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## A strategic approach to developing Schools' STEM Skills Hubs & Centres in England

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The Worshipful Company of Information ([WCIT](#)), the parliamentary Digital Policy Alliance ([DPA](#)) and the National Education Network ([NEN](#)) are collaborating on ways to support schools and colleges (for ages 5-19) to better prepare their students with the STEM, digital and 21<sup>st</sup>C skills and careers advice they need to help the economy grow and to play a full part in an increasingly technological society. Giving students richer and more inspiring technology-enhanced STEM experiences, particularly in Key Stages 2 & 3 (ages 8-14) should raise their ambitions and make them more motivated learners, and hence achieve better results and qualifications.

One aspect of the work is to build on the existing Grids for Learning, which already provide more than half the schools in England with broadband internet access. They already offer a range of services and access to a large amount of content, and so provide a cost-effective means to give learners and teachers better access to information and tools to improve their STEM/digital offerings. Part of this work is to identify the location of the vast amount of high-quality STEM resources developed over the past 25 years and to help schools make more effective use of them.

Schools and colleges are themselves local employers with their own skills needs. Some Academy Trusts already pay the apprenticeship levy. Their skills development falls within the Local Enterprise Partnerships' ([LEPs](#)) remit for Skills and Employment, and their pipeline of skilled leavers falls within their Growth and Industrial remit. The main connection between LEPs and their schools & colleges currently lies with the network of c120 Enterprise Coordinators (ECs) through the Careers & Enterprise Company ([C&EC](#)). Each EC is jointly funded by the LEP and C&EC to recruit, train, deploy and support a network of c20 volunteer Enterprise Advisers (EAs), who are in senior positions in local companies. They give about 6 days per year advising secondary schools and colleges on better links with employers. By September nearly all secondary schools and colleges in England should have an EA. All the 38 English LEPs have a Skills Strategy in place. Following a recent [Green Paper](#), each is now drawing up a local Industrial Strategy. The Department of Digital, Culture, Media & Sport ([DDCMS](#)) is currently setting up a number of local Digital Skills Partnerships, beginning with [Lancashire](#). The stimulus for this current Schools' STEM Skills initiative was the first [Berkshire Skills Summit](#), co-hosted by the Thames Valley Berkshire LEP ([TVBLEP](#)) and the C&EC in Reading on 19<sup>th</sup> April, attended by the Employment Minister, [Alok Sharma](#).

There is a lot of uncertainty ahead about skills needs post-Brexit, future organisation and funding of LEPs, recruitment and retention of STEM staff in schools, funding for schools and even the date of the next general election. Many secondary schools are ceasing to offer GCSE courses in key STEM subjects such as Computing and Design Technology (DT) through staffing and funding shortages. There is a new minister responsible for the LEPs, [James Brokenshire](#), the Housing, Communities and

Local Government Secretary. While the existing organisations and budgets are still in place, we aim to identify a national strategy to use them to support primary and secondary schools, UTCs and colleges (*'schools'* for short) through a network of Schools' STEM Skills Hubs and Centres based in the LEPs. A Hub is a group of schools which agree to work collectively to improve STEM opportunities for all learners. A Centre is a physical space with up-to-date equipment to which schools in a Hub have access to provide enhanced STEM activities for learners and teachers.

STEM teachers' professional associations, working with school leaders, have developed the [iSTEM+](#) approach to help schools embed STEM into the curriculum and to develop cross-curricular practical group activities. The WCIT has adopted the iSTEM+ approach as its education and skills policy. A Government minister, [Caroline Dinenage](#), has been promoting it with parliamentary colleagues. iSTEM+ Hubs have already been formed in Dover, Gosport & Fareham, Malmesbury, Medway, Newbury, Reading and Rushmore, and others are currently being formed. Microsoft UK is hosting the first [national iSTEM+](#) conference in Reading in June. A Hub is an alliance of schools in an area which meet regularly to share practice and to plan joint activities for students and staff. There are a number of organisations which may form the basis of such hubs, including Multi-academy Trusts, the networks of the Computing At School group's ([CAS](#)) and NCETM's [maths hubs](#), and the [Science Learning Partnerships](#). A new development which should also stimulate Hub formation is the [Enthuse Partnership](#) programme from STEM Learning and Tomorrow's Engineers.

There is already an extensive national scheme to support school development and teachers' professional development called the Teaching Schools Alliances ([TSA](#)), which has a local, regional and central structure. So an LEP seeking to improve skills provision in the school and college sector can work with its C&EC's Enterprise Coordinators to identify local TSA groups to lead the development of Schools' STEM Skills Hubs in key locations. This is what the DPA's 21<sup>st</sup>C Skills group is doing currently in areas such as Banbury, Bognor & Chichester, [Plymouth](#), Portsmouth, Reading and East Anglia. See Plymouth's STEM [Strategic Plan](#) 2016-22 for a model of what can be achieved.

Schools within such Skills Hubs will need support from the local community, such as skilled volunteers and employers. The main source of skilled volunteers already in place is the network of 19 [STEM Ambassador Hubs](#) across the UK, managed nationally by [STEM Learning](#). These Hubs already have very good links both with local schools and local employers. STEM Learning's website contains a wealth of free [resources](#), and it has an extensive programme of teacher's professional development ([CPD](#)). The Royal Academy of Engineering ([RAEng](#)) also has a network of c45 Teacher Coordinators (TC) across the UK supporting its '[Connecting STEM Teachers](#)' programme. Each of these manages a local network of around a dozen primary and secondary school STEM teachers which meet regularly to share practice, to disseminate high-quality resources and to plan local events for learners and teachers. The Institution of Engineering & Technology ([IET](#)) also has [Local Networks](#) covering the country, each of which has a nominated Schools' Liaison Officer ([SLO](#)). They can also provide small grants to facilitate the Hubs. The IET has extensive resources for schools on its [Faraday](#) sites, and also organises a range of competitions and activities. The Engineering Development Trust ([EDT](#)) also has a wide range of programmes to support STEM enrichment.

The LEPs, Enterprise Coordinators, STEM Ambassador Hubs and IET Networks all have good links with employers. [Tomorrow's Engineers](#) has a network of [Employer Support Managers](#) which can facilitate closer engagement of employers to support Hubs. The development of a national network of Schools' STEM Skills Hubs can be achieved in a short time with minimal expense. A relatively modest target would be to establish around 400 such Hubs across England in 2018 connecting together around 4000 schools and colleges catering for the 5-19 age-range.

Already several LEPs have contributed substantial funds to build STEM centres for education, such as in [Brockenhurst](#), [Oxford](#) and [Stevenage](#). A different approach has been taken in Norfolk where a [Community Interest Company](#) (CIC) has been formed to refurbish, equip and manage a new STEM Centre in a currently unused space above the library in Downham Market, serving local schools. One such CIC is the [Form The Future](#) partnership whose [Cambridge Launchpad](#) is supported by Marshalls. Ideally each Schools' STEM Skills Hub should have access to a well-equipped location which can support STEM activities for learners during the school day, and host a variety of activities, including teachers' continued professional development (CPD) out of school hours. The formation of a local CIC as a not-for-profit organisation allows the community to raise its own funds to support the initial refurbishment and equipping of a suitable location, and its continuing use.

In order to incentivise schools to form Schools' STEM Skills Hubs, and to develop their own Centres, some core funding will be needed. Hubs will need to be able to access funding to support their own planning meetings, and the activities they offer, so that none of their members are prevented from participating through lack of funds. They also need access to physical resources, such as IT, which can be shared to ensure learners and teachers learn to use appropriate tools. For example many schools have sets of [BBC micro:bits](#) which can form the basis for work in physical computing and science experiments with some low-cost additional equipment. They can also be used with sensors within a wireless network, such as [sigfox](#), to create smarter school environments. So a set-up grant, maybe around £50k, should be provided to each new Hub to cover running costs and physical resources. Hubs seeking to develop a physical centre will need to be able to apply for additional funding, maybe around £75k, to set up a CIC to refurbish and equip it.

2018 is also the Government's '[Year of Engineering](#)'. The Government is a major employer of STEM and digitally skilled staff, so support could be drawn from ministries supporting Business, Defence, Digital, Employment, Energy, Environment, Health, Housing, Industry and Science, as well as Education and Local Government. In order to stimulate the formation of a national network of Schools' STEM Skills and Hubs, a consortium of Government Departments could collaborate with a group of LEPs, employers and other organisations to run a substantial pilot.

As well as encouraging better STEM, digital and 21<sup>st</sup> skills and careers provision, the Hubs should also help schools to provide more effective leadership and management to ensure that these are firmly embedded within the schools' curriculum and ethos.