Progression into STEM programmes

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Progression through STEM Skills

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Progression – students to graduate careers







Incroacing domand for CTEN/

		Undergraduate FTEs		UCAS acceptances		A level entries	
		2005-06	% change 2005-	2007-08	% change 2007-	2006-07	% change 2006-
Area of SIVS	Discipline	2007-08	06 to 2007-08	2009-10	08 to 2009-10	2008-09	07 to 2008-09
Science		12,027		3,907		35,077	
	Chemistry	13,442	12%	3,956	1%	37,174	6%
		9,534		3,228		23,887	
	Physics	10,011	5%	3,573	11%	25,643	7%
Engineering and Technology		72,764		21,807			
	Engineering and technology	71,396	-2%	24,491	12%		
Mathematics		22,678		5,915		53,331	
	Mathematics	23,816	5%	6,908	17%	64,553	21%
	Further mathematics (A level					7,241	
	entries only)					9,449	30%
Modern foreign languages	European languages.			4,214			
	literature and related courses	28,004		4,631	10%	28,377	
	Non-European languages.			1,261			
	literature and related courses	26,812	-4%	1,002	-21%	29,542	4%
All subjects (SIVS and non-SIVS)		1,049,619		413,430		718,756	
		1,051,911	0%	477,277	15%	757,761	5%



Programme

HEFCE (2010)

Student Demand for STEM

Reasons for increase in demand:

- Impact of work of a range of national initiatives & organisations
- "The prevalent perception at my university (a Russell Group member) is that the humanities subjects are a poor career choice simply because theyleave you with a less concrete, more vague skill set that is harder to sell to a graduate employer"

Laura (May 2010)

 "Science is a way of thinking much more than it is a body of knowledge"



Employer Demand for STEM

 Businesses from all sectors want STEM Skills – nine out of ten (92%) firms employ STEM skilled people, valuing their analytical capabilities and problem solving skills...given a choice, four out of ten employers prefer STEM degrees over any other subject."

CBI Education and Skills Survey (2009)



Progression within HE

• First-year continuation rate for young 2002-03 UK

Result of first			Pakistani &		Indian &	Mixed &
year	White	Black	Bangladeshi	Chinese	other Asian	other
Continued to	140.040	4.070	4.050	2.075	0.555	4 2 2 5
second year	148,310	4,070	4,950	2,075	9,555	4,325
Changed course	9,875	525	740	155	1,170	435
Left HE	13,780	350	560	120	675	395
Total	171,965	4,945	6,245	2,350	11,395	5,155
Continued	86%	82%	79%	88%	84%	84%
Left HE	8%	7%	9%	5%	6%	8%
HEFCE (2010)						



The school-university interface

- Series of well documented issues (in STEM) from a HE perspective:
 - (Expected) prior knowledge of incoming undergraduates
 - Mathematical preparedness & fluency
 - Laboratory and practical skills
 - Problem solving skills
 - Attitudes to study
- Substantial work relating to mathematics



What do HE staff want?

- University lecturers want most:
 - Students with a curiosity and interest in the subject
 - Students who know how to study independently and who are prepared to work;
 - Students with the skills and knowledge required to The School to University Transition in succeed in their chosen course. **STEM Subjects (2005)**



HE staff expectations for student progress

- Attitudes:
 - Motivation
 - Persistence
 - Initiative & keenness
 - Ability to study independently
- General Skills:
 - Numeracy
 - Mathematical ability
 - Literacy

- Problem solving skills
- Practical skills
- IT skills
- Curriculum Content:
- Necessary pre-The School to University Transition in STEM Subjects (2005)



Student perspective Transitional Issues

- Academic
 - Teaching & learning styles
 - Assessment
 - Academic independence
 - Volume & pace of work
- Personal/Social
 - Finances
 - Friendships
 - New culture and lifestyle
 - Increased independence & freedom

Geographic

- Campus size
- Learning locations
- New city
- Administrative
 - University communication
 - Policies & procedures
 - Trapsition & Qrientation Rrogram University of Melbourne (2010)



Student adjustment to HE study

• "There is a bundle of factors identifying students at risk of failure in the system. These include low achievement, pressure from financial commitments, perceived lack of parental understanding and social support, lack of preparation for university study, and excessive hours first and for university study, and Universities: Findings from 1994 to 2009 (2010)



Easing the transition

- Substantial HE work to date
- "Strong partnerships between schools, communities and tertiary institutions is particularly important for enhancing students preparedness for university and for developing realistic expectations among potential university students of the future" Universities: Findings from 1994 to 2009 (2010)



The university-workplace transition

- "...over four-fifths (81%) of employers believe ensuring graduates possess employability skills should be the priority for higher education, followed by 42% of firms who want steps to raise the quantity and quality of STEM graduates"
- "Employability skills are the most important factor for employers (77%) when recruiting graduates. Degree subject remains relevant with a quarter (25%) of graduate jobs requiring a specific degree discipline" CBI Education and Skills Survey (2010)

