Bloodhound rocket cars and BBC micro:bits set to regenerate STEM education and skills

Two very different examples of British engineering and ingenuity are in the news currently: the Bloodhound Super-Sonic Car and the BBC micro:bit computer. Over a million BBC micro:bit devices have been distributed to schools this year for use by 11-year old students as part of the BBC's Make It Digital programme.

Bloodhound Education has just announced an extended entry date of 31st November 2016 for schools to enter the `Race for the Line' model rocket car competition sponsored by Microsoft. This is a splendid example of a STEM **Enrichment** activity involving groups of students from Years 3 to 11 (ages 7 to 16). The initiatives are linked, as each model rocket car must carry a BBC micro:bit device to record acceleration data.

The micro:bit device has an ARM mbed microprocessor, a low-energy Bluetooth radio and a range of built-in sensors. It is currently on general sale for just c£15 and is now supported by the newly announced Micro:bit Foundation. It can be programmed from laptops, tablets and smart phones using software such as Scratch, Java script, Microsoft's Touch Editor and Python. As well as a tool for use in schools in the Computing curriculum, it is also an ideal device to support cross-curricular practical activities involving the STEM subjects: Computing, Design Technology, Mathematics and Science. So it provides an excellent stimulus for the **Enhancement** of the curriculum by embedding physical computing (an important aspect of the Internet of Things) in the normal curriculum.

To ensure that these opportunities have the maximum impact in schools, they need the support of a wider community, which is a key plank of the iSTEM+ approach. One form of support is sponsorship – by supporting the purchase of Bloodhound rocket car kits and related equipment, as well as additional micro:bits and associated resources. More importantly there is the need for support for teachers and students in terms of expertise and advice.

One key resource freely available to schools is the time and energy of committed students. We have developed a new scheme for **Student Digital Ambassadors** SDA to contribute to STEM developments in their (and nearby) schools. Its current focus is on the wider use of micro:bits to support STEM activities. SDAs will work with STEM subject teachers to plan and resource cross-curricular STEM activities using micro:bits.

The SDAs can receive external help and support through a number of routes. These include their own family and friends, as well as alumni and retired staff from their schools. Fortunately there are also important networks now able to support schools with such activities. There are more than 30,000 volunteer STEM Ambassadors each attached to one of 19 STEM Hubs across the UK. The Institution for Engineering and Technology IET has some 70 Schools' Liaison Officers, each attached to one of 44 local networks in the UK. The Careers & Enterprise Company C&EC, working with the 39 Local Enterprise Partnerships, has developed a rapidly growing network of c100 Enterprise Coordinators each supporting a team of up to 20 volunteer Enterprise Advisors from employers attached to a local secondary school or college. By the end of this school year nearly all such schools will have its own Enterprise Adviser. Tomorrow's Engineers, supported by the C&EC, have established a growing network of regional Employer Support Managers to facilitate business and education collaboration.

So we have a real opportunity to bring schools, and students, in closer touch with skilled and experienced members of their local community. They can work together on inspiring projects to stimulate a re-energising of STEM education and skills in schools which will better prepare students for their future careers.