Labour/Management Programme

HIGHER EDUCATION, RESEARCH AND INNOVATION: PARTNERSHIP AND MOBILITY IN A GLOBALISED ECONOMY

Report on a meeting of trade union and business experts under the OECD Labour/Management Programme

Paris, 5 November 2004

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FOREWORD

Under the OECD Labour/Management Programme, a meeting of trade union experts and business on "Higher Education, Research and Innovation: Partnership and Mobility in a Globalised Economy” was held in Paris on 5 November 2004. The meeting was prepared in collaboration with the Trade Union Advisory Committee to the OECD (TUAC) and the Business and Industry Advisory Committee to the OECD (BIAC).

Below, you will find the Agenda of this meeting, along with the overall report of the discussions of the meeting of experts, which was prepared by Ms. Sue Kendall-Bilicki, designated as General Rapporteur for this activity.
AGENDA

Morning Session (chair BIAC)

1. 10:00-10:30 Introduction
    OECD, TUAC, BIAC

2. 10:30-11:00 Part 1: Rethinking higher education in a global economy

3. 11:00-11:30 Coffee break

4. 11:30-12:30 Discussion Part I

5. 12:30-14:30 Lunch

Afternoon Session (chair TUAC)

6. 14:30-15:15 Part II: International mobility of higher education and research personnel

7. 15:15-16:15 Discussion Part II

8. 16:15-16:45 Coffee break

9. 16:45-17:30 Part III: Recommendation to OECD and the Social Partners

Conclusions:

BIAC, TUAC, OECD: Oral summary by the Rapporteur
HIGHER EDUCATION, RESEARCH AND INNOVATION: PARTNERSHIP AND MOBILITY IN A GLOBALISED ECONOMY

FINAL REPORT

Meeting of trade union and employer experts
held under the OECD Labour/Management Programme
(Paris, 5 November 2004)

By
Sue Kendall-Bilicki
Senior Public Affairs Advisor,
Public Affairs and Communications Directorate

BACKGROUND AND INTRODUCTION

A meeting of OECD Science and Technology Ministers in Paris in January 2004 devoted much discussion to the mobility of higher education and research personnel. The related question of “brain drain/brain gain” was a major topic of interest, as well as broader issues such as supply and demand for researchers and the relationship between higher education institutions and the private sector.

As these issues are important to both employers and employees, BIAC and TUAC felt that it would be useful to meet to address the mobility question in more detail with OECD experts. So it was agreed to hold a joint seminar on “Higher Education, Research and Innovation: Partnership and Mobility in a Globalised Economy”.

The one-day meeting was organised around two main themes: “Rethinking higher education in a global economy” and “International mobility of higher education and research personnel”.

The seminar took into account related work on the internationalisation of education, such as that under way through the joint OECD/UNESCO project to develop guidelines for quality provision of cross-border education, and relevant aspects of the revised International Labor Organization (ILO) Recommendation on Human Resources Development.

The broad-ranging discussion also dealt with areas covered by other ongoing OECD projects, such as the OECD Thematic Review of Tertiary Education, work on fostering public-private partnership for innovation and to improve the performance of innovation policy, as well as the current reassessment of the OECD Jobs Strategy Recommendations.

Participants said that they found it particularly useful to bring together representatives of BIAC and TUAC with OECD secretariat experts in the related areas of education, science and employment to take an overall view of the issues at stake. They noted that the OECD has done much work in the area of student and researcher mobility, research and innovation and cross-border higher education and will continue to work in these areas.
RETHINKING HIGHER EDUCATION IN A GLOBAL ECONOMY

Introduction

Participants noted that there has been a fundamental change in recent years in the way higher education operates, and the way research and development is carried out in OECD countries and beyond. This raises questions about the relationships between universities, government and business, but also the wider relationship between the education system and society in a knowledge-based global economy. One area of concern in a new era of public-private partnerships for higher education and research is how to ensure that academic freedom is maintained, and that the humanities and social sciences are not under-funded.

At the same time, demand for highly-skilled science and research workers is increasing. Participants agreed on the need to bring together national education and science/technology policies, but also business conditions to encourage investment and incentives for students to opt for maths and science.

Once the scientists have been trained, there are also issues around the career opportunities available. This in turn raises the question of mobility, whether between the public and private sector or between countries. When science students and researchers change country this raises the whole thorny issue of brain drain/brain gain and whether the developed world is stripping poorer countries of the talents they need to develop.

New roles in higher education

Participants agreed that the role of institutions, government, business and students in relation to education has changed in recent years, because of the demands of an increasingly globalised knowledge-based economy. Much of the discussion focussed on the changes in their respective roles and relationships, described by one participant as a “paradigm shift”.

The secretariat noted that higher education is no longer the privilege of a select few gathering pearls of wisdom from professors in an academic ivory tower – tertiary education rose 22% in 1995 and 28% in 2002. But this brings new challenges: how to broaden access to higher education; how to ensure quality is maintained; how to pay for the increasing numbers of tertiary students, and how to ensure that the skills taught meet the needs not just of the economy, but also of society. A strong research community is important to fulfil that role, but more generally higher education institutions should be equipped to develop new knowledge themselves and to exploit new knowledge from elsewhere.

A BIAC representative said that now higher education has moved from an elite activity to a broad system, more needs to be done to encourage its role in innovation. This means good links between education and industry, and that in turn means more international mobility – if business is global, then education should be too.

A North American BIAC representative said the “paradigm shift” in the way research universities are expected to operate and relate to society has four key elements. Firstly, the innovation model has changed and borders are blurring between basic and applied research; secondly society now looks to universities to solve pressing problems and create new opportunities; thirdly globalisation means universities have to position themselves as an integral part of the global community; and fourthly the focus has shifted from the needs of the institution to the needs of the student. Much of the subsequent discussion elaborated on these four areas.

Changing innovation model

In the past, the BIAC representative said, research and scholarship was either basic or applied. Basic research was regarded as more prestigious, and was generally carried out in universities, while applied
research was generally carried out by business. But things are no longer so cut and dried; complex applications suggest new areas of fundamental research, which in turn leads to new applications, and neither type of research is exclusive to the university or business environment. This trend is set to continue, raising questions about the borders of disciplines, public-private partnerships and the very structure of universities. Industry-university relationships are not about dividing resources between work and knowledge; but about a new way of developing learning that contributes to the economy as a whole.

Participants from the business side generally agreed that university research, as well as that carried out in public laboratories, is important for innovation, particularly in applied sciences. There is evidence that a new type of interaction between academia and business is affecting traditional employment and career patterns, with an effect on the organisation of innovation processes, as is seen in university “incubators” and technical transfer offices.

But some argued that we must guard against a situation where university research is seen as existing chiefly to trigger new industrial research and innovation, which is generally driven by a the search for a particular result in response to customer need or production processes.

The OECD secretariat noted that the evidence suggests that public-private partnerships are a fruitful way of helping social as well as commercial needs in areas well beyond research. Barriers between business and universities are also breaking down elsewhere, and they are working together in domains of importance to society such as health and transport as well as innovation for business.

**Changing university role in society**

The second shift is that now universities are no longer seen as a distant “ivory tower”, society looks to them to solve pressing problems and create new opportunities in society. But because universities cannot provide the knowledge or skills to solve all society’s problems, they need new relationships and networks in the wider world of work, government etc. We need to rebalance the theoretical and practical aspects, and create a broad-based holistic education of experts in core disciplines to enable people to produce cross-boundary research.

A TUAC representative said that companies are also turning more to universities and public research laboratories for expertise, which leads to more rapid transmission of knowledge from universities. It is not so much that the research process as such is changing, but rather that there is a change in the way new knowledge is being used and transmitted into new processes.

**Effect of globalisation**

A third change noted by some observers is the effect of globalisation on universities. In a knowledge-based society, universities have to think of themselves as an integral part of the global community, and the best universities will be those that can understand, gather and explain the world. So universities will have to become truly international in presence, focus and scope, and integrate a cross-national dimension into the very nature of their structure, behaviour and external relationships. However, TUAC representatives warned against the current hype regarding the globalisation of universities. They pointed to an increasing gap between the rhetoric on globalising universities and the reality.

Other participants felt that universities had always been more universal and open to intercultural change, so that globalisation was rather reinforcing that role, since now there is no choice – in a fast-changing, knowledge-centred world, they need partnerships to enhance scholarship and knowledge because no single university can do it all alone.

But global or not, several participants, particularly TUAC delegates, said universities should not lose sight of their fundamental role and mission to further knowledge, not just to serve economic development.
**Shifting focus**

The fourth and final change is a shift of focus to the needs of the student, not the institution. This means greater flexibility and responsiveness in the way education is structured and delivered, and how business and universities relate. The new learning possibilities offered by new technologies are being seen as an important part of this change: some universities make notes from courses available free on the web; this can have an incredible effect on developing countries.

However, some participants expressed reservations regarding a hasty shift towards a predominantly ‘client-based’ approach; they stressed that such services could not replace national education systems tailored to a country’s needs. They also questioned how useful such information could be to students without any back-up in the form of teaching from a professor.

**Re-defining responsibilities**

If roles in education are changing, we need also to look at the responsibilities of the various parties involved, several participants said. One TUAC representative said that governments, business and researchers each have their own responsibilities:

- **Governments** must ensure that research retains the status of a public good with assured long-term funding and a large public research sector. It is not just a question of science and technology; social sciences are also indispensable to society. Governments need to support private research too.

- **Business** is responsible for financing private research and recognising the work of researchers. A brilliant young researcher today might find he is better off taking a job in finance. Lack of recognition of researchers’ role is clear in both the public and private sector.

- **Researchers** themselves have a responsibility to make their case known, as French researchers did when jobs were under threat.

A BIAC representative echoed this idea, but said that we need to go beyond the “division of labour” if we are to achieve an integrated higher education system between educators and stakeholders.

**Funding changes in education and research**

The question of who pays for higher education and research – government, students, business – at a time of shrinking public budgets is clearly a key element of the changes in higher education systems, participants said.

It raises a number of questions, notably over who sets the research agenda, and who owns the results. Some participants questioned whether research for the sake of advancing knowledge in the longer term is being squeezed out by research aimed at resolving a specific current problem because of the increase in private funding.

The secretariat noted that the days when publicly-funded universities were the prime source of research and development are long gone. Now, two-thirds of research and development in the most advanced nations is paid for by the private sector and is increasingly carried out in enterprises. Privately-funded research is often carried out in partnership with education institutions and the bulk of research, whether public or private, is still actually carried out in universities, which account for 50-60% of research in the OECD. One key reason is the fact that universities provide a forum for multi-disciplinary work, which is an increasing area of research.

But while joint research involving university and industry can be mutually beneficial, it can also lead to problems. Several participants drew attention to potential problems in partnerships between universities
and business, such as the risk of the research agenda being controlled by the business partner and focussed on commercial goals, rather than research for the sake of finding out more about something. Several participants stressed the need to maintain independence for education institutions if they were to retain their ability to be creative and innovative.

Others raised the question of conflict of interest or culture clash between universities, which generally want to publish research results early for peer feedback, and industry, which may want to keep the research secret for competitive reasons. There is also the question of what happens if industry-driven research does not produce the desired results, or if the private sector pulls out of a research project midway for some reason – would the public sector step in to pay to complete the project?

Several participants suggested that such questions can be resolved as long as there are clear rules from the outset on issues such as when research results are published and who owns them. Researchers, for example, could have the right to publish their results after a certain period of commercial use, such as when the patent expires, or the business partner could remove sensitive information from the published results until after the patent expires.

The secretariat said that the OECD is addressing these issues and has already carried out reviews of private-public partnerships in five countries, with more on the way and a synthesis report due to be published in 2005. On the specific issue of publicly-financed research data, OECD science ministers made a statement on this at their meeting in January 2004 and the OECD is drawing up guidelines in this area, with work being led by Canada and the Netherlands.

The secretariat also noted that there are a number of different types of potential partnerships, not just those between higher educations and business. There can be partnerships for education, training, research or information between institutions in a single country or cross-border; or between educational institutions and local employers or employment agencies. There could also be partnerships between educational institutions, regulatory authorities, employers and trades unions at local level for local development.

Several participants expressed concern about the future of subject areas, particularly the humanities, which are far less attractive to private financing than maths or science, fearing that this could lead to major funding problems in non-scientific areas. Some also wondered whether the new funding systems encouraged the best use of universities’ intellectual resources -- the more time professors spend raising money and forging partnerships, the less time they have to do the creative thinking the money is supposed to fund.

**Encouraging quality and equity of access**

One key problem is the shortfall between the number of researchers available and likely demand for them in coming years, participants said. They were particularly concerned about how more students, particularly girls, can be encouraged to study maths and science, and ensuring equity of access to scientific education in general.

At the same time, the quality of the education on offer is becoming even more important as the availability of courses cross-border spreads – there is little point in encouraging more students to study science if they end up with a qualification which is not recognised by potential employers.

The secretariat said that governments need to bring together national education policies and science/technology policies. At the same time, business conditions should be such as to encourage investment and there need to be incentives, including good career prospects, for students to go in for maths and science. The OECD Secretariat said there was a need to keep education at a local level too, since local education better responds to the needs of the local economy.
Women are a particular issue in highly-skilled science and technology areas. In many countries, more women than men graduate but then under-achieve or are under-represented in scientific areas – more must be done to attract them to science early, as was said at the science ministers meeting and again at the education ministers meeting earlier this year. A European TUAC representative called for broader access to higher education for both young men and women through a Europe-wide programme of expansion of higher education institutions.

TUAC participants said that higher education institutions must guarantee the quality of their work, and there should be some assessment of the qualifications they offer. Unions particularly want to be sure that qualifications are of a standard to meet business requirements and that new bachelor and masters’ courses are of high enough standard to replace old ones. They agreed with business that qualifications should be linked to employability, as long as that does not mean that education becomes focussed only on the short-term needs of the labour market. Education should form the basis for lifelong learning, not just meet the needs of the student’s first job.

Some participants noted that successful multinational companies see competition as motivating capacity building, not as a reason to try to secure their position; this is something that the system of higher education and research could benefit from.

Both BIAC and TUAC participants felt that while higher education and research policy is playing an important role in the multilateral debate on trade in services, UNESCO should have overall responsibility for internationalisation of education. A BIAC representative noted that UNESCO already has international standards for researchers and that these could be more widely used.

The secretariat noted that the OECD and UNESCO are working together on guidelines to increase transparency in how qualifications are recognised in different countries and to protect students from misinformation. But recognising qualifications across borders is not always easy.

**Role of higher education in economy and society**

Participants agreed that education is a key element in economic growth. OECD research shows that one year’s extra education increases output per capita by 3%-6%, and GDP by 1%. But this is an average figure, and it is unclear exactly how the link operates. In addition, one year of education does not represent the same thing in all countries, so comparisons are difficult. Nonetheless, there is a clear link between education and earnings. Earnings of people with tertiary education are 25-50% higher than those without. In most OECD countries, the employment ratio also increases with higher education – 58% of people with upper secondary education have jobs, and 83% of those with tertiary education.

TUAC participants warned that countries should not focus on the link between economic growth and education to the point where education became a commodity; it must remain a public good whose primary purpose is the pursuit of knowledge, not just economics.

A TUAC representative said that universities should play a constructive, productive role in company research and development but they also have a critical function to provide enlightenment, for which they need independence and institutional autonomy. Always following the mainstream, chasing the market and fashion-driven money hampers creative, innovative thinking.

Several participants stressed that universities should uphold key values that are important for society, such as free enquiry, respect for individuals and a willingness to take risks.

A BIAC North American representative said that the emergence of a new network model of research and development and a new organisational learning strategy has implications for business and workers.
One area that needs stressing is the importance of human capital. Knowledge-based societies need an increasing stock of human capital.

**Encouraging innovation**

Participants agreed that a key measure of the success of the new relationship between education institutions, business and students is its ability to transform research results into innovation.

A European TUAC representative said that when studying innovation we should look at the broad relationship between society and education, not just business and education. From the European point of view, the Lisbon strategy and Bologna process had given the incentive for a European view of higher education. But we need to find a way to shape closer links between higher education and the labour market, to shorten the route from basic to applied research and then to development and production of a new invention. Open dialogue is needed in this area.

A BIAC European participant said that when thinking about the role of universities in innovation, we need to remember that innovation is not a product with a shelf life; its usefulness is permanent. Using education for innovation implies more international mobility in education. To use education for innovation, you need good links between education and business/industry. If business/industry is global, then education should be too.

A BIAC representative urged the OECD in its review of higher education systems in member countries to connect research and development, and the partnerships developing in these areas, with changes in the higher education system.

**Research careers and employment**

For the system to work, once students have completed their scientific education they need to be able to find jobs to use their knowledge, whether in academic establishments or in business, and regardless of whether their salary is privately or publicly funded. It is no good investing time and effort in encouraging more students to study science, participants said, if there are no employment and career prospects afterwards. Measures are also needed to ensure the appropriate working conditions to encourage creativity and innovation and to recruit and support young academics.

Participants noted that the EU needs 700,000 more researchers to meet its Lisbon goal, so there is a need to make research careers more attractive. TUAC participants said one possible solution for Europe was to include employment conditions of academic staff in the Bologna process framework. A BIAC participant said that a European code of conduct to help tackle the question of career building for researchers might help. He said governments could help, for example by stimulating partnerships. The OECD secretariat agreed that academic careers are crucial and that in particular the post-doctorate transition from studying to work has to be improved.

Several participants agreed that making it easier for scientists to move between the public and private sectors is key to improving matters. At the moment, the movement is essentially one way: people leave the public sector for the private sector because it has better pay and working conditions. If nothing is done to change that, the situation in the public sector will not improve. On the other hand, several participants noted, if a science graduate with years of research experience in industry decides that he wants to return to a public academic institution, the institution often refuses to recognise his experience as valid and is unwilling to take him because he did not stay on as a student to complete a Phd. What is needed is a system where people can move between the public and private sectors and where their experience would be recognised in both.
The career structure in some universities does not help. Higher education institutions have a problem of ageing faculties – in the Czech Republic, for example, more than half of faculty members are over 50. Yet in many countries younger academics are leaving universities because of the long years of waiting for faculty posts. Some countries are now addressing this problem – the UK, for example, has limited the number of years people can be kept on post-doctorate contracts without being given a post.
INTRODUCTION

Participants noted that globalisation and new technologies have raised a number of new issues for mobility in both higher education and research. Not only can students and researchers go abroad to pursue their studies or their careers; they can also follow courses or share information and research via Internet.

But as demand for researchers increases in the developed world, there are questions about where a new supply of researchers will come from, and whether increased mobility is the answer. Some participants questioned whether meeting shortfalls in skilled workers in the developed world was best achieved by importing people with the relevant skills from less developed countries which perhaps needed them even more, and several asked whether this could in any case prove anything but a short-term solution.

The secretariat noted that it was clear from discussions at a meeting of OECD science and technology ministers in January 2004 that there was no interest among OECD governments in limiting mobility. But there was much discussion about the brain drain/brain gain problem – how to meet the labour and educational needs of all countries without further widening the skills gap. If one country is importing trained nurses or teachers, another country is seeing them leave. To cite just one example: since 1967, 25% of all doctors qualified in Pakistan have left the country. And mobility is on the rise. There are many reasons for this growing mobility: relative demand and supply; different job prospects and salary levels, and the development of global research and development operations by multinational enterprises.

There is a risk of brain drain for the sending countries, but there is also potential benefit from returning emigrants who bring back knowledge and expertise. Emerging economies could benefit from this brain return, but for developing countries it seems more difficult. Receiving countries use a number of methods to attract foreign talent, such as scholarships, visas, or tax breaks. These can bridge supply gaps in OECD countries but cannot be a permanent replacement for more national investment in a high-skilled workforce.

Participants suggested that in any case importing scientists or researchers to deal with a shortfall could only be a short-term solution; ultimately, mobility cannot compensate if demand exceeds overall supply and countries need to improve pay and career prospects so that more students choose science.

MOBILITY IN HIGHER EDUCATION

OECD research shows that student mobility has more than doubled in the past two decades, and the trend is continuing. There are 18 million foreign students in OECD countries, most of them from Asia, particularly China and India, with high numbers in the UK, US, Germany, France and Australia. In the US there were 84,000 foreign scholars in 2003, a 40% increase since 1992, and a quarter of science and engineering Phds are foreign-born. Mobility of education programmes is expanding even faster, and academic staff are also becoming increasingly mobile. This raises a number of policy issues, particularly the mobility of education programmes. Who checks standards? Does the imported education meet the social and economic needs of importing countries? Does it help improve equity of access to education and reduce the gap between receiving countries? One concern is that being able to import educational services may reduce the incentive to develop education and research in receiving countries.

Several participants said that heightened security concerns in the wake of 9/11 were understandable, but urged governments to strike an appropriate balance between the legitimate desire to protect their citizens and the mobility of students, researchers, academics and ideas which are vital for promoting knowledge and understanding.
At the same time, some participants said, mobility is not an end in itself; we need to ensure that international mobility brings real benefit, and questioned whether it always did so. In too many cases, OECD countries are failing to attract home-grown science students because careers in science are less attractive than careers in other fields, so they are importing students from abroad.

A TUAC representative cited Ireland’s experience in the past five years. Over that period, the requirements for students to enter college to study science and engineering have fallen, while they have risen in other areas such as medicine and accountancy, showing declining interest in scientific subjects, and by implication in scientific careers.

Ireland has tried several methods to persuade students to take science subjects, but with little success. The available science places are now being taken by a growing influx of students from areas such as Eastern Europe and Asia. This is in stark contrast to the 1970s, when the investment that created the Celtic Tiger saw a massive increase in science and engineering degree holders because these skills were needed to fill the job opportunities available, and there was no need for special incentives. Rather than importing foreign students in the short-term, the TUAC representative said, Ireland should improve the future pay and career prospects for science students, and give people already working who did not get the level of education available today the chance to upgrade their skills in scientific areas.

Other participants argued that given the current shortage, countries need both long-term and short-term solutions. Raising salaries might encourage more students to take science in the future, but it will not make more scientists available now, so going abroad to fill the gap is appropriate. One BIAC participant noted that businesses are also working with schools to interest young people in science and technology but this is a longer-term solution as it will be seven or eight years before we see the results.

Some participants also queried whether international mobility in higher education was really global. One TUAC representative noted that there are twice as many Koreans and Greeks studying abroad as US citizens.

The secretariat noted that there is a lot of mobility among US students but between states. Also, despite the opportunities for knowledge diffusion offered by IT, knowledge still has an important geographic component. There are a number of centres of excellence in OECD countries with a long history -- the US is known for its strength in physics and chemistry, which dates back essentially to a post-World War II movement of scientists.

It is also true that many students from small countries go abroad because they cannot find the particular education they want at home; the US is a large country with a broad system that covers all the bases, and with a reputation for quality: if you go to the US to study and return to your country with a US PhD you have a higher social status than a US student going abroad and coming home with a Greek PhD. Language is also an issue – why learn another language for your studies unless that is the only way to get the education you want.

And there are examples of movement in the other direction; the US National Science Foundation is trying to promote such movement, chiefly to Asia as a key area for future research. China, Japan and Korea are all developing centres of excellence and US researchers are going to them.

Mobility of research personnel

The lack of interest in science subjects among OECD students is all the more worrying as demand for researchers in OECD countries is rising, the OECD secretariat said. The number of researchers in OECD countries rose from 2.3 million in 1990 to 3.4 million in 2004, with most of the growth in business. As a share of the labour force, researchers are 2.1% in EU, 3.3% in Japan and 3.2% in the US, and there is
growing demand for talent and increased spending in research and development, with the EU targeting R&D spending of 3% of gross domestic product (GDP).

But where will these researchers come from? The supply of researchers in OECD countries is currently expanding with the growth in higher education, but the declining interest in studying maths and science will affect future supply.

Foreign researchers are one source. The secretariat said that countries such as Australia, Canada, UK and Switzerland have opted for skill-based migration. These countries use a variety of incentives to attract the skills they need, such as lower tax rates, and in the case of students the chance to stay on and work once they have finished their studies. In other words, the host country selects immigrants based on the skills and experience they have already obtained in their home country.

A TUAC representative challenged the emphasis placed by other participants on mobility and flexibility, and questioned whether labour market flexibility was as effective as asserted. He cited US statistics on employment relations in silicon valley during the dot.com boom showing that mobility in fact decreased: employers wanted to keep staff to finish projects so they had limited interest in mobility. Employers had a strong interest in flexibility, but in relation to internal changes and functions within a company rather than the outside labour market.

Other participants accepted that countries may need mobility, but said the fundamental problem was that the countries with most need of the highly-skilled are exporting rather than importing them. One argued that while it is clear that researchers need to be able to work together on projects, such co-operation could be achieved by means of temporarily moving people, or by simply exchanging ideas without the people themselves needing to move at all.

In any case, some participants argued, mobility is often effectively imposed on researchers, not something they choose. Researchers are highly skilled and their skills are often very specific; in developed countries they may have to move to where jobs are available in their particular field. In developing countries, researchers cannot find work because of lack of development so go elsewhere where there are jobs. In both cases they move to find jobs, not because they particularly want to move.

But not all countries are focussed on incentives to attract researchers, the secretariat said – globalisation of research and development now also leads to outsourcing. Multinationals are opening up research laboratories in Asia and elsewhere, not just to send people to work there but also to employ locals.

BIAC participants noted that this discussion raised several questions for employers. One was the fact that the root cause of the shortage of science and technical staff in OECD countries is the salary levels – in times of shortage, salaries should be competitive with other sectors.

BIAC and TUAC both felt it would be useful to co-operate on recommendations that could be integrated in ongoing projects by the three directorates present, such as the review of tertiary education. They also stressed that mobility will be facilitated by reciprocal agreements not only on the recognition of qualifications (the Bologna process) but also practical questions, such as mobility of pensions. If mobility between public and private sectors is to be favoured, it is important to address the issue of pensions, TUAC participants in particular noted.

The secretariat also noted that there is a lot of information available on the supply of researchers, but more data are needed on the dynamics of the demand side. The OECD is working in these areas; a long-term statistical survey under way on the long-term life of PhD holders will answer some of the questions raised today.
The OECD’s Global Science Forum is also looking at evidence and solutions for declining interest in scientific studies and trying to find solutions. A project on the broader issue of research working conditions and attractiveness is scheduled to conclude in 2006.

**Mobility and skills**

OECD research shows that the highly skilled are more mobile than average, although the proportion varies between countries. There is a clear relation between the amount of expatriation and the size of the country; the smaller the country, the more expatriates, simply because there are more opportunities in bigger countries. While 40-50% of graduates from some African countries are living in OECD countries, the figure is closer to 80% for graduates from Jamaica and Haiti.

Most OECD countries gain from migration of the highly skilled -- expatriates are more highly skilled than the foreign-born population of a particular country, who in turn are more highly educated than native-born -- and more than half (around 60%) of the “stock” of highly-skilled migration in the OECD comes outside the OECD area.

Some participants suggested that part of the reason for the need for OECD countries to import highly-skilled people is a failure of planning and resource management, not just unattractive salaries or career prospects. One example cited in OECD countries was medicine – countries have too few gerontologists and oncologists to deal with their ageing population, but the need for these could have been foreseen.

Participants appreciated that the whole mobility question is a very sensitive issue, but several noted this goes beyond a developing/developed country divide; the situation and challenges also vary between large and small countries and depending on whether they are more market-oriented or more welfare-oriented systems. But the same key questions apply to all – why mobility is now an essential part of working life, challenges for the future, and possible solutions.

One European BIAC participant noted that in a global economy smaller countries, such as Finland are very dependent on international networking, co-operation and trade. To be able to compete in the big global markets, Finnish companies have expanded abroad and now have nearly as many people working in foreign subsidiaries as in Finland.

Several participants questioned the need to physically move people in order to exchange ideas and co-operate, and suggested it might be useful to find better ways to move ideas, rather than people. One TUAC participant raised the question as to what social need was met by the mobility of the highly skilled. The Finnish example showed that multinationals can take advantage of the mobility of capital to successfully employ people in their home countries, rather than moving people.

But the BIAC representative said that international mobility is one form of strategic knowledge network. Mobility, both inward and outward, is needed for a country and its companies to be competitive in a knowledge society. The challenge of competition is a critical factor for innovation. Continuity is important, but organisations and societies also need diversity to help boost innovation, and international mobility is an effective tool to create that diversity. Other participants also suggested that scientific progress benefits from mobility, as the stock of knowledge increases.

The situation is also complicated by the fact that by going abroad, people from developing countries can acquire skills not available at home, which represents a gain for everyone. For African countries in particular, development and mobility go hand in hand, and this goes beyond mobility of the highly-skilled, so this question is difficult to resolve, participants said.
For companies, there is a trade-off between the advantages of mobility as a means of bringing in new blood and new ideas, and the advantages of keeping people and thus preserving firm-specific knowledge.

Questions of mobility of higher education and research personnel are currently addressed at the international level primarily through trade agreements. Participants noted that mobility of the highly-skilled is complicated by the fact that the movement of service providers is covered by the GATS discussions on trade in services, particularly by provisions known as Mode 4 of GATS. Service providers are only a small part of these talks, but the issue is controversial because of questions such as limits on movements and questions whether imported workers will be offered lower wages. Participants noted a proposal for a GATS “visa” to make it easier to move people to different sites working for the same company, but a TUAC participant warned that if the trade agenda is left to determine mobility a lot of elements would be omitted. He expressed particular concerns regarding the fact that trade agreements are predominantly aimed at the opening up of markets while leaving social aspects out of consideration. Several participants cited in particular the need to ensure that the needs of non-OECD and developing countries are taken into account when dealing with such topics.

**Brain drain/gain**

The brain drain/gain question attracted considerable debate, with several participants feeling that more research is needed into who benefits and who loses out from mobility of students and the highly-skilled.

Some felt that while mobility in itself is a health phenomenon, if it is to be sustainable there has to be some balance in the system. This applies both to attracting more women to science, not just as a desirable idea but because society needs more scientists, but also to trying to find a balance between developing and developed countries. Participants generally felt that the latter would be the hardest to achieve, but agreed that for the longer term it would be better for society if mobility does not remain a one-way trend.

Several participants said that part of the solution would be to provide more support for education in developing countries, so that students would not have to leave in such large numbers to complete their education, as well as finding incentives for people to return. It is no good bewailing the fact that poor countries train nurses who then go abroad to work while their own countries are desperately short of nurses, if the poor country cannot afford to employ more nurses. One participant pointed out that some countries such as the Philippines who cannot offer jobs to all their highly skilled population actually train more nurses than they need because they know that these people can find jobs abroad easily.

The idea of brain drain is fairly easy to define – people with degrees or particular skills moving to another country which gains their knowledge. But how to ensure that the gain does not go only to the developed countries, and whether developing countries are reaping any advantage at all, was more contentious.

One participant argued that “brain gain” was a term that could be defined as “the increase in knowledge and the number of people who have it,” but others felt this was not very useful as it ignored the question of where the increased knowledge was being used and for whose benefit.

If developing countries pay to train people, then they go to work in developed countries, there is certainly a brain gain for the developed country, which gains skilled staff it has not paid to train. Knowledge is also a source of growth; bringing in foreign scientists can help offset the ageing of the research population in developed countries. At the same time, foreign students can bring in revenue. But for developing countries it can have negative effects: loss of human capital, education and social investment. And highly-skilled emigrant workers generally send less money back to their home countries than the lower-skilled.
Some TUAC participants felt the equation so far has been very simple – one country’s brain gain was another’s brain drain – but this situation was not sustainable. Developed countries could not go on covering up the fact that they neglected to provide incentives to educate young scientists in their own country by importing scientists from elsewhere.

Other participants argued that the developing countries may gain indirectly and in the longer term, for example if the migrant returns home later in their career bringing with them knowledge and skills that can be used in their countries of origin.

The whole brain drain/brain gain/brain circulation debate is clearly very complex. It may take many years, but there is some evidence that the highly skilled do return home, at least to countries such as China, the secretariat said. As China, India and Taiwan develop, fewer researchers who leave their home countries intend to stay abroad in countries like the US, so it is not a zero sum game. In addition, researchers returning home maintain their contacts with the US or wherever they have spent time abroad, which enriches the knowledge exchange. There is also evidence that companies in developed countries can find it hard to keep foreign-imported highly-skilled staff.

And some countries, such as France, are in a sense familiar with both sides of the problem as they experience both brain drain and brain gain. The country is facing a shortage of researchers, and the French national institute for research in computers and control (INRIA) has opened up offices in China, which ultimately offers the chance to increase the mobility of researchers overall.

But it is true that it can take a long time for the wheel to come full circle, and the idea of “brain circulation” does not work at present for the poorest companies. India started promoting scientific higher education in the 1950s and 1960s, but it has taken until now to reap the benefit now in its domestic technological industry, with scientists either choosing to stay or to return. China regarded the idea of allowing students to go abroad to study as a long-term investment, which suggests that it takes some time to be able to judge whether mobility is positive or negative for developing countries.

For scientists, there is also the issue that mobility is considered part of a researcher’s development, and that moves may be driven by the desire to work in a particular field rather than money.

The whole matter is complicated by the fact that highly-skilled migration is not just a question of people going from developing to developed countries; OECD research shows that a shortage of IT and medical staff has led to “cascade” migration where people go from country A to country B for jobs and better conditions, partly because people from country B are going to country C for the same reason.

Some participants said that while it was appropriate to devote a great deal of attention to finding a solution to the “brain drain” in developing countries, it did also raise issues for developed countries. One BIAC representative cited Finland, saying that it could face a brain drain of its own if its highly-skilled young people decide they do not want to pay the taxes that enable their country to offer free education to Finns and foreigners, and go abroad to work in lower-tax countries. A TUAC participant said that there is also brain drain within some countries, for instance doctors or teachers not wanting to practice in remote areas, or people leaving universities for the private sector.

Conclusions

Participants generally felt that more work needs to be done on the whole the brain drain/brain gain/brain circulation question, and that greater international co-operation in this area would also be helpful.
But there were several suggestions of possible policy solutions to the brain drain problem and to ending a North-South knowledge divide, such as building a higher education and research capacity within countries. Participants also cited the need for better employment status, particularly in developing countries, if countries were to retain highly-skilled people, as well as protection of academic freedom and more regional and international academic networks.

One suggestion for stimulating return migration was to allow people to retain more than one nationality, as research shows that being able to have dual nationality makes it easier for people to return home, and to offer fiscal incentives.

There were also suggestions that more effort should be made to share the costs of brain drain/gain – such as development aid for education in the sending countries, or an “exit bond” to cover at least part of the cost of their education when educated people leave the country. There is already a Commonwealth code of good conduct where countries pledge not to recruit skilled people without the agreement of the sending authorities.

Participants recalled that letting markets rule could lead to choices that are only good for the short-term, such as importing people rather than making the skills in demand more attractive to home-grown talent.

Participants generally felt that there was a lot of consensus on many of the issues around higher education and mobility, and that it was particularly useful to bring together the educational, scientific and employment experts with BIAC and TUAC to take a view at these interdependent aspects of the issues.

BIAC and TUAC were interested in working together to look at existing work on education and research, such as the Eurocadre draft charter for research, UNESCO’s work on higher education, the ILO’s work on human resources and to consider how they could apply to OECD countries. BIAC in particular was interested in how the education, skills and mobility aspects could be integrated into the OECD’s work on reassessing the Jobs Strategy. TUAC delegates suggested that future work should pay particular attention to: involving stakeholders in policy developments regarding tertiary education and the internationalisation of universities and research; the question of values as an important element in public policies focusing on education and internationalisation; and the social outcomes of learning and equity.
MAIN POINTS

1. There has been a “paradigm shift” in recent years in the role of higher education and how it is financed, leading to a new type of partnership between business, education institutions and government. A growing need for innovation in business has led to demand for quicker transfer of innovation from research into the business sector. Universities are no longer an “ivory tower” providing all the knowledge and skills needed to solve society’s problems, but need new relationships and partnerships with the wider world. In a globalised knowledge-based society, universities need to be an integral part of the global community. The shift also applies to funding; budget constraints mean that governments are looking for alternative funding for higher education beyond the public purse.

2. Research and forecasts indicate that if economies are to have the researchers to provide the innovation to fuel economic growth, more needs to be done to stimulate careers in research in the public and private sectors, and to make it easier to move between the two. Modern economies require more highly educated personnel across the board but particularly need more researchers to keep development and innovation moving.

3. In an increasingly complex globalised world, mobility of research personnel is vital. Many new scientific/technological disciplines, such as neuro-informatics, cross the borders between several research specialisations so people need to be able to work together. As our scientific and technological knowledge becomes more complex, increasingly new developments require huge investment in huge expensive projects that no single university or government can fund or staff. At an individual level, researchers need to have a career path that enables them to switch from the public to private sector and back again, and that can allow them to cross borders to work. But at the same time, “brain drain” of highly educated personnel from developing countries for higher paid jobs in OECD countries can doubly penalise the developing countries by taking away highly educated people who have been educated at great cost to an already poor economy and it is far from clear that remittances they send back home compensate. More needs to be done to ensure such personnel are not “poached” from countries where they are needed and to verify whether in the longer term these highly educated people are able to re-transfer their knowledge to their home countries, as has begun to happen in India and China.

4. BIAC and TUAC are interested in working with all three directorates (ELS, STI and EDU) on these related issues, and in contributing to the OECD’s reassessment of the Job Strategy and its review of higher education which could help clarify some of these questions and suggest solutions.
### ANNEX

**LIST OF PARTICIPANTS**

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