

ENTERPRISE AND LIFELONG LEARNING COMMITTEE

Tuesday 8 May 2001
(*Afternoon*)

Session 1

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ENTERPRISE AND LIFELONG LEARNING COMMITTEE

14th Meeting 2001, Session 1

CONVENER

*Alex Neil (Central Scotland) (SNP)

DEPUTY CONVENER

*Miss Annabel Goldie (West of Scotland) (Con)

COMMITTEE MEMBERS

*Bill Butler (Glasgow Anniesland) (Lab)
*Mr Duncan Hamilton (Highlands and Islands) (SNP)
*Marilyn Livingstone (Kirkcaldy) (Lab)
*Mr Kenny MacAskill (Lothians) (SNP)
*Mr Kenneth Macintosh (Eastwood) (Lab)
*David Mundell (South of Scotland) (Con):
*Des McNulty (Clydebank and Milngavie) (Lab)
*Tavish Scott (Shetland) (LD)
*Elaine Thomson (Aberdeen North) (Lab)

*attended

THE FOLLOWING ALSO ATTENDED:

Mr David Davidson (North-East Scotland) (Con)

WITNESSES

Hugh Thomson (University of Strathclyde)
Professor John McClelland (Technology Ventures Scotland)
Douglas Mundie (Technology Ventures Scotland)
Nelson Gray

CLERK TO THE COMMITTEE

Simon Watkins

SENIOR ASSISTANT CLERK

Judith Evans

ASSISTANT CLERK

Linda Orton

LOCATION

Committee Room 1

Scottish Parliament

Enterprise and Lifelong Learning Committee

Tuesday 8 May 2001

(Afternoon)

[THE CONVENER *opened the meeting at 15:03*]

The Convener (Alex Neil): Good afternoon and welcome to the Enterprise and Lifelong Learning Committee's 14th meeting in 2001. First, I thank committee members for their kindness and condolences during my recent absence. Secondly, I welcome David Davidson in his role as rapporteur from the Finance Committee and as someone who is always interested in the Enterprise and Lifelong Learning Committee's work.

As members know, we have started an hour late, because the minister, Alasdair Morrison, is unfortunately down with flu. We will discuss rescheduling our meeting with him under agenda item 3.

Declaration of Interests

The Convener: I welcome David Mundell as a new member of the committee in place of Nick Johnston. It is appropriate that David joins the committee while we are completing our new economy inquiry report, as he has expertise in that field. Do you have any interests to declare?

David Mundell (South of Scotland) (Con): I have no registrable interests to declare. I was an employee of British Telecom, but I no longer have a pecuniary interest in that company. However, I am a member of the Scottish Executive's digital Scotland task force reference group, for my sins.

Item in Private

The Convener: The next agenda item is to decide whether to take agenda item 7 in private. As we will probably not hear the minister's evidence until 22 May, we will not discuss our budget report until after then. Nevertheless, does the committee agree that we will deal with that item in private when the time comes?

Members *indicated agreement.*

Budget Process 2002-03

The Convener: This agenda item falls, as the minister is not present to give evidence. All that we must do is confirm the rescheduling of the minister's evidence session. The proposal is that the minister will give evidence at 9 am on 15 May—next Tuesday. Is that agreed?

Members *indicated agreement.*

The Convener: The situation is unfortunate, but we must get the work done. We need the evidence and we must prepare our budget report. That is all part of a parliamentary process. Our hands are tied on the time scale.

Teaching and Research Funding (Scottish Higher Education Funding Council Review)

The Convener: The next agenda item is the SHEFC teaching and research funding inquiry. We will take two sets of evidence this afternoon.

Hugh Thomson has kindly circulated a paper. Before we ask questions, I ask him whether he would like to make a few introductory comments.

Hugh Thomson (University of Strathclyde): Thank you. I am director of the office of research and consultancy services at the University of Strathclyde. The office was formed in March 1984. Its work divides roughly into two elements. One aspect looks after the administration and negotiation of contracts and agreements that relate to the funding of research at the university. That is important for commercialisation, because we determine the ownership and the use of intellectual property rights that are brought to research projects and result from those projects.

The other half of the office is primarily concerned with the business development aspects of research—growing the research base and commercialising the results of research through the formation of spin-off companies and the patenting and licensing procedures.

In 1984, the university formally minuted through its court that it wanted to support and encourage those academic staff members who wished to take their research work into the commercial arena to do that, through the formation of companies. The task has been performed at the university for 17 and a bit years.

Miss Annabel Goldie (West of Scotland) (Con): I declare again that I am a member of the court of the University of Strathclyde. I am trying to ensure, Mr Thomson, that you and I are not removed. Thank you for the information that you made available. How significant is having a qualitative research base to the job that you do?

Hugh Thomson: It is essential. A high-quality research base is needed to attract the interest of industry, which is intent on using the cutting edge of research. Without question, academic staff members who are good at conducting first-class research in science and engineering are also the people who are most likely to create technologies with a commercial future and to be interested in participating in the commercialisation of those technologies.

Miss Goldie: Is a two-way dialogue conducted? Do talented academic staff members with a good idea approach you to try to commercialise it? Do

commercial entities also approach you? Which way does the process flow?

Hugh Thomson: A bit of both is involved. When we started back in 1984, it was rare for academic staff to present ideas that were suitable for commercialisation. Much of our work has involved making academic staff aware of and comfortable with the commercialisation processes and making them feel that engaging in such work would not harm their academic careers. The bulk of good ideas for commercial work now comes from academics who knock on our door and say that they want to talk about an idea.

The academic staff who bring forward ideas are an important part of the equation, but we also have approaches from industry, which is looking for technology to augment its technological bases. The fact that industry representatives inquire and ask questions of us causes us to research within the university to see who might have such technologies. For example, a year ago we became aware that the venture capital community was interested in technologies relating to optical signal processing, which caused us to have a close look at the work that we were doing in a number of departments in those areas. Even if members of staff were not thinking much about commercialisation, if they had relevant work, we could begin a conversation with them to see how best we might commercialise their work while keeping them comfortable with the process.

Miss Goldie: Would that dynamic be absent without the foundation of a good research base?

Hugh Thomson: A good research base is essential.

Miss Goldie: In your work, do you have to relate to Technology Ventures Scotland? What is the relationship between TVS and the University of Strathclyde?

Hugh Thomson: I am on the advisory panel for Technology Ventures Scotland, and the university was much involved in the move to get it established in the first place. We felt that there were a number of issues that required a longer-term or medium-term examination. One always hears talk of the obstacles to technology transfer or commercialisation, some of which do not lend themselves to a quick fix, but are buried in established cultures and ways of operating, in the university sector and outwith it. Technology Ventures Scotland is the right kind of organisation to tackle some of those obstacles. I rather hope, although I cannot determine, that it will concentrate on five or six significant topics, rather than being seduced into looking at too many short-term measures.

Marilyn Livingstone (Kirkcaldy) (Lab): As you are aware, the purpose of today's meeting is to

consider the whole issue of research funding. We are looking at distribution in particular. Last week, we took evidence on the research assessment exercise. Do you feel that the current and proposed distributions fairly represent the research work that is being carried out? Do you think that the way in which the funding is allocated is radical enough? Does it support the Scottish economy in the best way?

Hugh Thomson: I am broadly in favour of the funding formula that has evolved over the years. I am totally in favour of the idea that departments rated at 4 and 5 in the RAE ratings should continue to be well financed and funded. That is most important in attracting and keeping the researchers who are doing the best-quality research in Scotland.

In a sense, I want to have my cake and eat it. I am conscious that, if this spending round produces a greater volume of higher-quality submissions—as I think is likely—there will clearly be pressure on the departments that are rated 3a and 3b. One has to look closely at that, as the 3a and 3b departments represent a wide array of activities at universities. I would be upset and worried if people who are building a new research base in an important new area, and whose department fell into the 3a category, were to lack finance when it can be seen that they are growing something important. Nevertheless, the pressure on the funding system must be to look after the grade 4 and 5 departments at the top of the scale. That is where the future lies.

Marilyn Livingstone: Do you think that the proposed distribution system will achieve what you think the priorities are?

Hugh Thomson: I do not know, because I cannot second-guess the results of the RAE. People feel that there will be more departments gaining grades 4 and 5. With the existing formula, that will inevitably put pressure on the 3a and 3b departments.

Mr David Davidson (North-East Scotland) (Con): Would you care to expand on your comments on patent growth, constraints and costs? That is obviously an important area if Scottish universities are producing technological solutions that industry can then use to develop into products. You seemed to indicate that there is a severe constraint. How does it affect your university and the sector as a whole, and do you have any solutions to offer?

15:15

Hugh Thomson: There is a constraint. At a university such as the University of Strathclyde, the patent budget is significant. In my submission, I mentioned that the University of Strathclyde has,

over the years, been generous in that respect. However, in recent years, the university has had to look closely at all budgets. It was prudent management to have to put the squeeze on my office. Other universities are also feeling the squeeze.

The political as well as the internal pressures towards commercialisation are receiving a lot of publicity. Over the past 10 years, staff have become much more aware of the commercial opportunities for their research. They are much more willing and interested in being personally and directly engaged in that research. As a result, the number of disclosures, or potential patents, coming to offices such as mine has increased—over the past three years, I have seen a 50 per cent increase. However, patents cost money. Given that patent costs are rising all the time, if patent budgets are frozen, we will find—particularly if we want to take out patents in countries such as Japan to protect our technology there—that the number of patents that we can afford plateaus and may retreat a little.

That causes us to look hard at ensuring that we are not holding patents that do not have a viable future. At a university, it is difficult to be that knowledgeable, as most of our technology is several years from market. Nobody will give a cast-iron assessment of whether a patent will win through. One is loth to give up patents too quickly in order to effect an economy. That is particularly the case with patents from good academic areas—from research that we think is unique and where patent searchers say that the patent is sound.

Offices such as mine are asking their university for an increase in the patent budget, which is not easy for a university to give. The way to control patent costs is to license them and place them in industry and commerce as rapidly as possible. That enables the burden to be passed to the private sector. In turn, it requires us to have an ever-larger marketing and selling staff. We can conduct different styles of contract and negotiation with intermediaries; increasingly, we can offer intellectual property to a middleperson who will place it on our behalf and share the returns with us.

Mr Davidson: How does that compare with models in other countries?

Hugh Thomson: I am not familiar with the detail of models in many other countries. I am most familiar with universities in the United States, where, pro rata, higher patent budgets are run. However, those universities, too, will be under pressure. I notice that the Massachusetts Institute of Technology recovers a greater proportion of its costs through successful licensing. As the marketplace for new technology becomes better

established, the pressure begins to lift off patent budgets.

Mr Davidson: Has there been any move for Scottish institutions to work together to form a clearing house, management system or marketing system?

Hugh Thomson: I am not much in favour of that. We must try not to separate the academic researcher from the placing of their intellectual property in the market. Intellectual property—a patent—is often fairly worthless unless the academic concerned is totally motivated and supported in their work.

At the University of Strathclyde, we find that, when we have some exciting technology that we want to place under licence, a close working relationship—sometimes with a lot of face-to-face meetings day by day—and team building are essential. When we work with third-party organisations, the gap between those organisations and the academic staff is much greater and we sense that friction begins to arise.

Tavish Scott (Shetland) (LD): You said that technology was several years away from the marketplace. I was also interested in your initial comment about the formation of spin-off companies. Could you give the committee some idea of the scale of the formation of spin-off companies in which your institution is involved?

Hugh Thomson: We are currently spinning out four or five companies a year. Over the years, we have spun out 32 companies. They come in all shapes and sizes.

Some companies are formed with a marketplace four or five years away. Those companies are difficult to fund, because we are funding development and they are supposedly increasing in value while achieving no sales. We are familiar with that phenomenon.

Other companies are formed around technologies that are closer to market and have perhaps a one-year or two-year horizon. The average distance from market is seven years—MIT would say eight years. Software and products from areas of physics that are developing wafer-based technologies can be as close to market as two years—if the product works, somebody will buy it. New drugs, we know, will be 15 or 16 years from market. There is a wide span of companies.

Tavish Scott: I have two questions on the back of that. First, can you give me some idea of the scale of the companies? Secondly, you mentioned investment. How do you fund the companies?

Hugh Thomson: The policy at the University of Strathclyde is not to be a pseudo-venture capitalist and pick one winner out of 100 possibles; our task is to provide an enabling function, so that any

academic with a reasonable-looking plan, even if that plan is for a small niche market, is given the opportunity to establish a company.

At one extreme, we might have a very small company with just £20,000 to £30,000 capitalisation and two people working out of a garage who are speculating their salaries for two years and having a go. At the other extreme, we have equipment-based companies that require technicians to drive the equipment, perhaps have significant patenting costs to take on and require funding of £2 million or £3 million. However, I would say that the typical company is one that wants or needs to start with something in the order of £100,000 to £200,000 as a first round of seedcorn funding.

We find that, in the west of Scotland—I am sure that it is the same here in the east—we can raise £100,000, perhaps £150,000, relatively softly in the sense that it does not impact too heavily on the equity of the university or the academics at that early stage. There are Government-backed loans, grants and prizes, such as the small firms merit award for research and technology—relatively soft moneys—that can be brought together one way or another to form that kind of funding. We might also bring in money from a venture capitalist to top up that funding. In such circumstances, the academic staff will usually have the majority equity stake of, say, 55 per cent, the university might hold 25 per cent and the venture capitalists would hold the remainder.

Tavish Scott: You mentioned the amount of industry-driven work that is generated, although it is commercially driven in the sense that industry approaches institutions to develop an idea. Can you give us some idea of the scale of such work? How much comes directly to you from industry when it is looking for a solution to a problem?

Hugh Thomson: The university attracts a fair amount of work each year. About 20 per cent of external research funding is in the form of industry contracts, which are usually for work that is distant from the market. It is strategic research that has a commercial horizon, but with substantial academic content. We receive that sort of contract, rather than product-designed development, because industry knows that universities and their staff are skilled in the earlier stages of research work.

One-to-one contracts constitute a reasonably high proportion—20 per cent—of our work. I have not made a calculation recently, but in the past I found that of all our externally funded research—including research council funded projects and one-to-one industry contracts—industry is involved one way or another as a partner, collaborator and provider of equipment in about 50 per cent of our total research budget. Industry is highly visible in our research portfolio.

Mr Kenny MacAskill (Lothians) (SNP): How do you balance the quality of research with the nature of the subject that is being researched? I understand why we must have the RAE, but it could be argued that research that is classified as grade 4 in law or politics is of less social worth from an economic point of view for the national interest than, for example, optoelectronics that is graded only at 3a or 3b. How do you marry the social and economic interests of the state with research quality?

Hugh Thomson: It has always been the tradition in UK universities that there is a high level of academic freedom. In other words, when they are employed, academics are free to follow the line of research that interests them, provided that it is legal. Sometimes that takes them and the university down a blind alley, but sometimes, the results are predictable and worth while. At other times the results are truly unexpected and surprising and are of considerable quality and value. That is the joy of academic freedom.

It is particularly difficult for a university to pick subjects that might be regarded as economic or social winners. It is difficult to take a view, especially when research is often distant from the marketplace. To pick up the point about somebody receiving an RAE rating of 4 in an area of politics, a department at Strathclyde university works extensively with the European Union in helping it devise policies for better integration in research, technology and matters that are for the social good. Although such research has a political label attached to it in the first instance, it ends up in a practical form that is delivered by the European Parliament.

Mr MacAskill: I understand why a university would not want to be in the position of picking winners and I hesitate to say that Government can necessarily pick winners. Let us consider other smaller nations that regard themselves as part of a global economy and as being in a knowledge age, such as Finland. They know that, at some stage, hard choices will have to be made. That being the case, should we reconsider the grading system and focus the level of funding? The funding in some areas needs to be considerably higher than in areas such as politics and its relationship with the European Union. Would that be one way in which to address the issue?

15:30

Hugh Thomson: The present system already pulls in scientific engineering and other research in areas that are regarded as important for Scotland and/or the United Kingdom. We know that the foresight programme has had a significant influence on the research councils. They want increasingly to involve industry and commerce in

their projects, which pulls project work in certain directions that others think are important. I indicated that a fair proportion of our research funding comes from Europe and industry, both of which have clear views on their objectives. That does not endanger academic freedom too much. There are already pressures at work.

I am anxious that we do not go too far in tying research in Scotland to the perceived needs of Scottish industry and commerce. Ten years ago, there was a high level of optoelectronics research, which has developed into photonics and optical signal processing at several universities in Scotland. There was almost no industry to support it, yet it is now becoming a hot high-tech sector that has a great future.

One can say the same about pharmaceutical research and products. Unfortunately, we are not blessed with many major pharmaceutical manufacturing industries in Scotland, but the research in Scottish universities is substantial and there is growth in some important biotechnology and bioscience subjects, especially in the Lothians. I would have hated it if someone had been wise 10 years ago and said, "This is not an area that we should concentrate on," because I think that it is the future.

Des McNulty (Clydebank and Milngavie) (Lab): You have given us an impressive portfolio of outcomes from research and consultancy services at Strathclyde university—I was aware of those outcomes. How is your operation financially underpinned? There are four potential strands of income to universities: the teaching income from the Scottish Higher Education Funding Council; the research income from SHEFC; research grants and overheads; and what you might call commercial income. There might be other strands that you wish to identify. Will you outline where your operation gets its resources from, both for its day-to-day operation and—through seedcorn funding, if you like—its longer-term planning?

Hugh Thomson: To date, the funding has been SHEFC funding. We do not earn commission on projects that we bring in or—directly—on royalty income. That goes back a long time to when we wanted to make the commercialisation process as attractive to academic staff as possible. We have always been aware that if we work with academic staff to bring in a £500,000 research project, then lay claim to 10 per cent of that as funding for the office, we immediately get into arguments. Good academics do not like losing money in that way. They argue that they do all the work and that my office just checks the arithmetic and applies the rubber stamp. On some occasions, that might be true. We have separated ourselves from earning our income from the day-to-day business of the university and prefer instead to be judged at the

year-end by our senior officers.

Des McNulty: There is a slightly strange logic to that because you are taking money that is funded through taxation and investing it on the basis of your judgment about what is good for the university.

Hugh Thomson: We work much more closely than that with academic staff. Our office was set up first and foremost to provide services to the academic community, but we obviously take into account the university's risks, liabilities and corporate aims.

We believe that commercialisation is part of an academic's research activity. Without the research and the academic, commercialisation is dead in the water. Our job is to help academic staff to run that part of their business as professionally and as efficiently as possible. The only way that my office can succeed in all the areas that we have been talking about is by forming myriad instant teams with academic staff to go and do things such as applying for or licensing a patent, forming a spin-out company and so on. We must join forces and work together as a team.

The last thing I would do is to put my arm around the commercialisation work, take it away from the academic and run it as a separate business. Although some universities take that approach, the policy at Strathclyde is to involve academics intimately and to run the business through their interests and enthusiasms. For example, if an academic member of staff comes to me with some new intellectual property and wants to form a company, and I think that it would be a much better idea to licence the technology, I will argue the toss for quite a long time to try to get my way. However, we will probably allow the academic's wish to prevail and I would hope that, if the company was formed, it might be purchased in a couple of years' time by the licensee that I had in mind initially.

David Mundell: I want to ask about the nature of collaboration between your institution and others in Scotland and elsewhere. Is there an incentive or disincentive to build teams for projects? For example, it might be difficult to identify where the relevant experts are.

Hugh Thomson: There is great incentive to build teams. For example, the committee might be aware of our synergistic working relationship with the University of Glasgow on certain areas of research. That relationship stretches into the work of my office and commercialisation. Furthermore, we also have working relationships with all the Scottish universities, particularly the research-based universities. We know very well that we must often join forces to win funding for work on a major European or company initiative. As a result,

we will collaborate at research project level.

I find it to be a very worthwhile community, and I often meet my colleagues in other commercialisation offices to talk about common problems. Something is always bothering us; for example, if a major pharmaceutical charity decides to own all the intellectual property in sight, we sit down and discuss what might be a reasonable response. If major research companies send out invitations to bid for research work, we will get together and find out how best we can win funding as a group of Scottish universities. In some UK-funded initiatives, such as the university challenge or the science enterprise challenge, the universities got together willingly and comfortably to compete for those prizes, which we won.

David Mundell: What is the extent of your international collaboration? How well placed are you to win international research work?

Hugh Thomson: We are very well placed indeed. We were one of the first universities to take the European Union seriously back in 1985 or 1986, when some of the earliest research funding projects such as the European strategic programme for research and development in information technology—or ESPRIT—were introduced.

We were one of the first universities to win funding for and get the chance to run such a pilot project. We were much involved in Europe in the late 1980s and early 1990s and, in some funding areas, Strathclyde university did better than some states. On one famous occasion—for an advanced communications project—Strathclyde university obtained more money in one year than the state of Denmark. That was because we were in and interested, and because we had academic, corporate and industrial partners in Europe. We worked collaboratively in Japan and the United States. Research is an international business.

Mr Kenneth Macintosh (Eastwood) (Lab): With regard to the RAE awards, are the departments that have proven over the years that they are good at developing commercial ideas more successful at attracting research funding?

Hugh Thomson: Not necessarily. That is often so, but it is not always the case. The next commercially attractive project might come from unlikely sources. Some of the hottest property that I have at the moment comes from the department of psychology, which I had hitherto not rated as a major opportunity. However, it is. That was my mistake, not that department's. There are other subject areas that have strong research groups, and they will produce good opportunities.

There is tension between the research assessment exercise and commercialisation. The research assessment exercise requires good

papers and journals to be published, and departments are measured on that. If departments are serious about commercialising something however, they might be wise to delay patenting for a couple of years in order to strengthen a patent application and release it at the right time. That means that a department will not have published for a couple of years, so the tension between the RAE and commercialisation is not always comfortable.

The Convener: I want to pursue that point, because I was about to ask about it. In the formula that is used in the RAE, the weighting that is given to publications is substantially greater than that which is given to patents. Is there a need to revisit the RAE, to find out whether it is working against the commercialisation process? Perhaps greater weighting should be given in the formula to patenting.

Hugh Thomson: Yes—there is such a need. Over the period when the RAE has operated, it has evolved and moved in such a direction as to help and take into account work of a more commercial nature than purely academic research. It has a bit further to go.

The Convener: Do you agree that there needs to be a revisiting of the balance?

Hugh Thomson: Yes.

The Convener: My final question relates to scale of investment, both in the basic scientific base and in commercialisation. A few months ago, Scottish Enterprise announced an allocation of £40 million over four years for biotechnology and about a week later, the Irish Government announced funding of £500 million for biotechnology and information technology over three years. Conceptually, the proof-of-concept fund is absolutely the right way to go, but the amount that is invested here is peanuts relative to what some other countries invest. What do you think about the scale of funding? If you consider the example of the Irish—let alone the Finns and others—do not we need to upscale by about a factor of 10?

Hugh Thomson: I think that a lot more could be done. It is heartening that proof-of-concept and challenge fund schemes are with us—those schemes have plugged the gap. In the past, research council funding supported fundamental research, and the assumption thereafter was that everything else was near-market research, and that industry would pick it up. That is not the case. For many years, it was extremely difficult for the universities to find the level of money that was required to take research results a couple of years on from when they were produced and to translate them from something esoteric into something more tangible and more easily assessed by

industry and its backers.

People such as me have been standing on public platforms for the past decade, saying that we need support. I am pleased that that has begun to happen. I know from the example of my university and from other universities that many more good projects could come through. In a sense, to prove that the concept works, those should be our best potential commercial projects. They have been carefully selected and given most valuable privileged treatment and money that, in the past, was not available to such projects. Industry should be beating a path to our door, although it seems that I shall have to encourage industry to come to us—its funding is vital.

15:45

The Convener: Thank you—your evidence has been extremely helpful.

I now call to the table John McClelland, Douglas Mundie and Nelson Gray. John McClelland is the chair of, and Douglas Mundie the chief executive of, Technology Ventures Scotland. Nelson Gray is a business angel.

I assume that John McClelland will lead.

Professor John McClelland (Technology Ventures Scotland): We decided a few minutes ago that Douglas Mundie will lead, and that I will add a few words.

Douglas Mundie (Technology Ventures Scotland): I will introduce our personnel. As you said, convener, I am the chief executive of Technology Ventures Scotland and Professor John McClelland is our chairman. Members should have received a submission on our organisation and our role in the commercialisation of research in Scotland.

As well as being jointly funded by SHEFC and Scottish Enterprise national, we received extensive support from the Royal Society of Edinburgh in introducing the concept of TVS and in starting its life last year. We work closely with those three bodies and with all parties that are interested in improving the links between business and the research base.

You asked us to bring with us an expert witness on venture capital. I approached David Grahame of the Local Investment Networking Company—LINC Scotland—which works across the business angel network, but David is unavailable today, unfortunately. He recommended that we persuade the third member of our team—Nelson Gray—to join us, and we are fortunate to have him with us. Nelson is the chief executive officer of Gap Fund Managers. He is a business angel who also manages two venture capital funds in the east and west of Scotland. He has been involved with about

50 companies seeking venture capital funding.

John McClelland: Douglas Mundie is the only full-time operating employee of TVS and was recruited last year from industry. That was deliberately done to help with the activity and direction of TVS and to add as much industrial experience as possible to our theme of commercialisation. Part of our logic in recruiting Douglas, and part of the great advantage of having him in his role, is that he brings the industrial perspective into TVS.

As you heard Hugh Thomson say, elements of both the research side and the commercialisation side in universities are well organised. I emphasise that one element of the TVS theme was that of addressing the issues, challenges and obstacles for commercialisation. A challenge, or obstacle, is perceived to be—and is—the issue of industrial pull or involvement in the commercialisation process.

Nelson Gray: I have been an angel-investor in technology companies for five or six years. We have invested in up to 50 companies and have examined hundreds. I have had some interesting dealings with universities.

The Convener: Ever since the Wilson committee reported in the late 1970s or early 1980s, there has been a feeling that the problem is not lack of money, but lack of good projects. In Scotland, there is also a feeling that projects that cost under £500,000, for example, find it much more difficult to attract funding—particularly in the early stages of development—than do bigger projects, simply because small projects cost just as much to manage.

Given the stage that we have reached in Scotland, is there a shortage of projects or a shortage of money? Is it still difficult for projects that are initially low budget—that is, under £500,000—to get the right mix of funding? It is not just a case of getting the funding, as the individual concerned needs to get the right package. Is getting the right package no longer a problem?

Nelson Gray: There are problems and there are a lot of opportunities. Scottish Enterprise has identified the fact that the quality of the presentation of the propositions is an issue. The recent Bank of England report on funding technology companies noted that the creation of investor-ready propositions needs some significant work. Many of the propositions that we see, particularly in the technology sector, focus on the quality of the technology but give little if any emphasis to the market opportunity of that technology and do not show an understanding of how the technology is to be moved from the lab into the hands of a user. More resources have to be put into that area. The potential entrepreneur

must understand how to turn on an investor and know what an investor is interested in.

Scotland, particularly the central belt, is well served by the availability of funds. Business angels are important; the Bank of England report identified that as a key area of development. There are many angel networks in Scotland, several of which I am involved in. LINC Scotland has about 450 members who want to invest money. I suspect that probably 80 per cent of them are sitting on their hands and have not opened their wallets because they have not yet seen a well-presented proposition. A significant amount of money—I once estimated it to be as much as £1 million a week—is not being invested in Scotland because the propositions are not of sufficient quality, however good the idea might be.

There is a lot of money out there. Business growth funds are available, as are my two funds, although they will stop investing at the end of this year. There is the small firms loan guarantee and there will be more European regional development fund investment next year. Banks are also getting in on the action. There is a lot of money available if the propositions can be presented properly.

The Convener: How do we fill that gap? There is no shortage of relevant organisations. In the public sector, we have Scottish Enterprise, Technology Ventures Scotland, which is a kind of hybrid body, and so on. In the private sector, there is LINC Scotland and a host of other organisations. Presumably, closing the gap would get more projects off the ground.

Nelson Gray: There needs to be more interaction on a secondee basis between the people who are preparing the propositions and those who pass out the money. Most suppliers of funding would be happy to do that. Many people from banks are seconded to the people who are preparing their proposition but that process also has to go the other way. People from Scottish Enterprise need to be seconded to the funding organisations to gain an understanding of what the funders expect.

Funding is not based on a static position. It will not help if someone knows what it takes to fund a proposition on a certain day as most of the propositions will have to be funded for a number of years and will attract differing types of funder at various stages. The decision on the type of funding that is brought in at one point could well affect where the money comes from later. An educational process needs to be put in place.

The Convener: Are you saying that the organisation that is best placed to take the lead on this matter is Scottish Enterprise?

Nelson Gray: It is not yet best placed. I might get into trouble here, but, personally, I do not

believe that the customer-facing teams in most of the local enterprise companies have been given the required skills; they have been given skills in relation to Investors in People and various other initiatives. Over the past two years, in an attempt to communicate what turns people on, we have tried to work closely with LECs to explain the difference between funding and investing. I do not believe that it is a mountain to climb. I train my own staff about what we are looking for within a few months.

The Convener: Scottish Enterprise would be well placed if it bought in those services.

Nelson Gray: We need to take people from the public sector, who are champions of the public sector, and give them that education so that they go back into the public sector and act as champions within it. Currently, there is a wee bit of resistance to it, because those people think that venture capitalists and business angels are there to rip off companies. Most of the business angels that I know genuinely want to help companies. I regret that many of my colleagues have got to the stage where they prefer not to deal with the public sector because they feel frustrated. I believe that we could break that down through education and co-operation.

Miss Goldie: I am concerned less with the angel and more with Technology Ventures Scotland. Professor McClelland, I know that Technology Ventures Scotland was established last year, so it would be unfair to ask you to demonstrate that the organisation is a success, but what is the benchmark for measuring what it is doing? As chairman, where would you expect to be in three years' time? How would you determine whether tangible success is attaching to what you are doing?

Professor McClelland: In a few years' time, I would expect to be able to point to genuine economic activity, job creation and value-add that had resulted from the operation of the commercialisation process as opposed to the random operation of it. That is probably at least a year away.

What has been going on in the past six to nine months has been some of the analysis and essential work to understand the economic process and the engine associated with commercialisation. What we have found—I think it is included in the submission—is that there is a popular misconception that there is a silver bullet: that if you address one factor, the whole process will come to pass. The work that we did initially, which is continuing, showed that there are at least 30 different critical success factors or process steps in the commercialisation process. If any of them does not work well, the process will not work.

A popular misconception in the example that we have been discussing is that there is not enough venture capital. When you examine in detail what is going on, you find that there is enough venture capital; what is missing is the education and the preparedness to tap into that capital. A big part of our role is to understand the engine, to understand what is working and not working, to be the catalyst and the complementary force that gets it working and to see Scotland reap the success from that.

We are at the stage of understanding the engine and offering solutions for certain parts of it that are not currently working well.

At the end of the day—and I mean in a year or two, not three or four—I would expect to be able to document economic success from the commercialisation process. We have some of it today: some of it is natural and is working well, but some of it is working very badly.

Miss Goldie: Would that evidence flow from tangible projects or specific areas?

Professor McClelland: It would flow from two things. It would flow from being able to have an infrastructure that was perceived to work well; with individuals such as Nelson Gray being able to say that the part of the process that he is most worried about is working. I am sure that other parts could be focused on as well. The tangible result would be to be able to examine the process and say that it works well. Theoretically, it should drive the economy. There is a practical opportunity to evaluate tangibly, through jobs and value, the value that has been created from commercialising technology.

Miss Goldie: Unforgiving critics might say, having examined the submission, that there is a risk that Technology Ventures Scotland could be all over the place, flitting here and there trying to get a sense of purpose about where it is going. Do you think that there will be a need to have some clear, limited objectives?

Professor McClelland: We identified the 30 critical areas, but we could probably have gone on and found another 30 or 40 that are lower priority. Within the 30 critical areas, we tried to focus on the areas that we think will add most value most quickly.

In the diagram in appendix 4 of the submission, Douglas Mundie has put together the most critical steps. We have started to focus on them and we have two or three different solutions in the pipeline for some of the steps that are not working well. In that sense, we are prioritising.

We wanted to avoid leaping into one or two areas and then finding that, behind them, lie others that are equally important. Being focused is important, but being as comprehensive as

possible is also important.

16:00

Marilyn Livingstone: I will concentrate on your submission and ask you one or two specific questions about it. You talk about 5* research being

"well connected with global companies"

and say that that is where the spin-offs and business start-ups will come from. You go on to say:

"Existing Scottish business has difficulty finding access to such research ... The Research base needs to make itself easier to approach, to become more accessible ... to take real ownership".

Apart from SHEFC's proposal to introduce the

"permanent recurring funding stream for Knowledge Transfer",

what other initiatives do we need? If work is happening on such initiatives but people still find the system unapproachable, what can we do and what is being done to do it?

Professor McClelland: That was one of the critical areas that we considered and started to understand more fully. The initial perception was that the academic part of the process was ready and willing but there was not enough industrial pull.

On further analysis—I will ask Douglas Mundie to comment on it—we started to realise that, as much as there was great work going on in the universities that was available and ready to be commercialised, in dealing with the client base the access that was being provided was largely from a small group of people to large companies on large deals. It therefore did not really address some of the key opportunities that were available to the wider mass of small and medium enterprises.

We saw TVS's role as being to attack that part of the process and to offer a solution. That is one of the proposals that Douglas Mundie has been working on.

Douglas Mundie: As they are currently structured, university commercialisation departments can deal with relatively few high-value deals. The small and medium enterprise community in Scotland is fragmented. By its nature it consists of relatively small companies that are looking for relatively quick solutions to problems. The academic community will state clearly that it does not exist to problem-solve.

We are talking about the difference between the academic time scale and the needs of a business. The newer universities have geared themselves up to be much more commercial in outlook within their local markets. They can react with relatively

few weeks' notice to a problem that needs to be solved. More fundamental research and development takes more time. Trust needs to be built between businesses and universities to make that work.

For someone who has not been to university—frankly, even for someone who has—the universities are fairly difficult to approach. It is not easy to find the right department. We have 14 universities in Scotland with eight different names for their research and commercialisation departments. It is not easy for someone to get through that and find an academic who will take up their problem and work with it.

We are considering how best we can develop a system that will make those approaches easier, that will understand the needs of business better and that will bring the two parties closer together.

Mr Duncan Hamilton (Highlands and Islands) (SNP): I will first pick up on your last point, because it is interesting. The academic community and business have not traditionally been bedfellows. Have you encountered resistance on the part of the academic community to take such a venture seriously? Is there, because of the need for a culture change, a lack of desire to embrace the venture?

Douglas Mundie: I go back to what Hugh Thomson said earlier. The academic community has been made competitive by the research assessment exercise—institutions compete against each other. To get funding, our academic community is motivated to produce papers, to do research and to teach. Until recently, there was no focus on the need to work with existing businesses, or on telling academics that commercialisation is a good thing. Most academics do not instinctively feel that commercialisation is an important agenda or one that they want to pursue.

However, the situation is changing. Over the past year, the Scottish Institute for Enterprise was established specifically to work with academics, students and business to stimulate an enterprise culture. Some academics from 3 to 5* research departments are very motivated and commercially aware—they are absolutely excellent—but not enough academics have that attitude. There must also be incentives for academics, to make them aware that commercialisation is an important agenda.

We have seen SHEFC's proposal that a knowledge transfer fund should be established, which is a good first step, but I would question whether enough money is being detailed towards SHEFC's proposal to catch academics' attention—rather like the proof of concept fund. Equally, we must do something to attract the attention of small

and medium enterprises. As Nelson Gray said, there is cynicism about whether the academics, or the commercialisation departments, are really interested in this agenda. Do they really want to let the research come out? We must consider how best to catch the attention of small and medium enterprises and of academics, to bring them together to focus on commercialisation.

Mr Hamilton: I would like to pick up on two aspects of that stimulation of demand that are mentioned in your paper. As matters stand, there is no indigenous research in the Highlands, although that may change. You quote examples from the Highlands, where the challenge is helping small and medium enterprises to develop their own ideas. That raises the question whether that is the priority. It will always be easier to get businesses to take on their own ideas than to persuade them to take on those of anyone else. In the first instance, are you suggesting that the example of the Highlands could be rolled out, in that the core ideas of a business could be rolled out, after which some kind of relationship with the universities could be generated?

Douglas Mundie: There is room for both approaches. The situation in the Highlands interested me. Because of the lack of indigenous research on the doorstep, specific effort had been made by the LECs not just to get to know the people involved in the business community but to find out how their businesses operated, what ideas they had and what they could do if they were helped in a broader way than their existing businesses allowed for. As I said earlier, the result of that work is that a research facility has been set up which is developing ideas and that 10 projects—which will lead to new businesses—have been established. Four of those projects are very active.

I use that analogy when I work with small and medium enterprises south of the Highlands. I try to understand the businesses and to find out what they need. Where there are solutions that can be helped by the research bases, I try to ensure that those projects are understood within the academic community to get results from them that meet the needs of business.

Mr Hamilton: I have a final question on the other aspect of stimulation of demand. In your submission, you mention the Scottish Executive "Report on the Knowledge Economy Cross-Cutting Initiative", a core part of which deals with the online exchange mechanism. Could you say a little more about that? What is the time line for delivering that exchange mechanism? Are you charging for that work? I presume that it is a commercial operation.

Douglas Mundie: Not necessarily. About 90 per cent of the research conducted in Scottish

universities is not commercialised. That does not mean to say that all research is commercialisable, but there would be a lot to work on if even 50 per cent of that 90 per cent was commercialisable.

I came in from business in September. It was not easy to find what research is being undertaken. I can knock on the door of any university and be told about their departments. I can visit research departments with the aid of people from the university, but there is no easy way in which to find out who is undertaking broad or specialist research.

When I arrived, SHEFC had been funding phase 1 of the Scottish research information system for about a year. The idea was to have the research work undertaken by the SHEFC-funded institutions freely available for anyone to examine. That was a great first step. Equally, that work has drawn attention to several problems, such as the difficulty of and the need for keeping the research database up to date.

At present, it is proposed that specialists input into specific fields in the database. That costs money. Alternative proposals have been developed by the SIE universities that use the database that can take output from academics—plain text documents—put it straight into a database and develop it from there. We are having discussions with SHEFC and SIE about integrating the two systems and we hope that, by the end of the summer, SHEFC-funded research projects will be available in such a form.

I should also like research from other databases, such as the Scottish agricultural and biological research institutes and the Economic and Social Research Council, included in the project so that we have a true picture of the complementary research that is being undertaken in Scotland.

The Convener: Can I clarify a couple of points? What about Longman's research base for all academic research in science and technology? It has information on all contracts in every university in the United Kingdom and is updated every six months.

As for the relationship between SMEs and universities, our concentration is obviously on research, but do you agree that much is going on between SMEs and certain universities in technology graduate placement programmes, for examples, which are beneficial to SMEs and graduates?

Douglas Mundie: I shall take your last point first. Yes there is activity in specific sectors, but not enough. There are 100,000-odd SMEs that might be able to use our new technology better than the 300,000 VAT-registered SMEs in Scotland; we could make more research available to interested parties.

Yes research databases are available, but we are discussing one that is easily searchable in plain English and focuses on Scotland, not the United Kingdom as a whole, and would be of benefit to the Scottish community. It would lead to a better relationship in developing technology than we have at the moment.

Tavish Scott: I should not like to become one of the unforgiving critics to whom Annabel Goldie referred, but I notice under appendix 4 of your submission that you have omitted my constituency. I am sure that, in future, your map will reflect the whole of Scotland, not just part of it; otherwise I shall send you a tee-shirt that we produce in Shetland of Scotland as a little box off our coast, not the other way round.

I was interested in Mr Gray's comments about the quality of propositions. Earlier, Hugh Thomson referred to spin-off companies and their development funding. Is it your proposition that the quality of the bids fail on the academic side or the business side, or is it a combination of both? Is there a pattern that you regard as a barrier to entry and something that needs to be dealt with?

Nelson Gray: My problem is with the business side of propositions. Because of their nature and interests, academics and universities focus on producing the best possible technology. However, some of the largest companies in the world, such as Microsoft, are not founded on the best possible technology—in fact, I suspect that Microsoft's technology is not terribly good, but the company has got the business aspects right. The important thing is to understand how to move a piece of technology into the marketplace and meet customers' needs.

16:15

As for how that fits into funding of research, I had not read the documentation for funding for research before last weekend. I was interested to find that none of the three research papers that the clerks sent me mentions market demand. A reference might be found under the suggestion about the research development foundation grant in one of the papers, where it says that the fact that someone is willing to put money into a project is perhaps an indicator that it might be worth while. That makes me wonder whether there is any significant element of market assessment when money is provided for research. In that light, it is probably not surprising that no one is beating a path to the door of the institution to take on its research. There should be a bit more market awareness.

Although blue sky research is important, a balance needs to be struck between blue sky investment that will give us something in five, 10,

15 or 20 years' time and finding out what we need from institutions today to provide jobs and wealth creation within a relatively short period of time.

Tavish Scott: So am I right in saying that you do not think that the balance is right yet? Earlier, Hugh Thomson said that the formation of a spin-off company was often two—if not more—years away from being a commercial reality.

Nelson Gray: There is a difference between the point at which technology or a business hits the marketplace—in other words, the point at which you have a paying customer—and the point at which it becomes investable. Venture capitalists and business angels accept that we could well be investing in things today that a customer will not see for many years to come. The important issue is to demonstrate that there might be a market need for a product and that, to reach a customer, the product will be licensed, sold to a large pharmaceutical company or developed in partnership with someone else. Very often that approach is not present.

I am part of the VeRN group, which is made up of 20 or so technology entrepreneurs who have come together with the desire to get involved with technology companies at a very early stage. It has been very hard work to get into the universities and other institutions early enough. We want to see the technology and the individuals who will support that technology before a company is formed. Some key organisations in Scotland know the value of such private sector commercial input early on. For example, some of the technology used by a company called Kymata was developed by the University of Southampton and the University of Glasgow. Although both institutions will probably take 100 per cent credit for the work, I wonder whether the credit should actually go to the three guys who put £10,000 each into the pot and created a real commercial business plan.

A few weeks ago, I visited an institution—it had better remain nameless—with five potential spin-out companies on its books. They were the same five companies that the institution had on my previous visit 14 months before. That institution needs to get someone in who can motivate, push and shove to create opportunities. Furthermore, the companies need entrepreneurs who have the desire, guts and determination to make things happen. The academics have their place, but we need to introduce that other element.

Professor McClelland: My day job is managing part of a US technology company. It is interesting to find that, even within that silicon valley company, the very best engineers coming up with the very best innovations are not necessarily the best businessmen to put business plans together. In Scotland, we have good innovation and research and available funding; the vital ingredient

that is missing is business management. For example, in my business, I have business managers who shadow the engineers and put the business plans together. It is simpler and easier to train up a business manager than to train the very best scientists to become the world's best business managers.

The Convener: As two more members want to ask questions, I will limit the discussion to them so that they get a fair crack of the whip.

Mr Macintosh: Your analysis that businesses are willing to make long-term investments contradicts Mr Thomson's evidence. He suggested that few Scottish companies are ready and willing to commit to the considerable risk and expense of taking several years—

Nelson Gray: Are we talking about companies or venture capitalists? Companies have a responsibility to their shareholders, and most of them look for short-term survival or profits. Furthermore, most large-scale venture capital funds have to report back to their shareholders and need a return on that money, probably within five years or a heck of a lot sooner than that—indeed, they might be looking for a three to five-year pay-off.

The people who need to get involved are the business angels, who include such well-known names as Andy Davis, and Ian and Martin Ritchie. They are willing to be involved in companies at the early stage before the company is even formed and will probably put in a few pounds of their money as well as the more important factors of time and expertise. They are people who have operated businesses in the United States and who have been involved in negotiating contracts with companies such as Sony.

Traditionally, the angel network was willing to wait at least five years for any type of pay-off, as that was when they got the tax breaks. The tax-break rule has been changed to three years, but when I make an investment as a private individual, I am looking at five to 10 years before the company is going to be big.

We are talking about putting only £20,000 to £30,000 into a company to get it going and make it viable. In January last year, one of our funds put £20,000 into a company. After working with the company for five months, we got 3i involved and 3i picked up the company. What is important is the little bit of commercialisation that goes in early. The simple answer to the question is yes—we will wait a long time.

Mr Macintosh: Mr Gray said that academics are unlikely to work to predict demand or guide research into an area where there is likely to be business demand for the product that they are developing. Could academics in the university

sector ever do that job?

Nelson Gray: I do not necessarily say that academics cannot predict demand, but the way in which they are funded does not encourage them to do so. It is your money and my money that pays those guys—I wonder whether we should not have a bit of a pay-off as well. When we go in to do a deal with a university, we are told that what we are talking about is the IP—intellectual property—of the university or academic. I could say, "Hey guys, as the public sector has been paying for that for the past 20 years, why should we not get a pay-off as well?" That might be a convoluted argument, but let us get some benefit of that public sector IP back into the community. If the academics are being monitored, promoted and judged on how many academic papers they have produced and not on how much IP they have produced or how many spin-out companies they have promoted, there is a disincentive to push for commercialisation.

Mr Macintosh: I will put my final question first to Mr Gray and then to Technology Ventures Scotland. I want to ask about the tension between commercialisation and academic freedom. Is there a need for a more strategic approach to the application of research money in our higher education system? Such an approach would not need to promote commercial criteria, but would take a view as to the business sectors that we should be investing in, including high technology and pharmaceuticals. Would you welcome that approach, rather than the RAE system, which is based on the number of research papers produced and so on? The criteria should not necessarily be baldly commercial, but they should be more in tune with the needs of the economy.

Nelson Gray: I will answer that indirectly by considering the example of biotechnology. There are many very small biotechnology spin-outs, most of which will not succeed because they are too small. It is necessary to bring them together, so that there is critical mass and they can compete in a world marketplace. My instinct—it is no more than that—is that the research base needs to be similarly focused. I would not like to be the guy who had to decide about which bit of research would go and which would not, but an across-the-board application of research may not get the best result out of any one area.

Professor McClelland: Directionally, technology foresight was intended to do that. The result was too tentative. It was directionally correct, but we should be stronger in directing funds from a research point of view.

Des McNulty: I will ask one question in three parts.

The underlying message that I have picked up

about technology transfer in the commercialisation of research is that there are too many universities and that trying to deal with 14 universities is a problem. Do you want to comment on that?

Secondly, does the RAE method of certification serve a purpose from your point of view? Presumably, most of the departments that you deal with have ratings of 4 or 5. I notice that you have referred to 5* rated academic departments, but I understand that there are fewer than five of those in Scotland. Does RAE rating give you any indication of the quality, or do you focus on the quality of the proposition from the individual researcher or group of researchers?

Finally, are there too many organisations on your side of the equation trying to help the commercialisation process from the public sector? Do you regard your organisation as distinct, unique and having a specific purpose, or do other organisations do parts of what you do in different ways? Is there some confusion?

Professor McClelland: I will answer the last question first. That is an excellent point. Technology Ventures Scotland had, and still has, an umbrella role. It might not even be necessary in the perfect environment, but so many organisations deal with so many different aspects of this engine—as I call it—that our role is primarily to co-ordinate, oversee, stimulate and act as a catalyst where things are going badly. We can even create organisations where they are absent.

For example, an organisation is in place to deal with the entrepreneurial culture and we work with it. We are considering forming organisations to complement our work in sectors such as brokering, in which there is an absence of activity. I see our role as being intended to be complementary. We do not want to be a competitive player in what is an active but unco-ordinated sector.

Douglas Mundie: On whether there is too much activity and whether TVS is part of that, much of the noise in the business support sector comes from Scottish Enterprise. Major changes are taking place within Scottish Enterprise and Highlands and Islands Enterprise to produce a much more focused delivery. That is important. Business wants to deal with one point of contact—or perhaps two.

On brokerage, it would aid business enormously if there were one point of contact on the business support side and an equally focused point of contact for universities. I did not say that 14 universities was too many; I said that having eight different names for commercialisation departments in 14 universities added to the confusion. We do not signpost the front door clearly enough, but we

are seeking to address that to allow easier access and, when access is gained, deliver ownership of the relationship between universities and businesses.

16:30

The Convener: Your evidence has been extremely helpful. Thank you also for your submission, which was circulated to the committee prior to the meeting.

Item 5 is a paper, which has been circulated, on the specification for an adviser to the teaching and research funding inquiry. I hope that it is straightforward. Do members have any comments?

Marilyn Livingstone: The adviser would have to get the process under way soon, so we need to choose an adviser quite quickly.

The Convener: Absolutely.

Lifelong Learning

The Convener: Item 6 is our lifelong learning inquiry, on which a paper has been circulated. We have agreed the general remit for the inquiry, but we need to be a bit more specific about how it is to be fleshed out. We must be clear about what questions the inquiry should pose and answer. We are seeking members' feedback on that and on the specification for an adviser.

Based on the experience of the committee's first major inquiry into economic development, I suggest that we build in the flexibility to have more than one adviser, if required, as the range of subjects that we will cover and the nature of the institutional structure of lifelong learning is such that we would be extremely lucky to find one person who can cover everything. I am not saying that such a person does not exist, but we should allow ourselves the flexibility to have another adviser. Simon Watkins tells me that we had up to four advisers at various stages in the inquiry into economic development. Given the scope of this inquiry and the fact that we do not want it to be too long, more than one adviser may be required.

Marilyn Livingstone: I agree. We have allowed only 10 days for the adviser. If there were only one adviser, that would not be enough time. Therefore, we must think about consulting three or four advisers, each for that time scale. We will have the adviser on the SHEFC inquiry for 14 days, and we will need more than one adviser in this inquiry.

Under the heading,

"The Committee will wish to investigate",

I would like us to focus on the issue of accessibility to institutions and the widening access and social inclusion agenda, which we considered at our previous meeting. We should also focus on the issue of gender equality. There should be bullet points in the paper for accessibility, equality, widening access and social inclusion, as those are important aspects of our remit.

The Convener: I am not suggesting that we should undertake a series of visits, but I think that we should also include international comparisons. We know that there are comparable countries that it would be easy to get information about through the Organisation for Economic Co-operation and Development, which has experts in that field who are based in Paris. A key part of the inquiry is about improving Scotland's competitiveness in the international market. If we do not look at what other people are doing, we clearly do not know how to benchmark that, so I suggest that we build in a reference to some international comparators and benchmarking as part of the research.

Tavish Scott: I want to make two small points. The statistic that has haunted me in the brief time that I have been on the committee is the one that Electronic Scotland gave us when we were in Linlithgow: we are not producing enough graduates in particular engineering disciplines to satisfy the needs of that growing sector. Which bullet point does that come under? Do we need another mechanism to achieve that?

Marilyn Livingstone mentioned social inclusion, but there is also geographical inclusion. For example, there are now strong demands from the south of Scotland to consider how learning institutions can best meet the requirements of communities in that area. We need to be mindful of that need as we conduct our study. We are not talking about only Edinburgh, Glasgow and Aberdeen.

Elaine Thomson (Aberdeen North) (Lab): I support what Marilyn Livingstone said, and I also agree with Tavish Scott's point about geographical inclusion. There are different kinds of inclusion.

My main point is the one that you made, convener, and concerns the extent to which we have a lifelong learning strategy and delivery mechanisms that meet our economic objectives. That needs to be clearly specified, as it relates directly to what Tavish Scott is saying. Unfortunately, the whole problem with technology and engineering does not reside only in Electronic Scotland. The situation is equally bad, if not worse, in the oil and gas sector.

The Convener: Or in the construction industry. Many sectors face similar problems.

Elaine Thomson: I would like clear objectives.

Miss Goldie: I am glad that Elaine Thomson has mentioned that, because that seems to me to be the anchor around which the whole inquiry pivots—if it is possible to pivot on an anchor.

Marilyn Livingstone: I am sure it is, Annabel.

Des McNulty: My concern would be whether the specification prevents us from looking at one or two difficult short-term areas that need to be considered as part of the lifelong learning inquiry. I am thinking particularly about the funding arrangements that are associated with further education, and the extent to which deliverables can be pursued through that. There are issues that will hit us in the face in the course of the inquiry, and we need to ensure that we have something in our specification to take account of that.

The Convener: You make a good point. I suggest that, under the fourth bullet point, we should refer not only to "funding mechanisms" but to funding levels and the distribution of funding. We are concerned with the whole architecture of the funding and not just with the mechanisms.

Des McNulty: We are also concerned with how that relates to the points that Marilyn Livingstone raised, and perhaps also to the Government's broader social justice agenda. We have been given a framework that the Government says is the core of what it is trying to do. We need to ask whether the deliverables that are operating are geared towards that set of objectives and how well they are working from that point of view.

The Convener: We should not forget the role of community education, as it clearly has a major role in lifelong learning, depending on what geographical area we are talking about.

Des McNulty: If there is any community education left.

Elaine Thomson: I would like to amplify Des McNulty's point, which I think is valid. The other aspect that we have to consider is what investment companies and organisations are making in training and lifelong learning.

The Convener: Until recently, companies were not allowed to get support for in-house training from the enterprise network, as a result of Treasury rules. Yet the whole thrust of the business development strategy is to make businesses more competitive, and we cannot do that unless we are prepared to invest. Perhaps we should specify that as an area that we want to be sure about. Clearly, part of the lifelong learning drive is to support companies to upgrade the management and vocational skills of their people.

I shall ask Simon Watkins and his clerking team to redraft the remit of the lifelong learning inquiry in the light of the comments that have been made. I think that there is broad agreement on what we are trying to achieve, but I shall ask him to circulate the remit for any additional comment before we finalise it. It is the type of thing that members may want to give a bit more thought to. We want to finalise it fairly soon, so that we can then agree the methodology, the time scale and the list of people whom we want to interview. That will give members a further opportunity to input suggestions. Is that agreed?

Members *indicated agreement.*

The Convener: I look forward to seeing members at 9 o'clock next Tuesday morning, when the Deputy Minister for Enterprise and Lifelong Learning and Gaelic will be here.

Meeting closed at 16:39.

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