

Inquiry Into The Economic Contribution Of Higher Education By The National Assembly For Wales' Enterprise And Learning Committee

Action Points Arising From HEFCW's Appearance On 10/07/08

Action Point 1 – a note on the highlights of the HE Business and Community Interaction Survey (HEBCIS)

1. The latest UK-wide Higher Education – Business and Community Interaction Survey (HEBCIS) was published by HEFCE, on behalf of the four UK funding bodies, on 10 July 2008. The survey is much used across UK Government Departments as they look to assess and react to the impact of HE on the economy.
2. HEBCIS is an annual exercise (currently in its seventh year) that is developing into a key vehicle for assessing the volume and development of knowledge exchange activity between the higher education sector and business and the wider community. Business in this context means both private companies of all sizes and sectors and public bodies such as the NHS. Community is taken to mean society as a whole and includes all its social, civic and cultural components.
3. HEBCIS also allows a comparison between the performance of the HE sector in Wales not only with Scotland, England and Northern Ireland, but also with individual regional development areas (RDAs) across the UK. This year's survey covers the academic year 2006/07.
4. Wales continues to punch above its nominal 5% weighting in a number of important areas and some of these are highlighted below. It is also encouraging to note that successive surveys illustrate the progress being made by Welsh HEIs in areas where hitherto their performance has compared unfavourably with the rest of the UK, notably in relation to the commercialisation and exploitation of the intellectual property that resides within them. In this context implementing the recommendations of the Gibson Review will provide an opportunity to move still further forward in this area.
5. Key findings show that in 2006/07 Wales:
 - accounted for 10.1% of income from collaborative research involving both public funding and funding from business, outperforming 7 out of 9 English RDA regions. Welsh income generation has increased in this area by more than 77% since 2001/02 and in 2006/07 reached over £67.7 million.
 - accounted for 7.3% of UK income from consultancy contracts with small and medium-sized enterprises (SMEs) and 6.3% of total UK contracts. In 2001/02, Welsh HEIs handled 780 consultancy contracts; in 2006/07 they handled 3,658.

- held 6.4% of the UK higher education sector's cumulative portfolio of active patents, again outperforming all English RDA regions with the exception of London and the South East. Welsh patent activity has increased significantly since 2001/02.
 - generated 13.1% of all higher education business spinout and staff start-up activity and 10.7% of all UK graduate start-ups. Since 2001/02 the number of spinout companies and staff start-ups which have survived for more than three years has more than doubled, with the estimated turnover of all active firms now reaching over £41.8 million compared with just over £22 million in 2001/02.
6. HEBCIS also provides qualitative as well quantitative data and here it is interesting to note the table overleaf that compares the economic development priorities of HEIs in Wales with those in England, Scotland and Northern Ireland. Last year's HEBCIS reported "that HEIs in Wales have a relatively strong focus on developing skills and retaining graduates in their home country" and this is further evidenced in Table 1 (attached at Annex A), where the percentage of Welsh HEIs citing *meeting regional skills needs* as one of their top three economic development priorities has now risen to 55%.
 7. HEBCIS is building a picture of long term trends that also facilitates the identification of unexpected results in a particular survey year. For example, the 2006/07 survey indicates a large drop in the provision of continuing professional development (CPD) to SMEs – an area where HEIs in Wales have previously performed well in comparison with the rest of the UK. This drop may possibly be due to a data collection issue. Although it is countered by the fact that Wales' percentage of total learner days delivered has jumped from 1.3% in 2005/06 to 4% in 2006/07 (with Wales also accounting for over 6.5% of associated revenue) the fall-off in CPD provision to SMEs will need investigation.
 8. In other areas Wales continues to do well in penetrating the often hard to reach SME market. For example in 2006/07 Wales accounted for:
 - 25% of software only licences granted to SMEs;
 - nearly 8.5% of facilities and equipment related service contracts with SMEs; and
 - over 7% of consultancy contracts with SMEs.
 9. However, while Wales's share of overall income from intellectual property has been rising steadily since the HEBCIS began, its total share in 2006/07 is at 4.1% still below its nominal 5% UK weighting. This may in part reflect the large volume of interactions between HEIs and SMEs in Wales but it also reflects the findings of the Gibson Review and underlines the opportunities that might accrue

from increasing the level of interactions with large national and multi-national companies.

Action Point 2 – an analysis of the numbers graduating in STEM subjects in Wales and other parts of the UK and how they compare

10. HEFCW's written evidence summarised our involvement in a number of UK wide initiatives that will seek to address concerns about the low numbers of young people graduating with degrees in STEM subjects. We also stated that our own analysis showed that this issue is less acute in Wales than in other parts of the UK.
11. The report commissioned by HEFCW in 2006, *Subjects of Broader Importance in Wales*, is attached at Annex B. A comparison of full-time undergraduate enrolments in strategically important and vulnerable subjects (2004/05) indicates a number of subjects where provision in Wales is proportionally higher than in England:
 - Agriculture
 - Forestry landscape
 - Forensic Science
 - Astronomy
 - Geology
 - Ocean Science
 - Physical Geography
 - General Engineering
 - Civil Engineering
 - Mechanical Engineering
 - Electrical and Electronic Engineering
 - Production Engineering
12. The proportion of full-time Biological Sciences undergraduate enrolments was also higher in Wales than in England. However, in some branches of Engineering (namely Aerospace Engineering, Chemical Engineering) the situation is reversed, with the numbers of enrolments in Wales proportionally lower than in England. In Chemistry, Physics and Mathematical Sciences enrolments in Wales are only marginally lower than those in England
13. The analysis led HEFCW to conclude that there is no need for radical supply side intervention. We will continue to monitor closely the position in relation to subjects of specific concern, but in a Wales-England context, rather than focusing solely in Welsh provision, working jointly with HEFCE as described in our written evidence.
14. Annex C provides figures for UCAS applications to STEM subject courses at UK HEIs from 2003/04 to 2005/06. These figures confirm that the number of

applications to HEIs in Wales is relatively strong compared to other parts of the UK.

15. The report of the Royal Society, *A degree of concern? UK first degrees in science, technology and mathematics*, is also relevant in the context of the UK market for students. Chapter 4 looks at trends in student choice post-16, and indicates a recovery in the take-up of A levels in chemistry, biology and mathematics over recent years, with only physics still in decline. The report also states that there is evidence that the fall in overall numbers entering A-level mathematics, physics and chemistry has been largely in less able students in these disciplines, with the number of A grade passes actually increasing. The report can be accessed via the following link
<http://royalsociety.org/document.asp?tip=1&id=5467>.

Table 1 Economic development priorities (proportion of HEIs)*

Areas of activity	Northern					UK
	England	Ireland	Scotland	Wales		
Access to education	55%	50%	65%	64%	57%	
Research collaboration with industry	39%	0%	35%	45%	39%	
Supporting SMEs	38%	50%	12%	36%	36%	
Meeting regional skills needs	35%	50%	24%	55%	35%	
Technology transfer	30%	100%	53%	9%	32%	
Meeting national skills needs	28%	0%	41%	0%	27%	
Graduate retention in local region	20%	0%	6%	27%	19%	
Developing local partnerships	17%	0%	18%	9%	16%	
Attracting non-local students to the region	14%	0%	29%	9%	15%	
Support for community development	14%	0%	0%	27%	13%	
Attracting inward investment to region	5%	0%	6%	9%	5%	
Spin-off activity	2%	50%	12%	9%	4%	
Management development	4%	0%	0%	0%	3%	

* Respondents were asked to select the top three areas of priority in terms of making an economic impact

Source: HE-BCI Part A Question 1



SUBJECTS OF BROADER IMPORTANCE IN WALES

Tender No T04HE/2005/06

**Report to the
Higher Education Funding Council for Wales**

April 2006

**Richard Lewis, Centre for Higher Education Research and Information
(CHERI), Open University, in association with Nigel Brown of Nigel Brown
Associates**

SUBJECTS OF BROADER IMPORTANCE IN WALES

Contents

INTRODUCTION	3
OVERVIEW OF THE WELSH HIGHER EDUCATION SYSTEM	6
Size of institutions	6
Level and mode of study	7
Students from outside the UK	8
Cross border flows within the United Kingdom	9
Changes in full-time undergraduate fees	11
Subjects of study	11
WELSH HIGHER EDUCATION: A SEPARATE SYSTEM?	14
DEFINING SUBJECTS OF BROADER IMPORTANCE TO WALES	15
The demand for graduates in Wales	15
Evidence of graduate shortage	16
Disciplines of economic and industrial importance to Wales	16
The specific needs of Wales	18
<i>Welsh language, literature and culture</i>	18
<i>Welsh medium and bilingual education</i>	19
<i>Welsh and initial teacher training</i>	20
<i>Cwrricwlwm Cymreig</i>	21
<i>Differences in the requirements for professional qualification</i>	21
<i>Other factors</i>	21
ENGLISH REVIEWS OF SHORTAGE SUBJECTS	23
Definitions of strategic importance and vulnerability	23
The group's methodology	23
The supply of places in strategically important subjects in England and Wales	25
STUDENT DEMAND FOR PART-TIME HIGHER EDUCATION	27
CONCLUSION	30
Overall conclusion and recommendations	32
ANNEX	34

INTRODUCTION

This is the report of a study commissioned by HEFCW on subjects of broader importance to Wales. The genesis of this study was the requirement placed on HEFCW by the Minister for Education and Lifelong Learning in her 2005 remit letter:

“I expect HEFCW to stay abreast of the work going on in England to identify and protect strategically important subjects. The issues facing us in Wales are quite different. We will not be able to sustain the same breadth of subjects. I am, however, anxious that we should not deprive Welsh-based students of the opportunity to study subjects that have a broader importance in the Welsh context. By the turn of the year I would like preliminary advice from the Council on those subjects that might fall into this category and which may be difficult to sustain and on options as to how we should respond to this”.

The broad aim of the study was, on the basis primarily of desk research, to provide an initial indication of subjects that can be considered of broader importance in a Welsh context.

We have conducted an extensive review of the literature and held discussions with a number of individuals from the Welsh Development Agency, the Welsh Assembly Government and HEFCW. (Details of which are set out in an annex to this report.)

Following discussion with the Chief Executive of HEFCW, we used as a working definition of subjects of broader importance:

Subjects, which if they were to disappear from the range of subjects offered by Welsh Higher Education Institutions, either at postgraduate or undergraduate level, would have a serious deleterious impact on the Welsh Economy, Culture or Society.

The issue of vulnerable subjects has been addressed in the English context, most recently through the report of the HEFCE Chief Executive's "Strategically Important Subjects Advisory Committee", chaired by Sir Gareth Roberts, whose report was published in June 2005 (HEFCE 2005a) and by the House of Commons Science and Technology Select Committee report also published in 2005 (Science and Technology Committee, 2005). We have taken note of the findings of the two committees in making our recommendations.

A number of the reports that we have reviewed, most notably *Knowledge Economy Nexus* (WAG 2004), have stressed the important contributions that Higher Education Institutions (HEIs) make to the Welsh Economy, Culture and Society, through direct contributions as businesses in their own right, through the supply of graduates and other highly qualified manpower to the economy, through the commercialisation of knowledge through engagement in Knowledge Transfer programmes, and through their cultural influence linked to excellence in teaching, scholarship and research, through which the self-confidence and the 'can-do' attitude of a community can be enhanced. However, we have not, with only a few exceptions, found either in the literature, or from our discussions with individuals, any evidence that identifies individual subjects as being of broader importance to Wales, insofar that there would be great concerns if that subject was not offered by any HEIs in Wales.

Two of the exceptions are the availability of the teaching of certain subjects through the medium of Welsh, where individuals are preparing for employment in public services, such as teaching and social work, and the study of the Welsh language and culture in its own right. In both these areas Welsh HEIs must be the principal providers.

There is clearly a need for the training of professional staff, but especially those training to teach in Welsh schools, to be available through the medium of Welsh both in terms of access for predominantly Welsh speakers and to ensure a flow of individuals with the confidence and capability to exercise their profession through the Welsh medium.

The academic study of the Welsh language, literature and culture is an essential element in sustaining that culture and is clearly of broader importance to Wales. It is necessary in order to ensure the continued supply of individuals capable of using the language at a high level and in providing the future supply of academic staff to continue the tradition of research and scholarship. This must be a strong and integral part of the Welsh higher education system.

Another exception relates to those areas where there are differences between the professional qualification arrangements in Wales and England and other parts of the United Kingdom, and where the differences relate to requirements for academic study involving HEIs. This is perhaps currently most advanced in Nursing and Social Work which are moving from diploma level qualifications to degree level qualifications for professional registration, and it is likely that it will be of increasing significance in other professional areas.

The issues surrounding 'Cwrricwlwm Cymreig' that education at all levels (including higher education) will give due weight to the Welsh issues within different subject areas were also drawn to our attention. This has implications for all disciplines delivered in Wales, but especially initial teacher training, and its importance needs to be borne in mind in considering subjects of broader importance.

Special considerations apply to the availability of subjects for part-time higher education study because a significant part of this is aimed at students who cannot readily access full-time provision. Here the most important factor is to ensure that students resident throughout Wales have the opportunities to select from a broad range of subjects.

The conclusion that, with the important exceptions referred to above, there are no subjects of broader importance in Wales flows, in our view, from the answer to a prior question; whether or not the higher education system in Wales should be self-sufficient providing programmes in all areas of need to Wales. A case could be made that, as a matter of national identity, or even pride, it was important to establish a self-sufficient system and not have to rely on HEIs from outside the country to produce some of the qualified personnel on whom the country depends. We have not, during our investigations, found anyone who advocates this position.

This is not only a matter of relevance to Wales. We live in a world where simultaneously new frontier lines are drawn, as a result of devolution, but where existing lines are being made porous through the creation of such entities as the European Union. Higher education has always been an international activity and so the reduction in the significance of national frontiers has had an especially important impact on higher education.

It is perhaps best not to think in terms of one system of higher education but of many systems. A Welsh institution is of course part of the Welsh system of Higher Education but it is also part of the UK system and, increasingly because of Bologna, of the European system and the World system.

It appears that the general view, at least so far as full-time undergraduate provision is concerned, is that the present situation where there is a healthy exchange of students and graduates between Wales and the rest of the UK (but especially England) is an acceptable model to take forward.

As *Knowledge Economy Nexus* (WAG 2004) observes, nearly half (46%) of all Welsh-domiciled graduates (who represented 6% of all UK graduates in 1998-99) either did not return to Wales or moved away on graduation. While recognising that this is a problem in terms of the lack of return on the investment in higher education, it is similar to that found in some other regions of the UK with South East England and especially London being the principal beneficiaries.

On the other hand, informal surveys of students of all nationalities studying in Wales have indicated that at least 70% of them would like to remain in Wales were appropriate jobs to be made available. More highly skilled jobs for Wales is part of the solution as are schemes aimed at providing graduates with direct help to enter employment in Wales. However, graduates who leave or develop specialist skills elsewhere may eventually return or migrate to Wales for family, career or quality of life reasons. Research is currently being undertaken on behalf of the Welsh Assembly Government, by an independent

consultant working with Welsh HEIs, which seeks to measure this propensity of alumni to return to Wales.

The acceptance of the point that the provision of subjects in Wales should not be viewed in isolation, but in the context of provision elsewhere in the United Kingdom, and especially in England, does not absolve HEFCW from taking responsibility for the health and adequacy of provision of important subjects but we argue that this should be done in close cooperation with HEFCW's counterpart agencies in other parts of the UK and that provision should be assessed in that broader context.

There are, however, clear limits to the dependency of Wales on institutions outside Wales for the supply of graduates and other highly qualified people in particular disciplines, but our conclusion is that rather than focussing concern on the availability of particular disciplines it is more important to ensure that Welsh HEIs remain coherent and credible institutions able to deliver higher education of international quality. To this end it is important that all of the HEIs, other than specialist providers, are able to make provision across a reasonably comprehensive range of disciplines. In this context it is the depth of provision within disciplines rather than whether a particular subject is offered that is critical. This kind of coherence and provision in depth is necessary to underpin the quality of research and the knowledge transfer that is required to support the development of the Welsh Economy as the Report *Knowledge Transfer Nexus* (WAG 2004) cogently argues.

This desideratum is less easily achieved in Wales than in England because the majority of HEIs in Wales are relatively small in size. This inevitably imposes limits both on the breadth of the curriculum and the depth of provision in the individual subjects. This is reflected in small pockets of provision in a number of institutions in some disciplines. As was recognised in *Reaching Higher* (WAG 2002) and subsequent reports collaboration between institutions based on complementary strengths can deliver the kind of strength in depth that is required to serve the needs of Wales as a whole. However, the development of such collaboration on a sound basis can itself be a resource intensive and time consuming process. Even the availability of funding from HEFCW's Reconfiguration and Development Fund to support the process cannot guarantee success.

The position relating to part-time undergraduate provision is different from full-time undergraduate provision because students who study part-time need to be able to access local provision which is a particular difficulty to those students living in rural areas. Similar constraints often apply to postgraduate study and continuing professional development. The range of subject offerings needs to reflect the more immediately vocational motivation of many part-time students.

We are aware that part-time provision and support for part-time students in Wales are currently being reviewed by a Committee established by the Welsh Assembly Government (The Graham Committee). Some disciplines are currently mainly available on a part-time basis only through distance learning with the Open University in Wales. To the extent that the availability of particular disciplines is an issue for some part-time students, we believe that increased use of blended learning might prove attractive to them by providing both a local learning environment and access to a broadly based curriculum. We are aware that the Open University has been funded from HEFCW's Strategic Development Fund to review the feasibility of this approach working with traditional HEIs and Further Education Colleges (FECs) in Wales.

OVERVIEW OF THE WELSH HIGHER EDUCATION SYSTEM

The first issue we address is the extent to which the Welsh Higher Education (HE) system is self-contained or whether it is best regarded as part of the wider UK system. We have examined the principal characteristics of the Welsh HE system, looked at cross border flows of students and looked, in some detail, at the subject provision by Welsh HEIs.

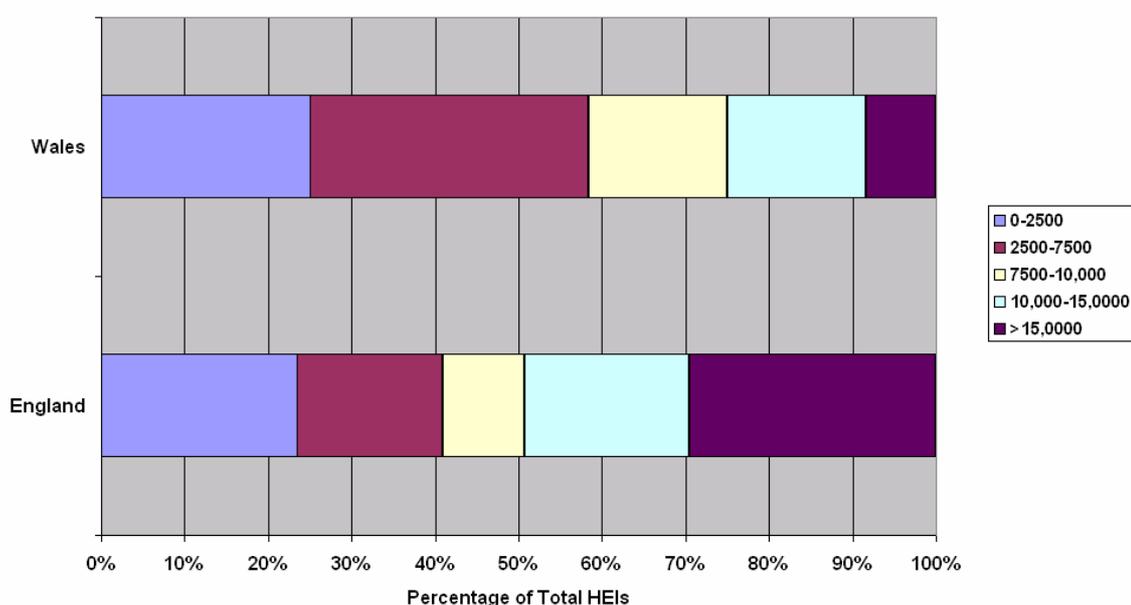
At present there are 12 HEIs located in Wales and funded by the Higher Education Funding Council for Wales (HEFCW) plus the Open University in Wales which will also be funded by HEFCW from 1 August 2006, separate from the funding for the University from the Higher Education Funding Council for England (HEFCE) and the Scottish Higher Education Funding Council (SHEFC). In addition HEFCW funds directly a limited number of courses in seven FECs. However, the large majority of HE courses provided by FECs in Wales are provided under franchise arrangements with one of the HEIs in Wales and are predominantly part-time programmes aimed at reaching people not readily able to travel to the main sites of the HEIs.

The comparisons that follow are, unless otherwise stated, comparisons with the position in England. As we will demonstrate below most of transfers of students between HEIs in the different UK administrations are between England and Wales and therefore the relative position of English HEIs is the most relevant for considering the issues of subject provision in Wales.

Size of institutions

Figure 1 below shows the distribution of HEIs in England and Wales by size bands using total full-time equivalent student numbers as the measure. This shows a much higher proportion of large or very large institutions in England. In 2004/05 close to 50% (65 out of 132) of all English HEIs had 10,000 or more FTE students whereas only 25% (3 out of 12) were of this size in Wales. There was a correspondingly much higher proportion of Welsh HEIs that had between 2,500 and 10,000 FTE students in 2004/05 (42% as against 27%) than English HEIs. The proportion of very small institutions was similar in both countries.

Figure 1: Distribution of HEIs by Total FTE in England and Wales 2004/05



Source: *Students in Higher Education Institutions 2004/05* Higher Education Statistics Agency (HESA) March 2006.

It is more difficult, in general, for smaller institutions to sustain the broad curricular range offered by many large HEIs and to generate the level of surpluses needed to underpin investment in future development.

Level and mode of study

Tables 1a and 1b below compare students enrolled on programmes of study in English and Welsh HEIs in 2004/05.

Table 1a: Students enrolled at Welsh and English HEIs in 2004/05 by level and mode of study

	Wales		England	
	Number	% of Total Enrolments	Number	% of Total Enrolments
Full-time postgraduate	9,800	7.4	190,660	10.2
Part-time Postgraduate(1)	14,455	10.9	254,575	13.6
Total Postgraduate	24,255	18.2	445,235	23.8
Full-time Undergraduate	63,835	48.0	945,120	50.6
Part-time Undergraduate(1)	45,010	33.8	478,900	25.6
Total Undergraduate	108,845	81.8	1,424,020	76.2
Total Enrolments	133,100	100	1,869,255	100
Total Full-time Enrolments	73,635	55.3	1,135,780	60.8
Total Part-time Enrolments(1)	59,465	44.7	733,475	39.2

Source: *Students in Higher Education Institutions 2004/05* HESA March 2006.

Table 1b: The ratios of students enrolled at English and Welsh HEIs in 2004/05 by level and mode of study

	Ratios England to Wales
Full-time postgraduate	19.5
Part-time Postgraduate(1)	17.6
Total Postgraduate	18.4
Full-time Undergraduate	14.8
Part-time Undergraduate(1)	10.6
Total Undergraduate	13.1
Total Enrolments	14.0
Total Full-time Enrolments	15.4
Total Part-time Enrolments(1)	12.3
Ratio of English to Welsh populations (2)	17.0

Source: *Derived from Students in Higher Education Institutions 2004/05* HESA March 2006 and the National Statistical Office's website.

Notes

- (1) The part-time postgraduate and undergraduate numbers have been adjusted to include Welsh domiciled students enrolled at the Open University in the Welsh figures and to exclude all of the OU students domiciled in other countries of the UK from the English figures.
- (2) The National Statistical Office's estimates of the populations of England and Wales at mid 2004 are 50,093,100 and 2,952,500¹, yielding a ratio of 17.0:1

Table 1a indicates that the proportion of part-time undergraduate students in Wales is significantly higher than the proportion in England. Further analysis indicates that in Wales a far higher proportion of part-time undergraduates are on "other undergraduate courses".

Table 1b indicates that, when judged in comparison to proportions of the populations of the two countries, the numbers of both full and part-time undergraduate students in Wales are significantly higher than the corresponding figures for England. In proportionate terms, at postgraduate level, the Welsh figures are slightly lower for part-time provision while there is a larger difference for full-time students. More detailed analysis shows that the Welsh postgraduate numbers are commensurate with the figures for most of the

¹ <http://www.statistics.gov.uk/CCI/nugget.asp?ID=6>

English regions, other than London and the East in which regions there are significantly higher proportions of post-graduate students.

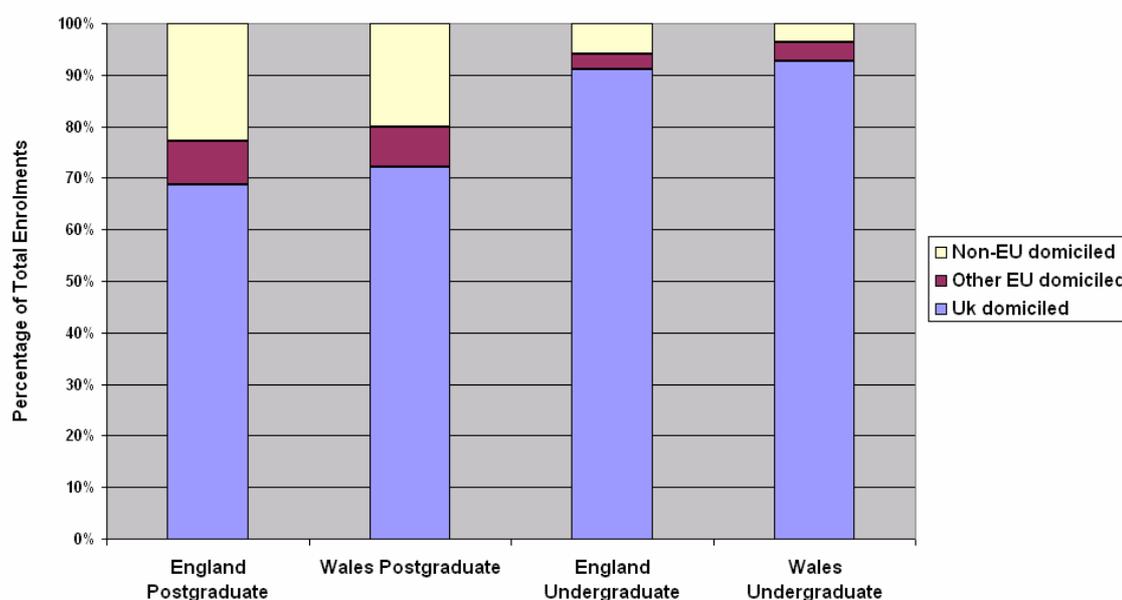
It is of interest to note in this context of participation rates that the only figures we have been able to access (HEFCE 2005b) showed that the young undergraduate participation rate for Welsh domiciled students was higher than for English domiciled students at 30.1% compared to 29.1% of English domiciled students. Furthermore, as Taylor and Gorard demonstrate in their report *Participation in Higher Education, Wales* prepared for the Independent Study into the Devolution of the Student Support System and Tuition fee regime (the Rees Review) (WAG 2005a) the participation rate of Welsh domiciled 18-20 year olds has risen since 2000/01 from around 40% to 43% (Figure 5.1, page 37).

The relatively low proportion of postgraduate students may simply reflect lack of demand because there are fewer graduates in jobs in Wales able to obtain release to study at postgraduate level, but we have no direct evidence to support that view. The only indirect evidence is that postgraduate provision in England is strongly concentrated in London where there is a far higher proportion of graduates employed than in the rest of the UK.

Students from outside the UK

Figure 2 below shows the distribution of students by domicile – UK, other EU and non-EU - for students enrolled at postgraduate and undergraduate level in 2004/05.

Figure 2: Domicile of Students in English and Welsh HEIs 2004/05



Source: *Students in Higher Education Institutions 2004/05*: HESA March 2006.

This figure shows that overall Welsh HEIs enrolled a very similar proportion of students from outside the UK to the proportion enrolled by English HEIs. Welsh HEIs recruited a slightly higher proportion of their undergraduates from other EU countries and a correspondingly lower proportion from outside the EU than their English counterparts. The figure also shows for both English and Welsh HEIs the significantly higher proportion of enrolments from outside the UK at postgraduate level than at undergraduate level.

It is clearly important to Wales that Welsh HEIs are able to continue to compete alongside English HEIs to secure an appropriate share of the overseas student markets at postgraduate and undergraduate level. Demand from overseas students is an important measure of the perceived quality of HEIs within the international HE marketplace.

Cross border flows within the United Kingdom

Tables 2a and 2b below set out the UK Country domicile of full-time students by level for Welsh HEIs and English HEIs respectively.

Table 2a: Domicile of full-time UK students by level of study in Welsh HEIs in 2004/05

Domicile of Students	Level of Study			Total All Levels Number (%)
	Postgraduate Number (%)	Undergraduate First Degree Number (%)	Other Undergraduate Number (%)	
Wales	3,780 (67.9)	28,255 (52.7)	3,265 (75.3)	35,300 (55.6)
England	1,685 (30.2)	24,995 (46.6)	1,040 (23.9)	27,720 (43.6)
Other UK	100 (1.8)	405 (0.8)	30 (0.7)	535 (0.8)
Total	5,565 (100)	53,655 (100)	4,335 (100)	63,555 (100)

Table 2b: Domicile of full-time UK students in English HEIs by level of study 2004/05

Domicile of Students	Level of Study			Total All Levels Number (%)
	Postgraduate Number (%)	Undergraduate First Degree Number (%)	Other Undergraduate Number (%)	
Wales	1,770 (1.9)	17,650 (2.4)	835 (0.9)	20,255 (2.2)
England	88,290 (95.2)	707,210 (96.0)	96,245 (98.5)	891,745 (96.1)
Other UK	2,650 (2.9)	11,750 (1.6)	640 (0.7)	15,040 (1.6)
Total	92,710 (100)	736,610 (100)	97,720 (100)	927,040 (100)

Source: *Students in Higher Education Institutions 2004/05 table 5ai* HESA March 2006.

These tables demonstrate a substantial flow of English and Welsh domiciled full-time students across the border, but the incoming English students represent a much higher proportion of the total enrolments in the Welsh HEIs because of the much smaller system in Wales. The flows are most marked at first degree level where they form part of the much wider flow of young undergraduates across the UK.

Tables 3a and 3b below set out the corresponding flows of part-time students between English and Welsh HEIs. For part-time students, as might be expected, the cross-border flows are substantially lower. The Welsh HEI figures include the Welsh domiciled students enrolled at the Open University in 2004/05. The English HEI figures include only English domiciled students enrolled at the Open University.

Table 3a: Part-time students at Welsh HEIs (including the Welsh region of the Open University) by domicile 2004/05

Domicile	Postgraduate		First Degree		Other Undergraduate	
	Number	% of total	Number	% of Total	Number	% of Total
Wales	8,460	70.3	7,320	88.6	29,230	84.2
England	3,290	27.3	880	10.6	5,015	14.4
Other UK	280	2.3	65	0.8	485	1.4
Total	12,030	100.0	8,265	100.0	34,730	100.0

Table 3b: Part-time students at English HEIs by UK domicile 2004/05

Domicile	Postgraduate		First Degree		Other Undergraduate	
	Number	% of Total	Number	% of total	Number	% of Total
Wales	3,070	1.5	810	0.5	1,895	0.6
England	203,420	96.7	155,745	98.9	293,165	98.4
Other UK	5,690	2.7	845	0.5	3,000	1.0
Total	210,380	100.0	157,400	100.0	298,060	100.0

Source: *Students in Higher Education Institutions 2004/05 Table 5b* HESA March 2006 and *Private Communication* from the Open University.

Table 3a shows that about 82% (45,010 out of 55,025) of all UK part-time students at Welsh HEIs, including the Open University in Wales, were Welsh-domiciled and just over 17% were English-domiciled.

Table 4 below summarises the destination of all Welsh domiciled students by level in 2004/05.

Table 4: Destination of study for Welsh domiciled student by level and mode of study 2004/05

Region of Institution	Postgraduate		Undergraduate First Degree		Other Undergraduate		Total	
	Full-time Number (%)	Part-time Number (%)	Full-time Number (%)	Part-time Number (%)	Full-time Number (%)	Part-time Number (%)	Full-time Number (%)	Part-time Number (%)
Wales	3,760 (67.2)	7,835 (67.3)	28,255 (61.0)	4,065 (49.8)	3,265 (79.6)	29,230 (86.6)	35,280 (63.0)	41,130 (76.8)
Open University	0	625 (5.4)	0	3,255 (39.9)	0	2,595 (7.7)	0	6,475 (12.1)
England	1,770 (31.6)	3,070 (26.4)	17,650 (38.1)	810 (9.9)	835 (20.4)	1,895 (5.6)	20,255 (36.2)	5,775 (10.8)
Other UK	65 (1.2)	120 (1.0)	415 (0.9)	30 (0.4)	0	15 (0.1)	480 (0.9)	165 (0.3)
Total	5595 (100)	11,650 (100)	46,320 (100)	8,160 (100)	4,100 (100)	33,735 (100)	56,015 (100)	53,545 (100)

Source: *Students in Higher Education Institutions 2005/06 Tables 5a and 5b* HESA March 2006.

This table shows that in 2004/05, 37% of Welsh domiciled full-time students were studying at HEIs in other countries of the United Kingdom, the vast majority in England. For full-time first degree students, the proportion of Welsh domiciled students studying in countries of the UK other than Wales was 39%. At the same time 44% of all full-time students and 47% of full-time first degree students in Welsh HEIs were from other countries of the United Kingdom, the vast majority of whom were English domiciled (see Table 2a).

In 2004/05 there was a net inflow of around 7,500 full-time students, almost entirely undergraduates, from other countries of the UK into Welsh HEIs. Tables 3b and 4 show that there were 5,775 Welsh domiciled part-time students at English HEIs in 2004/05, just under 11% of all Welsh domiciled part-time students. Including the Open University in Wales nearly 90% of Welsh domiciled part-time students were studying at HEIs in Wales in 2004/05. There were only 165 Welsh domiciled students studying part-time at HEIs in Scotland or Northern Ireland in 2004/05. Overall there is a net outflow of some 350 part-time students from Wales to HEIs in other countries of the UK.

The Border between England and Wales is pretty porous to the flow of full-time undergraduates (especially those studying for first degrees) and postgraduates. Part-time students, apart from those living close to the Border or studying by distance learning, are of course substantially more likely to study in their Home Country.

However, as Table 4 shows, over one quarter of Welsh domiciled part-time postgraduate students were studying at English HEIs in 2004/05. Over 60% of these students were studying at HEIs in the three regions adjacent to Wales – the North West, the West

Midlands and the South West. For some in Wales, Bristol, Birmingham, Liverpool and Manchester may be more accessible than Cardiff. By contrast only 4% of English part-time postgraduate students in 2004/05 studied at HEIs in other countries of the UK.

There were nearly 6,000 English domiciled students studying part-time other undergraduate programmes at Welsh HEIs in 2004/05. This probably reflects a number of specialised sub-degree programmes being offered on a distance learning basis by some Welsh HEIs.

Overall this analysis suggests that, especially for young full-time undergraduate students the HEIs in England and Wales are viewed to an extent as a single system. But for older people who need to study part-time, excluding those who study through the Open University and other distance learning providers, local provision is much more important.

Changes in full-time undergraduate fees

The move to variable deferred fees for full-time undergraduates from September 2006 in England with a competitive system of institutional bursaries and the corresponding changes to full-time undergraduate fees in Wales from 2007, with fee remission grants for Welsh domiciled students of £1,500 are likely to provide a substantial incentive for Welsh domiciled students to study at Welsh HEIs and increase the competition for places. English students will effectively pay the same whether they study at an English or Welsh HEI.

However, it was put to us that Welsh domiciled students who wished to study a particular subject not offered by any Welsh HEI would, under the new fee arrangements, have reason to feel aggrieved since they would emerge with a higher level of debt than if they had been able to study the subject in Wales. We have carried out an analysis of current undergraduate enrolments at subject level (see below) that shows that, of the subject areas, only veterinary science is not offered by any Welsh HEI. This anomaly was identified at the time of the full-time fee settlement in Wales last summer as an issue that needed special consideration in the light of the fee settlement agreed by the Welsh Assembly Government.

Detailed analysis of the distribution of full-time first degree enrolments in 2004/05 shows that there are a few other specific subjects within the subject areas where there are few if any places currently available in Wales; these include materials science, metallurgy, glass, ceramics and polymer technologies, and South Asian, African, Japanese and Chinese studies within the languages subject area.

Subjects of study

Table 5 compares the distribution by subject area of full-time undergraduate student numbers enrolled in Welsh and English HEIs in 2004/05. This includes both students studying for first degrees and other undergraduate qualifications. The table reveals a broadly similar pattern at this broad subject level. For example, in both England and Wales in 2004/05 over 44% of total full-time undergraduate enrolments were in the four subject areas – subjects allied to medicine, biological sciences, business and administrative studies and creative arts and design. The table does reveal some significant differences in that in Wales the proportion of total full-time undergraduate enrolments in both Physical Sciences and Biological Sciences was higher than the proportion studying such subjects as full-time undergraduates in English HEIs. These were offset by a lower proportion of total enrolments in computer science, social studies and business and administrative studies in Welsh HEIs.

Table 5: Comparison of the distribution of total full-time undergraduate enrolments by subject area in Welsh and English HEIs 2004/05

	Welsh HEIs		English HEIs	
	Number	% of Total	Number	% of Total
Clinical Medicine and Dentistry	1,770	2.7	29,850	3.2
Subjects Allied to Medicine	7,055	11.1	117,005	12.4
Biological Science	7,650	12.0	77,805	8.2
Veterinary Science	0	-	2,505	0.3
Agriculture and Related Studies	705	1.1	7,830	0.8
Physical Sciences	3,170	5.0	37,875	4.0
Mathematical Sciences	755	1.2	16,450	1.7
Computer Science	2,735	4.3	61,765	6.5
Engineering and Technology	4,285	6.7	59,735	6.3
Architecture, Building and Planning	1,000	1.6	17,650	1.9
Social Studies	4,855	7.7	84,285	8.9
Law	3,355	5.3	41,515	4.4
Business and Administrative Studies	6,730	10.5	122,845	13.0
Mass Communication and Documentation	1,500	2.4	28,955	3.1
Languages	5,050	7.9	60,620	6.4
Historical and Philosophical Studies	3,400	5.3	39,160	4.1
Creative Arts and Design	6,625	10.4	101,005	10.7
Education	2,885	4.5	31,775	3.4
Combined	280	0.4	6,385	0.7
Total	63,835	100.0	945,120	100.0

Source: Students in Higher Education Institutions 2004/05 HESA March 2006.

Leaving aside Veterinary Science, all the remaining subject areas, apart from Medicine and Dentistry, Agriculture and Related Subjects and Architecture, Building and Planning, had in 2004/05 substantial provision (more than 50 full-time enrolments) in at least five of the HEIs in Wales. Seven of the twelve HEIs had substantial provision in at least ten of the subject areas, two had substantial numbers in between five and ten of the subject areas and the remaining three institutions had substantial provision in five or fewer of the subject areas.

However, as noted earlier, there are a few subjects such as Materials Science and East Asian languages where there is currently little or no full-time undergraduate provision in Wales, although there is a full-time degree programme and part-time other undergraduate programmes in Japanese and Chinese at the University of Cardiff.

Table 6 below shows the same comparison as in Table 5 for part-time undergraduate numbers by subject area for 2004/05. This table includes within the Wales totals the numbers enrolled at the Open University in Wales by subject group. The England totals are correspondingly reduced.

Table 6: Comparison of the distribution of total part-time undergraduate enrolments by subject area in Welsh and English HEIs 2004/05

	Welsh HEIs		English HEIs	
	Number	% of Total	Number	% of Total
Clinical Medicine and Dentistry	0	-	85	-
Subjects Allied to Medicine	3,620	7.9	94,885	19.1
Biological Science	1,310	2.8	18,840	3.8
Veterinary Science	0	-	25	-
Agriculture and Related Studies	285	0.6	1,760	0.4
Physical Sciences	1,195	2.6	9,595	1.9
Mathematical Sciences	470	1.0	4,590	0.9
Computer Science	1,790	3.9	30,230	6.1
Engineering and Technology	3,285	7.1	17,185	3.5
Architecture, Building and Planning	690	1.5	10,225	2.1
Social Studies	6,230	13.5	38,735	7.8
Law	405	0.9	11,110	2.2
Business and Administrative Studies	3,885	8.4	38,285	7.7
Mass Communication and Documentation	355	0.8	3,140	0.6
Languages	8,230	17.9	31,990	6.4
Historical and Philosophical Studies	3,755	8.1	26,405	5.3
Creative Arts and Design	1,510	3.3	14,040	2.8
Education	5,630	12.2	44,200	8.9
Combined	3,460	7.5	101,045	20.4
Total	46,105	100.0	496,370	100.0

Source: Students in Higher Education Institutions 2004/05, HESA March 2006 and the Open University Private Communication.

This table shows up some marked differences between the patterns of subject provision for part-time undergraduates from the pattern for full-time both in England and Wales. There are also some marked differences between the subject distribution of part-time students between the main subject groups in England and Wales.

The high proportion of part-time undergraduate students recorded under the 'Combined' category in both England and Wales reflects in part enrolments on adult and continuing education programmes, for which individuals may choose across a wide menu. They also reflect the high proportion of Open University students on 'Other Undergraduate' programmes who remain uncommitted to a particular subject of study.

The very high proportion of part-time undergraduate students in Wales enrolled on languages programmes is striking and reflects in part a high number of enrolments on 'Celtic Studies' (Welsh) programmes (mainly individuals seeking Welsh language competence by distance or e-learning), but a similarly high number are studying English.

The table also shows a high proportion of part-time undergraduate students enrolled on subjects allied to Medicine, Social Studies and Education programmes – just over one-third of all part-time undergraduate enrolments in both Wales and England in 2004/05. These programmes include the initial training and continuing professional development of nurses, social workers, teachers and college lecturers. However, it is noteworthy that the proportion of part-time undergraduate nursing courses is much lower in Wales than in England. This may reflect the changed pattern of initial education and training for nurses in Wales with the move to a requirement for a first degree.

WELSH HIGHER EDUCATION: A SEPARATE SYSTEM?

Against the analysis of the supply of higher education places in Wales and the cross border flows of students within the UK we have sought to examine whether it is possible or necessary to think in terms of the Welsh higher education system as being separate and distinct from the higher education system in the rest of the UK and particular in England.

The evidence presented above indicates both that the full-time subject provision in Welsh HEIs is broadly similar to that in English HEIs and that there is a substantial flow across the border of English and Welsh domiciled students. This indicates that many young Welsh undergraduates view the English and Welsh systems as a single system from the point of view of choosing where to study. This reflects the historically general high level of mobility of young full-time undergraduates. However, this mobility has declined generally in recent years under the impact of student loans and other factors. Moreover, as we have noted earlier, the flow out of Wales of full-time undergraduate students may be substantially reduced by the incentive of the Assembly fee remission grant to be introduced alongside variable deferred fees from 2007 in Wales. This could serve to differentiate the systems more sharply (although from the perspective of an English domiciled student there will continue to be no substantive distinction) and raise political expectations that all major subjects were available in Wales. This could lead to a long list of subjects which could be seen as of broader importance to Wales.

On the other hand, those to whom we talked recognised that there were significant benefits to Wales from the flow of individuals between HEIs across the UK. Not least because, without the net inflow of undergraduates into Welsh HEIs, the viability of some of the institutions and particular subject areas might be seriously threatened.

There is no evidence either to indicate that Wales loses out in terms of the availability of graduates from the cross border flows of full-time undergraduates. The Institute of Employment Studies (IES) (IES 2006), in its draft final report which was made available to us, and which we analyse further below, makes clear that there is little evidence of high level skill shortages in Wales. In practice, although only a third of Welsh students studying outside Wales return on graduation, a quarter of non-Welsh students stay in Wales on graduation. This would suggest that a dependence on English HEIs or HEIs in other parts of the UK for certain specialised subjects should not be seen as deleterious to Wales. Indeed there are examples of specialist courses, such as the stained glass technology at Swansea Institute and food technology provision at UWIC, where Welsh HEIs are the major providers for the UK.

Our conclusion is that, notwithstanding the likely impact of the new full-time undergraduate fee arrangements on Welsh domiciled undergraduate choices, the list of subjects of broader importance to Wales is more limited than would be implied by a 'Fortress Wales' model. At the level of the individual subject Wales could rely on graduates from elsewhere as it has done in the past and continues to do in, for example, "Veterinary Science".

DEFINING SUBJECTS OF BROADER IMPORTANCE TO WALES

Since the establishment of the Welsh Assembly Government (WAG) there has been a continuing flow of publications and statements that have emphasised the importance of higher education to the economic, cultural and social life of Wales. These include *Reaching Higher, Higher Education and the Learning Country* (WAG 2002), *Knowledge Economy Nexus: Role of Higher Education in Wales*, (WAG 2004) and *Wales: A Vibrant Economy* (WAG 2005b).

While the publications indicate that, in many areas, significant progress has been made, including the greater involvement of Welsh HEIs with business (WAG 2004, p 5) and the fact that the number of "hard to fill" vacancies identified by employers has halved since 1998 (WAG 2005b, p 53), they also point to the need to intensify further the efforts to link HEIs even more closely to the needs of the economy. For example, *Knowledge Economy Nexus* states the view that "In particular, the links between "university excellence" and "company value-added" strands could be strengthened at both ends and our science and technology base improved in accord with market-place drivers." (WAG 2004, p 2).

However, the prime aim of this project was to identify, in the context of this recognition of the important contribution of HEIs to the success of the Welsh Economy, whether there were any subjects within the range of higher education provision that are of broader importance to Wales in the sense that if they disappeared from the range offered by Welsh HEIs they would have a serious deleterious impact on the Welsh economy, culture and society.

In our analysis of the literature and discussions with individuals we have sought to identify a series of factors that could be used as a basis for determining whether subjects were of broader importance to Wales. We have identified the following factors:

- A high level of demand from employers, including public sector employers, in Wales for graduates with particular specialist skills.
- Demand for expertise in disciplines of particular relevance to the future development of the Welsh economy through research and knowledge transfer.
- Demand from Welsh domiciled students whose employment, family or other commitments mean that they must be able to study part-time locally or by distance learning. From 2007 this will extend to include demand from students for full-time study, who, in the absence of specific subject provision within Welsh HEIs, would in principle be denied access to benefits available to other Welsh domiciled students.
- Disciplines where there are specifically Welsh requirements that differ from the English requirements. This increasingly applies to the public sector professions such as social work, nursing and teaching, but more broadly includes Welsh medium provision in higher education and the need for Welsh higher education to reflect the expectations of 'Cwrricwlwm Cymreig' that education at all levels will give due weight to the Welsh issues within a subject area.
- The need to sustain the Welsh language, its literature and the culture of Wales.

We examined each of these in turn against the evidence from the literature that we have reviewed and from the limited discussions we have had with individuals.

The demand for graduates in Wales

Against the analysis of the supply of higher education places in Wales and the cross border flows of students within then UK we have sought to examine the evidence available about the demand for highly skilled manpower in Wales through an analysis of the literature and discussions with a few key individuals (See annex).

We should emphasise that this section of the report is concerned principally with full-time undergraduate provision. This is clearly the main route to higher level skills for young people and is the area where there is greatest public investment in supporting students financially. However, both for individuals wishing to improve their skills and the Economy, part-time undergraduate provision and postgraduate provision are also important. Part-time undergraduate provision in particular because it is tailored more towards the needs of individuals who are less mobile than typical young undergraduates is very important to Wales.

Evidence of graduate shortage

It is important to review the available evidence of shortages in Wales of graduates in particular subjects.

In the major study undertaken by the Institute of Employment Studies (IES 2006), whose draft final report, to which reference has already been made, reported that just under a fifth of employers in Wales had some hard to fill vacancies but that when employers were asked whether these vacancies were specifically for graduates, only three per cent reported that they found it hard to fill this particular type of vacancy. The IES team concluded that, "The numbers involved are therefore too small for any further analysis, and this survey therefore provides no evidence of systematic or significant difficulties with regard to graduate recruitment in Wales." (IES 2006, p 101).

Our research of the literature did not disclose a source that was able to provide a more specific insight into the overall evidence of graduate shortage than that provided in the IES report.

One factor that it is important to consider in this context is the very high dependency on the public sector in Wales as an employer of higher education graduates/diplomates, especially in health, education and public administration. This is higher in Wales than any other country of the UK, with just over 50% of full-time employees (age 21-40) with NVQ Level 4 and above in Wales employed in the public sector in 2001/02, compared with a UK average of 32.9%². As we noted earlier this is reflected in the high proportion of enrolments on part-time undergraduate courses in initial training and Continuing Professional Development (CPD) for nurses, teachers and social workers in Welsh HEIs. In practice public sector employment, requiring professionally qualified staff, for which HEIs are the principal source of supply, includes a far wider range of jobs than nurses, teachers and social workers, and includes doctors, dentists, staff with responsibilities for children below five such as nursery nurses, health visitors and nursery teachers (early years staff), and those working in public administration. We understand from discussions with officers of the Welsh Assembly Government (WAG) that there is a desire to undertake much greater manpower planning for the public services, especially for the NHS, in Wales and that relevant provision in HEIs in Wales should reflect those manpower plans. In part this reflects the increasing divergence between the professional requirements in England and Wales and in part the requirement for many public sector jobs in Wales that people are bilingual, especially where the job involves working with clients.

Disciplines of economic and industrial importance to Wales

The supply of graduates to the Welsh commercial economy and to the public services is of vital importance, but so too is the availability of the academic expertise in the institutions that is required for the provision of particular subjects. This expertise is essential, through the basis it provides for research and knowledge transfer activities, for the continuing health of Welsh industry and the Welsh economy more generally. A number of reports have identified the industrial sectors that are of importance to Wales. While the reports do not highlight specific academic disciplines the findings of the reports may be of relevance when assessing the extent to which the curricula offered by Welsh HEIs match the

² Data from the Labour Force Survey from September 2001 to August 2002 tabulated for *Graduate Market Trends* Spring 2003, cited in Ralph Fevre, *An analysis of graduate demand, employment and income in Wales: a briefing paper for 'The changing graduate labour market: a review of the evidence' Enquiry commissioned by the National Assembly for Wales*, research commissioned by the Rees Review (Cardiff, WAG, 2005a, p9).

requirements of the country through minimising the need to rely on the graduates from other countries.

Perhaps an even more important reason for matching these industries against the curricula is that if the links between industry and academia are to be strengthened, as has been advocated in a number of reports notably *Knowledge Economy Nexus* (WAG 2004, p2) and *Wales- A Vibrant Economy* (WAG 2005b, p 58), it is important to ensure that the knowledge and competences of the academic staff of Welsh HEIs are related to the needs of the identified industrial sectors.

The industrial sectors listed in *Wales – A Vibrant Economy* (2005b)³ are

Aerospace
Agri-Food
Automotive
Construction
Creative industries
Financial services
High Technology
Hospitality, leisure and tourism
Pharmaceuticals/bio-chemicals
Social care

On a related issue the Chief Technology Officer of the Welsh Assembly Government, Dr Ron Loveland, issued in January 2006 a consultative document, *A Science Policy for Wales?* (Loveland 2006).

The document identifies three main strands of a future policy for Science for Wales

- health developments including public health, tele-medicine and links to demographic change and epidemiology
- low carbon energy systems
- enabling sustained economic and social renewal (using both natural and social sciences expertise). (Loveland 2006, p 2).

There is clearly a significant overlap between these strands and the industrial sectors mentioned in the earlier reports. The outcomes of the consultation will be of importance in helping to achieve a strong, but not necessarily one-to-one, relationship between the policy drivers and the nature of institutional curricula.

The consultative document gives emphasis to making use of existing Centres of Excellence through identifying a number of academic departments or units as examples of existing strengths in Wales that should be built on. These are:

- advanced manufacturing operations such as those at the Cardiff School of Engineering
- a world class product design support operation at UWIC
- visualisation centre developments at the University of Wales Aberystwyth and the University of Wales Bangor
- significant creative sector/media units in most of the Welsh colleges and the School of Journalism in Cardiff University
- the bio-polymers and food research units at the University of Wales Bangor
- behavioural science/psychology departments in the University of Wales Bangor and Cardiff University – a unit at Bangor focussing on experimental consumer psychology
- business schools in each of the major institutions sometimes accompanied by planning/regional developments such as the department of city and regional planning at Cardiff University and the rural economy unit at the University of Wales Aberystwyth
- ESRC centre for business relationships, accountability, sustainability and society (BRASS) at Cardiff University
- certain groups within the social science department of Cardiff University

³ The list of sectors identified in *Knowledge Economy Nexus* (WAG 2004) is very similar.

- School of “environment and society” at the University of Wales Swansea and the centre for “social policy research” at the University of Wales Bangor.

(Extracted from “*A Science Policy for Wales Consultation Paper?*” (Loveland 2006)).

Centres of Excellence of this kind are difficult, and often extremely costly, to develop and once such a centre has been established it should only allowed to disappear after an explicit decision that it is no longer of significant relevance to Wales.

We do not consider, however, that the identification of the industrial priority sectors, nor the existence of Centres of Excellence relevant to those priorities, of themselves lead to the identification of particular subjects as being of broader importance to Wales in the sense that, if the subjects concerned were to cease to be offered by any Welsh HEI there would be serious implications for the Welsh Economy. This was also the view of those to whom we talked. It assumes, however, that a sufficient flow of graduates to meet the needs of Wales would be generated by universities in England or from further afield.

For strategically important and vulnerable subjects when viewed in the context of the UK (or even England and Wales), however, that assumption may be unsafe. We consider later in this report the position of Welsh HEIs in relation to the review of these subjects undertaken by HEFCE in England.

The specific needs of Wales

These can be divided into two areas. One relates to aspects of the curriculum and requirements for professional qualifications that differ significantly between Wales and the rest of the UK and the other relating to the study of the Welsh language, literature and culture in their own right. There is significant overlap in respect of the availability of Welsh medium teaching across academic disciplines and the expectations of the issues surrounding ‘Cwrricwlwm Cymreig’ that education at all levels will give due weight to the Welsh issues within different subject areas.

Welsh language, literature and culture

The Welsh Assembly Government set out its vision for a bilingual Wales in *Iaith Pawb* (WAG 2003). In the light of this the study of the Welsh Language, literature and culture meet the definition of subjects of broader importance to Wales. If Welsh and associated Celtic Studies were no longer to be offered as academic disciplines in any Welsh HEI serious concerns would arise about the future health of the language and culture.

Table 7 below shows the distribution of enrolments by level and mode in each of the twelve Welsh HEIs in 2004/05.

Table 7: Enrolments on Celtic Studies (mainly Welsh) programmes in 2004/05 at each Welsh HEI

Institution	Postgraduate		Undergraduate First Degree		Undergraduate Other Qualifications	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
University of Wales Aberystwyth	10	40	115	50	0	0
University of Wales Bangor	5	10	70	0	0	0
Cardiff University	5	15	85	0	0	95
UWIC	0	0	10	0	0	0
University of Glamorgan	0	0	0	0	0	20
University of Wales Lampeter	0	25	30	15	0	2,505
University of Wales Newport	0	0	5	0	0	0
North East Wales Institute	0	0	10	0	0	0
Royal Welsh College of Music and Drama	0	0	0	0	0	0
Swansea Institute	0	0	0	0	0	0
University of Wales Swansea	0	0	70	0	0	0
Trinity College Carmarthen	0	0	10	0	0	0
Total	20	90	405	65	0	2,620

Source: *Students in Higher Education Institutions 2004/05 Tables 8a, 8b, 8c, 8d, 8e and 8f* HESA March 2006.

There are a number of things worth noting about this table:

- Only four HEIs had any postgraduate provision in Celtic Studies (Welsh) in 2004/05 and most of that provision was for part-time students.
- Full-time first degree provision was available in nine HEIs, but in only four institutions was the provision substantial.
- There was relatively little part-time first degree provision and it was in only two HEIs.
- The very large number of part-time other undergraduate numbers at the University of Wales Lampeter reflects the on-line provision it offers to learn Welsh almost from scratch.
- There are four HEIs with ten or fewer enrolments in Celtic Studies, including two with no enrolments.

The limited number of postgraduate students studying the Welsh language, literature and culture must be a cause for some anxiety since these postgraduates are the main source of future academic staff for Departments of Welsh in Welsh HEIs. In addition the very limited – or indeed absence of - provision for Welsh language and literature in some HEIs might be expected to limit these institutions' ability to deliver Welsh medium provision.

Welsh medium and bilingual education

The issues relating to Welsh medium provision in higher education were summarised in HEFCW's Welsh Language Scheme published in May 2005 (HEFCW 2005):

"The Council recognises the important role which higher education has in fulfilling the Welsh Assembly Government's vision for a bilingual Wales, as set out in *Iaith Pawb* (WAG 2003), and in building capacity to enable the provisions of the 1993 Welsh Language Act for equality between the Welsh and English language in the conduct of public business is to be realised.

- Departments of Welsh and Celtic Studies in Wales provide the academic underpinning of scholarship and research which is essential for the vitality and development of the language. They also produce graduates who are able to work in the Welsh language at a high level.
- Research and scholarship in other disciplines on issues relating to Wales, undertaken either in Welsh or English, contribute to the base of knowledge and understanding which informs the cultural, educational and economic development in Wales.

- The opportunity to take other subjects through the medium of Welsh in higher education is important in enabling students to study in their preferred language, in extending the scope of their bilingualism and in providing progression routes from school, further or adult education.
- Welsh medium higher education is also key in meeting the needs of the economy, communities, and the wider education system for bilingual graduates and postgraduates in a range of subject areas and professions, serving the entire public and private sector.
- Welsh higher education institutions provide initial training for primary and secondary school teachers. This includes teachers for the Welsh medium and bilingual sectors as well as for pupils in English medium schools to learn Welsh."

In the context of the availability of Welsh medium provision across different disciplines, we have noted the funding support already being given by HEFCW to the maintenance and development of Welsh medium provision through the Welsh Medium Provision grants to HEIs and to support the Welsh Medium Development Centre (HEFCW Funding Allocations 2005-06 and Welsh Medium provision (www.hefcw.ac.uk). This support comes within HEFCW's strategy for Welsh Medium Provision developed by a Steering Group whose report was presented to the Welsh Assembly Government in 2004 "*Steering Group for Welsh Medium Provision in Higher Education: Strategy*" (HEFCW 2004) and reflected in HEFCW's Welsh Language scheme (HEFCW May 2005). The strategic approach being adopted by HEFCW demonstrates its acceptance of the broader importance of Welsh medium provision in higher education.

In terms of demand from the economy there is evidence of a desire to be able to employ more Welsh speaking graduates. This was covered in the IES report who found that 21% of graduate employers stated that they would prefer to recruit graduates with Welsh language skills (IES 2006). One of the reasons given was the need to serve a predominantly Welsh speaking customer base.

The IES report refers to research on language skills in the workplace undertaken by ELWa (ELWa 2004) which showed that there is a lack of good data regarding language requirements in jobs and varied approaches to identifying language skills of employees and needs of business for language skills.

In general it is difficult to relate the expressed desire for Welsh speaking graduates with the more specific needs of the work-place. No evidence has been found that would provide a basis of estimating the actual numbers who need to follow a particular subject through the medium of Welsh as opposed to having sufficient fluency in both languages to deal with clients who prefer to use Welsh. As we shall discuss below, this is at the moment true even in the case of initial teacher training which HEIs provide and where as indicated in HEFCW's Welsh Language Scheme the needs are clearest.

Welsh and initial teacher training

This issue is addressed in the report on Initial Teaching Training in Wales prepared by the University of Oxford, Department of Educational Studies on behalf of the Welsh Assembly Government that was published in January 2006. (Furlong et al 2006).

The report identifies four different types of Welsh medium teachers

- Those able to teach Welsh as a second language in both primary and secondary schools.
- Those able to teach Welsh as a subject (including Welsh literature) in secondary schools.
- Primary teachers able to teach through the medium of Welsh.
- Secondary school specialist teachers able to teach through the medium of Welsh.

In its evidence sessions "the team heard claims of significant 'concealed and suppressed shortages' of teachers able to teach through the medium of Welsh. These include teachers teaching outside their areas of expertise and an unmet demand for new Welsh medium schools. However, without robust data we found it difficult to refute or substantiate these assertions" (Furlong et al 2006, p 47).

It does appear that in this context that the removal of provision of ITT through the medium of Welsh would seriously undermine the desire of WAG and HEFCW as set out in the Welsh Language Scheme to bring about a substantial increase in those able to teach through the medium of Welsh.

However, as the Furlong Report points out it is difficult to be precise about the numbers and types of teachers involved and it is, perhaps noteworthy in this respect that recommendation 26 of the Furlong Report is "That, as a matter of priority, the Welsh Assembly Government establish a new Review in order to consider the supply and training needs of all teachers able to teach through the medium of Welsh." (Furlong et al 2006, p 67). We most strongly support this recommendation.

The Report notes that those HEIs with the strongest Welsh medium ITT provision such as Trinity College Carmarthen seek to recruit as many Welsh speaking students as possible rather than having specific targets for their Welsh medium provision.

Cwrricwlwm Cymreig

There is also the issue that has been raised with us of what might be described as the 'Cwrricwlwm Cymreig' effect which is already identified in a school context and relates to the wide range of subjects in which there is a specific Welsh dimension when studied in Wales.

It seems to us that that this has a relevance, to varying degrees, to a wide range of disciplines. It indicates the need to encourage a larger number of Welsh residents both to pursue their higher education and their subsequent careers in Wales, but we could not identify in our search of the literature any specific subjects which would fall, by virtue of the need to give recognition of the Welsh dimension, within our definition of subjects of broader importance.

Differences in the requirements for professional qualification

One area which has a specific Welsh dimension not directly connected with the Welsh language is the increasing divergence in the requirements for professional registration in Wales for public sector professionals. Nurses are now required in Wales to obtain a first degree for registration in Wales while the predominant qualification for initial registration in England remains the Higher Diploma in nursing. Similarly, in the case of Social Work, the Care Council of Wales is moving to the replacement of Diplomas by Degrees and we understand that Welsh HEIs have responded quickly and effectively to meet the new requirements.

Initial Teacher Training in Wales, quite separate from the Welsh medium issue, also seeks to ensure that trainee teachers are equipped to deliver 'Cwrricwlwm Cymreig' and able to give due weight to Welsh issues in teaching particular subjects.

While we have seen no evidence to suggest that HEIs in Wales have not been able to respond to these changing requirements for professional registration, the need to meet specifically Welsh requirements puts the relevant professional disciplines within the definition of subjects of broader importance to Wales.

Other factors

We believe that rather than focussing concern on the availability of particular disciplines it is more important to ensure that Welsh HEIs remain coherent and credible institutions able to deliver higher education of international quality. To this end it is important that all of the HEIs other than specialist providers are able to make provision across a reasonably comprehensive range of disciplines. In this context it is the depth of provision within disciplines rather than whether a particular subject is offered that is critical.

This kind of coherence and provision in depth is necessary to underpin the quality of research and the knowledge transfer that is required to support the development of the Welsh Economy as the Report *Knowledge Economy Nexus* (WAG 2004) argues cogently.

The small size of the system, and the relatively small size of individual institutions within it, means that it is particularly difficult to ensure that the system is able to deliver across a

reasonably comprehensive range of disciplines. It is certainly more difficult than is the case in England. We believe that these factors place a particularly strong responsibility on HEFCW to adopt a monitoring role. This role would involve the Council in familiarising itself with views and policies of relevant bodies that relate in broad terms to the range of subjects provided by Welsh HEIs and to report both to WAG and to the HEIs when, in its view, there is a danger that the difference between what is required and what is available might be of such a magnitude as to hinder economic and other forms of development.

We should emphasise our belief that monitoring should be mainly concerned with curriculum balance and spread but the work would need to be carried out in the context of the recommendation (below) that HEFCW and HEFCE work together to identify vulnerable subjects of strategic importance.

ENGLISH REVIEWS OF SHORTAGE SUBJECTS

The most significant recent report has been that prepared by the HEFCE Chief Executive's Strategically Important Subjects Advisory Group, chaired by Sir Gareth Roberts, which was published in June 2005 (HEFCE 2005a). This group considered what principles should be used to define strategically important and vulnerable subjects in higher education.

The Secretary of State for Education and Skills had earlier written to HEFCE asking for the Council's view on 'whether there are any higher education subjects or courses that are of national strategic importance, where intervention might be appropriate to enable them to be available ... and the types of intervention which it believes could be considered' (Secretary of State's letter to HEFCE, 1 December 2004).

The letter also contained an annex that listed the subjects which the Secretary of State believed were both of strategic importance and venerable.

Definitions of strategic importance and vulnerability

The criteria developed by the group to establish whether a subject is of strategic importance were:

- a. Does the subject currently provide vital research and/or graduates with recognisably specialist knowledge, skills and competencies to the economy or society?
- b. Is there a substantiated prediction that vital research and/or graduates with recognisably specialist knowledge, skills and competencies will be required by the economy, society or Government in future? (HEFCE 2005a, p3)

Two definitions of vulnerability were also employed (HEFCE 2005a, p3).

One related to institutional vulnerability, meaning subjects which are primarily located in small specialist institutions (monotechnics), which may, because of their comparatively small size, be more susceptible than other institutions to changes in the external environment.

The second definition was where there is a vulnerability of the public interest, in that the provision of the subject is misaligned with employer, government or other demand. This mismatch may be identified at national level and/or at regional level. Vulnerable subjects should be defined as those where there is a mismatch between two or more parts of the chain linking the supply of potential students to HE provision to current or predicted demand, whether expressed by employers, government or from elsewhere.

A significant point is that the report states specifically that departmental closures do not of themselves mean vulnerability (HEFCE 2005a, p1).

The group's methodology

The group examined a range of data including A-level results and UCAS applications. But it appears that they started their investigations with prior thoughts about what subjects might be found to be both strategic and important in that they selected a number of subjects for more detailed scrutiny. These were science, technology, engineering and maths (STEM) subjects and languages, and, where information was available, at minority language provision.

In the case of STEM subjects the more detailed scrutiny involved an examination of time series analysis, for the period 1999-2000 to 2003-04 of Higher Education Statistics Agency (HESA) data, while for languages the HESA data considered only covered 2002-03.

The group also drew on the analysis in the Science and Technology Select Committee's recent enquiry into strategic science provision in English universities. This analysis suggested that 'it would be exaggerating to say that university STEM [science, technology, engineering, mathematics] departments are in crisis'. Having said that, if departmental closures continued unchecked, the Committee believed 'there is a very real possibility that the system will no longer be able to provide sufficient numbers of STEM graduates to meet the needs of the UK economy' (Science and Technology Committee 2005, vol 1, para 15). The group also noted the ambition in the Government's 10 year Science and Innovation Investment Framework 2004-2014 to 'achieve a step change in ... the numbers choosing SET (science, engineering, technology) subjects in post-16 education and in higher education; and the proportion of better qualified students pursuing R&D (research and development) careers' (HM Treasury 2004, para 12).

Their investigations led the group to identify the following subjects as being of national strategic importance and vulnerable. In many cases withdrawal would have an impact on other disciplines:

- science, technology, engineering and mathematics
- area studies and related minority languages, including:
 - Arabic and Turkish language studies and other Middle Eastern area studies, former Soviet Union Caucasus and central Asian area studies
 - Japanese, Chinese, Mandarin and other far eastern languages and area studies
 - Courses relating to recent EU accession countries, especially those in Eastern Europe and the Baltic (which includes new accession countries such as Bulgaria and Romania scheduled for entry in January 2007)
- modern foreign languages
- land-based studies
- quantitative social science
- vocationally oriented courses of particular interest to employers in industries that are of growing importance to the UK economy. This may include certain specialised sub-disciplines in the cultural and creative industries where employers clearly identify a lack of skills at HE level. However, the advisory group did not recommend that creative and cultural industries should be specified as a target subject as a whole, because these subjects, while strategically important, show no signs of vulnerability on grounds of lack of student demand at the national level. There are however, some concerns about the long-term sustainability of some creative arts institutions.

The group pointed out that this list is broadly similar to that in the Annex to the Secretary of State's letter, with the following exceptions:

- the addition of modern languages, land-based studies and quantitative social science.
 - a. Modern languages were identified in the National Languages Strategy for Higher Education⁴ as an area of concern. This was due to the shrinkage in language capacity at national and regional level in HE, with institutional concentration of provision and a narrow student class profile.
 - b. Land-based studies are vulnerable both because demand is falling, but also because provision is frequently supplied by monotechs which are more vulnerable to change than larger, multi-faculty institutions.
 - c. Quantitative social science is a particular concern of the Economic and Social Research Council, as supply is seen as insufficient, particularly as this subject underpins other disciplines.
- the removal of e-skills. Although strategic, the group could see no evidence that this subject was vulnerable at present. However, HEFCE will need to continue to work with

⁴ Commissioned from Hilary Footitt, on behalf of the University Council of Modern Languages, and managed by the Higher Education Academy Subject Centre for Languages, Linguistics and Area Studies. Published by the DfES in 2005.

other stakeholders, including e-skills UK and JISC (Joint Information Systems Committee) to ensure that growing demand in this area is met.

The supply of places in strategically important subjects in England and Wales

Table 8 below compares the numbers of full-time enrolments in the individual strategically important and vulnerable subjects in Wales and England. The numbers in brackets with the Welsh figures are the numbers of Welsh HEIs with enrolments recorded in the relevant subject and mode of study.

Table 8 Comparison of full-time enrolments in strategically important and vulnerable subjects 2004/05

Subject of Study	Postgraduate			Undergraduate		
	England	Wales	Ratio Eng to Wales	England	Wales	Ratio Eng to Wales
Agriculture	695	50 (3)	13.9:1	3,540	510 (3)	6.9:1
Forestry	110	45 (1)	2.4:1	250	25 (1)	10.0:1
Landscape	350	0	-	840	0	-
Architecture						
Chemistry	3,155	215 (4)	14.7:1	9,105	495 (4)	18.4:1
Materials Science	230	0	-	175	0	-
Physics	2,350	35 (2)	67.1:1	7,810	435 (3)	18.0:1
Forensic Science	755	35 (1)	21.6:1	3,220	605 (3)	5.3:1
Astronomy	170	40 (1)	4.2:1	740	140 (3)	5.3:1
Geology	945	70 (1)	13.5:1	3,320	410 (4)	8.1:1
Ocean Science	190	95 (2)	2.0:1	630	110 (2)	5.7:1
Physical Geography	2,155	125 (5)	17.2:1	10,185	1,925 (9)	5.3:1
Mathematical Science	2,760	65 (4)	42.5:1	16,090	750 (7)	21.5:1
General Engineering	2,705	65 (3)	41.6:1	7,130	575 (4)	12.4:1
Civil Engineering	2,620	115 (3)	22.8:1	7,335	765 (4)	9.6:1
Mechanical Engineering	1,990	40 (2)	49.8:1	10,905	895 (5)	12.2:1
Aerospace Engineering	545	0	-	4,860	145 (3)	33.5:1
Electrical and Electronic Engineering	5,685	205 (4)	27.7:1	15,655	1,170 (7)	13.4:1
Production Engineering	1,600	15 (2)	106.7:1	2,735	170 (4)	16.1:1
Chemical Engineering	1,235	15 (1)	82.3:1	2,620	65 (1)	40.3:1
Economics	4,535	120 (3)	37.8:1	19,995	735 (4)	27.2:1
Modern European Languages	455	0	-	13,085	1,010 (5)	13.0:1
Chinese	140	0	-	385	0	-
Japanese	55	0	-	520	20 (1)	26.0:1
South Asian and Other Asian Studies	170	0	-	310	0	-
TOTALS	35,600	1,350	26.4:1	141,440	10,995	12.9:1

Source: *Students in Higher Education Institutions 2004/05 Tables 8a, 8b, and 8c*. HESA March 2006

The ratio of the English and Welsh populations is 17:1.

Thus, it appears that at postgraduate level the numbers in Wales, proportionate to the populations, are significantly below those in England but that the situation is reversed in the case of undergraduates. At the undergraduate level, provision in Wales, in what have been identified as strategically important and vulnerable subjects, is much higher, in proportion, than in England, with the main exceptions being mathematics, the physical sciences and some branches of engineering.

Other noteworthy features of these figures are:

- As with full-time postgraduates in general, English HEIs have a bigger share of the student market in these subjects than Welsh HEIs.
- The total absence in Welsh HEIs of any full-time postgraduate enrolments in any of the language disciplines – there are virtually no part-time postgraduate enrolments either.
- In some subjects such as Forestry and Ocean Sciences, Welsh HEIs enjoy a significantly high share of the total England and Wales market.

- The small numbers in some subjects in Wales are spread across several institutions. This increases the vulnerability of provision to closure because it is unsustainable. This might be expected to increase pressures for increased collaboration.

In our view the arguments that underpinned the judgement by HEFCE in England of the subjects that are both strategically important and vulnerable apply similarly to provision in those subjects in Wales and in some cases more widely across the United Kingdom. We would recommend therefore that HEFCW seek to work closely with HEFCE and the other funding bodies to ensure that provision in these subjects is considered on a UK basis.

STUDENT DEMAND FOR PART-TIME HIGHER EDUCATION

In this section of the report we consider the implications of the demand from Welsh domiciled students for different subjects in the identification of subjects of broader importance to Wales. At present this is principally about the subjects of study of part-time students who tend to be less mobile for employment or family reasons and are much less likely than full-time students to study outside Wales as we showed in Tables 2a, 2b, 3a and 3b and 4. The remoteness of some communities in Wales and the long travelling time to the main centres of population where most of the HEIs are located also put a premium on locally based part-time provision.

As we noted earlier, it is likely that from 2007 more Welsh domiciled full-time undergraduates will choose to study in Wales because of the financial incentive provided by the fee remission grant of £1,500 per annum available if they so choose. This alone could have the effect of extending the list of subjects of broader importance to Wales if they were to be ceased to be offered at any Welsh HEI.

One member of the research team for this project has been involved in parallel with this study in a detailed study of the institutional part-time HE provision in Wales⁵ as a contribution to the Graham Review (WAG 2006) of part-time higher education study in Wales. Although the Graham report will not be published until May we have, following discussion with HEFCW officers, drawn on that work in considering the availability of part-time study opportunities as a factor in assessing subjects of broader importance for Wales.

The principal conclusion from that work is that part-time higher education is not simply an adjunct to full-time higher education. Part-time higher education consists of a wide diversity of strands serving different student markets and delivered at times and in ways to suit the needs of particular groups of students. The evidence collected for the Graham Review demonstrated that Welsh HEIs make very considerable efforts to deliver part-time programmes as close as possible to where students live and work in recognition of the difficulties of travelling around Wales. While the majority of part-time programmes delivered by HEIs in Wales are offered by the institution alone, often through extensive outreach programmes or distance/blended learning programmes, a significant proportion are offered under franchising arrangements with FE colleges (FECs). These are far more common in Wales than elsewhere in the UK. In Wales, 14% of all part-time students were on franchise programmes in 2003/04 (that is 6,595 from a total of 47,755 students, excluding students enrolled with the Open University in Wales). This compares with 5% of all part-time students in England, 2% in Northern Ireland and 1% in Scotland. Of a total number of 570 franchising partners with HEIs across the UK, 68 franchise partners were in Wales.

Part-time study opportunities are available at all levels from postgraduate research through to non-vocational undergraduate sub-degree level programmes. As we showed in Table 3a over 80% of part-time undergraduate students at Welsh HEIs in 2004/05 were enrolled on sub-degree programmes. This includes both vocational programmes such as Higher National Certificates (HNCs) and Foundation degrees and students undertaking continuing professional development programmes (CPD) and non-vocational programmes including low credit based programmes for those entering higher education for the first time (often within the context of widening participation programmes) and adult and continuing education programmes building on liberal adult education provision in traditional university extra mural departments. The Open University in Wales is a significant provider of part-time distance learning opportunities both at this other undergraduate level and more especially at part-time first degree level where it provided over 40% of all part-time first degree enrolments in Wales in 2004/05 (*HESA Students in Higher Education 2004/05 Table 5b*).

⁵ *The Graham Review of part-time Higher Education in Wales: Commissioned Research Strand- the Collection of Quantitative Data not in the Public Domain*: to be published Welsh Assembly Government May 2006.

The different student markets served by part-time HE provision include those in employment seeking to enhance their career or change career; those on state benefits seeking to enhance their employability; those undertaking CPD whether employer or individually driven; individuals entering higher education for the first time and lifelong and 'third age' learners. The analysis for the Graham Review showed that a higher proportion of part-time undergraduate students in Wales were on HNC and undergraduate professional programmes and a lower proportion were on first degree programmes than in the UK as a whole.

The study for the Graham Review (WAG 2006) also included an analysis of the most popular subjects of study for part-time first degree students and part-time students on other undergraduate programmes in 2003-04. The analysis is presented in Table 9 below.

The table shows that for part-time first degree enrolments the 16 most popular subjects represent over two thirds of all such enrolments and 22% of all part-time first degree enrolments are in the four public sector professional disciplines of nursing, social work, teacher training and Academic Studies in Education. Although the Open University in Wales has a slightly lower proportion of the part-time first degree enrolments in these most popular subjects than its proportion of all part-time first degree enrolments, in six of the most popular subject areas it is the sole or predominant provider in Wales.

Subjects associated with public sector professions also appeared up amongst the most popular subjects for part-time other undergraduate enrolments. The large number of part-time other undergraduate enrolments in Celtic studies or Welsh language tuition are almost entirely at one institution. Similarly the large numbers of part-time other undergraduate enrolments in English Studies are at a single institution, largely within the institution's Community Studies programme. Vocational subjects such as business studies, management studies, electrical and electronic engineering, and computer science are also well-represented.

Table 9: Most popular subjects of study for those studying part-time for first degrees and other undergraduate qualifications 2003/04

First Degree		Other Undergraduate Qualifications	
Subject of Study	Enrolments	Subject of Study	Enrolments
Nursing	915	Social Work	3,870
Social Work	480	Others in Education	2,615
Computer Science	455	English Studies	2,440
Sociology	380	Celtic Studies	2,440
Business Studies	375	Combined Study	2,435
Teacher Training	360	Teacher Training	1,430
Theology	350	Nursing	1,385
General Engineering	280	Business Studies	1,320
Electrical and Electronic Engineering	275	Computer Science	1,200
Psychology	265	Theology	1,020
Others in Historical and Philosophical Studies	255	Management Studies	790
Physical and Terrestrial Science	255	Accounting	735
Geography and Environmental Science		Others in Historical and Philosophical Studies	665
Mathematics	245	Electrical and Electronic Engineering	620
Academic Studies in Education	210	Spanish Studies	605
Building	190		

Source: Students in Higher Education in 2003/04 HESA 2005 and the Open University (private communication).

This pattern of subjects for part-time undergraduate study clearly reflects demand from individuals and employers although the study found that only a minority of students received financial support from their employers for tuition fees. Nevertheless part-time provision is a significant element within the totality of higher education provision in Wales and has been growing more rapidly than full-time undergraduate provision in recent years. For many who participate in part-time higher education it is the only way that they can participate given the demands of their employment and families. Full-time participation is not an alternative.

In our view the continued availability of much of the part-time provision is of itself of broader importance to Wales. However, the study for the Graham Review found that part-time undergraduate higher education was potentially at risk if institutions sought to raise part-time fees pro rata to the increase in full-time fees. Market research suggested that such an increase would substantially reduce demand and render some part-time provision at least unsustainable.

CONCLUSION

There are many subjects within higher education that are of major importance to the economy and life of Wales; there are many disciplines the graduates of which play an essential part in the life of the country. In that sense there are many subjects which are of importance to Wales.

But our task was to identify those subjects of broader importance defined as follows

Subjects, which if they were to disappear from the range of subjects offered by Welsh Higher Education Institutions, either at postgraduate or undergraduate level, would have a serious deleterious impact on the Welsh Economy, Culture or Society.

We have identified a number of such subjects relating to Welsh Language and Culture, including the delivery of disciplines through the medium of Welsh, and the emergence of differing professional qualifications structures in Wales than those in other parts of the UK.

In terms of the generality of subjects, however, our literature search, supported by a small number of interviews, did not indicate that there were any specific disciplines which satisfied the chosen definitions of subjects of broader importance. This conclusion does depend on the answer to a fundamental question as to whether it is thought desirable to establish a self-sufficient system of higher education in Wales. If the answer to this question is positive then there is a very long list of subjects that are of broader importance to Wales.

We conclude that the general consensus is that it would not be desirable, on economic if on no other grounds, to establish such a separate system and that it is entirely possible for the needs of Wales, with the exceptions we have noted, to be satisfied not only by the universities of Wales but also by the universities in England and, to a lesser extent, the universities of other countries.

But having made that statement, one important caveat and one critical consequence need to be very firmly stated.

The caveat is that Wales needs to sustain and enhance a higher education system made up of healthy and viable institutions that, other than in the case of specialist institutions, offer a broad range of provision and that there needs to be in Wales more than the critical mass for the academic pursuit of the major disciplinary groupings. To provide a possibly invidious example, it is important to ensure that there is a flourishing community of social scientists in Wales and that that community is reasonably widely spread over a number of institutions. But it would not necessarily have a major deleterious effect on Wales if there were no undergraduate degrees in, say, anthropology, in the country, but it would damage the health of the Welsh higher education system and its ability to contribute to the Welsh economy if degrees in a number of social science disciplines were no longer available in a Welsh institution.

The consequence, given the significant observed flows of students and graduates between England and Wales, is that there will be subjects of broader importance but with the above definition amended as follows.

Subjects deemed to be of broader importance to Wales are those

Subjects, which if they were to disappear from the range of subjects offered by Welsh *or English* Higher Education Institutions either at postgraduate or undergraduate level, would have a serious deleterious impact on the Welsh Economy, Culture or Society.

Given the relatively low level of exchange between the graduates and students of Wales and the other nations comprising the United Kingdom the change in the working definition of subjects of broader importance is confined to the inclusion of the reference to England.

In the light of the above we recommend that HEFCW work closely with HEFCE, and where appropriate agencies covering Scotland and Northern Ireland, to identify subjects that are of importance but whose sustainability appears to be at risk and to take appropriate actions to protect those strategically important subjects.

There are a number of features relating to the comparatively small size of the Welsh higher education sector which need to be addressed in order to ensure that the system remains healthy and vibrant and comprehensive in its coverage.

In a small system decisions made at the individual institutional level will, all other things being equal, have a more significant impact on the system as a whole than would be the case in a large system.

The second point is that within the smaller system Wales has a higher proportion of smaller institutions than are found in England and many other countries. Smaller institutions find it more difficult to offer and sustain a broad curriculum than larger institutions and are often more vulnerable to sudden changes in student demand.

We believe that these factors place a particularly strong responsibility on HEFCW to adopt a monitoring role. This role would involve the Council in familiarising itself with views and policies of relevant bodies that relate in broad terms to the range of subjects provided by Welsh HEIs and to report to WAG and to the HEIs when, in its view, there is a danger that the difference between what is required and what is available might be of such a magnitude as to hinder economic and other forms of development.

We should emphasise our belief that monitoring should be mainly concerned with curriculum balance and spread but the work would need to be carried out in the context of the recommendation that HEFCW and HEFCE work together to identify vulnerable subjects of strategic importance.

While the importance of a vibrant system of HEIs able to offer a balanced and reasonably comprehensive HE curriculum for full-time students cannot be over-emphasised, it is arguably more critical for part-time students who often lack mobility. It is extremely desirable that part-time students in all parts of Wales are presented with as wide a range of opportunities as possible. HEIs in Wales, through extensive franchising of courses to FE colleges and their own outreach programmes, have made considerable efforts to deliver part-time higher education in a range of disciplines, but the range tends to be limited by the expertise available in the colleges.

While it may be difficult to construct a list of subjects of broader importance to Wales as a whole it is likely that many students who have little choice but to study part-time or even more importantly, perhaps, potential part-time students will have their own lists of subjects that are of broader, indeed critical, importance to them. Save for those living in the larger conurbations, few part-time students will have the opportunities to select from a broader subject range unless they opt, at least in part, for some form of distance education.

We suggest that in undertaking its monitoring role, HEFCW should not only concern itself with the opportunities available to full-time students but also examine the position of part-time students. We further suggest that the position of part-time students would be much improved if there were closer links between local providers and distance educators. We understand that the principal distance learning provider in Wales has received funding from HEFCW's Strategic Development Fund to support a post that will explore the potential for it to work with local providers – both traditional HEIs and FE colleges - to deliver part-time higher education in a broad range of subjects. We consider this to be a very timely and important initiative to widen the range of opportunities for part-time study in Wales. We consider that, as part of its continuing analysis and monitoring, HEFCW give particular attention to the possibilities of encouraging such partnerships.

While we have argued that for a high proportion of subjects Wales should work with England in identifying and protecting strategically important provision, when considering the Welsh language and other aspects of life that relate primarily to Wales, Wales will have to rely on its own resources and the definition of subjects of broader importance within higher education reverts to its more restricted definition referring to the withdrawal of provision in Wales.

The opportunity to study the Welsh language, literature and culture at all levels from postgraduate to lower level language training is central. Most of the provision is currently concentrated in four institutions and the numbers involved are quite modest, except for full-time first degrees. The low numbers of students studying Celtic Studies at Welsh HEIs appears of particular concern, given that it is from amongst these individuals that the future academic staff in Welsh language, literature and culture will be recruited.

The 'Cwrricwlwm Cymreig' effect relates to the wide range of subjects in which there is a specific Welsh dimension when studied in Wales. It seems to us that this has a relevance, to varying degrees, to a wide range of disciplines. It indicates the need to encourage a larger number of Welsh residents both to pursue their higher education and their subsequent careers in Wales, but we could not identify in our search of the literature any specific subjects which would fall, by virtue of the need to give recognition of the Welsh dimension, within our definition of subjects of broader importance.

Finally, there are a number of professions where the nature of the qualifications and modes of entry to the profession are beginning to differ between Wales and the rest of the United Kingdom.

The Welsh dimension is a major factor in determining subjects of broader importance to Wales. This range from the study of the Welsh language and literature through Welsh medium provision in a range of disciplines, in particular ITT to professional disciplines where the requirements for registration are diverging from those in England. In all these areas Wales must look to its own HEIs to offer relevant programmes. A good deal of this is already covered by HEFCW's Welsh language scheme and its strategy for Welsh Medium provision. The changing requirements for professional registration in Wales is the one area that does not fit within this framework and it will be important that HEFCW continues to liaise closely with the relevant departments in WAG and with the accrediting agencies for the professions to ensure that HEIs are properly informed and to monitor their responses.

Overall conclusion and recommendations

With the important exceptions of a number of subjects that relate to the language and literature of Wales and to other aspects of Welsh life, including differing professional qualifications, we could not identify any subjects that would be regarded as being of broader importance in that their disappearance from the range of subjects offered by Welsh Higher Education Institutions, either at postgraduate or undergraduate level, would have a serious deleterious impact on the Welsh Economy, Culture or Society.

In the course of our report we make the following recommendations. That:

1. HEFCW work closely with HEFCE and the other funding bodies to ensure the adequate maintenance of provision in those subjects that are, in the context of the United Kingdom, considered as being both strategic important and vulnerable.
2. HEFCW should adopt a monitoring role to familiarise itself with views and policies of relevant bodies that relate in broad terms to the range of subjects provided by Welsh HEIs and to report to WAG and to the HEIs when, in its view, there is a danger that the difference between what is required and what is available might be of such a magnitude as to hinder economic and other forms of development.
3. In its institutional monitoring HEFCW should concern itself with curriculum balance and spread, but that the work would need to be carried out in the context of the recommendation that HEFCW and HEFCE work together to identify vulnerable subjects of strategic importance.
4. In undertaking its monitoring role HEFCW should not only concern itself with the opportunities available to full-time students but also examine the position of part-time students and should consider how it might encourage appropriate partnerships between institutions and distance learning providers.

5. Recommendation 26 of the Furlong report (Furlong et al 2006) "That, as a matter of priority, the Welsh Assembly Government establish a new Review in order to consider the supply and training needs of all teachers able to teach through the medium of Welsh" be implemented.
6. In the context of the requirements for the registration of professional staff it is important that HEFCW continues to liaise closely with the relevant departments in WAG and with the accrediting agencies for the professions to ensure that HEIs are properly informed of developments and expectations and should monitor the responses of HEIs to this intelligence.

ANNEX

References

- ELWa (2004) "Research into Welsh language skills: needs of employers", ELWa.
- Furlong, John; Hagger, Hazel; Butcher, Cerys and Howson, John (2006) "Review of Initial Teacher Training Provision in Wales", University of Oxford Department of Educational Studies.
- HEFCE (2005 (1)) "Strategically Important and Vulnerable Subjects", HEFCE.
- HEFCE (2005(2)) "Young participation in higher education" (HEFCE 2005/03).
- HEFCW (2004) "Steering Group for Welsh Medium Provision in Higher Education Strategy" HEFCW.
- HEFCW (2005) "Welsh Language Scheme" Cardiff, HEFCW.
- HM Treasury (2004) "Science and innovation investment framework 2004-12".
- IES (2006) "Graduate Employment and Employability in Wales", Draft Report, Institute of Employment Studies.
- Loveland, R (2006) "A Science Policy for Wales? Consultation Paper", WAG.
- Science and Technology Committee (2005) "Strategic Science Provision in English Universities" London, House of Commons.
- WAG (2002) "Reaching Higher, Higher Education and the Learning Country" Cardiff, WAG.
- WAG (2003) "Iaith Pawb- A National Action Plan for a Bilingual Wales" Cardiff, WAG.
- WAG (2004) "Knowledge Economy Nexus: Role of Higher Education in Wales", Cardiff.
- WAG (2005a) "Fair and Flexible Funding; A Welsh Model to Promote Quality and Access in HE", The Rees Review, Cardiff, WAG.
- WAG (2005b) "Wales: A Vibrant Economy", Cardiff, WAG.
- WAG (2006) "The Graham Review of part-time Higher Education in Wales: Commissioned Research Strand the Collection of Quantitative Data not in the Public Domain". To be published Welsh Assembly Government May 2006.

Other publications consulted

- Brown, Nigel and Clark, Tony (2005) "A Study of Current and Emerging Collaborative Activities between Higher Education Institutions in Wales", Cardiff, Higher Education Wales.
- Bull, John and Cooke, Ron (2005) "Review of "Post-92" Higher Education in Southeast Wales", Cardiff, HEFCW.
- Future Skills Wales (2005), Sector Skills Survey, Cardiff, Future Skills Wales.
- Leitch, Sandy (2005), "Skills in the UK: The long-term challenge – Interim Report", London, HMSO.
- National Assembly for Wales (2004) "Student Flows in Wales 2001/02 and 2002/03" Cardiff, Statistical Directorate, National Assembly for Wales.
- Robert Huggins Associates (2005) "Strategic Review of Modern Language Provision in HEFCW-funded Higher Education Institutions".
- WAG (2005) "Iaith Pawb and Welsh Language Scheme- Annual Report 2004/05" Cardiff, WAG.

Web sites consulted

A sample of the web sites of Welsh Higher Education Institutions

- The Economic Research Advisory Committee
- NHS Wales
- Welsh Local Government Association
- Fforwm – the representative body of FE colleges and institutions in Wales
- Dysg Cymru - the national operational arm for Wales of the Learning and Skills Development Agency (LSDA)
- ACCAC, (the curriculum authority for Wales)
- British Council in Wales
- National Union of Students Cymru
- CBI: Wales Management Council

- Wales Trade International – a body of the Welsh Assembly which provides central export services in Wales
- Wales International Consortium – an organisation owned by the 12 Welsh HEIs concerned with the recruitment of international students
- TUC (Web pages relating to Wales)
- HE Europe Unit at Universities UK
- Higher Education Wales – the Welsh arm of universities UK
- General Teaching Council for Wales
- Welsh Language Board
- The Welsh Development Agency
- Future Skills Wales
- HEFCW
- ELWa

People interviewed

Anthony Armitage, Technology Innovation Unit, WDA

Phil Gummett, Chief Executive, HEFCW

Roger Carter, Head of Economic Development, HEFCW

Siân Lloyd-Jones, Chief Executive, Finance Wales (A wholly owned subsidiary of the WDA)

Ron Loveland, Welsh Assembly Government

John Howells, Head of Higher Education, Welsh Assembly Government.

Richard Rossington, Head of Innovation Branch, Welsh Assembly Government from 1 April 2006, formerly of the Welsh Development Agency

UCAS applications to STEM subject courses at UK HEIs 2003/04 to 2005/06

Country of insitution	STEM applications 2003/04	All applications 2003/04	Proportion STEM 2003/04	STEM applications 2004/05	All applications 2004/05	Proportion STEM 2004/05	STEM applications 2005/06	All applications 2005/06	Proportion STEM 2005/06
Wales	27,755	89,320	31%	25,970	85,730	30%	28,015	101,345	28%
England	469,510	1,683,150	28%	443,315	1,712,225	26%	473,090	1,875,295	25%
Scotland	49,750	170,015	29%	48,990	176,690	28%	51,090	190,560	27%
Northern Ireland	13,845	56,980	24%	14,120	60,940	23%	14,520	64,160	23%
Total	560,860	1,999,465	28%	532,395	2,035,585	26%	566,715	2,231,360	25%

Percentage change in the number of STEM applications:

2003/04 to 2004/05	2004/05 to 2005/06	2003/04 to 2005/06
-6%	8%	1%
-6%	7%	1%
-2%	4%	3%
2%	3%	5%
-5%	6%	1%

Source: HEIDI

Notes:

These figures are not accurate as rounded figures taken from the HEIDI website have been added to produce the figures shown. The figures shown here should be used as a general guide rather than considered actual figures.

STEM subjects include:

Biological Sciences
 Veterinary Science, Agriculture and Related
 Physical Sciences
 Mathematical and Computer Sciences
 Engineering
 Technologies
 Combined Sciences

jures.