,9 |
| | 2001–2002 | 2,7 | 4,2 | 3,6 | 40,6 | 35,3 | 13,6 |
| | 2002–2003 | 2,6 | 3,1 | 4,5 | 42,0 | 33,1 | 14,6 |
| | 2003–2004 | 2,6 | 3,0 | 5,1 | 41,8 | 32,8 | 14,6 |
| | 2004–2005 | 3,0 | 3,6 | 4,2 | 32,1 | 36,3 | 20,8 |
| | 2005–2006 | 3,3 | 3,2 | 4,8 | 37,1 | 31,2 | 20,5 |

It is common to all school levels that there were more teachers in full time posts in autumn 2005 than in autumn 2000. A salient feature is the high number of pre-school teachers that are working part time and of upper secondary school teachers who are working in excess of full time. This indicates different working conditions for teachers between the three school levels.

Tafla 7. Brottfall kennara eftir skólastigum, %

Table 7. Teachers' turnover by school level, %

| | Leikskólar <i>Pre-primary schools</i> | Grunnskólar <i>Compulsory schools</i> | Framhaldsskólar <i>Upper secondary schools</i> |
|-----------|--|--|---|
| 2000–2001 | 28,5 | 16,3 | 21,9 |
| 2001–2002 | 25,6 | 15,8 | 20,1 |
| 2002–2003 | 21,7 | 14,3 | 18,3 |
| 2003–2004 | 21,5 | 15,1 | 17,4 |
| 2004–2005 | 22,7 | 16,1 | 15,6 |
| 2005–2006 | 24,6 | 15,2 | 15,4 |

Skýringar Notes: Brottfallsprósentan sýnir það hlutfall kennara sem var við störf að hausti en var ekki við störf haustið á eftir. Árið 2005–2006 sýnir hlutfall þeirra sem voru ekki við störf skólaárið 2005–2006 en voru við störf 2004–2005. The turnover rate indicates the proportion of teachers who were working in the autumn but were not working the following autumn.

Dropout from teaching has decreased and it is less in all years among teachers at the statutory school level and upper secondary school level than among pre-school teachers.

Teacher education students tend to take up teaching posts on completion of their studies. More than 70% of newly qualified teachers start teaching immediately after qualifying. The proportion is highest among teachers at the pre-school level, just over 81%, and a little less at statutory school level, a little under 78%. More than 86% of pre-school teachers who qualified during the last 5 years were still working as teachers in autumn 2005, compared with a little fewer than 70% of teachers at the statutory school level and over 54% of specialist subject teachers.

3. The main recent policy initiatives

The Ministry of Education, Science and Culture is currently very active in policy development.

- In August 2004 it published a report: *New framework for pre-university education with a view to a more continuity in transition between school levels*. The emphasis is placed on continuity in education and attention is drawn to the lines of demarcation between school levels.
- In February 2006, the Ministry of Education, Science and Culture and the Icelandic Teachers' Union signed a 10-step agreement for improvements in schools. The Teacher' Union and the Ministry of Education, Science and Culture will cooperate on developing a better school system, by making an overall review of teaching and learning and by introducing a new structure for the different levels of schooling.
- In June 2006 a report was published: *New Upper Secondary School: Report of the Joint Committee on VET*. The focus is on upper secondary education and the relationship between academic, trade and VET.
- New Education laws on higher education passed, *nr. 63 13. June 2006*. New provisions governing higher education, quality management and accreditation. Regulations are being written to implement these laws, and it is clear that they will affect some changes to the

structure of education at university level, including teacher education. Proposals for the merging of The University of Iceland and the Iceland University of Education may be examined in the light of this development.

- A full review of the education laws is underway, covering pre-school to upper secondary levels. The laws will strive to make more continuous transitions between school levels, to increase flexibility and variety in studies, teaching and curricula, both within and between school levels. Constraints should be removed and cooperation between teachers, their educational institutions and school levels should be enhanced in this context. The report on the changed framework and other reports that have followed in its wake, have underlined the need to enhance guidance and vocational counselling, both at statutory school and upper secondary school levels.

In March 2006 the *Working Group for Future Structure for Teacher Education* completed its work and sent its proposals to the Minister. The report includes recommendations emphasising the extension of teacher education such that a 5 year teacher education course or a masters at a teacher education institution at university level will be needed to become a qualified teacher at upper secondary school, statutory school, or pre-school level. Emphasis is also laid on the need for varied routes to qualified teacher status and that increasingly one should ignore the demarcation between school levels when awarding the status of qualified teacher. The report underlines the importance of training for student teachers, parallel to academic studies and also after teacher education, in the years of master studies, before the status of qualified teacher is formally awarded. The group examined working conditions in teacher education and in teaching, drew attention to examples from other countries of teaching councils and proposed a standardised quality system with defined goals and standards, to guarantee the educational level of teacher education. In this way the domestic teacher education institutions will be encouraged to adhere to comparable standards and the status of Icelandic teacher education qualification will be strengthened abroad.

Individual universities are now working on a new structure for teacher education. In the Iceland University of Education a total review of the academic structure of the institution is taking place. The University of Iceland has developed a masters curriculum in education and the Teacher Education Department of the University of Akureyri is working on similar developments on the basis of a report on a new structure for teacher education that was published in June 2005.

The Icelandic Teachers' Union forms its own policy in order to encourage critical and informed discussion on teaching. In its 2005-2008 policy the Icelandic Teachers' Union states what it considers to be prerequisites if the schools are to meet the targets they are set. There are many conditions that concern teachers' education and working conditions. The Icelandic Teachers' Union and its individual member associations also form policy on matters relating to the teaching profession and on other pressing issues in the education system. They emphasise action to enable continuous transition between school levels from pre-school to upper secondary school level with flexibility for pupils both at the demarcation between school levels, at entry to school levels and in matters relating to curricula, choice of courses, and variety of courses *inter alia*. Emphasis is also placed on teachers' conditions and working facilities provided for both students and teachers.

4. What are the main unresolved issues in teachers' education and their working conditions?

There is a direct link between the quality and efficiency of the education system on the one hand, and of the society's education level, quality of life and economic growth on the other. This has long been recognised in those countries that Icelanders compare themselves to. Increasingly, when forming education policy both international organisations and individual countries realise that the teachers play a key role in the process of change as does the education of teachers in the education system. Solidarity on these issues must also be achieved in this country.

It is clear that changes are imminent in the teaching profession and in teacher education in Iceland. It is highly important to understand the reasons that lie behind the changes that are occurring and not least to ensure that these changes be implemented with care. Best practice examples can be examined in neighbouring countries.

Icelandic government policy has long taken into account the policies adopted by neighbouring countries and by the international institutions to which Iceland is a party. The debate on the Icelandic education system in the context of the EU policy "Education & Training 2010" creates a new dimension in Icelandic education policy. In recent years Iceland has participated in international comparative studies such as PISA, TIMSS and PIRLS. The OECD also forms policy on education, which Iceland has long used as a reference. The PISA study is part of this policy work. TALIS is a pending international survey to find indicators for teachers, in which Icelanders will participate. It is important to get international evaluation of teachers' working conditions in a comparative international context.

The level of teacher professional responsibility must be increased

Increased independence along with greater teacher responsibility calls for a new structure within the education system, where professionals develop the schools' academic and pedagogic policy. The group's ideas on the future structure of teacher education²⁸, about the Teaching Council and about the quality system, standards and references, about teaching and teacher education can be used as a framework for increased professional responsibility for teachers. Important aspects need to be augmented, such as quality reference standards for teacher education, management of the teacher probationary period and the induction of new teachers into the job. It is no less important in Iceland than in neighbouring countries to increase respect for the teaching profession, while making greater demands on teacher education for all school levels and on the work of teachers, guidance and vocational counsellors and school managers. Establishing a Teaching Council would certainly place significant professional responsibility on teachers' shoulders. Such a change needs to be prepared carefully, and it is necessary that such preparation should include a detailed examination of the pros and cons of adopting new practices.

The school system and quality framework

The school system, the structure of school levels and length of each level needs to be established at an early stage and should be based on international references, such that Icelandic pupils are on the same footing as their counterparts abroad. Ideas about changed curricula structure and continuity across school levels need to be developed in the context of new emphases in teacher education, basic education, further education and lifelong learning.

Devolution should be increased in the school system, along with increased independence for schools. Quality monitoring should also be increased and evaluation of school operations. School self evaluation is based on the professional work of teachers, school curricula work and clear criteria. The working group on the future of teacher education proposed that a standardised reference for teacher education should be set that teacher education institutions could use in their work. These criteria would be the basis for quality management of teacher education, which would in turn be part of the universities' quality system. The Teaching Council would issue a quality reference and would develop quality standards for teaching and for teacher education. This would in turn form the foundation on which to build an accreditation system for teacher education institutions and for teaching.

The nature of teacher education and demarcation between school levels

There has been lively debate on teacher education and on the social status of teachers. It is important that teacher education in Iceland should be comparable with international references, based on the principles of the Bologna and Lisbon declarations. University institutions need to be ensured the academic freedom to offer varied ways for individuals to achieve the status of qualified teacher at all school levels, pre-school, statutory school and upper secondary school levels. There are many indications that in the coming years there will be a sufficient supply of statutory school and upper secondary school level teachers to meet

²⁸ The working group's proposals for teacher education (Ministry of Education, Science and Culture. March 2006).

society's needs. This is then a golden opportunity to implement various pressing improvements to teachers' working conditions and to teacher education. The situation at the pre-school level is different, having only recently become part of the official school system. There is a clear and pressing need for more pre-school teachers, for enhancement of their education and for improvements to their conditions. It should be considered whether to link the status of qualified teacher to school levels.

The demarcation between school levels needs attention and continuity in the school system has to be ensured. There is no reason to believe that the existing structure will be permanent. The role of pre-school needs to be defined. Such definition will in turn define the aspects to be emphasised in pre-school teacher education. The demarcation between pre-school and the statutory school level should be defined and the division of tasks between these levels. The same aspects need clarification in the demarcation between the statutory school and upper secondary school levels. There needs to be continuity between these two school levels (and in all likelihood also between upper secondary school and university). There is also a need to examine teacher education for adult and continuing education. Education in pedagogy needs to be increased for upper secondary school teachers and subject education for statutory school teachers, particularly for those teaching grades 8-10.

The duration of teacher education

Teacher education in Iceland is now structured as a 3-4 year university education (180-240 ECTS credits). This makes it the shortest in EEA and OECD. The average length of teacher education in OECD countries is now more than 4 years for statutory school teachers and a little under 5 years for upper secondary school teachers. These are averages, which means that in some countries teacher education has a longer duration e.g. in Finland, France, Italy, Slovakia and Germany. In addition to this there are provisions for teacher in-service education after teacher education, during masters studies, before the formal status of qualified teacher is granted (there is often also a special teaching test). Examples of such structure for masters studies can be found in England, Portugal, Spain, Scotland and elsewhere. Examples of a special teaching examination at the end of vocational training can be found in France, Germany, Italy and elsewhere. Outside Europe one can find interesting examples of longer teacher education, masters programmes and teaching tests in many states in Australia, Canada and the US.

Eurydice published a report in 2002 on education for statutory school teachers who were teaching at lower secondary level.²⁹ Teacher education is often divided into the concurrent model and the consecutive model. The concurrent model has courses in education, pedagogy, specialist subjects and training, whereas the consecutive model implies that upbringing, pedagogy and student teaching are taken after completion of a first university degree. In B.Ed. education for statutory school teachers in Iceland, the concurrent model is most frequently used, while the consecutive model is used for upper secondary certification. The following table on the duration of teacher education is from the Eurydice report:

| Length | Concurrent Model | Consecutive Model |
|-----------------|---|--|
| 3-3½ years | Belgium, Austria, Iceland | |
| 4-4½ years | Denmark, Ireland, Holland, Sweden, United Kingdom (Wales), Norway, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Malta Roumania. | Spain, Ireland, Sweden, United Kingdom (Wales), Iceland, Norway, Bulgaria, Malta. |
| 5-5½ years | Portugal, Finland, United Kingdom (England and Northern Ireland), Poland, Slovenia, Slovakia. | France, Austria, Finland, United Kingdom (England and N-Ireland), Cyprus, Latvia, Lithuania, Slovenia. |
| 6 years or more | Germany, United Kingdom (Scotland). | Italy, Luxembourg, Poland, United Kingdom (Scotland). |

²⁹ Key topics in education, volume 3. *The Teaching Profession in Europe: Profile, trends and concerns. Report 1. Initial training and transition to working life of teachers in general lower secondary education.* (Eurydice, September 2002).

It is normal that professional and academic subjects in teacher education in Iceland should be covered in greater depth in step with increased demands on teaching, because of changes in society and new knowledge regarding the relationship between education and the development of society. In an era of rapid social change, increased demands have to be made on the teaching profession at all school levels. The working group on the future structure for teacher education proposed in its report that teacher education at pre-school, statutory school and upper secondary school levels should be extended such that it would be comparable with that of neighbouring countries. At the same time its structure would be adapted to the Bologna Process for the structure of university education in Europe. This means that teacher education could be a 5 year continuous course of study comprised of 3 years of undergraduate studies followed by 2 years post-graduate (for MEd, MA or MSc). In addition, other post graduate studies would be offered. Corresponding changes of emphasis need to be made to the education of teachers of vocational subjects in accordance with the Copenhagen Declaration of 2003. There the emphasis was on ensuring the quality of the education, where an element of the strategy would be the improvement of education for VET teachers. In addition to the prescribed education in the subject being taught there would be an additional two years of teacher education, tailored to the needs of VET.

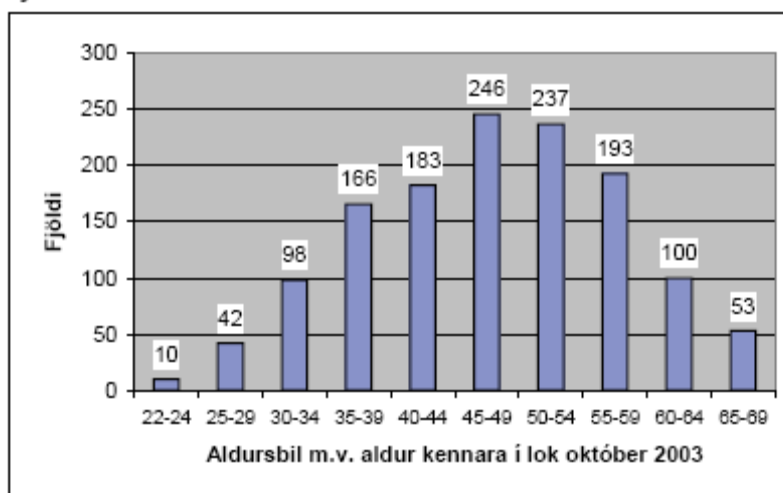
Lifelong learning for teachers

Lifelong learning is a basic issue in a time of rapid social change, which is why legislation on teacher education covers in-service education and lifelong learning. It is not just that teachers need the opportunity for further education in the subjects they teach but equally they need to take part in the debate on development work in individual schools and in the education system as a whole. It has to be ensured that the teacher's working environment encourages continuous development and facilitates professional cooperation between teachers in "Learning Communities". Curriculum development and self-evaluation needs to be greatly augmented, as it is the key to development in schools on the one hand and to lifelong learning for teachers and managers on the other, if done properly.

Age structure and renewal of the teaching profession

If nothing is done, the age structure of upper secondary school teachers could cause problems in staffing when many older teachers retire at the same time in coming years. The Graph shows the distribution of secondary school teachers according to age in October 2003, in total 1328 teachers. Around 11.5% of them are 60 years old or older.

Mynd 1. Aldursbil m.v. aldur kennara í lok október 2003



This distribution can be explained by the fact that in the 1970s there was an increase in the number of a type of upper secondary schools that was new to Iceland (colleges/comprehensive schools).

There is no reason to believe that age structure among teachers at the primary school level will require any special actions.

| Teachers and headmasters/mistresses in primary schools 2005 | Numbers |
|--|----------------|
| Total number of teachers: | 4.841 |
| 24 years and younger | 74 |
| 25-29 years of age | 454 |
| 30-34 years of age | 675 |
| 35-39 years of age | 648 |
| 40-44 years of age | 781 |
| 45-49 years of age | 686 |
| 50-54 years of age | 656 |
| 55-59 years of age | 522 |
| 60-64 years of age | 258 |
| 65 and older | 87 |

In September 2003 The Icelandic National Audit Office projected the trend in numbers of statutory school teachers, *Teachers at statutory school level Numbers and Education, Official Study*, where the following appears:

Since it is likely that soon it will be possible to fill teaching posts at statutory school level mostly, or even fully, with fully qualified teachers, it is to be expected that the school community and school authorities will soon seriously consider whether extending teacher education by one year would be a positive option. The reasons for this are many. Teacher education elsewhere in Europe is longer than in Iceland. Teachers that go abroad for further education have a shorter period of studies behind them than do their foreign colleagues, and professional education in many other subject areas at university level takes longer than 3 years in Iceland.

According to the Icelandic National Audit Office it was assumed that for the school year 2004-2005, 751 qualified teachers would still be needed to fill 603 available posts in the primary schools but that in 2008-2009 there would be hardly, if any posts for unqualified teachers. According to figures from Statistics Iceland, there was in fact a shortage of 680 qualified teachers at the statutory school level in the school year 2004-2005.

Projections for the recruitment of teachers at the pre-school level in the coming years will in all likelihood be based on different premises. In 2005, 4155 persons worked in pre-school institutions and only about one third of them (1370) were qualified teachers. Their age structure was as follows:

| Pre-school teachers 2005 | Younger than 20 | 20-29 years | 30-39 years | 40-49 years | 50-59 years | 60-66 years | 67 and older |
|---------------------------------|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| | | | | | | | |
| Total 1.370 | 0 | 104 | 473 | 481 | 265 | 44 | 3 |

5. Possible development, preferable solutions in the opinion of the discussion group

Increased discussion in society at large and increased awareness of the importance of education and expectations of education is a necessary foundation for the continuing development of the Icelandic education system including teacher education. The general discourse on education and schools must change; the emphasis must be shifted from discussions on teachers' salaries and union struggle to the issues of quality of teaching and education for the 21st Century and the knowledge society. Teachers themselves should lead that discussion.

- The importance of teaching and education that leads to independent thought and views is increasing as society changes. Education needed for the 21st Century must be defined, not only for the economy and industry but also for culture – both intercultural aspects and national culture. [The professional responsibility of teachers in their work and greater freedom and development of teaching methods are the foundation for the changes that have to be made.](#)
- The education system has to take into account the rapid social changes that we are facing. It is necessary to understand the demands that changed working environments will make on the education system. It is no less important to look ahead to those changes that will occur in employment in coming decades. [Special attention has to be paid to the education of VET teachers, both those working in schools and those at the work place.](#) The education of upper secondary school teachers must also be reviewed, keeping in mind the proposals of the Ministry of Education, Science and Culture VET Committee of June 2006.
- Changed social patterns, the effects of multiculturalism and changing family patterns in Icelandic society also make new demands on the education system. [Decisions have to be made on the growing role of the school in upbringing, particularly at pre-school and statutory school levels, and the effect this has on teachers and teacher education.](#)
- New information technology has become established in society during the past decades and the first experiments with ICT and net communications are now taking place on schools. This requires a review of curricula, teaching material and teaching methods. It is important to ensure that teachers are educated in the new technology, particularly in its possible effects on society and culture.
- Teacher education is too short in Iceland and as a result it neither contains sufficient coverage of pedagogy nor of specialising in particular curriculum fields. The duration of teaching practice for trainee teachers is too short. Teacher education for pre-school, statutory school and upper secondary school teachers should be extended, for teachers of academic subjects and vocational alike. The education of school administrators (headmasters, heads of department etc.), of guidance and vocational counsellors and of special needs teachers needs also to be reviewed.
- The current age structure of upper secondary school teachers means that a large number of them will retire during the next few years. Timely action has to be taken to remedy this problem.
- Working conditions for teachers at statutory school level are often difficult, classes too large; too many and sometimes confusing tasks are allocated to teachers, where there may be doubt as to whether they are within the scope of his work – or whether it is desirable that they should be there. Teachers' conditions are not yet good enough.
- There are too few qualified pre-school teachers as a proportion of the total staff at pre-school level. [The uniqueness of Icelandic pre-school education has to be preserved and teacher education for this level has to be enhanced.](#)
- In the melting pot of societal change of the past years, there is not sufficient distinction made between teaching, care and leisure activities in the school system – often with the result that all these activities suffer. [The distinctive attributes and social roles of the various school levels have to be defined. There may be a reason to review the existing school system and also to consider if it is right to link the status of qualified teacher to school levels.](#)
- The principles of education and teacher education must be closely related to a nation's culture and to the development of its society. One should welcome the current

upheaval at university level that will reform teacher education. The autonomy granted to individual universities to organise teacher education and to develop quality management systems for university level education should be a catalyst for innovation in teaching and research and for variety in the education of Icelandic teachers.

6. What next?

The deliberations in Discussion Group B and the proposals in this report are in line with the recent final report from the ministerial committee on future structure of teacher education.³⁰ Discussions at the conference, *Education and Training 2010 – The Development of Education Policy in Iceland in the context of Europe*, held in Reykjavík 26 October 2006, were along similar lines. Marijk van der Wende, the conference keynote speaker emphasised the need to enhance and lengthen Icelandic teacher education. Views were also expressed on the need for more transparency, flexibility, efficiency and accountability of teacher education institutions. Peter Blok pointed out that lifelong learning for teachers should be enhanced and should be linked to a system of rewards. Opportunities for teachers to take leave and for temporary work exchange placements both within the education system and outside, should be made more accessible. It is also desirable that teachers should be able to teach at more than one school level. He also emphasised the value of *learning communities* for teachers' professional development. These points harmonise well with the discussion group's proposals (see Chapter 3). Conference delegates echoed these views. They highlighted the quality issues and management in the school system, the extension of professional education of teachers, their specialisation possibilities and their working conditions at all school levels. Decisions have to be taken on the report from the ministerial committee on future structure of teacher education and its proposals must be implemented as soon as possible.

³⁰ The working group's proposals for teacher education (Ministry of Education, Science and Culture, March 2006).

Addenda to the report of the discussion group on TEACHERS AND TRAINING

- Feedback from expert and from conference delegates

At the conference *Education and Training 2010 - The Development of Education Policy in Iceland in the context of Europe* the report of Group B was presented and debated. The following are some of the comments and questions raised in the discussions.

1. Expert reactions

Peter Blok, a teacher and senior adviser of the Department of Human Resources Management and Governance at the Hogeschool van Amsterdam in The Netherlands was the expert commentator for Group B. He said that his comments were based on his experience of human resources management in the teaching profession and of developments in The Netherlands in recent years.

Management and Governance:

- In The Netherlands there is currently a lively debate on the effects of government policy of adopting corporate management techniques in the running of vocational colleges (Hogescolen), a practice that was introduced when these colleges were merged and reduced from about 200 to 35. This is a development that started in about 1980. There is a lot to be learned from the Dutch experience in this process.
 - Advantages of the new management practices: Increased transparency, flexibility, efficiency, accountability
 - Disadvantages of the new management practices: loss of professionalism (staff tasks are separated into operational units), the running of operations becomes more important than the content.
- Group B's report indicates that schools need more autonomy. This is a good idea but be careful of the situation described above; autonomy is important for schools but with increased autonomy, excessive emphasis on management of operations is just around the corner.

Rising average age and enhancing the teaching profession:

- Teachers who have been in the profession a long time (and are in the top salary grade) are a risk group. This is not only because replacements have to be found when they retire (which the report indicates is a problem with upper secondary school teachers), but also professionally. Lifelong learning is essential to tackle this problem. Possible actions for this problem are:
 - To develop masters courses in upbringing and education and in teacher education
 - Investment in sabbaticals instead of salary increases (particularly for the 45+ group)
 - Development of professional learning communities that can be introduced in innovation centres, of knowledge gathering and of professionalisation. Cooperation with regional government is important here. The staff need to bear the main responsibility for the development of such centres.
- The report poses the question whether it is right to examine more carefully whether the status of qualified teacher should be linked to a specific school level. From the point of view of human resource management it would certainly be desirable to have maximum flexibility in moving between school levels. This provision would not only enhance a teacher's professional interest but would also increase flexibility in the school system as a whole.

Quality issues:

- In Marijk van der Wende's opening lecture, she talked about quality in teaching and said that "poor teaching often arouses little interest and good teaching seldom receives recognition". The classic solution from human resource management to this problem is rather technical. Staff evaluation needs to be improved, result-oriented contracts should be introduced to name some measures. In The Netherlands there are interesting examples of how peer evaluation has improved teaching. In this way teachers help each other in their quest to improve their teaching. Teachers ask for feedback from their colleagues, sit in on each other's classes and receive pertinent advice from the observer (e.g. from a more experienced teacher). The question is whether those responsible for running the school should also supervise professional instruction.

2. Comments and questions from conference delegates

Quality issues:

- How can one assure the quality of teaching?
- Is there a need for a quality management system for teacher education? There are quality systems for all universities. Is there a need for more? One cannot drown everything in quality systems. What about educational councils? There is no legislation governing the nature of teacher education. We need a forum for discussions on pedagogy.
- Why are good teachers not paid higher salaries?
- How can one evaluate who are good teachers and who are not? Very complex and subjective.
- Good leaders and good teachers need the same qualities. It is difficult to assess them but it is possible.
- What are the ways to give more responsibility to the teaching profession, for their teaching, for school activities and for the quality of teacher education?

Teacher education:

- Teachers' education has to be augmented at all school levels, and this applies also to those who teach in the adult education sector and to managers of training departments in organisations. The duration of teacher education needs to be extended and it needs to be under continuous review.
- Should a teacher's education be aimed at a specific school level? How should one educate teachers in VET - or teachers that teach adults?
- We need to give more thought to people who enter education later in life.
- How can one ensure that serving teachers get access to lifelong learning? Society becomes increasingly complex and teachers need to familiarise themselves with new developments. They need more lifelong learning in e.g. languages and mathematics. Should teachers who are going to retire in 5-10 years continue to educate themselves? Where should we get new teachers?
- How should we extend the duration of teacher education and who should make it happen?
- The Iceland University of Education has already elaborated a schedule for extending teacher education. The institution will be offering a new two year professional masters programme from the autumn of 2007.
- It is normal that legislation follows reality.

Managing school activities:

- Teachers spend too much time and energy on management. Leadership in schools needs to be strengthened in order to take the weight off the shoulders of subject teachers.
- Do not oversimplify. We may not jump directly from the question of too much autonomy for teachers to a simple operational model. But that does not mean to say

that we should not distinguish between good and poor teaching. We must assure the input, i.e. good teacher education, but that is not enough. One must also be able to evaluate the results.

- There appears to be consensus about extending the duration of teacher education. What about the proposal on letting the status of qualified teacher apply across school levels?

Schools and the employment sector:

- The points emphasised the report point to a new and welcome direction in how the education system serves the employment sector.
- Regarding dropout from the teaching profession, did the group discuss the role of teacher education in this process? Is it possible that people are being educated for the wrong jobs?
- What happens to all the people who qualify but do not teach? Why do people drop out (salaries, lack of interest)? They probably benefit the employment sector, so should we worry? Teaching is not necessarily a lifelong occupation. A teacher's education is not just a professional education, it is also a good university education as such. The MEd degree is only vocational to a certain extent.
- The status of VET teachers needs to be examined as a special case, and this is one action that is planned, under the auspices of the EU. This work has to be done in close cooperation with the social partners.

Competition and specialisation:

- Are schools stagnating because of a lack of competition?
- It has to be possible to choose between schools.
- How can one reconcile the possibility of teachers moving between school levels and demands for more specialisation (team work)? What about the needs of the schools – e.g. for teachers that are not available? Do they have the right to ask specialist language teachers to teach mathematics?

European Qualifications Framework – National Qualifications Framework (EQF/NQF):

- How should one work with EQF/NQF("learning outcomes") in teacher education?

III. INCREASING PARTICIPATION IN MATHS, SCIENCE AND TECHNOLOGY

Discussion Group C Report

The discussion group that dealt with increasing participation in maths, science and technology presents many thought-provoking proposals as to how improvements can be achieved. This group considers that it is of primary importance to give teachers the opportunity to improve their competence in science teaching based on simple experiments and observations, field work and trips and on the use of ICT. Emphasis must be placed on extending the flora of teaching methods at the expense of the narrow book-learning approach. The teaching environment should become more flexible and ways found to encourage teachers to take up science teaching. The group also feels it important to improve the scientist's image in the eyes of young people, by e.g. having scientists visit schools to show students the work they do.

From the Minister of Education, Science and Culture's opening address

1. Introduction

- The main reasons why Maths, Science and Technology (MST) should be given more weight in the education system

In a recent OECD report³¹ it was observed that maths science and technology were playing a larger part in our lives. Being science literate is increasingly becoming a prerequisite for taking full advantage of the opportunities that life offers today. The performance of its best students in maths and related subjects can be an indicator of the chances a country has in high tech and of the competitiveness of its economy. Lack of knowledge in key competition areas can also have negative effects on an individual's future prospects on the employment market and on his potential earnings, not to mention his ability to fully participate in society.

³¹ Education at a glance – OECD indicators. 2006 edition. OECD, 2006.

2. The current situation in Iceland

Iceland compared to other countries

MST students graduating from university in 2000, 2001, 2003³² (per 1000 inhabitants 20-29 years of age)



Here Iceland has about 9 MST graduations/1000 inhabitants, while Finland has 17, Sweden 14 and the UK 21. The EU average is about 12.

Increase in MST graduations (%) 2000-2003 (Annual increase)



The chart shows that the increase is close to the mean for EU countries

The current situation in Europe regarding students in maths, science and technology (MST)³³

- Increase in MST graduates has followed graduate increase in the higher education sector. So the EU target of 15% increase for the period 2000- 2010 was achieved for 2003.

³² **Commission staff working document.** "Progress towards the Lisbon objectives in education and training". Report based on indicators and benchmarks. Report 2006. Brussels, 16.5.2006, SEC(2006) 639.

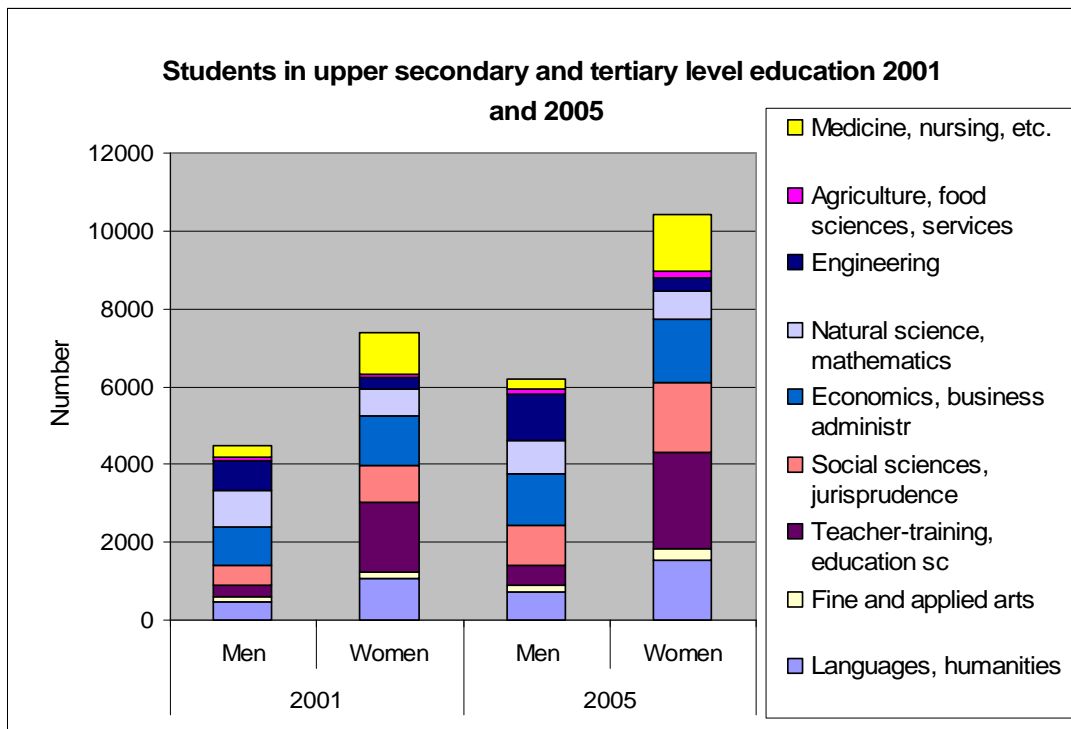
³³ **Commission staff working document.** "Progress towards the Lisbon objectives in education and training". Report based on indicators and benchmarks. Report 2006. Brussels, 16.5.2006, SEC(2006) 639.

- Despite a large overall increase in MST graduates there is little increase, even decrease in physics, maths and statistics. Action is needed to encourage young people to take these subjects.
- Little progress in redressing the male/female ratio in these subjects Action is needed to encourage more women to take MST subjects.
- There are barriers to appointing students to research positions in companies and institutions as insufficient funds are deployed for this purpose. This encourages brain drain from Europe.

Iceland

Statistics Iceland indicates that during 2001-2004 there was a total increase in further education graduations of 15% and a relative increase in graduations in sciences of 30% for the same period. Women were 61% of graduates in 2001 and 63% in 2004. They are also a majority of students graduating from MST.

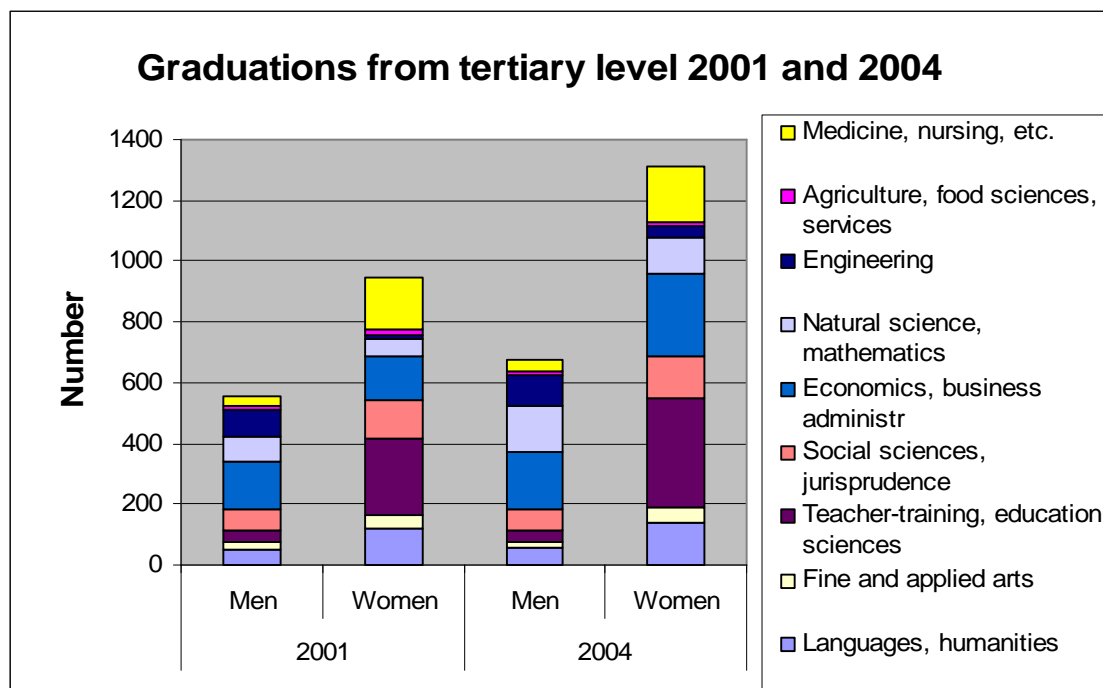
Registrations in Icelandic universities 2001-2005 have increased by 28%. Registrations for biology and maths fell by 6% during this period while they increased by 30% for technology and engineering courses. In total these subjects had 22% of students in 2001 but were 18% of students in 2005. There was a proportional decrease in MST students during this period.



The gender proportion in these subjects in 2001 were that in natural sciences and maths there was 44% women, 56% men, while in 2005 there was 46% women and 54% men. In 2001 in technical subjects and engineering there was 26% women and 74% men and in 2005 22% women and 78% men. So these subjects had an overall proportion of 37:63 men to women in 2001 and 33:67 in 2005.

If one looks at those graduating from universities in Iceland (with a first university degree) one can see an increase for the period 2001-2004 of 25% while for the same period the increase was 47% in natural sciences and mathematics and 29% in engineering and technical studies. In total these subjects had 9% of students in 2001 but were 20% of students in 2004. This is a considerable increase.

The gender proportion in these subjects in 2001 were that in natural sciences and maths there was 41% women, 59% men, while in 2004 there was 44% women and 56% men. In 2001 in technical subjects and engineering there was 13% women and 87% men and in 2005 27% women and 73% men. In total graduations for these subjects were 30% women and 70% men in 2001 and 38% women and 62% men in 2004. In universities the overall graduation figures for women were 63% 2001 and 66% in 2004.



This shows that there was a higher overall percentage increase in both student registrations and graduations in MST than in total registrations and graduations during 2001-2004. But women are a minority in registrations and graduations in MST, though they have increased as a proportion of the whole for the same period. This increase is in line with the proportional increase of women graduates as a whole.

Given the drop in registrations in MST in 2005 (relative to 2001), one can expect a drop in graduations in two years time. One may also expect a corresponding drop in the number of women, given the registration figures.

On the whole there is a numerical increase. In 2001 there were 240 MST graduations and 405 in 2004. By comparison it can be noted that there were 287 graduations from teacher and sports training in 2001 and 402 in 2004.

3. The main recent policy initiatives

The Ministry of Education, Science and Culture presented its policy statement to the Science and Technology Board earlier this year. One of its statements is that "Building human capital in order to strengthen the foundations of the knowledge society" is the top priority at the ministry. The aim is to increase the demand among young people for technical and scientific studies

In the Science and Technology Board policy statement for 2006-2009, the main aim is "to make the education and scientific infrastructure among the best in the world", and this statement is further elaborated in Chapter 4 (Education of the highest quality) where the Board, in the context of planned improvements in statutory and further education, underlines the importance of "emphasising improvements in science and technology teaching and of

increasing the number of students taking these subjects, by measures including improvements of teacher education in these subjects.”

In November 2004 the Minister of Education, Science and Culture appointed a working group to prepare action designed to increase the number of science students. The group delivered its proposals to the Minister in April 2006. The group’s conclusions have been reflected in ministry policy and in the policy followed by the Science and Technology Board for the next three years and are used in this section of this report.

4. Main challenges as seen by the discussion group.

The quote from the article by Ari Ólafsson entitled “Research Lab. Resources for teachers of natural science in statutory schools” expresses in a nutshell the points on which the group agreed at their meetings:

“It is generally accepted that teaching in natural science at statutory school level has long been caught in a vicious circle. Most teachers come from a background in language and social sciences, so it follows that relatively few choose science in their teacher education programmes. Teachers are nevertheless required to teach all subjects at the younger levels, apart from a few exceptions such as domestic science, crafts and physical education. Teachers’ uncertainty when dealing with concepts and phenomena from science is quickly transferred to their students, which has led to such subjects being wrongly labelled as difficult or even boring. Students who are raised with this image of science will tend to avoid contact with such subjects in their education and subsequent choice of occupation, and among these students are those who choose teaching. This completes the circle, and the time has come to break it.”

Many of the conclusions of the previous EU working group on increasing participation in MST (see the following chapter) are reflected in Ari’s words. The following points were highlighted as the main challenges in the opinion of Discussion Group C:

- Available research, both from Iceland and from abroad show the **need to enhance secondary school teacher skills in science teaching**. Both with regards to their own knowledge and to use of available teaching material.
- **Few students at the Iceland University of Education choose science** as a core subject.
- **There are difficulties in introducing new teaching material** and examples of substantial obstacles to the introduction of innovatory mathematics teaching at the statutory school level. There is no standard procedure for introducing new material that ensures that it will be used effectively.
- **Technical subjects do not have enough space in the curriculum**, with the exception of subjects that can be classified as Information Technology.
- It should be emphasised that **all children receive teaching in the physical sciences** according to the curriculum. In some schools teaching in physical sciences does not start at school entry level, even though the curriculum states that it should take place in 1-10 grade levels.
- The most important objective in studying natural science is **that the students become science literate**, that is that they become critical and think independently on the effects that science and technology have on their own lives, their society and on their environment.
- **The unique position of natural sciences needs to be taken into account in the light of learning assessment**, e.g. the National Standardised Examinations, and more weight should be given to practical (work) aspects.
- **The image of science and scientists needs to be improved**.
- **Parents need to be informed** that their children’s competence in science subjects was a key to university study and to future job prospects in the knowledge society.

5. Possible ways to improvements

The working group in which Iceland participated along with a number of European nations in 2001-2003, reached conclusions on a number of issues related to science and technology teaching that required attention.³⁴ The main points are as follows:

- **Methods targeted at individuals should be used** to encourage more young people to study science.
- **Education needs to reach the whole spectrum of society**, using cooperation between schools, universities and the employment sector. This has been shown to be effective.
- **Teacher education needs to be improved** for this purpose, both initial education and re-training. Teachers' confidence in the classroom has to be enhanced and their education improved. Practical teaching needs to be used more effectively.
- **Children should be taught science at an early age** with suitable methods – performing practical tasks related to everyday life where the children participate.
- **Make more use of science competitions, fairs and similar events** to increase interest among students.
- **Gender difference should be taken more into account** when trying to increase student interest in science.
- **Use other people's experience of effective grass roots activities.** Make it more visible.

The working group also made proposals to the authorities responsible for education. They include:

- **Each and every child has a right to education in maths, science and technology** from an early age and these subjects should be on the curriculum of all schools.
- **Teaching methods need to be more interesting for the children in the younger levels of schooling**, particularly through linking school subjects with reality and with society and by blending classroom learning with less formal methods such as, competitions, science trips, science museum visits, expeditions etc.
- **Science teacher competence needs to be increased even more**, e.g. with lifelong learning and improved facilities. Resources need to be earmarked for these actions.
- **Take difference in students' individual needs into account** and improve teaching methods and evaluation with this in mind.
- **Place emphasis on strong and productive cooperation** between schools, universities, research institutes, companies, parents and other stakeholders in order to improve the quality of teaching and to prepare young people better for employment and for active participation in society. Use the universities more effectively as leaders in this process.

Discussion Group C agreed that proposals for improvement should include proposals for action to improve science teaching, create facilities, use role models and reward what has been well done.

Specific areas for improvement:

- **give teachers the opportunity to improve their skills**, particularly in science teaching based on simple experiments and observations, improving competence, field work, demonstrations, solution oriented teaching, use of ICT etc.
- **place more emphasis on variety in education as opposed to concentrating solely on book learning**
- **increase flexibility in the internal organisation of school activities** and provide stimuli to encourage teachers to take up science teaching.³⁵

³⁴ Working Group D 'Mathematics, Science and Technology' Objective 1.4 "Increasing recruitment to scientific and technical studies". Interim report: Summary of the outcomes and conclusions. November 2003.

³⁵

In Meyvants report ("The status of physics and chemistry teaching statutory level schools in Reykjavik in Autumn 1997: Results of a survey of subject department heads and course leaders") it is stated that consideration is

Here follows a summary of Discussion Group C's proposals, which is mostly based on the proposals for improvements in science teaching that were delivered to the Minister of Education, Science and Culture last April.³⁶ The proposals cover five main areas as follows:

- **improve teaching**
- **education and training of teachers**
- **science knowledge and scientific literacy**
- **assessment of teaching and**
- **improve the image of science and scientists**

Each area is covered in more detail in chapters 5.1-5.5.

5.1 Improve teaching

There is a host of valid arguments for researching the status of natural sciences in schools, for increasing lifelong learning and for making natural sciences a core subject and compulsory in teacher education programmes.

Proposals:

- Schools should be encouraged to assess their status in natural sciences before the end of 2007.
- Natural sciences should be given priority in schools' continuing education programmes for the next 3-5 years.
- Natural sciences should be made core subjects for senior pupils in secondary schools and should command more space in the timetable than they currently enjoy.
- Pressure should be put on the Iceland University of Education to make natural sciences compulsory subjects in teacher education.

5.2 Education and training of teachers

Studying and teaching the natural sciences requires knowledge, skill and a variety of methods that teachers are familiar with to a varying degree. It is probably difficult to find a teacher at statutory school level who has a clear and good overview of all the material he is to teach in this subject area.

Proposal

- Provide continuing education courses for teachers that cover in detail the main input for natural sciences, concepts and methods. Teachers' working framework has to be adapted to accommodate such courses.

5.3 Science knowledge and science literacy

The most important objective in studying natural science is that the students become science literate, that is that they become critical and think independently on the effects that science and technology have on their own lives, their society and on their environment. This involves ethical, knowledge, cultural, economic and social aspects.

Observations:

- Courses and professional support for teachers need not only to address knowledge of the natural sciences and knowledge of their role in society, but also knowledge of pedagogy and of upbringing.

not given to the unique position of natural science teaching that is due to supervision of equipment, materials and tools and to the sizes of groups for practical sessions.

³⁶

See: http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/final_report_3.pdf

Empirica: http://www.empirica.biz/empirica/aktuelles/meldungen/pm041006_en.htm .

- It needs to be explained how natural sciences serve the individual and his personal needs and the importance of scientific knowledge and of competence to be able to play a full role in life and work in modern society.
- Studies must be organised so that they are attractive, interesting and perceived to be important for boys and girls alike, regardless of cultural or social background.

5.4 Evaluation

Natural Sciences have special status, equally in the light of evaluation of learning as in teaching methods. Variety in evaluation criteria and methods must go hand in hand with variety in teaching content and teaching methods. Processes need to be evaluated, that is to say all the training that takes place during learning, and results need to be evaluated, that is the results of the course of study at the end of the period of study.

Proposals:

- To allow students who prefer science to languages, to take more science subjects instead of a third language if they so wish.
- To introduce solid counselling services and discussion in schools and at the Education Evaluation Institute on varied evaluation methods in addition to traditional methods and to provide support for high quality and variety in school exams in natural sciences.
- Disseminate information on evaluation methods and on data collection in formal and informal evaluation.

5.5 The image of science and scientists

The interest of students at statutory and further education levels in university science studies depends to a certain extent on the image of scientists working in the relevant fields. Research suggests that students have a negative image of scientists. This attitude appears to apply particularly in the case of girls.

Proposals:

- Present a positive image of scientists to students at statutory and further education levels and to their parents. The image should have a general appeal, not bound to sex or race. The main channels for getting the attention of the students are through the schools and through the media.
- Organise school visits by practising scientists, where they present specialised subjects related to the curriculum. Special efforts should be made to appeal to girls by selecting female scientists.
- Media adverts that show scientists as individuals.
- Encourage cooperation in presenting study offers in order to increase demand for places in university science departments.
- The Confederation of Industries and fora for cooperation between high-tech companies are natural partners for the task of presenting research and development as a future occupation for young people. These parties would be offered the opportunity to cooperate on informing young people of the link between science education and interesting careers in a variety of fields.
- Encourage continuing grass roots work that supports the above-mentioned action.

6. What next?

Proposals for ways to improve the situation affect many parties. The Ministry of Education, Science and Culture disseminated the proposals to them. They are universities that provide teacher education, the working group for the review of the curriculum in natural sciences, and headmasters from the statutory school level and school committees.

The Ministry also made an agreement with the Education Gateway portal to publish and maintain a website about science where information on the various scientific activities already going on in the country and on science teaching and related material is disseminated to pupils and teachers. The web is at: <http://www.menntagatt.is/?pageid=514>.

The Icelandic Centre for Research, Rannis, has organised a number of events that encourage cooperation between scientists and schools, along with scientific presentations for young people. This work will be continued.

The Minister of Education has declared herself willing to support education in science and one idea being currently examined by the Ministry is the opening of a science centre. The science centre will be a place that can offer instruction in science to teachers and media people who have to talk about science, so that they can be more confident about understanding the subject. There will be a support system that can give these groups specialist advice on how to discuss the subject in their work. Teaching material that fulfils professional quality standards will be made. There will be equipment there that would be too expensive for individual schools. It will not least be the place that gives families and the public access to informal learning about science in a manner open to everyone. The simplest way to this end is through games with concepts and phenomena. "Science centre" is a well-established concept. The school system can also use this new place for formal teaching about specific subjects. The ideas that such a science centre is based on are relevant to the school system as a whole, to the dissemination of information on science and technology and to the variety in the country's culture.

Addenda to the report of the discussion group on INCREASING PARTICIPATION IN MATHS, SCIENCE AND TECHNOLOGY

- Feedback from expert and from conference delegates

At the conference, *Education & Training 2010 – The Development of Education Policy in Iceland in the context of Europe*³⁷ the reports of the five discussion groups were discussed, including the report on Enhancing teaching in Maths, Science and Technology. After the chairmen of the discussion groups had made their presentations, experts gave their reactions in short, but prepared presentations. The floor was then opened to conference delegates, who variously made comments or asked questions, both in the main auditorium and in the discussion groups that were convened in the extended coffee breaks. The following are some of the comments and questions raised in the discussions.

1. Expert reactions

Vilhjálmur Egilsson, manager of the Confederation of Icelandic Employers, was brought in to comment on the conclusions of Discussion Group C. Among the comments he made were the following:

- It is important to begin teaching in maths, science and technology at an early age. The approach to teaching these subjects has been too abstract and too little emphasis placed on their practical application. That is why children do not appreciate the importance of maths science and technology. Teaching should be connected with practical applications from the start.
- The group's proposals are good as far as they go, but they do not tackle the question of prioritising in schools. One could in fact use the same reasoning for most other subjects. The question is really about whether we need to improve our schools or not.
- The message from the employment sector is that a good education system is important if a nation is to increase its competitiveness. That is why it is important to work carefully.
- Are we thinking about the importance of maths, science and technology as manufacturers or consumers? We have to think in the right proportions and context. In some subjects, e.g. in economics, there has been an **over**emphasis on maths. That does not benefit the subject.

2 Comments and questions from conference delegates

- It is true that one should not overemphasise individual subjects like e.g. maths, but scientific literacy is important for most subjects.

Teacher education

- How can we break the vicious circle described in the report? Can it be done simply by lengthening teacher education or is it necessary to alter it?
- This is an international problem to which we do not know the solution. Further research is needed e.g. on why interest that is seen in young children is suffocated at a certain age.
- It is not true that research is not available on the problems of maths, science and technology. The source of the problem has been established. Now it is time for action, and the group's proposals do address possible solutions.

- Differences of opinion about the problem are not so great, but it is not right to focus just on teacher education in this respect.

Teaching methods

- It is necessary to show relevance to practical applications, but we must not lose sight of the importance of training in abstract thinking. We must not teach maths with only its practical applications in mind.
- It is a misunderstanding that pupils avoid maths, science and technology because they are more difficult subjects than others. It is possible that the reason is that they are made more boring in our system. We may need to try a more cross-curricular emphasis and approach when these subjects are first introduced.
- Teaching methods must make the subjects more attractive. But this is a complex matter. That is, after all, how the “new” maths of the sixties and seventies failed. Teaching has to link understanding with calculation, which are not opposites. Problem based learning should be used and it should be started early. The work being done in some pre-schools in Iceland is exemplary. This method tests a teacher’s knowledge and confidence. It is also a method where everyone learns, teachers and pupils alike.
- The high dropout rate from maths is not normal, at least from some courses in the University of Iceland. There is a need to mix abstract and concrete aspects. Abstract thinking is after all the core of maths. There is a need to bring the subject “to life”.
- There were some discussions about the role of the teacher. The consensus was that his role was to arouse interest, to encourage and not necessarily to know. It could represent a change in attitude to teachers, both in the students and in the teachers themselves.
- The idea of immersion in training for maths, science and technology teachers requires closer scrutiny.
- Maths and science are too often lumped together. Science teaching has been a mess for the last decades. It is not possible to force pupils into specific subjects. They choose themselves. Science teachers have simply failed to make their subject interesting. They must show their pupils the strengths of science subjects.
- Maths teachers have usually performed badly, both with regards to the teaching itself and to the training of maths teachers.

Maths, science and technology as compulsory subjects in teacher education?

- Should the study of MST be made compulsory in the Iceland University of Education? The question led to discussions on subject specialisation, with delegates splitting over the issue, some for and some against. The point was made that scientific literacy was not limited to the natural sciences and that the scientific approach embraced a much wider set of disciplines. There was no particular reason to limit oneself to the natural sciences when discussing the need for teaching scientific literacy. Pupils could simply choose their subjects themselves without there being any concessions on the requirements for a scientific approach. It was also pointed out that “large group teaching” currently being introduced into the school system, where a specialist and others helped larger groups, was a move in the direction of specialisation. It was also mentioned that at the Iceland University of Education, the need for specialisation is being discussed, while at the same time emphasising group work and a pedagogic approach.
- There was consensus that basic teacher education in maths, science and technology was necessary.

Quality issues and management

- It is necessary to link universities with the upper secondary schools. This link has been rather weak during the last decades.
- It is necessary to address the question of a quality management system for teaching, just as for other jobs. Attention was drawn to the University of Iceland policy 2006-2011 which proposes greater emphasis on the quality of teaching and on rewarding good teaching in the same way that publishing papers in recognised journals is rewarded.

- The system of rewarding teachers is flawed. In addition to rewarding with salary one could imagine other ways, e.g. competitions *inter alia*. The science centre could play a major role here.

Renewal in maths, science and technology

- The technology society is growing old and about to retire. Those who “drive” technology today are growing old. How is technology to be driven when they retire? The only answer is that all conceivable efforts have to be made to increase the number of students that study technical subjects.

IV. ICT IN EDUCATION

Discussion Group D Report

In the conclusions of the group dealing with the use of ICT in teaching, the main emphasis is placed on offering practising teachers training courses that introduce new methods that employ ICT. The group also emphasises better access to the technology and more development activities in schools. These proposals harmonise well with the proposals from the maths, science and technology group.

From the Minister of Education, Science and Culture's opening address

1. Introduction

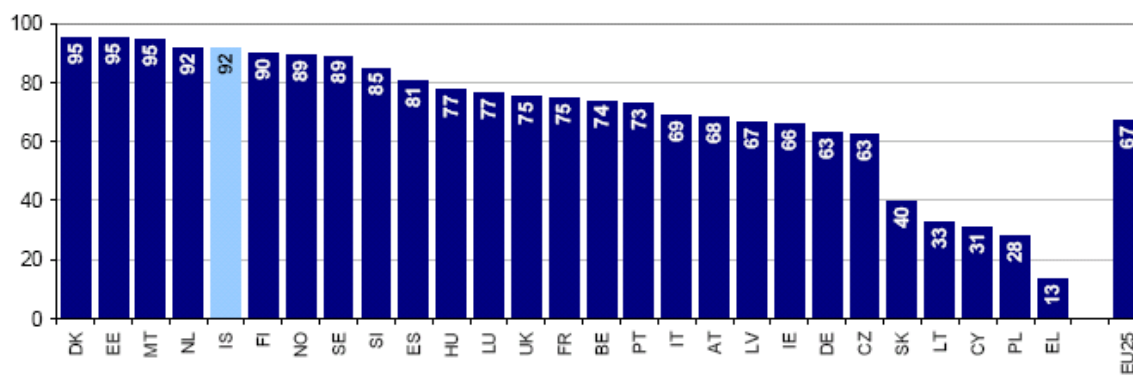
In Europe today the use of ICT for education is emphasised. Though some countries have longer experience of changes that come with the use of ICT, experts working in this field agree that ICT should be introduced in the descriptions of all curricula. They also agree that targeted use of ICT should be increased in all school operations and that evaluation of learning should be reviewed in the light of use of ICT. The emphasis should be on encouraging debate on research into the pedagogy of use of ICT and on promoting a better understanding of concepts like distributed learning, mixed learning, individual learning, cooperative learning and problem based learning (www.pbl.is) in discussions on teaching. Methods used for evaluating teaching and learning need to be reviewed and the management practices of educational institutions need to adapt to changes in the way schools operate.

2. The current situation in Iceland

The EU commissioned a survey in the EU countries and in Iceland and Norway, early in 2006, about the use of ICT in schools. One of the aims was that the results could provide guidance for teachers and policy makers. The results of the survey show that Iceland is among the countries that have the highest incidence of broadband connections to schools, with 92% having such a connection.

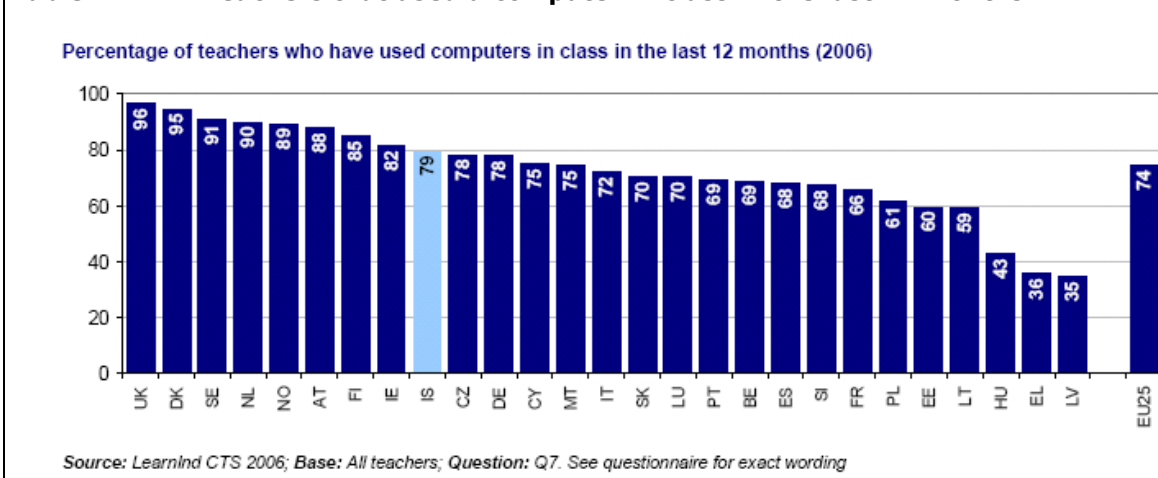
Table 1 Percentage of schools with Broadband Internet Access in Europe 2006

Percentage of Schools with Broadband Internet Access in Europe 2006



The survey also showed that during the twelve months preceding the survey, 79% of Icelandic teachers had used a computer in teaching.

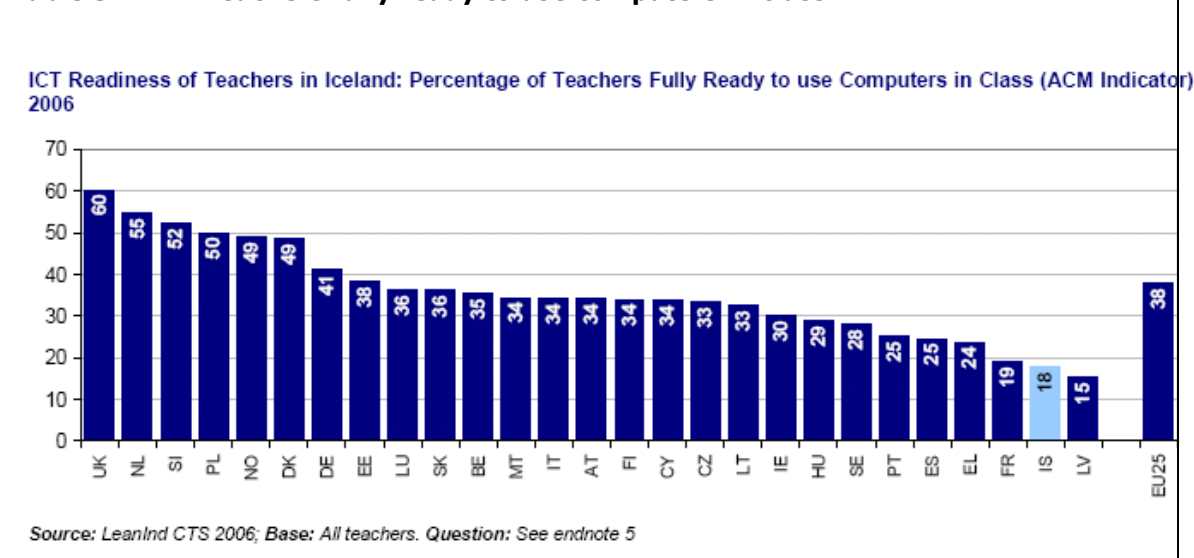
Table 2 Teachers that used a computer in class in the last 12 months



There was no significant variation in the use of computers between schools but there was a considerable difference between use at the statutory school level and upper secondary school, when teachers' use of computers was examined. At upper secondary school level 70% of teachers used computers in class against 30% at statutory school level.

According to the survey Icelandic teachers were generally more satisfied with their school's computer equipment and with the ICT-related services provided, and in comparison with their European colleagues they consider themselves well capable of using computers and ICT in their teaching. But the survey also shows that compared with their European colleagues they are not as ready to use the ICT at their disposal in class.

Table 3 Teachers fully ready to use computers in class

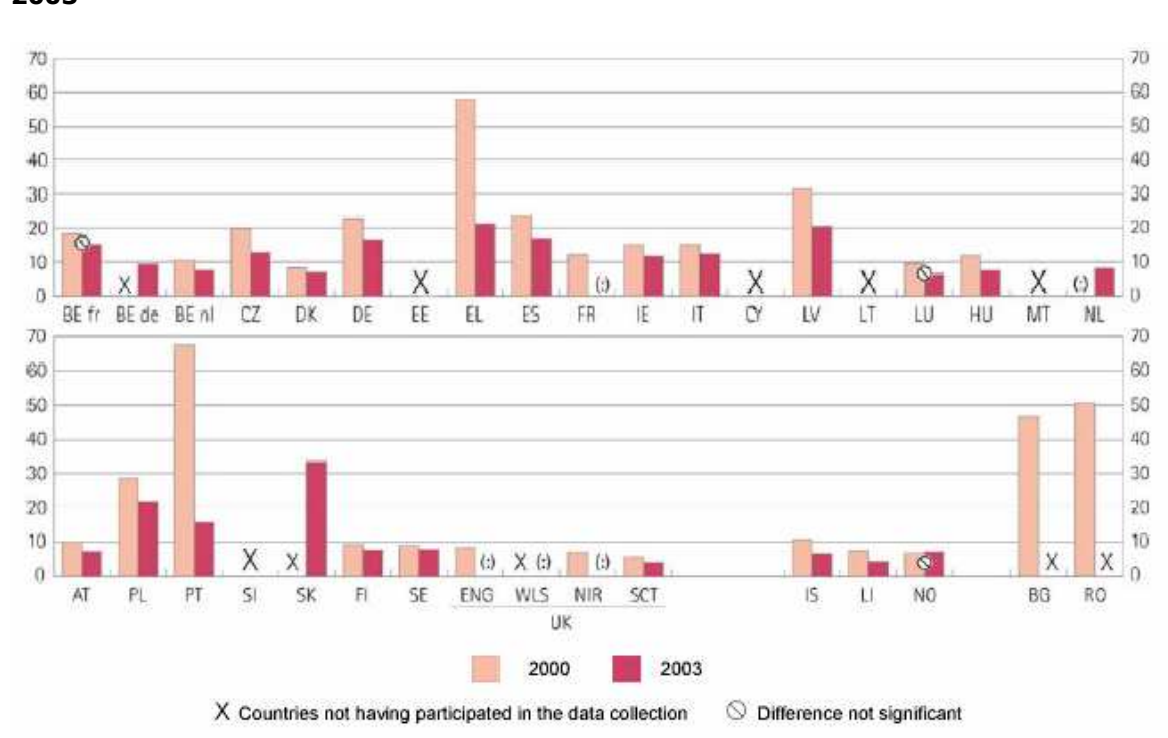


In the *Progress towards the Lisbon Objectives in Education and Training - 2005 Report*, it was stated that in Iceland more than 90% of schools had an internet connection in **2003** which was similar to Luxembourg, Finland, Sweden and Scotland. In the same report it was noted that in **2000**, 15.5% of 9 year olds used a computer at least once a week to find information. This was similar to children in Germany (15.4%), The Netherlands (15.4%) and Latvia

(14.3%) but much less than in Sweden (43%), England (47.8%) and Scotland (42.3%). It was also noted that 25.9% of 9 year olds used a computer at least once a week to write, was similar to children in France (29.4%), Cyprus (23.7%) and Rumania (26.1%), but much less than in Sweden (47.3%), England (40.7%) and Scotland (31.8%). Computers did not seem to be used much for communication according to this survey, 0.9% 9 year olds in Iceland used a computer at least once a week for communication, but this situation was similar in most countries except in Rumania (8.5%), France (8%) and Sweden (6.2%). The survey also showed that computer usage of 15 year olds had a similar pattern to that of the 9 year olds.

As table 4 shows the number of 15 year old pupils to each computer in schools during the period **2000 till 2003** was under 10, which was then satisfactory in comparison with other European countries.

Table 4 The number of 15 year olds per computer in schools for the period 2000 till 2003



In the conclusions of the research on computer use in Icelandic schools in **2006** "Use of Computers and the Internet in Schools in Europe 2006. Country Brief: Iceland 6 / 2006" done by Empirica in connection with Lisbon targets and the i2010 programme, in cooperation with the University of Iceland, it is shown that computers are used in schools at all levels. 20% of teachers say they do not use them in class because they are not suitable for the subject being taught but very few consider ICT unnecessary. The results show that Icelandic teachers are very competent in using ICT in class, among the most competent in Europe. But they consider that they need better skills.³⁸

In 2006 ICT has become an inseparable part of the daily routine in Icelandic schools, but the development still needs to be supported as new possibilities and demands appear continuously in ICT for schools. It is particularly important to nurture access to new possibilities and to review internal organisation within the schools, which could inhibit progress. In the "námUST" (learningICT) study, carried out by The Iceland University of Education, University of Reykjavík and University of Akureyri during the period 2002-2005, the results indicate that

³⁸ Working group proposals for increasing pupil participation in science and science subjects, 12.04.2006.

... Though the national curriculum prescribes efficient use of ICT in schools, in practice the use varies between schools. The use of ICT in learning and in teaching demands a clear policy on the part of school authorities, school managers (heads), flexibility in organising school operations both regarding time and space and finally it requires competent teachers and access to hardware and software. What arouses particular interest is that children and teenagers gain considerable skills in using the technology outside school, but that the schools do not seem to take this into the equation in their planning and curricula.

At university level the increased use of ICT has led to an increase in distance learning offers and to a general increase in the use of technology throughout the faculties. Despite this, the technology is often used to support traditional teaching methods with the emphasis on improved dissemination and presentation. In distance learning one can see indications of changing emphasis where the formation of learning communities is considered important and where the value of communication is stressed. The internet is clearly a powerful tool for pupils to gather information, communicate and present material.

In general one could say that the technology is used in an efficient way to present or gather information. The capability of the technology to enhance communication as an element in learning and teaching is not as well developed, particularly when one has in mind how dominant the communication element is in the use of ICT outside the classroom, in daily life in our society.³⁹

In the OECD Education Policy Analysis 2004 it says: "The final stage in innovation is the effective use of ICT"⁴⁰ which one can interpret as encouragement to greatly augment the use of ICT in schools, where the emphasis is on innovation and progress. In the OECD expert report on higher education in Iceland, it is also noted that there is a need for being able to see the whole picture of the Icelandic school system and that there is a shortage of information about the implementation of education at university level in Iceland. It can be assumed that ICT can be used to resolve this issue as structured registration has taken place at this education level. But the data needs processing and even standardising, so it is important to support processing and research on the existing data.

3. The main recent policy initiatives

Since 1999 the Ministry of Education, Science and Culture has issued policy on the use of ICT in schools which has been followed. The first policy paper published in ICT and education was "Policy of the Ministry of Education, Science and Culture in Information Affairs 1996-1999". The next was in 2002 "Advantage for the Future. Project Plan for E-education 2001-2003" and then "Risk with responsibility. Policy for ICT in education, science and culture 2005 – 2008".

Among the projects that have been implemented are the following:

- Annual conferences, ICT conferences, about the use of ICT in schools. These have been held in the first weekend of March 1999-2006
- Six development schools in ICT 1999-2003
- *Menntagátt Íslands - menntagatt.is*. The Ministry of Education, Science and Culture School web
- Curricula stored in a database and pointed to from the Ministry of Education, Science and Culture School web
- Joint database for libraries with internet search
- National access to electronic data banks at www.hvar.is
- High speed network *fsnet.is* for upper secondary schools and lifelong learning centres.
- Upper secondary school system *inna.is*.
- Additional lifelong learning offer for teachers
- Initiative to enhance production of teaching material
- International cooperation on development using ICT e.g. with the European schools web *eun.org* and in other projects such as the peer-learning clusters of countries (<http://cordis.europa.eu/eesd/ka3/cluster4.htm>)
- Lifelong learning centres and a knowledge centre at university level

³⁹ (taken from the web: www.namust.khi.is 2006-10-19):

⁴⁰ (page 5 in the Icelandic summary)

- Development projects supported
- Research project námUST (learning ICT) (*namust.khi.is*).
- Added emphasis on distributed education

4. Main challenges

The aim of government is that pupils and teachers should have unhindered access to powerful ICT equipment and to web material that supports learning and teaching, both inside and outside school. In 2006, ICT is an aid in schools, where the emphasis is placed on use of standard office software, and on distribution of material. The technology is good as such, however the level of access to both hardware and software still hinders progress, especially in the lower age groups. In upper secondary schools and universities, it is becoming increasingly common for students to have their own laptop, while the schools provide access to a wireless network and to software. Good access to computers and a good selection of software matters a lot when introducing ICT in the school system, but it is a matter of opinion what is sufficient. Organisation and location of hardware is also important. Are there a few computers in each classroom or a dedicated computer lab, or a laptop trolley that has to be ordered specially? A teacher with 25 pupils and one computer cannot use it effectively in teaching. In discussions with a number of teachers at statutory school and upper secondary school level it came to light that they rarely get access to the computer lab because it is usually booked for ICT teaching, and they find the laptop trolley too time-consuming to use given its location. It also came to light that the demand for quick replies to parents' e-mails, who now have easy electronic access to the teachers, worried the teachers and put them under pressure.

Attention needs to be paid to augmenting the use of ICT in all fields, as it affects the personal development of pupils, teachers and school managers where the individual can develop his skills with the help of technology. The use of ICT also affects the development of teaching and curricula. New opportunities must be supported and also research on the effects of the use of the new technology. To develop use of ICT one needs to put more emphasis on opportunities for cooperation, exchange of views and self-expression. Opportunities for collaboration in real time and for dissemination should be strengthened by increasing use of the more developed functionality so that the technology will become education's servant.

Computer games develop fast and they capture the attention of young people more and more effectively with improved presentation, more interactivity, access through more media, a bigger and better connected net-community and with design that builds on functionality that has proved itself to be effective. In this way ICT has revolutionised leisure and has succeeded in merging it with young people's lives at many levels simultaneously. Instead of seeing this development as negative, it would be more constructive to grasp the opportunity and research the question of how the technology of computer games can be harnessed for teaching purposes. This means not only using the methods for designing interactive material, but also using the equipment that now exists for these games. There are examples from abroad where it has worked well to use the newest game technology in teach-yourself language courses, with a familiar interface being a significant factor. Emphasising such research and development of new teaching techniques in the context of young people's use of ICT, would be a strong move which would not only inform us about what is going on outside the classroom but would also give us the opportunity to bridge the gap between the two worlds.

It is important to increase teachers' interest in using ICT in the classroom and to ensure that pupils are given tasks that encourage the use of those opportunities on offer. It is important to open pupils' eyes to the possibilities that studies in ICT can bring them at the end of their school years.

ICT also influences development in schools as institutions as the varied opportunities create new ways to work. Figure 1 is to show these effects.

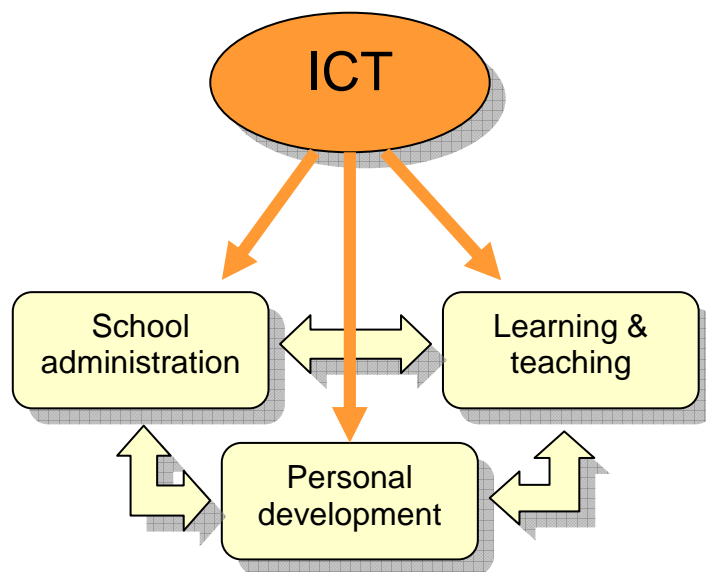


Figure 5 The Impact of ICT

The following section deals in more detail with use of ICT in school administration and the effect of ICT on learning and teaching. It applies to all school levels, from pre-school to university. The discussion group's ideas on improved use of ICT in schools will be disseminated.

ICT in school administration

Use of ICT offers many possibilities for making changes to school administration.

1. ICT offers a variety of possibilities to **promote** a school's activities. Schools can use their web site to disseminate information. This is a way to strengthen ties with parents and others who are interested in school activities. School web sites also play an important role in informing those who are choosing an upper secondary school or a university, or who have to move between schools at the statutory school level. Pre-school web sites are also useful for parents and for others who would like to find out about their work.
2. ICT supports **daily operations** in schools where systems are used to manage registration, student history, timetables, bookkeeping, monitoring and quality management to name but a few. It is necessary to support the development of these systems in cooperation with school administrations.
3. More has to be done in **processing and researching data** that has been gathered in electronic form in school systems. Here there are many unused opportunities. The results from such data processing then need to be disseminated in an effective manner. It is necessary to use ICT to follow paths to defined goals.
4. **Development and change** in school activities needs to be supported in step with developments in society. Lifelong learning opportunities for school administration staff need to be augmented and it needs to be emphasised that courses in change management in the context of education systems can be useful.
5. School administration needs to emphasise support for **work leading to change** in their schools despite criticism that e.g. comes from various parents and others that are not familiar with the inner work of schools. Innovation needs to be supported, such as distributed learning, in order to facilitate informed discussion on such issues.
6. Normal **renewal** of hardware and software in schools must be ensured and also that such equipment operates as it should, so that the effort of school administration, teachers and students is well used and so that crashes and downtime do not cause disruption and negative attitudes in the users.
7. Research on school activities needs to be increased, such as the effect of ICT on learning, teaching, teachers and on administration.
8. **Cooperation** between educational institutions and teachers' organisations should be supported. ICT can play a huge role here, e.g. with fora for exchange of views.

ICT in learning and teaching

The prerequisites for effective use of ICT in teaching and learning being and for development leading to sounder school activities are:

1. Easy access to new equipment. It needs to be both relatively new and to operate reliably. The technical equipment needs to harmonise with development in pedagogy, in well equipped schools, with good pupil facilities, well equipped libraries, stimulating facilities for teachers and the development and use of open plan areas.
2. A good and varied supply of **teaching material** must be ensured that takes advantage of the possibilities offered by the technology, such as video tapes, audio presentation, visualisation, sound, images, interactivity, moving images, recording and broadcasting *inter alia*. Here one can also mention media material and new types of small devices like phones that can be used as aids in learning and teaching. Research should be supported for new methods of making teaching material and innovative methods of presentation.
3. A good supply of interesting **projects** has to be assured, where pupils use the capabilities of new technology, e.g. in searching and processing, cooperation and communication, self-expression and presentation, analysis and criticism and other elements used to build and use knowledge.
4. New ways of **learning assessment** must be developed in cooperation with pupils, teachers and school administration. Parallel to supporting innovation in learning and teaching methods with the help of ICT, one has to consider developments in learning evaluation that takes the new technology into account.
5. **Research** on the effects of using ICT technology on learning and teaching needs to be strengthened along with methods to evaluate the effects. Research should also be carried out on school institutions as ICT is a significant factor in school activities.
6. **Current best practice should be disseminated** more effectively and those who are working along similar lines should be brought together.
7. Effective **continuing education and training** for teachers should be provided along with strong promotion of new and existing possibilities and not least with the provision of support for developing and implementing innovatory ideas. The development of varied learning methods should be supported, like distributed education with a mixture of on site learning and distance learning, individual oriented learning, solution oriented learning and other methods that can be strengthened with varied use of technology.
8. On-line **curriculum advisory services** need to be increased where help will be given on selecting a school or course at statutory school or upper secondary school levels and with choosing subjects and courses at university level. Support will also be provided for individuals such as those from other countries and having other native languages. The internet provides great possibilities to help such groups.
9. **Learning Management Systems** (LMS) that support communication, cooperation and distribution of material should be considered. There are rapid developments in LMS today where functionality aims to support the pupils' learning.
10. **ICT subjects need to be promoted**, e.g. computer science, at statutory school and upper secondary school levels so that pupils can choose subjects and subsequently a profession in an informed manner. In recent years, pupils have shown less interest in these subjects, which is why promotion of the possibilities in this discipline is needed. Individuals that are well-educated in ICT subjects will support progress in this area in coming years.
11. Make better use of the **energy and imagination of the younger generation**. Listen to their needs and observe their perceptions.

5. Possible ways to improvements

Use of ICT in schools has increased and strengthened during the past years and government policy is clear on this issue. The EU has been active in this area by supporting a variety of collaborative projects that aim to enhance the role of ICT. One aspect of collaboration with other countries is that it supports common standards that will enable databases to talk together which in turn will lead to the sharing of electronic teaching material.

The group's main proposals

Access to the internet is generally good in Iceland, so ICT should be used to support pupils at statutory and upper secondary school levels by providing them with a variety of possible routes in their education.

- It is necessary to support the development of ICT in school activities with emphasis on **accessibility** of the technology and availability of **learning material** enabled by ICT. The making of **assignments** should be improved by employing ICT's variety of capabilities.
- Lifelong learning for teachers and for school administrators should be enhanced, emphasising ICT, changes in school activities and innovation in teaching and learning methodology.
- The use of the internet should be encouraged for **student counselling** and to increase **support for pupils' learning**. Institutions and companies that are developing support for pupils and teachers should be strengthened, like Menntagátt (Icelandic School Web) and the European School Web and other such parties.
- **Teacher education should be strengthened** with emphasis on a normal role for ICT in all school activities and the opportunities it creates for **new teaching practices**.
- ICT can support teaching practices that are developing rapidly today such as, distance learning, distributed learning, mixed learning and individual oriented learning. It is important to support these developments and to encourage schools to adopt development and to increase research in this area significantly.
- Use of ICT in homework should be supported and it should be ensured that pupils' learning is enhanced by current innovation and research, both domestic and foreign.
- The **newest game technology should be used** in self-learning of languages while at the same time emphasising research and development of new teaching practices that derive from young people's use of technology.
- International cooperation should be emphasised, using the information and funding that such cooperation brings, both within and outside organised projects.

School web

Finally, emphasis will be placed on one of the issues named above. That is to increase the level of personal support that is available on-line, through a specialised school web that is available on-line. On such a web, pupils could submit queries related to their schoolwork. The answers would then be visible to all who visit the web. **It would be best to build such a web immediately for the core subjects, i.e. maths, Icelandic and English**, then later in other subjects. It would also be possible to use school webs to support immigrants' studies, where they could get answers in their own languages. This web could be run in cooperation with Menntagátt the Icelandic School Web and with universities that offer teacher education, such as the Iceland University of Education, University of Iceland, Reykjavík University, University of Akureyri, Academy of the Arts and others. Trainee teachers could, as part of their studies and supervised by their tutors, take on the task of answering the questions received by such a web. Learning techniques could also be conveyed over this web under the slogan: **"Learn to learn"**. A similar web could be developed for students in upper secondary schools in connection with planned shortening of the period of study before qualifying for university. This could possibly be one and the same web that had the main aim of using technology to reinforce pupils' learning.

6. What next?

ICT offers possibilities that can enhance school activities, so it is essential to constantly be on the lookout for opportunities.

The Ministry of Education, Science and Culture policy to the year 2008 has been published in the policy document, "Risk with Responsibility". Work will be continued on reaching the targets set there. In a European context the sights are set on 2010, and one can assume that Iceland will make every effort not to fall behind.

Changes at the transition zone between statutory and upper secondary school levels are a catalyst for reviewing teaching practices, which maps well to the planned effort in teacher education and teaching material. Changes to the structure of teacher education are in the pipeline as a result of the merging of the University of Iceland and the Iceland University of Education. There is also more going on in school environment at all levels, so one should assume this will bring a review of learning and teaching content.

Distributed learning is becoming increasingly popular, with more than half of the upper secondary schools offering their students distance or distributed learning along with traditional study on location. More than 1000 courses in upper secondary schools are taken by students in distributed learning.

Strong use of the new media has opened the doors to new ways of learning and teaching. The expectations are that they will be implemented if teachers and schools are supported.

Addenda to the report of the discussion group on ICT IN EDUCATION

- Feedback from expert and from conference delegates

At the conference *Education and Training - The Development of Education Policy in Iceland in the context of Europe*, the report of Group D was presented and debated. The following are some of the comments and questions raised in the discussions.

1. Expert reactions

The approach adopted by the commentator for Group D was different from that used with the other groups. Hilmar V Pétursson, director of CCP made a lively presentation of the Icelandic produced computer game, *Eve-online*⁴¹ which has been a hit worldwide. There will be no attempt here made to repeat Hilmar's presentation, but it can be said without fear of contradiction that it was greatly appreciated and that it opened the eyes of many conference delegates to the possibilities that ICT offers both in teaching and in play, while also showing the importance of software development for the Icelandic economy.

2. Comments and questions from conference delegates

- The same vicious circle as in maths, science and technology, plagues ICT. People who choose the teaching profession tend to have little interest or competence in using the technology. This affects the way it is taught which in turn leads to a lack of interest among pupils in the technology.
- The main users of ICT have been banks and the employment sector, so that is where the development has taken place which has affected the way software and hardware has developed. Use of ICT in schools has however not been as fast and the technology is not yet sufficiently well-adapted to use in schools.
- And additionally, one can hardly expect much while in some schools there is only one computer in each classroom.
- One can already learn a lot by playing games like *EVE Online* but it is also possible to build similar games that are targeted more at teaching the players.
- ICT should be used in schools to make school activities more transparent, so that parents, future pupils and not least employers can see what pupils are learning and what demands are made on them and on teachers.
- The concept ICT, just like electricity and telephone, is only important for a limited period of time. The main issue is the actual use of the technology.
- How can one ensure that pupils gain basic skills in ICT? One cannot expect pupils to learn the skills on their own, and it is difficult to make room in the timetable because there is so much there already that has powerful advocates.
- The net environment for the education system as a whole has to be developed even further, a user friendly network that is both collaborative and interactive. In this way it would allow everyone to get information while also allowing them to post advertisements.
- One issue that was discussed was the importance of enabling the employment sector to introduce electronic teaching material for use in schools.
- The question was posed whether schools had stagnated for lack of competition.
- Do the teachers need more encouragement?
- Is it desirable or interesting to use virtual worlds and games to teach and learn e.g. about the art of living?
- Should the employment sector provide digital teaching material?

⁴¹ See: <http://www.eve-online.com>

V. RECOGNITION OF LEARNING OUTCOMES

Discussion Group E Report

The group dealing with recognition of learning outcomes points out that the EU has published a framework for education after completion of statutory education, also for non-formal education and recommends that this framework be adopted in Iceland in phases. This system is designed to bridge the gap between formal and non-formal education. Work has already been done in Iceland on developing evaluation techniques for non-formal education and for real competence, which will be useful input for the task in hand. By developing a framework that is compatible with those of other European countries we make it easier for Icelandic students and employees to have their qualifications and job experience recognised abroad.

From the Minister of Education, Science and Culture's opening address

1. Introduction

The discussion group on recognition of learning outcomes was asked to discuss learning outcomes and how they could be made clearer, more transparent and more visible. In their deliberations the group focused its attention largely on the European Qualifications Framework (EQF). This is a system developed by the Directorate for Education and Culture of the European Commission that categorises the learning objectives of upper secondary and university education in steps (vertical categorisation) and uses horizontal categorisation for objectives in skills, knowledge and competence. The aim of the system is to make education in Europe more transparent and to make comparisons easier within the EU.⁴²

2. The current situation in Iceland

Learning outcome oriented curricula

In 1996 new laws were passed governing the upper secondary school level in Iceland. Following the adoption of this legislation a total review of the national curriculum for the upper secondary school level was commenced. The first step was to review the curriculum for academic learning, with the revised curriculum coming into force in 1999. Special trade boards were appointed in 1998 for all trades that have programmes at upper secondary school level, 14 in all, and they got down to the work immediately, each for its own trade, revising curricula or preparing a rewrite as appropriate.

Curricula in vocational training appeared in most trades in the following years and now main curricula have been published for the metalwork trades, the building trade, printing and publishing and some partial curricula for electricians, health and social workers, upbringing

⁴²See more detail on the EQF system on the EU web, http://ec.europa.eu/education/policies/2010/et_2010_en.html
See the conference programme in appendix I

and leisure, design and handicrafts. More curricula are being written, including curricula for office and retail workers.

The Ministry of Education, Science and Culture emphasised that in the curricular development work, that all trades or occupations that might need instruction at upper secondary school level should be included. It was also emphasised that efforts should be made to standardise the curricula as much as possible, both in structure and appearance. This led to the introduction of new courses of study for new sectors, such as health and social work, upbringing and leisure. Studies were carried out that led to the decision that the Ministry would not organise curriculum development in other sectors, such as security, policing and search and rescue.

Curricula are structured as follows: first there is an introduction that specifies the occupation for which the material is designed and the demands that are made on knowledge and skills for a person to be able to perform adequately in the occupation. Then the structure of the curriculum is described and how the learning and teaching will be implemented. In the introduction the final objectives of the course of studies is stated, as the laws on upper secondary schools prescribe. Then a description of the course of studies is given followed by descriptions of the component courses.

Both in the final objectives for the course of studies and in the component course descriptions, the aims are shown by describing the knowledge or competence that the course should impart. It says what the learner should know and be able to do at the end of the course. The objectives are in this way made tangible and using this method it should be possible to show if the objectives have been met. It is fair to say that this is a revolutionary change in the way curricula are presented. Previously, the curriculum described what was done in the classes, which is a teacher-oriented approach. Now the curriculum is learner-oriented and deals with the learner's knowledge and competence. So the approach has come full circle – from a view of the input to a view of the output. Similar changes have been implemented in many EEA countries.

Adult education

At the same time, the Ministry of Education, Science and Culture has placed a stronger emphasis on adult education. Nine lifelong learning centres have been opened outside the capital city area that provide courses for the general public, both vocational courses and leisure courses. Adult education in the capital area has also flourished concurrently, and government support for this work has increased year by year. The aim of this work is to increase the public's participation in lifelong learning and continuing education of whatever type and to introduce the view or philosophy that education is for life - that one never stops learning. Increased participation in adult education leads to a higher level of education, knowledge and skills for participants.

The battle against dropout

It is a matter for real concern that a large proportion of the Icelandic labour force (approx 30%) has no formal education at upper secondary school level. The government has shown interest in lowering this proportion and in using methods that give results. Cooperation with associations of employers and employees has been initiated with a view to addressing the problem. In 2002 the Icelandic Confederation of Labour and the Confederation of Icelandic Employers founded the Education and Training Service Centre. The Centre was given the role of being a centre for cooperation on adult education and vocational training in cooperation with other educational institutions working under the auspices of the founders. The work of the Education and Training Service Centre targets those people who have not completed upper secondary school education and its objective is to give these individuals the opportunity to obtain a formal qualification or to improve their status on the labour market.

Evaluation of real skills

In 2003 a service agreement was made between the Ministry of Education, Science and Culture and the Education and Training Service Centre that stated that the Centre should assist the Ministry in developing methods to evaluate people's real skills, i.e. to evaluate an

individual's learning status on the basis of knowledge and skills gained in life, regardless of whether they were gained in formal or informal education, through work experience or elsewhere, such as from participation in social activities. A special evaluation committee was set up with representatives from the Ministry, schools and from the Education and Training Service Centre that produced a set of rules for evaluation of learning resulting from courses taken at the centres of lifelong learning, *Mímir-Símenntun* Adult Learning Centre and other related parties. The committee examined the curricula for the courses of learning that the Education and Training Service Centre had produced on the basis of an accredited process and quality references. The committee delivered proposals to the Ministry on how the courses in question could be evaluated in the context of studies at upper secondary school level. The Ministry has subsequently confirmed the evaluation of the courses in question with a circular to the upper secondary schools where proposals are made as to how these courses should be evaluated. This process led to base references for evaluation of non-formal learning that can be used to support continued development of a system for evaluation of real skills. This work will continue and a system developed that ensures the rights of individuals to have their existing education assessed in a fair manner where knowledge and skills that the individual has gained are taken into account regardless of whether they originate from the formal school system or outside it.

In health and social work and in upbringing and leisure, another methodology has been used to evaluate workers' real skills. The professional training board for the relevant sector made a proposal to the Ministry on how one could evaluate an individual's work experience and attended courses in the upbringing and leisure sector such that it can be recognised for credits in a specific course of studies such that it will shorten the time needed to qualify at upper secondary school level. The Ministry has since endorsed rules about assessment of previous education and published these rules in a circular to upper secondary schools. Considerable interest has been shown by individuals in this method of gaining formal education and one could say that it has bridged the gap between formal and non-formal education. Individual lifelong learning centres and adult education institutions have also been given the opportunity to offer education using this method.

Student counselling and vocational guidance

The Ministry of Education, Science and Culture recently provided funding for the centres for lifelong learning that enabled them to employ student guidance counsellors, the purpose being to offer services to the public related to choice of education or employment. One emphasis has been that the advisors can meet workers in a familiar environment e.g. at the workplace. This is part of the process of gradually building a homogenous system that can serve individuals that want to complete formal education and that need help in getting their previous education and experience assessed.

3. The main recent policy initiatives

At the beginning of 2006 the Ministry of Education, Science and Culture opened a new department for lifelong learning which had the role of developing official policy in adult education and lifelong learning. Among the department's tasks was to help an advisory group on management of lifelong learning to elaborate proposals for future policy in lifelong learning, where one of the issues would be to decide whether there was a need to set special laws on lifelong learning. Another task was to properly organise the collection of information and statistics on lifelong learning.

During the last three years work on development for the Icelandic school system in general has been going on, from pre-school level to university. New laws governing universities came into force in 2006 and revision of the laws for other levels of education are on the current agenda, with flexibility and reliability being the guiding principles. The Minister of Education, Science and Culture appointed a special cooperative committee that delivered suggestions for changes at upper secondary school level in July 2006. The suggestions include a proposal for a system where all learning at upper secondary school level should have equal weighting, such that credits in VET have the same value towards qualifying for university as credits from

academic learning, but where all learners must finish a core set of courses in Icelandic, English and maths. The committee also proposes that the curriculum should specify the increased participation of companies in vocational training at the workplace and that funds should be set up that support companies that receive pupils for training.

The Minister of Education has reached a special agreement with the Icelandic Teachers' Union about further elaborating the policy mentioned above. This will include the structure of teaching at upper secondary school level and it is planned to have the results of this work available in the near future. Following this there will be a review of the laws governing the pre-school, statutory school and upper secondary school levels, with the national curriculum for these school levels being reviewed concurrently.

4. The main challenges and possible improvements

As was indicated in the introduction, the main task of the discussion group was to consider the European Qualifications Framework (EQF). EQF categorises the learning objectives of upper secondary and university education in steps (vertical categorisation) and uses horizontal categorisation for objectives in skills, knowledge and competence. The aim of the system is to make education in Europe more transparent and to make comparisons easier within the EU.

On completion of its deliberations, the discussion group agrees that Iceland should consider the benefits of introducing a corresponding system in this country, while at the same time designing a system that builds on a shift of emphasis where personal skills are accredited with a standardised methodology. This National Qualifications Framework would use EQF as a reference and it would allow for easy links to EQF. The reason for this is that the EQF system enables comparison and equation of learning by degree of difficulty, regardless of where the learning has taken place.

The idea fits well with government policy in education in general and with the upper secondary school course credit system and the new presentation of the curriculum, which is now based on final objectives for learning and the planned learning outcomes. The idea also echoes the changes currently being made to educational systems, changed demands on education and evaluation of skills and government emphasis on lifelong learning. This enables the comparison between formal and non-formal education thus enabling heterogeneous systems to communicate with each other. Then attention would be focused even more on the content of learning and on final objectives, on when the learner has achieved certain skills, and not on the length of the learning period. The system is learner-oriented, not school-oriented, and adapts to the individual's skills and knowledge.

Given that there has been a minimum of public debate on EQF in Iceland, it should be vigorously promoted to all stakeholders, both within the formal system and the non-formal.

It seems that provisions will need to be made to totally refactor the system with the help of experts, both from the education system and also from the employment sector and from the centres of lifelong learning. The National Qualifications Framework could be the basis for all curriculum development in Iceland, within and without the formal system.

It is proposed that work commence immediately on designing, promoting and finally introducing the system. A board should be appointed to manage the project and to ensure that it receives as broad consensus as possible. A project schedule should be made with three phases, i.e. preparation, design and implementation.

Preparation and design

In the preparation phase the basic design of the system will be worked out along with the mapping to existing evaluation systems and adaptation to curriculum development and to the learning outcomes methodology.

- The system will make the individual's skills apparent.
- The system will extend over all school levels from completion of statutory education, and also over non-formal learning.
- The system should include methods and work processes for evaluation of real skills and for implementing evaluation of quality policy, quality monitoring and quality systems of educational institutions.

To be written:

- A reference model for a National Qualifications Framework – NQF, which is the Icelandic version of EQF; it should be possible to map the NQF to European references and should cover all school levels from completion of statutory education. Seamless transition between levels should be aimed for.
- Description of references for skills, knowledge and competence that have a general correspondence with skills and knowledge gained from the education referred to above. Solid cooperation with the employment sector is the foundation on which this work will be based. The system will refer to Icelandic circumstances while implementing the aspects defined in EQF.
- Work methods, evaluation methods and quality references in non-formal learning, that adult education institutions can build on such that learning outside formal education can be assessed as part of the learning required at upper secondary school level.

In the light of the fact that the above-mentioned system is intended to bridge the gap between formal and non-formal education it is necessary to take into account the work that has gone on in Iceland towards evaluation of non-formal education, evaluation of real skills. There has to be cooperation with those who developed the methodology for evaluation of real skills in order to elaborate the final proposals for the evaluation system, for training those who will perform the evaluation, for proposals on monitoring evaluators' assessments, about procedures for conflict resolution, for the writing of work rules and/or evaluation methods and their review. Proposals also have to be made about the operational status (private/public entity) of the service providers and about supervision of the evaluations.

Those who are accredited to perform real skills evaluation must have received the prescribed training and they must use the standardised methods and work rules in their evaluations. These work methods and rules shall be harmonised with the basic references in corresponding systems being used in other countries. A service institution will supervise the evaluation process, provide the evaluating organisation with advice and provide assistance with resolving disputes or points of interpretation. The institution will train evaluators and in certain instances will act as a kind of evaluation tribunal if requested and will provide a final ruling on the basis of statements.

As it is important that all parties trust the system, the decision-making process must be clear and the premises on which decisions are based. The references shall be clear and the evaluation accurate. The evaluation shall be independent of the length of the period of learning and also of how it took place.

Introduction and adaptation period

It is clear that a National Qualifications Framework will not be made in one step, so it is suggested that the system be introduced in phases such that initially the existing methods will remain in force and little by little phased out as the new methods are introduced. During the period of adaptation the system will be introduced to the stakeholders and further tuned to users' wishes and needs. It is important to achieve full consensus on the system so a significant amount of time has to be earmarked for promoting the idea to stakeholders and for training them to use it. Teachers have an important role in the implementation, so it is

essential to win their trust and arouse their interest in the project, while at the same time leveraging their knowledge and experience.

Implementation and review

A period of three years must be allowed for the preparation phase. At the end of that period it should be possible to formally introduce the system and to provide the legislation, regulations/rules that will govern the work processes (see e.g. article 5 of the new legislation on universities). At the same time the introduction of informal work rules and communication practices on which such systems are based, should have been completed. The system shall cover all learning, non-formal and formal, and shall be adapted to corresponding systems in other countries. Continued development of the system shall be in cooperation with the university sector.

5. What next?

There is currently much debate in Iceland on the structure of education at upper secondary school level. The committee appointed by the Minister of Education, Science and Culture in August 2003 to review training at the workplace, delivered its proposals in April 2006. The main points were as follows:

- Rules about learning at the workplace, that should be set according to article 32 of the laws on upper secondary schools, should be part of the national curriculum for upper secondary schools with the same weighting as learning in other sections of the curriculum. Such rules have not yet been set despite the above provisions by law.
- Costs accrued by companies, that can be ascribed to providing instruction for learners at the workplace shall be levelled.
- A vocational training fund shall be set up that shall level the costs resulting from teaching students at the workplace, between companies.

The VET committee appointed by the Minister of Education in December 2005 supported these proposals in its final report which was presented in July 2006, while at the same time proposing changes to the structure of vocational training at upper secondary school level. The main proposals of the VET Committee were as follows:

- The practice of separating vocational training from academic learning at upper secondary school level will be discontinued.
- Studies at upper secondary school level shall be a unified entity composed of a range of diverse learning programmes. Schools will be free to organise and offer learning programmes corresponding to their final objectives, to the needs of pupils and to the requirements of the subsequent school level and/or of the employment sector such that the pupil will be as well-prepared as possible for the next phase of learning.
- Studies at upper secondary school level leading to university admission will be oriented to what is expected to succeed the learning programme. The programme will have a core with Icelandic, maths and English. The core and additional courses according to a curriculum agreed by the Ministry of Education, Science and Culture shall be evaluated as equivalent to qualification for university entry.
- Courses in new upper secondary schools in addition to the core shall be structured with formal cooperation between upper secondary schools and universities with a view to further studies and between the upper secondary schools and the employment sector through the trade boards.
- Learning programmes shall be oriented to the activity that will succeed the programme in question, employment or university, to the final objectives of the programme and to the needs of the pupil. The pupil should complete the programme of studies in the time required, given the factors named above.
- University entry qualification can be a milestone on a pupil's route to a defined destination of a given learning programme.

The above-mentioned ideas are being discussed within the framework of cooperation between the Icelandic Teachers' Union and the Ministry of Education, Science and Culture in the context of their agreement on "Ten steps to progress in school work and school reform". The cooperation aims at revision of the laws governing the pre-school, statutory school and upper secondary school levels, in order to enhance seamless transition between levels, increase flexibility within and between levels and to meet the varied needs of pupils. The agreement involves more issues, but it is clear that education will now be in a melting pot, which creates opportunities for a review of learning structure and for various innovative initiatives.

In this context it is also necessary to have in mind the report of the advisory group on management of lifelong learning that was published in October 2006, where a proposal is made for special legislation on lifelong learning that assures adults the right to complete education at upper secondary school level. It is proposed that the Ministry of Education, Science and Culture should pay providers of adult education the student related cost for each person receiving adult education, using the same payment model as in day schools. Pupils shall have easy access to evaluation of real skills, have access to student loans and adult education shall be built up in close cooperation with the Social partners and their educational institutions.

It is normal that debate on a National Qualifications Framework in Iceland should go hand in hand with the extensive current debate on revision of the structure of upper secondary education and on lifelong learning. During the process of revision of the laws governing upper secondary schools one should address the question of how to discuss the reference model for categorisation of knowledge and skills objectives and make room for them in the legislation, and equally connect them with the legislation on lifelong learning if such legislation is to be prepared.

Addenda to the report of the discussion group on RECOGNITION OF LEARNING OUTCOMES.

- Feedback from expert and from conference delegates

At the conference, Education & Training 2010 – The Development of Education Policy in Iceland in the context of Europe⁴³ the reports of the five discussion groups were discussed, including the report on Recognition of learning outcomes. After the chairmen of the discussion groups had made their presentations, experts gave their reactions in short, but prepared presentations. The floor was then opened to conference delegates, who variously made comments or asked questions, both in the main auditorium and in the discussion groups that were convened in the extended coffee breaks. The following are some of the comments and questions raised in the discussions.

1 Expert reaction

Elna Katrín Jónsdóttir deputy chairperson of the Icelandic Teachers' Union was the expert commentator for Discussion Group E. The following are some of the point she made:

- Iceland is heading in the same direction as others in terms of curriculum development (shifting the emphasis from "input" to "output", but the discussion group might have drawn more attention to Iceland's uniqueness and of the flexibility of its education system.
- Too much is made of the real meaning of changed curricula. It is not certain that the "hidden curriculum" has lost any of its influence.
- The elaboration of the concept "learning oriented education" and the idea that all learning should be like this is not something that can be easily dealt with.
- Much good work has been done on evaluation of real skills, but there is still much to do, e.g. to inform the public about the individual's right to such an evaluation.
- New legislation on adult education and on measures to guarantee the individual's right to a second chance for education is more than due. The advisory group on management of LLL that the Minister of Education, Science and Culture appointed in 2004 is now writing its final report. One of the recommendations in this report is that special legislation should be set that assures the individual the right to complete a suitable learning programme at upper secondary school level.
- The opening of a department of lifelong learning in the Ministry has not come a day too soon! Regarding suitable tasks for the department, Elna Katrín referred to the draft report of the advisory group on managing LLL.

The Icelandic and European Education Qualification Frameworks - NQF and EQF

- Without National Qualification Frameworks the European Qualification Framework (EQF) is meaningless. The discussion group's emphasis on starting work on an NQF for Iceland is in full agreement with the EU's thinking in this matter, but the proposal needs further explanation.
- It is necessary to highlight the trichotomy of the discussion – from a common European reference to a nation or country reference and thirdly from there to specific sectors within the country.
- Without an EQF or similar categorisation system, there is a danger that hurdles or walls between institutions and countries will hinder not only access to education and training but literally prevent the use of knowledge and skills that have already been acquired.
- The discussion group's observations on the need for a powerful promotional campaign to inform about NQF/EQF are wholeheartedly endorsed.

See the conference programme in appendix I

- Dissemination of information to the public and to stakeholders on Iceland's participation in European education cooperation needs to be greatly strengthened.

Finally, Elna Katrín expressed her support for the ETUCE⁴⁴ view that the positive aspects of working on definition and presentation of EQF are:

- To facilitate reciprocal recognition of education and skills between the countries of Europe, both formal and non-formal
- That bridges will be built within education systems i.e. between vocational and academic,
- That EQF will enhance the value of learning (lifelong) and
- That EQF is part of the aims of the Lisbon Declaration on social and employment issues in Europe.
- Additionally – and as would be expected, ETUCE⁴⁵ particularly emphasises the potential EQF has with reference to teacher education and the potential for teachers to practise their profession with full rights in different countries in Europe on the basis of an evaluation of their education, training and experience.

BUT: ETUCE underlines:

- EQF is meaningless if the work on NQF is not done first,
- The purpose and planned impact of EQF needs further explanation,
- That emphasis on the value of non-formal and informal education may neither obscure the importance of formal education nor the efforts of nations to raise their level of education in terms of formal education.
- Additionally it is pointed out that more precision in the wording of the system is needed if the objective is to be achieved of enabling education and education systems of diverse countries to "talk" together.
- Finally there is a strong warning that EQF may not cause all education to be cast in the same mould.

2 Comments and questions from conference delegates

- Why complicate life with participation in EQF?
- There is a mutual recognition system connected to the EU internal market, but it does not speak the same language as EQF
- Does the need for support for implementation of EQF at university level refer to advisory services and training as well as funding?
- How far will descriptions of skills go?
- Evaluation of personal skills is lacking when evaluating knowledge generally.
- With EQF will it be perhaps possible to stop talking about the length of an education? The gain could for example be not least in the possibility for people to go through the system faster.
- Who will evaluate skills and what skills will be evaluated?
- It is not necessary to change the school system. It just needs to be better defined.
- Would it be right to extend to RQF ("Regional Qualification Framework") for example in Scandinavia, or even SQF ("Sectoral Qualification Framework") as has already been done in e.g. hairdressing?
- The development of NQF on the basis of EQF lays a foundation made of results in learning (skill demands) for both formal learning and evaluation of real skills. This common base is very important for assuring the quality of the evaluation of real skills. At the same time the basis is laid for a decision on what skills should be evaluated in each instance.
- The EQF reference places great emphasis on personal skills, which are often lacking in descriptions of curricula, but which are important in employment.

⁴⁴ ETUCE Working Group on the EQF December 2005

⁴⁵ ETUCE Working Group on the EQF December 2005

- The Commission representative emphasised that people should not get lost in the technical details of the elaboration of EQF. It is necessary for each country to develop its own system. The question hinges on evaluation of real skills and on nothing more. The introduction of the system could bring considerable savings. Finally he said that this was one of the most important EU political initiatives in education in recent years and he encouraged serious deliberations on the advantages of adopting the system.



References and main information sources of the discussion groups

Web, Education & Training 2010

http://ec.europa.eu/education/policies/2010/et_2010_en.html

Communication from the Commission: Modernising education and training: a vital contribution to prosperity and social cohesion in Europe. Draft 2006 joint progress report of the Council of Ministers and the Commission on the implementation of the *Education & Training 2010 Work Programme*. (COM/2005) 549 final)

See: http://europa.eu.int/comm/education/policies/2010/doc/progressreport06_en.pdf

Commission staff working document. Annex to the Communication from the Commission

See: <http://europa.eu.int/comm/education/policies/2010/doc/report06staff.pdf>

Progress towards the Lisbon Objectives in Education and Training – 2006 report based on indicators and benchmarks

Implementing the *Education and Training 2010 Work Programme: 2005 Progress report – ICELAND.*

http://europa.eu.int/comm/education/policies/2010/nationalreport_en.html

2006-2007 framework of activities in the context of the Education and Training 2010 work programme: clusters and other main measures. Note to the attention of the Education & Training 2010 Co-ordination Group (ETCG) (20 January 2006)

Bernd Wächter, "**Knowledge as the Key to Growth and Employment**", in: Maria Kelo (ed.), *The Future of the University, ACA Papers on International Cooperation in Education*, Bonn: Lemmens Verlag, 2006, pp. 13-28.

Discussion Group A also used sources from the E&T 2010 web through the following link:

"*The European Higher Education Area – Higher Education in the Lisbon Strategy*"

See: http://europa.eu.int/comm/education/policies/2010/lisbon_en.html

Also:

European Commission DG EAC 2006: **Cluster "Modernisation of Higher Education" – Issue-paper on Funding** Doc. MHE 6, **Issue-paper on Governance** Doc. MHE 7, **Issue-paper on Curricular Reform** Doc. MHE 8

Richard Lambert and Nick Butler: **The Future of European Universities – Renaissance or decay?** Centre for European Reform, May 2006

Current and Future Trends in Higher Education A study by Hof Wittenberg commissioned by the Austrian Federal Ministry for Education, Science and Culture. Das Zukunftsministerium 2006.

Discussion Group B

Sources from E&T 2010 that refer to "*Key objectives and areas of co-operation*".

See: http://europa.eu.int/comm/education/policies/2010/objectives_en.html

Also from:

Education and Training of Teachers and Trainers

http://ec.europa.eu/education/policies/2010/objectives_en.html#training

Key Competences

http://ec.europa.eu/education/policies/2010/objectives_en.html#basic

Discussion Group C

Sources from E&T 2010 that refer to "Key objectives and areas of co-operation".

See: http://europa.eu.int/comm/education/policies/2010/objectives_en.html

Also from:

Math, Science and Technology

http://ec.europa.eu/education/policies/2010/objectives_en.html#math

Discussion Group D

Sources from E&T 2010 that refer to "Key objectives and areas of co-operation".

See: http://europa.eu.int/comm/education/policies/2010/objectives_en.html

Also from:

Information and Communication Technology

http://ec.europa.eu/education/policies/2010/objectives_en.html#information

Also:

„Benchmarking Access and Use of ICT in European Schools 2006“. Sought 21. 12. 2006 on web:

http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/final_report_3.pdf

http://www.empirica.biz/empirica/aktuelles/meldungen/pm041006_en.htm

Discussion Group E

Sources from E&T 2010 that refer to "Key objectives and areas of co-operation".

See: http://europa.eu.int/comm/education/policies/2010/objectives_en.html

Also from:

"Recognition of non-formal and informal learning"

http://ec.europa.eu/education/policies/2010/objectives_en.html#recognising

"Vocational Education and Training (Copenhagen Process)"

http://europa.eu.int/comm/education/policies/2010/vocational_en.html

Also:

European Commission DG EAC 2006: **Towards a European Qualifications Framework for Lifelong Learning** - Commission staff working document SEC(2005) 957

APPENDIX I : Conference Agenda

EDUCATION & TRAINING 2010

The Development of Education Policy in Iceland in the context of Europe

Conference held at the premises of Orkuveita Reykjavíkur
(Reykjavik Energy Providers)
26 October 2006

Agenda

Hour:

- | | |
|-------------|--|
| 9-9:15 | Registration |
| 9:15-9:30 | Opening address by the Minister of Education, Science and Culture Thorgerdur Katrin Gunnarsdottir |
| 9:30-10:00 | <i>Education & Training 2010</i> – the context of the work. Sebastian Volkers, representative of the European Commission |
| 10-10:15 | <i>Icelandic participation in Education & Training 2010.</i> Solrun Jensdottir Director, Department of Education, Ministry of Education, Science & Culture |
| 10:15-10:30 | Coffee break |
| 10:30-11:30 | Key note: <i>Shaping the Future – The role of higher education in the knowledge society</i> Professor Marijk van der Wende Centre for Higher Education Policy Studies, University of Twente and President of the Governing Board of the OECD's Programme on Institutional Management in Higher Education - Discussions |
| 11:30-12:00 | Short presentations of the conclusions of the discussion groups that have been working in recent months followed by feedback from commentators <u>Theme A: Modernising Higher Education</u> <i>Presentation:</i> Hellen M. Gunnarsdóttir Ministry of Education, Science and Culture <i>Commentator:</i> Professor Dr. Marijk van der Wende <u>Theme B: Teachers and Trainers</u> <i>Presentation:</i> Sigurjón Mýrdal Ministry of Education, Science and Culture <i>Commentator:</i> Peter Blok Hogeschool van Amsterdam |
| 12:30-13:30 | Lunch |
| 13:30-15:00 | Continuation of presentations of discussion groups followed by feedback from commentators <u>Theme C: Increasing Participation in Maths, Science & Technology</u> <i>Presentation:</i> Edda Lilja Sveinsdóttir Ministry of Education, Science and Culture |

Commentator: Vilhjálmur Egilsson, director of SA-Confederation of Icelandic Employers

Theme D: ICT in Education

Presentation: Jóna Pálsdóttir Ministry of Education, Science and Culture

Commentator: Hilmar V. Pétursson CEO of CCP

Theme E: Recognition of Learning Outcomes

Presentation: Ólafur Grétar Kristjánsson Ministry of Education, Science and Culture

Commentator: Elna Katrín Jónsdóttir, deputy chairperson of the Icelandic Teachers' Union

15:00-16:00 Coffee break with 5 discussion groups open to conference delegates. An opportunity to provide input to the debate.

16:00-17:00 Panel discussions –

Participants: Minister of Education, Science and Culture Thorgerður Katrín Gunnarsdóttir, Professor Guðmundur Hálfðanarson, Ingibjörg Elsa Guðmundsdóttir, CEO of The Education and Training Service Centre, Professor Marijk van der Wende, Dr. Ólafur Proppé, Rector of the Iceland University of Education and Svafa Grönfeldt deputy CEO of Actavis Group

Chair Ágúst Ingthórsson Director of the Research Liaison Office, University of Iceland

17:00-18:30 Reception – light refreshments

National Leonardo da Vinci quality in mobility awards

conferred by the Minister of Education, Science and Culture Thorgerður Katrín Gunnarsdóttir


Presented by Thórdís Eiríksdóttir from the Leonardo da Vinci National Agency in Iceland

APPENDIX II :

Presentation slides Sebastian Volkers, representative of the European Commission

Directorate-General for Education and Culture

“EDUCATION & TRAINING 2010”



http://europa.eu.int/comm/education/index_en.html

Directorate-General for Education and Culture

RECALLING THE MAIN POLITICAL STEPS SINCE LISBON

- ✓ **February 2001:** Adoption of « **historical** » report on common future concrete objectives
- ✓ **November 2001:** Communication « Making LLL a reality »
- ✓ **February 2002:** Adoption of the « E&T 2010 » work programme
- ✓ **November 2002:** Adoption of the Copenhagen Declaration
- ✓ **May 2003:** adoption of 5 European « Benchmarks »
- ✓ **February 2004:** first joint Council/Commission Joint Report
- ✓ **2005 Mid-term Review of the Lisbon strategy:**
The E&T 2010 OMC will continue to the full and contribute to the new Lisbon Integrated Guidelines.



**MAIN OUTCOMES OF FIRST PHASE OF
IMPLEMENTATION AT EU LEVEL (2002-2004)**

- ✓ Objectives and Copenhagen groups
- ✓ A set of **policy recommendations** and first exchange of **good policy practices**
- ✓ A first set of **29 indicators** and plans for developing new indicators. Annual report on progress.
- ✓ Definition of **European principles and references** in key areas



**SECURING MORE CONCRETE
IMPLEMENTATION IN 2006**

- ✓ Clusters and peer learning activities (PLAs)
- ✓ Improved governance and coordination: ETCG
- ✓ Policy initiatives presented to Education Council
 - key competences
 - EQF
 - Efficiency and Equity etc



***“Modernising E&T: a vital contribution
to prosperity and social cohesion in Europe”***

Commission proposal - Second E&T 2010 Joint Report



What is the draft 2006 “E&T 2010” Joint Report?

- ✓ The **second progress report** on developments in education and training towards the Lisbon goals
- ✓ A contribution to the **Lisbon strategy** for growth and jobs and to strengthening **social cohesion**
- ✓ **Commission’s view** on progress and challenges – a basis for discussion at Council level (2/06)
- ✓ Finding based on **32 national reports**
- ✓ Detailed **transversal analysis** in the Staff Working Document, including EU developments!



**NATIONAL LEVEL:
REFORMS ARE GOING IN THE RIGHT DIRECTION!**

- ✓ The **Lisbon strategy** is increasingly a factor in national policy developments
- ✓ Lifelong learning strategies are **gaining ground**
- ✓ National priorities/efforts **rightly focus** on
 - key competences
 - efficient and equitable use of resources
 - teachers’ qualifications
 - recognition of prior learning
 - quality assurance
 - university reforms,
 - making VET more attractive, etc
- ✓ **Social inclusion** of target groups is a priority



HOWEVER MORE NEEDS TO BE DONE TO MEET COMMITMENTS! 80 million low-skilled!

| Benchmark | 2000 | Today (2005) | Benchmark 2010 |
|---|---------|--------------|----------------|
| 1. Early school leavers, (%) | 17.3 | 14.9 | 10 |
| 2. MST graduates | 650 000 | 755 000 | 750 000 (+15%) |
| 3. Youth education attainment (up.sec %) | 76.4 | 77.3 | 85 |
| 4. Low achieving 15 year olds, reading, % | 19.4 | 19.8 | -20% (15.5) |
| 5. Participation in LLL, % of adults | 7.9 | 10.8 | 12.5 |



The pace of reforms needs to be accelerated!

- ✓ Commission **reaffirms the 2004 key priorities** (investment in HR, LLL and EQF)
- ✓ Reforms supporting both **efficiency and equity**
- ✓ Improved **governance** and **learning partnerships**
- ✓ Improving **monitoring and evaluation** of systems
- ✓ Increasing **peer learning**
- ✓ Better use of the **structural funds**



Next Steps

- ✓ Securing **E&T 2010 input into the Lisbon** Annual Progress Report
- ✓ Implementing the **EQF**
- ✓ Adopting the **recommendations** on key competences and the quality of teacher training
- ✓ **Communications** on efficiency/equity and on adult learning
- ✓ Making progress on the **language indicator**
- ✓ Securing a relevant and well-focused **PLA progr.**
- ✓ 2008 Joint Interim Report



EDUCATION & TRAINING 2010

FOR MORE INFORMATION

http://www.europa.eu.int/comm/education/policies/2010/et_2010_en.html

Presentation slides Professor Marijk van der Wende

Shaping the Future The Role of Higher Education in the Knowledge Society

*Marijk van der Wende
26 October 2006
Reykjavik, Iceland*

Structure of Presentation

- HE and the Knowledge Society:
 - OECD perspective
 - Europe: Bologna and Lisbon
- Quality and Qualifications
- Innovation in higher education
- International cooperation and competition

OECD Perspective

Meeting of HE Ministers

- Higher education: from *bigger to better*.
- Reforms needed:
 - Funding
 - Access & equity
 - Focus on what students learn
 - Responsiveness and diversity
 - Research and innovation
 - Migration and internationalisation

Europe: Lisbon

- Alarming messages about underperformance:
 - Funding levels
 - Access and equity
 - Excellence
 - Graduates: numbers, profiles, employment, competencies
 - Position and reputation (global rankings)
 - Innovation (cooperation with B&I)
 - Lifelong learning
- A Confrontation of Values and Results:
 - While most of Europe sees higher education as a "public good", tertiary enrolments have been stronger and faster in other parts of the world, mainly thanks to much higher private funding (*EC 2005*).
 - Despite the strong social values, the EU is performing much weaker when it comes to access and equity than the US. (*OECD, 2006*).
 - External perception:
 - EU: culture, tradition and history
 - US: quality, reputation and innovation

(ACA, 2006)

Lisbon: Problem Analysis

- **Uniformity in provision**
 - due to a tendency to egalitarianism and a lack of differentiation;
- **Insularity**
 - systems remain fragmented between and even within countries, and higher education as a whole remains insulated from industry;
- **Over-regulation**
 - strong dependence on the state inhibiting reform, modernisation, and efficiency (micro-management)
- **Denial of the changing research environment**
 - from individuals to research networks, global competition, across disciplinary boundaries
- **Under-funding***
 - R&D spending in EU (1.9 per cent of GDP) compared to the US, Japan and South Korea (all close to 3 per cent thanks to much higher investments from industry).
 - Spending on higher education in EU (1.1 per cent of GDP) compared with US and South Korea (both 2.7 per cent, again related to differences in private investments).

**Both OECD and EC say that more funding should be made available for HE, including funding from private sources (e.g. student fees)*

Lisbon Strategy

Challenges:

- Access and Excellence
- Diversity and flexibility
- Right mix of skills and competencies for the labour market
- Lifelong learning
- Innovation, interdisciplinarity
- Interaction with society and B&I

Conditions:

- Enhanced investments – efficiency and effectiveness
- Deregulation
- Greater institutional autonomy and accountability (new governance arrangements)
- Professionalised management
- Competition-based funding in research
- Output-related funding in education,
- Supported by more contributions from industry and from students via tuition fees.

Bologna & Lisbon: a Continuum

- Bologna: Creating a coherent & transparent system
 - internal convergence
 - dialogue, acceptance, recognition, cooperation
- Lisbon: Enhancing system performance
 - diversity, hierarchy
 - internal and external benchmarking and competition

Quality and Qualifications

- *Bad teaching often goes un-noticed, good teaching often goes un-rewarded.*
- *More transparency in higher education outcomes is a key driver for improving institutional performance.*
- *Internationalization of higher education can provide competitive pressure and benchmarking that contribute to quality improvement.*

Quality and Qualifications

Quality assurance:

- ENQA, European registry and guidelines (independence of agency)
- Focus on learning outcomes (Dublin Descriptors; Tuning)
- Better evidence: "PISA" for HE (OECD)

- *As for the system: size matters!*

Qualifications:

- EQF – NQF
- ECTS
- IDS

Global Rankings

"The problem with ranking concerns the practice, not the principle" (Altbach, 2006)

The Dilemmas of Ranking:

- Universities have different goals and missions
- Universities are internally differentiated: cannot be measured as a whole
- Bias towards research (low/no focus on teaching quality)
- Popularity contests (appreciation – facts)
- Bias towards natural & medical sciences
- Bias towards English language / Anglosaxon world

Global Rankings

"The German system of institutional ranking is nothing short of brilliant"

Alex Usher, Vice-President of the Educational Policy Institute

CHE Model as a Best Practice:

- High-quality comparative data at the departmental level
- No spurious "overall" ranking
- Web-enabled database
- Permits each student to examine rank institutions based on the criteria that matter most to them, the student.

Innovation in Higher Education

| Main Challenges: | Major recent innovations: |
|--|---|
| Better preparation for work Demands from the labour market Employability | From teaching to learning: Activating methods (PBL – projects, case studies, etc.) Changed focus of curricula: Competencies: knowledge, skills & attitudes |
| Respond to an increasingly diverse demand Lifelong learning / recurrent learning) | Flexibility: Bachelor-master Blended learning / e-learning Individual learning paths (credit accumulation and transfer, portfolios, . Etc) |
| Prepare for life and work in a globalised world, i.e. a diverse and competitive knowledge society High knowledge level Competitive attitude See diversity as a key to success | Internationalisation: Internationalised curricula Intercultural skills Foreign languages |
| Train more and better researchers | PhD in-depth research training + generic skills (Bologna third cycle) |

Lessons on Innovation in HE

- Full innovation cycle in HE: 10 yrs
- 75% of innovations in HE fail
- Innovations should be evidence based
 - what's the problem, how do we know that this is the solution?
- And lead to measurable improvement
 - enhance quality, efficiency, effectiveness, relevance

Innovation in Higher Education Success & Failure Factors

- *Great expectations and mixed performances*
- *Failure is not in the production of innovations but in their institutional acceptance*
- *Lots of innovations, but low dissemination*
- *Disseminations rarely reach any except those already committed to it*
 - Uni-directional dissemination flow
 - Loosely-coupled systems / fragmentation
 - Professional autonomy (organised anarchy)
 - Compatibility – profitability
 - Implementation strategy

E-learning: the evidence

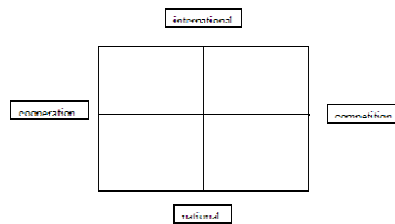
- After the hype of the new economy, growing disenchantment with e-learning has replaced over-enthusiasm
- Failures of e-learning have, at least temporarily, overshadowed the prospects of widened and flexible access to tertiary education, pedagogic innovation, decreased costs, etc.
- Enrolments are relatively low and represent a small share of total enrolments
- In most campus-based institutions, the growth of e-learning to date has not challenged the centrality of the face-to-face classroom setting

(OECD, 2005)

- Beyond the technology push
- Blended learning
- Strategic use: specific target groups and markets (e.g. lifelong learners)

Cooperation and Competition

- Strategic options for enhancing global competitiveness



Thank you!

APPENDIX III : List of conference participants

| | |
|-------------------------------|---|
| Svafa Grönfeldt | Actavis Group |
| Jónína Ágústsdóttir | Akurskóli Secondary School |
| Karitas Kvaran | Office of International Education (higher education) |
| Anna Bergljót Thorarensen | Association of Icelandic Students |
| Eyrún Jónsdóttir | Association of Icelandic Students |
| Haukur Logi Karlsson | Association of Icelandic Students |
| Bryndís Sigurjónsdóttir | Borgarholtsskóli Comprehensive Upper Secondary School |
| Magnús Árni Magnússon | Capacent |
| Hilmar V. Pétursson | CCP hf. |
| Sebastian Volkers | European Commission DG EAC |
| Baldur Gíslason | Association of Icelandic Upper Secondary Colleges |
| Guðmundur Páll Ásgeirsson | Association of Icelandic Upper Secondary Colleges |
| Heimir Jón Guðjónsson | Breiðholt Upper Secondary College |
| Kristen Swenson | Ármúli Upper Secondary College |
| Fjóla María Lárusdóttir | The Education and Training Service Centre for the Employment Sector |
| Ingibjörg Elsa Guðmundsdóttir | The Education and Training Service Centre for the Employment Sector |
| Ari Ólafsson | University of Iceland |
| Guðmundur Hálfðanarson | University of Iceland |
| Guðrún Geirsdóttir | University of Iceland |
| Guðrún Nordal | University of Iceland |
| Hafdís Ingvarsdóttir | University of Iceland |
| Hördur Filippusson | University of Iceland |
| Ingjaldur Hannibalsson | University of Iceland |
| Jón Atli Benediktsson | University of Iceland |
| Kristín Ingólfssdóttir | University of Iceland |
| Magnús Diðrik Baldursson | University of Iceland |
| Ólafur Þ. Harðarson | University of Iceland |
| Þórður Kristinsson | University of Iceland |
| Bragi Guðmundsson | University of Akureyri |
| Laufey P. Magnúsdóttir | University of Akureyri |
| María Steingrimsdóttir | University of Akureyri |
| Trausti Þorsteinsson | University of Akureyri |
| Bryndís Hlökkversdóttir | Bifröst University |
| Reynir Kristinsson | Bifröst University |
| Runólfur Ágústsson | Bifröst University |
| Helgi Thorarensen | Hólar University College |
| Sólrun Harðardóttir | Hólar University College |
| Ásrún Matthíasdóttir | Reykjavík University |
| Bjarki A. Brynjarsson | Reykjavík University |
| Björg Birgisdóttir | Reykjavík University |
| Hannes Högni Vilhjálmsson | Reykjavík University |
| Steinn Jóhannsson | Reykjavík University |
| Peter Blok | Hogeschool van Amsterdam |
| Sigríður Bílddal | Holtaskóli School |
| Sigrún Eva Ármannsdóttir | Hugi/Ax |
| Gylfi Einarsson | Iðun - Education Centre |
| Hafsteinn Eggertsson | Iðunn - Education Centre |
| Hildur Elín Vignir | Iðunn - Education Centre |

| | |
|--------------------------------|--|
| Marijk van der Wende | IMHE OECD |
| Börkur Hansen | Iceland University of Education |
| Grétar Marinósson | Iceland University of Education |
| Guðmundur Birgisson | Iceland University of Education |
| Hafþór Guðjónsson | Iceland University of Education |
| Meyvant Þórólfsson | Iceland University of Education |
| Ólafur Proppé | Iceland University of Education |
| Ragnhildur Bjarnadóttir | Iceland University of Education |
| Aðalheiður Steingrimsdóttir | The new Icelandic Teachers' Union |
| Anna María Gunnarsdóttir | The Icelandic Teachers' Union |
| Björg Bjarnadóttir | The Icelandic Teachers' Union |
| Brynja Á Sigurðardóttir | The Icelandic Teachers' Union |
| Eiríkur Jónsson | The Icelandic Teachers' Union |
| Elna Katrín Jónsdóttir | The Icelandic Teachers' Union |
| Hanna Hjartardóttir | The Icelandic Teachers' Union |
| Helgi E. Helgason | The Icelandic Teachers' Union |
| Jónína Konráðsdóttir | The Icelandic Teachers' Union |
| Kristín Elfa Guðnadóttir | The Icelandic Teachers' Union |
| Ólafur Loftsson | The Icelandic Teachers' Union |
| Sesselja Sigurðardóttir | The Icelandic Teachers' Union |
| Þorgerður Diðriksdóttir | The Icelandic Teachers' Union |
| Ágúst Sigurðsson | Agricultural University of Iceland |
| Ólafur Arnalds | Agricultural University of Iceland |
| Björg Árnadóttir | Leikn |
| Bryndís K. Þráinsdóttir | Leikn |
| Hulda Ólafsdóttir | Leikn |
| Óli Halldórsson | Leikn |
| Anna Kristín Ólafsdóttir | Iceland Academy of the Arts |
| Einar Bergmundur Arnbjörnsson | Iceland Academy of the Arts |
| Hjálmar H. Ragnarsson | Iceland Academy of the Arts |
| Kjartan Ólafsson | Iceland Academy of the Arts |
| Sverrir Þór Halldórsson | Master Chef |
| Aðalheiður Jónsdóttir | EDUCATE Iceland |
| Arnór Guðmundsson | Ministry of Education, Science and Culture |
| Áslaug Hulda Jónsdóttir | Ministry of Education, Science and Culture |
| Björg Pétursdóttir | Ministry of Education, Science and Culture |
| Edda Lilja Sveinsdóttir | Ministry of Education, Science and Culture |
| Einar Hreinsson | Ministry of Education, Science and Culture |
| Guðmundur Árnason | Ministry of Education, Science and Culture |
| Hellen M. Gunnardóttir | Ministry of Education, Science and Culture |
| Jóna Pálsdóttir | Ministry of Education, Science and Culture |
| Ólafur Grétar Kristjánsson | Ministry of Education, Science and Culture |
| Rósa Gunnarsdóttir | Ministry of Education, Science and Culture |
| Sigurjón Mýrdal | Ministry of Education, Science and Culture |
| Sólrun Jensdóttir | Ministry of Education, Science and Culture |
| Stefán Stefánsson | Ministry of Education, Science and Culture |
| Steingrímur Sigurgeirsson | Ministry of Education, Science and Culture |
| Þorgerður Katrín Gunnarsdóttir | Ministry of Education, Science and Culture |
| Þórir Ólafsson | Ministry of Education, Science and Culture |
| Þórunn Bragadóttir | Ministry of Education, Science and Culture |
| Ársæll Guðmundsson | Borgarfjörður Upper Secondary College |
| Ágúst H. Ingbórsson | Research Liaison Office of the University of Iceland |
| Ásta Erlingsdóttir | Research Liaison Office of the University of Iceland |

| | |
|------------------------------|--|
| Ástríður Guðlaugsdóttir | Research Liaison Office of the University of Iceland |
| Margrét Jóhannsdóttir | Research Liaison Office of the University of Iceland |
| María Kristín Gylfadóttir | Research Liaison Office of the University of Iceland |
| Sigurður Guðmundsson | Research Liaison Office of the University of Iceland |
| Þóra Magnúsdóttir | Research Liaison Office of the University of Iceland |
| Þórdís Eiríksdóttir | Research Liaison Office of the University of Iceland |
| Stefán Helgi Valsson | University of Iceland Student Services Newsletter |
| Sigurður Albert Ármannsson | Association of Icelandic Bank Employees |
| Kristín Hreinsdóttir | The Association of Local Authorities in Iceland |
| Svandís Ingimundardóttir | The Association of Local Authorities in Iceland |
| Leifur A. Ísaksson | SAMSTARF |
| Gústaf Adolf Skúlason | SA-Confederation of Icelandic Employers |
| Vilhjálmur Egilsson | SA-Confederation of Icelandic Employers |
| Ingi Bogi Bogason | Confederation of Icelandic Industries |
| Þóra Björk Jónsdóttir | Education Office of Skagafjörður District |
| Alma Joensen | Student Board of University of Iceland |
| Ásgeir Runólfsson | Student Board of University of Iceland |
| Sunna Kristín Hilmarsdóttir | Student Board of University of Iceland |
| Hildur Friðriksdóttir | The Commercial College of Iceland |
| Guðrún Stella Gissurardóttir | The West Fjords Directorate of Labour |