

Results of competition: Learning technologies - design for impact – SBRI

Total available funding for this competition was £100k from the Department of Business Innovation and Skills and £1m from Innovate UK.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Anarkik3D Limited	A touchable universe: potential of haptic technology to improve learning outcomes	£79,452	£79,452
Project description (provided by applicants)			
<p>Title: The touchable universe: exploring the potential of haptic technology to improve learning outcomes.</p> <p>Haptics is an emerging technology that enables people to feel digital information. When combined with 3D audio-visual interfaces, it offers enormous potential for education. For instance, a well-designed system will enable dental students to feel the tooth as they practice drilling in a virtual patient’s mouth, while physics students could compare pushing snowballs uphill on Earth and Europa, and designers could learn how to shape glassware without the need for a furnace. Haptics makes the virtual universe touchable.</p> <p>Anarkik 3D’s proposal is to take the idea of the touchable universe and build the digital platform that will enable developers to create and build haptic apps for use inside an affordable but convincing virtual classroom, where students can experience lessons in a fundamentally more realistic and interesting manner than ever before. Working with educators, experience designers and students, we will define the requirements for vivid learning experiences that link directly to the national curriculum, with a particular focus on ‘hard to teach’ topics. These will be evaluated by educational and business partners, including universities and an international distributor, against a matrix including cost, complexity, educational value and market appeal.</p> <p>The best of these requirements will then be taken forward and built into the platform. Prototype demonstrators as software applications combining haptics and, for example, 3D audio-video materials will be tested in a range of schools across the UK to help prove the key message – that haptic learning environments provide an affordable and effective way to improve skills and understanding in ‘hard to teach’ subject areas.</p>			

The core technology enabling this to happen is Anarkik3D's proven 'A-Frame' system, developed in 2008 with a SMART award. This award winning commercially available 3D modelling application was designed and built using the A-Frame system which is highly expandable for use as an educational resource to support the development of educational apps that need access to various engines, such as a physics engine or a learn-to-code sandbox. Our team has the coding expertise to make the changes, and distributors to help to prioritise and market the resultant apps.

The outputs of this feasibility study will therefore include tested develop methodologies, an adapted A-Frame, a clear understanding of which haptic kits offer most educational benefit for what cost, better understanding of development costs and projections for return on investment.

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Carduino Limited	Carduino	£78,675	£78,675
Project description (provided by applicants)			
<p>We believe that accessible 3D printing, open source technology, inexpensive components and easy to use software could be the perfect storm to empower a generation to create rather than consume. To prepare for this step-change, we urgently need to equip people with an understanding of technology that is cross-curricular, creatively led and scalable.</p> <p>We propose a new tool for learning that uses an innovative mix of gamification, smartphone technology, collaborative data sharing and hands-on making to affordably teach the world to invent. Informed by expert pedagogy, we want to create an online resource that teaches programming, 3D design and electronic engineering on a massive scale. Through the building of desirable maker projects built with accessible components and taught with an intuitive, reward based user experience, this is a new pedagogy based around making and sharing, increasing engagement and preparing students for the future with a relevant understanding of current technology.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
CEM, Durham University	First steps in Computer Science	£65,357	£65,357
Project description (provided by applicants)			
<p>This project will develop friendly and engaging graphical touch screen software for Year 1 pupils to introduce them to the world of computer programming. The aim of the software is to introduce basic programming concepts accompanied by increasingly complex programming challenges to embed this new knowledge as they begin their journey into the world of computer science.</p> <p>The software will collect data behind the scenes on how the pupils interact with the challenges and provide quick and easy-to-understand, individually tailored reports to teachers showing where key learning objectives from the computer science national curriculum have been achieved or misconceptions about important concepts are developing. The aim of the reports is to support learning and enable the effective and fun teaching of programming to children from Year 1 upwards.</p> <p>Current world leading research in the field will inform the design along with discussions with expert researchers and Key Stage 1 teachers to ensure that the pupils are given the best possible introduction to their computer science education and that teachers are supported in implementing the new computer science curriculum.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Daden Limited	VFTaaS – Virtual Field Trips as a Service	£78,415	£78,415
Project description (provided by applicants)			
<p>Virtual Field Trips as a Service</p> <p>Hundreds of thousands of students benefit from science-related field trips every year, particularly in the areas of geography, biology, geology and environmental science. These trips are highly valued by students and educators, and are vital to give students the skills and knowledge to meet learning objectives – yet they are declining in number and frequency. Schools, colleges and universities are facing increasing challenges in providing such trips, including the financial cost, educator time, and health and safety issues.</p> <p>Three-dimensional (3D) Virtual World technology has been used in support of education for over a decade, ranging from virtual history to paramedic training. However technical, commercial, usability and social challenges have always limited its adoption. Issues have included technical concerns from school and university IT departments, privacy issues, the lack of ready-to-go content, and the poor reliability of open-ended multi-user virtual environments.</p> <p>This project aims to develop a national Virtual Field Trip Service, a Software-as-a-Service for virtual field trips, bringing the benefits of virtual worlds to educators and students in a very specific, managed and focused way. The service will allow groups of students to viscerally experience a wide variety of learning locations within a multi-user 3D avatar-driven environment. Drawing on a prototype virtual field trip - Virtual Skiddaw, already developed by Daden for The Open University – the service will evolve into a valuable national (and potentially international) resource to support and deliver field-trip-based science education via the Web, PC/Mac and Tablet computers. We will use game-based technology to create a library of virtual field trips covering multiple sites in the UK and abroad (and even off planet, such as a trip to Mars), and more importantly the pedagogic and commercial frameworks to enable educators to contribute new sites, and new learning experiences on existing sites. The result would be improved engagement and attainment levels across environmental science, related STEM (Science, Technology, Engineering and Mathematics), and even humanities disciplines, in schools and Tertiary education.</p>			

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Dolphin Computer Access Limited	SafeReads: A productivity tool for learners with dyslexia	£79,937	£79,937
Project description (provided by applicants)			
<p>SafeReads – embedded, personalised reading strategies for learners with dyslexia</p> <p>In school age groups alone 800,000 people are affected by dyslexia with persistent reading and spelling difficulties throughout their education. Supporting learners with dyslexia is increasingly challenging at a time when decentralisation through academy status is becoming more popular, funding for special education needs is being decreased, and lower grade staff are assuming specialist teaching responsibilities. This creates a greater demand for reliable teaching resources to address the needs of learners with dyslexia across the UK. The proposed project will design a productivity tool called SafeReads.</p> <p>SafeReads will be targeted to children with dyslexia transitioning from Key Stage 2 to 3 (ages 8-14), a crucial point in children’s education as they shift from learning to read to reading to learn. SafeReads will support children in recognising problems with reading; it will teach them to use strategies so that they cope with these problems; it will help them learn how to monitor their own progress. The outcome of this learning process will be the development of skills critical to children’s academic success and lifelong learning.</p> <p>SafeReads will be available to install as a plugin that operates across different applications and devices (e.g. word processing tools, web browsers) covering the wide range of contexts involved in literacy. It will be designed for independent use as well as use with teaching assistants, teachers and parents who will have access to an interactive portal where they can share best practices with SafeReads, supporting them in their role to help children overcome their difficulties. Moreover, SafeReads will be usable and simple in order to accommodate the attention, organisation and memory problems that children with dyslexia often have. This simplicity will be in part achieved through the application of artificial intelligence approaches that will automatically diagnose a child’s weaknesses and strengths, and adapt the potentially vast content of the tool to match their profile.</p>			

A final feature of SafeReads will be its collaborative nature. Alongside a pool of reading strategies provided by experts and made available through SafeReads, children will be encouraged and supported to develop their own. We hope this will foster a 'can do' attitude and improve children's confidence in their abilities. A strong participatory ethos will drive the SafeReads design process. Our team will co-design the technology with children, teaching assistants, parents, special education needs coordinators, specialist teachers and IT administrators. This process will ensure the tool is grounded in a sound pedagogical foundation, addresses the needs of both primary and secondary users; supports best practice implementation, and is technically feasible.

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Interactive Scientific Limited	Danceroom Spectroscopy: Immersive Science Resources	£78,726	£78,726
Project description (provided by applicants)			
<p>Interactive Scientific has developed the multi-award winning danceroom Spectroscopy (dS) technology, an integrated software/hardware system with the potential to transform the way science is taught in schools. dS takes the atomic nano-world out of textbooks so it exists all around us, enabling students to interact with, manipulate and understand atoms. It has huge potential for enhancing the understanding of abstract science in schools, often only accessible to the brightest pupils.</p> <p>Visualisation and interaction is at the heart of dS, improving attainment amongst learners at KS3/4. The dS team includes chemists, computer scientists and creative technologists, working closely with educators to determine the areas of the curriculum that can be most enhanced with this technology. The project outlined in this proposal is for pre-industrial research to overcome challenges of moving the technology onto platforms that can be feasibly used in schools. This involves consideration of technical, design, pedagogical and commercial aspects.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Seeper Limited	Project Immersion	£78,578	£78,578
Project description (provided by applicants)			
<p>Project Immersion will transform learning and community spaces into interactive multi-sensory environments for learners aged 8 – 25 with support needs (particularly learning disabilities and autism). Learners benefit from experiences which promote and enhance learning outcomes around social engagement, collaboration, more confident communication and challenge learners' perceptions of their own abilities to exercise choice and control through digital technology. Individuals can then develop transferable competencies, leading to greater independence and employability: enhanced communication, working with others, personal creativity, social engagement and coping with change and anxiety.</p> <p>The Immersion 'Box' will contains video projector, speakers, camera, sensors, and bespoke software to project applications onto walls in a darkened room, to create multi-sensory immersive experiences controlled through user gesture or touch. The Box is designed for ease of use by individual learners and educators and to support inclusive educational practice which is democratic in nature and supports 'discovery-based' learning.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Solvexx Solutions Limited	Problem Based Learning in a 3D Virtual Laboratory	£79,985	£79,985
Project description (provided by applicants)			
<p>The project will develop the first 3D virtual laboratory to support problem-based learning (PBL) in the natural sciences at university level. This builds on a successful track record of the Learnexx3D Platform, which enables users to learn practical, scientific skills in a 3D virtual environment. There are two rationales for this: the first is educational, and concerns the value of PBL for improved graduate learning outcomes and employability; the second is financial, and concerns the likely return on investment in a tool which is already in use in several top UK universities and has the potential to reach a much larger international higher education market.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Stepping into Business Limited	Stepping Into Business: Primary Enterprise App for Learning	£78,660	£78,660
Project description (provided by applicants)			
<p>Stepping into Business: A Primary Enterprise</p> <p>The Young Review Enterprise for All (2014) highlighted that schools need to cultivate enterprise understanding from an early age, to develop optimism and an enduring, positive attitude to life.</p> <p>We have successfully piloted Enterprise Education in Primary schools; instilling resilience, confidence and enhanced engagement through relevant simulation.</p> <p>This early introduction of business, financial and life skills resulted in improved attainment in key curriculum areas and increased community engagement.</p> <p>By designing a unique, fun, engaging, social and safe digital simulation we will make enterprise learning outcomes fully accessible -enabling teachers to fulfil their role as mentor and leader, develop a trusted social community of practice and improve attainment through play: inspiring the next generation.</p> <p>We will explore and innovate new learning possibilities offered by cutting edge digital design, adding exponentially more to the user experience, bring new ideas into learning to enthuse the learner.</p>			

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TAG Assessment (Part of Sherston Software Ltd)	FormativeAssess	£76,224	£76,224
Project description (provided by applicants)			
<p>The traditional school model of passively learning facts and then reciting them out of context in exams is no longer sufficient to prepare students to participate in today's globalised knowledge economy. Project-based learning offers significant advantages. However, in practical terms, delivering such project-based learning and the opportunities for authentic assessment that accompany them is difficult. As the volume of this student-generated material quickly increases, regularly reviewing the material in order to make formative and summative assessments becomes time consuming and difficult.</p> <p>FormativeAssess uses data-mining techniques to allow an online application to support project-based teaching. Where social networks currently employ intelligent advertising to scan what users type in order to feed relevant product advertising, FormativeAssess scans what students type in order to feed relevant formative assessment interventions.</p>			

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Technology Will Save Us Limited	POP Kits	£79,590	£79,590
Project description (provided by applicants)			
<p>Technology Will Save Us has worked with over 5K teachers & 20K young people & families since 2012. This project will consolidate our experiences with the new requirements of the new Computer Science curriculum, insights from educators, & growing access to tablets in order to develop affordable, easy to use, effective & fun programming kits to engage Key stage (KS) 1-2 (4-11yrs) young people, their teachers & families.</p> <p>Science, mathematics & programming are often presented to young people as abstract topics devoid of personalised, real-world connections - therefore students become bored & unengaged. Traditional approaches can often exclude diverse learners & alienate girls from seeing technology & programming as relevant topics of interest to pursue. The new UK curriculum requires primary school teachers to bring programming & technology into their classrooms. POP Kits will leverage 4-11 year olds' innate curiosity & creativity by using technology & programming as tools for invention, understanding & problem solving in real-life. This experience will inspire diverse young people to use both logic and creativity to learn programming principles such as algorithms, routines and variables. They will use sensors to detect the world around them, electronics to make things come to life & programming to make them personal - imagining new possibilities.</p> <p>Everyone learns more when they care about what they are making.</p> <p>The POP Kit ecosystem of hardware, a web application & support material will enable teachers to teach the way kids love to learn: hands-on. These tools will be designed to encourage best practice teaching, even for non tech educators & families. Our user-centred, agile approach to R&D & efficacy will include key stakeholders at every stage, increasing learning outcomes, usability, desirability and feasibility in schools.</p> <p>We will use an innovative way of programming hardware & software though light & sound to eliminate the barrier for teachers & schools around USB connections. As more schools become tablet focused & families in the UK increase usage of tablets at home, POP kits will be accessible</p>			

to more young people to learn & use programming related to things they care about.

POP Kits support 21st century learning of technology & programming everywhere - on the playground, in the classroom & at the kitchen table.

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The Women's Organisation	Building entrepreneurial capability of HE students through gamification	£67,062	£67,062
Project description (provided by applicants)			
<p>PLEASE NOTE: THIS IS AN APPLICATION FOR THE DEVELOPMENT OF AN ENTERPRISE EDUCATION APP</p> <p>The aim of our product is to connect students in higher education to the opportunity of entrepreneurship and to build their entrepreneurial capability. We will achieve that by designing an enterprise education “serious game” Smartphone and/or tablet app, which has two specific purposes;</p> <p>(a) to enable students to work towards required entrepreneurship learning outcomes based on NCEE’s Learning Outcomes Framework and</p> <p>(b) to build business growth ambition into new venture creation from the outset.</p> <p>For students, we will design the game around rewards, motivational feedback and competition for accomplishing tasks and knowledge acquisition. For educators, we will design materials on how to use the game to support the development of entrepreneurial learning outcomes in students and outline how to recognise achievement. We will employ co-creation techniques when engaging with our stakeholders to enable collective creativity to inspire our product design and deploy a robust commercial framework to ensure that the product has a successful route to market.</p>			

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Tinder Foundation	EduMakers: transforming adult and community learning through technology	£78,840	£78,840
Project description (provided by applicants)			
<p>EduMakers aims to disrupt the adult and community learning (ACL) sector by radically increasing the adoption of digital technologies within teaching and learning. Led by Tinder Foundation, this project will test the feasibility of and co-design an open collaborative content-creation, sharing and learning platform. It will be defined by enabling tutors, volunteers and learners in the ACL sector to create, share, remix, organise and manage interactive online learning content, linked to a learner management system.</p> <p>The project aims to work with the ACL sector to test the following:</p> <ul style="list-style-type: none"> i) feasibility of the concept, through research with leaders and managers ii) desirability and usability, through user needs analysis iii) technical feasibility, through design and user testing iv) commercial viability, through market analysis and business modelling. <p>Longer-term, the hypothesis is that EduMakers will lead to more relevant, collaborative and personalised learning, improving the impact of teaching and learning within ACL.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
Tonguesten Limited	Engage - a new, motivational tool for primary school literacy	£79,845	£79,845
Project description (provided by applicants)			
<p>Engage - a new, motivational tool for Primary School Literacy.</p> <p>Literacy is a major challenge in the UK Education System, with 1 in 6 leaving school "functionally illiterate." (source: National Literacy Trust). Our project Engage is a real-time, gamified, adaptive platform for English learning and literacy; it draws upon international evidence based research which shows that educational products that use engaging content (music, film, television) together with subtitles, can result in dramatic improvement in attainment for young learners' literacy outcomes. Powered by artificial intelligence, and alongside research from Cambridge University and London's Institute of Education, Engage automatically creates a personalised educational experience around students' strengths and weaknesses from any online video source - all wrapped in a game interface that gives students aged 7-11 an exciting, motivational framework for literacy.</p> <p>Engage provides a safe, adaptive framework for online literacy learning and assessment, giving teachers and head teachers a deeper understanding of students' progress, while allowing the students to enjoy approved video content and improve their English in accordance with the National Curriculum.</p>			

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Participant organisation names	Project title	Proposed project costs	Proposed project contract value
University of Portsmouth	Life-3D: A New Tool for Interactive Visualisation of 3D Molecular Interaction	£80,000	£80,000
Project description (provided by applicants)			
<p>Life-3D: A New Tool for Interactive Visualisation of 3D Molecular Interactions</p> <p>The last 20 years have seen a revolution in our understanding of processes that occur within living cells. Exciting biomedical advances are continually being made in our understanding of the structure and function of the tiny biological machines inside cells that are responsible for life. Discoveries about these molecules – what they look like, how they work, how they can go wrong - and cause diseases like cancer or diabetes – continue to drive important advances across the UK Life Sciences sector.</p> <p>Our project - Life-3D - proposes a new way for university students to explore and visualise the nanoworld of molecules, genes and cells. Using state-of-the-art object recognition, 3D printing and augmented reality, our aim is to produce life-size high-resolution physical models of molecules that bioscience students can easily manipulate, take-apart and explore in their hands. By using real-time object-tracking technology, an image of the physical model they are holding will be displayed on a computer screen. As they move the physical model, the virtual model moves too, triggering rich and relevant teaching material that shows more about where the molecule is found in a cell, what its function is, and how its role changes in health or disease.</p> <p>The aim of this project is to provide a step-change in student engagement, knowledge and attainment in molecular biology teaching, bringing molecules to life in a completely new way.</p>			