

**Enterprise and Business Committee follow-up inquiry into Science, Technology,
Engineering and Mathematics (STEM) Skills:
A response by CITB Cymru Wales**

CITB Cymru Wales welcomes the opportunity to provide evidence to the Enterprise and Business Committee's follow-up inquiry into Science, Technology, Engineering and Mathematics (STEM) Skills. Adequate STEM provision is essential in laying the foundations for careers in the construction sector, allowing the next generation of Wales' construction workers to progress to apprenticeships and training.

What progress has been made in addressing the issues identified in the Enterprise and Learning Committee's 2011 inquiry into the STEM agenda, including:

- **The adequacy of provision of STEM skills in schools, further education colleges, higher education and work-based learning (including apprenticeships);**

The general impression often expressed anecdotally by employers is that employees, especially younger employees including apprenticeships have low or poorly developed basic skills in literacy and numeracy. This would seem to be the case in England as well as Wales, so may not be considered a Welsh issue only. The concern extends to Graduates as well as those entering work at the lower level. Numeracy and STEM seems to have been overshadowed by issues relating to Literacy and the English GCSE in Wales over recent months.

During discussions with Further Education colleges it is apparent that their intake of students and apprentices require significant remedial work to attempt to bring them to the required standard around C Grade GCSE which is costly in time and resources. Developing students STEM skills Post 16 can be considered as being additionally difficult as learners will have a number of years' experience of failure at Secondary Schools in subjects such as Maths and are at a transitional period from adolescence to adulthood and employments with all the added distractions associated with this.

With regards to the acquisition of the basic STEM skills required for Construction Apprenticeships which are largely basic calculations of quantities, ratios and angles these should be learnt and consolidated by the end of the Primary school phase and built upon and enriched during latter education phases. It is inconceivable that learners 'lose' consolidated learnt skills during the Secondary Education phase and that it is wasteful for employers FE and HE to be 'picking up the pieces' of failure lower down the Education system.

Secondary Schools and FE have been, and continue to be, in the case of Secondary Education held to account for their performance or lack of performance whilst it would seem that Primary schools who are tasked with ensuring the development of basic skills are unaccountable and are not subject to the same scrutiny with regards to STEM subjects or basic skills transition in general. Before progress on these matters is made it is essential that the success of the primary sector is rigorously assessed as it is likely that transition levels are unrealistic causing issues and waste throughout the system. It would seem that ESTYN have been ineffective in their role in scrutinizing this sector and to this end an independent task force led by industry should be formed to lead this enquiry.

An additional factor which affects all stages of Education is the lack of STEM ability amongst teachers and lecturers; this has been acknowledged by ESTYN in a recent report on the Construction Sector in Wales. This situation is highly likely to exist in the Primary sector and is likely to be exasperated with the introduction of an additional

GCSE in Mathematics in the Secondary Sector without sufficient thought or planning with regards to the number or availability of teachers capable of delivering the additional qualification. The reality will probably be that specialist and semi specialist teachers will be taken away from the lower ability student to teach middle and higher ability students making the support for potential apprentices in the lower academic cohort weaker. This needs to be planned effectively.

- **Value for money from the additional funding to support and promote STEM skills and whether the current supply of STEM skills is meeting the needs of the Welsh labour market;**

As noted elsewhere within this report, employers continue to complain about the lack of basic skills amongst employees old and young. Initiatives such as the Basic Skills in the workplace initiative were a positive step but were ineffective in its lack of ability to help sole traders who are the backbone of the Construction Industry.

The cost of remedial work for apprentices and graduates is also a concern as this is increasingly expensive with only the examination bodies profiting if students continue to have to re-sit qualifications they are likely to repeatedly fail.

- **The supply of education professionals able to teach STEM subjects and the impact of Initial Teacher Training Grants and the Graduate Teacher Programme on recruiting STEM teachers and education professionals;**

Whilst it is not possible for us to comment specifically on the success of the specific initiatives without data regarding the numbers successfully recruited and entering teaching, the notes above the comments in the 1st section of this report indicate concern at the current situation on Primary and FE and points to additional potential concern within the Secondary Sector.

This is a key requirement of success for the development of STEM at all levels. Additional up-skilling and assessment of capability needs to be undertaken at all levels for existing staff and especially for FE Construction Craft lecturers.

- **The effectiveness of education and business links between education institutions and STEM employers.**

With the demise of Careers Wales EBP activities seem to have reduced and lack a clear purpose and focus compared to their peak in the 1980's and 1990's through the EBP network. At best they can be said to be responsive to school needs rather than industry needs with an over emphasis on end of year summer activities perceived by employers rightly or wrongly as providing time for teachers to complete end of year tasks.

The sheep dip approach of offering work experience to all students within a narrow time band during the summer term has disengaged many employers from participating in links with schools due to past experiences for a number of reasons.

There is an opportunity for positive and meaningful engagement with industry through the new Welsh Baccalaureate and the Challenges which are a key part of their structure.

The level 2 and potential level 3 WJEC qualifications also provide an opportunity for meaningful employer input as a key part of their design.

Whether any progress has been made on addressing negative perceptions and gender stereotypes of STEM and promoting good practice to encourage women to acquire STEM skills and to follow STEM related careers.

The number of learners within the Russell Group Universities in Wales such as Civil Engineering and Architecture have a roughly 50-50 split male and female. This is not to say that these are Welsh learners or that these learners will chose to live and work in Wales or the UK following graduation as many are overseas students. Numbers are holding up well due to the international reputation of these institutions.

The situation with regards to courses such as Foundation Degrees, HNC's and degrees from institutions who have more recently gained university status is less encouraging with Construction Management etc. showing a residual male dominance.

Craft and Technical courses and Apprenticeships show the highest percentage of male learners compared to female, with apprenticeships showing the lowest number of females entering through this route. This is also true of the recently launched Civil Engineering Pathway at level 3 (technical) with no females applying for places in South East Wales.

CITB have over the years undertaken a number of initiatives from funded work experience for females and positive action events, some of which continue today. Unfortunately little measurable impact against investment can be seen.

The level 2 WJEC design and architecture qualification available from September 2014 is designed to assist in addressing this issue.

What progress has been made on learning STEM skills through Welsh medium education and training?

With regards to construction and education limited progress has been made in the provision of learning through the medium of Welsh. To a large extent this is influenced by a number of factors including demand from learners, availability of bi-lingual lecturers and issues relating to assessment of learners work and additional work and costs imposed by awarding bodies. The lack of bi-lingual external verifiers and examiners is also an issue that needs to be addressed.

On a positive note the development of 3 GCSE sized qualifications for schools delivery with the WJEC will potentially assist in addressing this issue as the qualifications can be delivered by Welsh medium schools who have the teaching staff. The development of a level 3 qualification equivalent to a GCE A level will assist progression and continued Welsh Language provision.

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