November 2024

ukie

Bringing Digital Creativity to Secondary Schools across the United Kingdom

ukie edu

ukie.org.uk

Contents

Foreword

In an age defined by rapid technological change, our education system must evolve to keep pace. My career in games began when video games were just emerging as a new form of entertainment. Today, the industry has grown into a cultural and economic powerhouse, generating billions for the UK economy and shaping the way we work, learn, and play. And if the UK is to stay at the forefront of the global digital economy, we must equip and empower the next generation with the skills needed to navigate and innovate in a world being transformed by AI and robotics.

Our education system is still largely knowledge-based and rooted in the past. While we teach young people about subjects like programming, there is an urgent need to broaden our approach to digital skills, cross-curriculum. Technology is not just about code; it's about creativity, problem-solving, and design. These are the skills that drive innovation across the Creative Industries, from video games and animation to music and film, where the UK has long excelled. Creativity gives the UK an edge as a nation. Imagination is key to the 'maker' generation. And creative thinking is needed in all industries, from engineering to automotive to advertising. An authentic education for the digital world requires the curriculum to evolve, bringing the arts and sciences together.

That's why I am delighted to support Ukie's proposal for a Digital Creativity GCSE. This qualification is more than just an addition to the curriculum—it's a bold step towards reimagining what education can be. By combining digital skills with creative thinking, this GCSE will allow students to explore the full potential of technology, equipping them not just to consume the digital world, but to shape it. Whether it's creating the next blockbuster game, producing a virtual reality experience, or solving complex problems in sectors like healthcare, the opportunities for young people to apply digital creativity are limitless.

We have seen the transformative power of blending the arts and technology through initiatives like Digital Schoolhouse, which has reached hundreds of thousands of students. The impact has been profound, building enthusiasm for applied learning and developing skills that extend far beyond the classroom. With the introduction of a Digital Creativity GCSE, we have the chance to take this success nationwide, ensuring that all young people, regardless of their background, can gain the skills they need to succeed in the digital age, to help them become job makers as well as job seekers.

Sir Ian Livingstone CBE

Co-founder Games Workshop, author, and General Partner Hiro Capital

Creative digital technologies are a perfect fusion of creativity, art, technology and science, the full breadth of STEAM skills that a 21st economy needs.

These skills need to be firmly embedded within education for all students starting at a young age.

This paper calls for a Digital Creativity GCSE and explains the two-fold benefit of its introduction to schools, the creative digital industries and the wider economy.

Executive Summary

The current state of Computing education within the national curriculum, spanning Key Stage 1 to Key Stage 4, is critically examined in this paper. Despite efforts over the past decade to enhance Computing provision, significant gaps remain, particularly at Key Stage 4. The existing qualifications, such as the Computer Science GCSE and OCR Creative iMedia, fail to comprehensively address the diverse needs and interests of all students. The Computer Science GCSE focuses heavily on theoretical knowledge and programming, is often perceived as difficult and irrelevant to many students' experiences and aspirations. On the other hand, the OCR Creative iMedia, though it incorporates creative digital skills, is vocational and not widely available or equally valued compared to academic routes.

The removal of GCSE ICT in 2013 and current structure of the existing qualifications has resulted in a drastic decline in the number of females taking a computing related qualification in Key Stage 4. As a consequence, the current landscape seems to have widened the gender gap in the uptake of digital qualifications rather than narrow it. This paper proposes the introduction of a Digital Creativity GCSE to bridge these gaps. The proposed qualification aims to combine the principles of computer science with creative digital applications, addressing the need for a curriculum that fosters both technical and creative skills.

It is designed to cater to students interested in harnessing technology creatively, offering a pathway that complements the existing Computer Science GCSE.

> "We need a brand-new qualification at Key Stage 4 that is not called Computer Science or IT... call it something else... you could have sections that were programming based, but... also sections where you did something... more practical and creative, and more IT based... if you have that medley...you're much more likely to attract a broader range of people to it... there needs to be a national conversation about it."

Senior Leader in a school (Kemp et al, 2024)

Key reasons for introducing the Digital Creativity GCSE:

1. **Addressing Curriculum Gaps:**
   Filling the current void in Key Stage 4 GCSE offerings by providing a course that focuses on the creative application of technology.

2. **Enhancing Creativity in Education:**
   Encouraging creative thinking and practices across the curriculum, aligning with the findings of the Durham Commission on Creativity and Education.

3. **Driving Innovation and Economic Growth:**
   Preparing students with the skills required by modern employers, fostering innovation, and supporting the creative digital industries.

4. **Supporting the Creative Digital Industries:**
   Addressing skill shortages in the video games and wider creative digital sectors, enhancing the talent pipeline from education to employment.

5. **Integrating Art and Science:**
   Demonstrating the power of combining artistic creativity with scientific and technological knowledge, preparing students for interdisciplinary careers.

6. **Empowering Digital Creators:**
   Enabling students to become creators of digital content and experiences, not just consumers, and leveraging the growth of digital interactive and immersive technologies.

7. **Encourage greater uptake of computing related qualifications:**
   Provide a broad and balanced Key Stage 4 offer, thereby increasing the number of students, and in particular, girls, taking a computing related qualification significantly.

The paper outlines a proposed qualification structure based on three core pillars: Audio, Visual, and Creative Design Thinking. It emphasizes the importance of practical coursework and interwoven careers education to provide students with real-world insights and skills.

The Current Landscape

The issues outlined in this paper are largely applicable across the United Kingdom's devolved nations. However, the landscape analysis that follows focuses on the English National Curriculum as an example to support our understanding of the issues at hand.

Computing is a foundation subject on the national curriculum, covering Key Stage 1 to Key Stage 4 (ages 5 to 16) that the Royal Society defines as covering the disciplines of Computer Science, Information Technology (IT) and Digital Literacy (DL)[1]. Their report went on to define IT as a distinct and separate subject to Computer Science in that it is primarily about the "assembly, deployment and configuration of digital systems to meet user needs for particular purposes". Digital Literacy is defined as a core skill that refers to an individual's ability to use a computer confidently, safely and effectively.

Digital Literacy by its very nature is cross-curricular, therefore every subject in the school bears some responsibility towards enabling students to develop their skills here. The realm of IT and Computer Science comes under the Computing National Curriculum. In Key Stages 1, 2 and 3 these are usually explicit lessons in Computing where students are taught a range of skills and concepts. Much work has taken place over the course of the last decade to ensure every student is able to receive a sufficient degree of Computing provision. This has perhaps resulted in the Key Stage 3 curriculum in particular being more skewed towards the delivery of Computer Science in order to prepare students for the GCSE.

When moving from Key Stage 3 to Key Stage 4, it is largely anticipated that the computing curriculum will continue to be covered for all students via cross-curricular means, through implementation in other school subjects. In practice, it is fair to say that this largely does not happen. The delivery of Computing in non-specialist cross-curricular Key Stage 4 qualifications is dependent primarily on teacher motivation and expertise and school provision. The distribution of this teaching provision is by no means equal for all students, even within a school let alone across the country.

There are numerous reasons for this gross variance in provision of computing and digital skills across the curriculum and the reasons will vary from teacher to teacher. However, lack of confidence in the use of digital technologies is likely to play a key role; and when you also factor in poor resourcing and lack of sufficient time to build in opportunities the problems are only further exacerbated. Cross-curricular teaching of digital literacy is not a new concept, it has been attempted several times before and has never been fully successful. There are systemic issues within the education system that prevent consistently high quality digital skills delivery across all classrooms across the UK. Digital Literacy will need to be given a higher priority in schools, with wider issues addressed if we are going to see cross-curricular digital skills teaching being a success.

There are a range of qualifications available for students that allow them to continue to develop their technology skills. The most popular of these pathways are Computer Science GCSE, or the OCR Creative iMedia. The Computer Science GCSE does not cover the full breadth of the Computing curriculum as defined by the Royal Society (2012), rather it focuses specifically on pure Computer Science, with qualifications leaning heavily towards knowledge-driven recall rather than a practical application of the subject. Coursework has been significantly reduced, so students' ability to demonstrate their learning through practical application has been almost entirely removed from the assessment structure. The content rich course does not naturally allow for students to explore and develop their creative skills or an understanding of the

wider technology industries, including the video games industry and other creative digital sectors. The demand on teachers to ensure high results for a pure exam-based assessment means there is little time for them to be able to find ways to effectively integrate industry based creative applications of the subject material.

The Computer Science GCSE was originally introduced in 2010 with a great deal of hope and aspiration about developing the next generation of talent. However, the nature of the qualification and its sporadic offering across the country means that it is consistently one of the least popular subjects to choose from. BCS in their 2021 landscape review[2] highlighted that only 23% of students were aiming to pursue Computer Science, as compared to 74% for Humanities subjects. The male to female ratio continues to cause concern sitting at 4:1 and has been as high as 10:1 for A Level Computer Science.

It is fair to say that the vast majority of students do not pursue this route. There are many reasons for this, some of which include: the heavy focus on programming, and underpinning computer science fundamentals with a severe lack of emphasis on the application of technology and creativity. Student's perception of this being a 'difficult' GCSE with little to no relevance to their own experience of technology or future aspirations also play a key role.

The GCSE qualification does, however, provide a strong foundational knowledge of computer science and programming. Students leave with an understanding of the discipline, which serves as a good foundation for development roles within the video games and technology industries. What they lack however is the ability to develop their creative skills and an understanding of using technology effectively to design and create digital products and solutions.

The second most popular pathway is that of the OCR Creative iMedia qualification. Unlike the Computer Science GCSE this does tap into creative digital skills and more specifically, games development. However, video games industry relevant course modules listed are optional and so will not be delivered by all schools. Moreover, the qualification is vocational in nature and therefore, will not be on offer by all schools or available to all students.

The very fact that it is a vocational course will also impact take-up amongst students; not just through their independent choice but also through the schools directing which students are given the opportunity to take the course. There continue to be entrenched beliefs within the wider community that academic routes are somehow better than vocational routes, which are at best seen as a second-rate alternative[3]. This creates a divide within schools. Many schools will only offer the vocational courses to those students with lower academic attainment, so these have traditionally been a route to help those students achieve a minimum number of qualifications.

> **People think, you have to be, like, really smart to take it...it's sometimes not that enjoyable, people think...you have to be, like, quite quick thinking and know it quite quickly to be able to do it. And know quite a lot of stuff around computing to understand it all.**

Year 10 Girl studying GCSE Computer Science (Kemp et al, 2024[4])

Where the vocational courses are openly available to all students, the stigma of following a vocational course will result in very few high performing academic students opting to study it. This has created a vacuum within our education system. While the stigma of vocational qualifications and their perception within society is not one that can be addressed easily or within a short period of time; reforming vocational qualifications is an issue that needs to be tackled.

Recent research by Kemp et al (2024) highlights the steady decline of students following a digital qualification, dropping from 71% of all students in 2013 to just 28% in 2023[5]. In 2013 just before the curriculum changed and while GCSE ICT was still an option, 69% of female students took an exam at Key Stage 4, which is only slightly lower than the figure of 72% for male students within the same year. Figures have since then dropped substantially, with only 17% of females taking any computing related qualification against 39% of male students. The research estimates that if the previous uptake had been maintained than an additional 160,000 girls would have taken a qualification in 2020 alone. Kemp et al (2024) go on to identify that digital making activities (e.g. game development, digital art, 3D printing etc.) are the essential missing ingredient in the current GCSE offer. They ask for a reform of the computing curriculum.

There is a definite gap within the Key Stage 4 GCSE offer. Key Stage 3 courses by and large allow students to experience the breadth of computing. This will include the creative application of computer science principles as well as the discipline of computer science itself. For those students who are more interested in the former there is no clear educational pathway for them. If their school offers a Computer Science GCSE, they might choose to purse that; although it will be a subject that is perhaps not best aligned to their interests. The alternative route is one of the vocational qualifications. However, as outlined above this may not be available to all students or the very nature of it being vocational may render this as an unacceptable option.

The resulting consequence of this is that the vast majority of these students will drop the subject entirely and pursue another area of interest.

The Creative Curriculum

Creativity in schools is usually considered to be the realm of the 'creative subjects', namely Art, Music, Dance, Drama and Design & Technology. While creative thinking and creative practices are not limited to just the creative subjects, it is true that the creative subjects are an essential component of a broad and balanced curriculum. The creative industries are a thriving sector in the UK economy. DCMS estimates that the GVA by the creative industries was £126bn in 2022, 12% higher in real terms than 2019, compared to the rest of the UK economy which was 2% above 2019 levels[6]. Additionally, prior to COVID-19 the creative industries generated around 30 million jobs, employing more young people (15-19 year olds) than any other sector, with females accounting for nearly half the what[7]. The video games industry, a fusion of the technology and creative sectors, alone was valued at £7.82bn in 2023; a 4.4% growth since 2022[8]. This growth in the creative industries sector alongside the changing technological climate needs to be reflected at school level if we are to ensure our sectors and the economy can continue to thrive.

Unfortunately, the opposite seems to be happening in schools. GCSE entries for the creative subjects has been in steady decline for a number of years, with fewer schools offering the qualifications entirely[9]. This lack of provision seems to be exacerbated in schools with the most disadvantaged populations. Subjects such as Design and Technology have seen a 43% decline in A Level entries since 2010 and Music has seen a 46% drop within the same time frame according to Campaign for the Arts. Even Art and Design has seen a 7% decline in entries since 2010[10].

Interestingly, the gender disparity for the creative subjects' swings in the opposite direction to the uptake of computing and STEM subjects. In 2018 there were twice as many female students taking GCSE Art and Design as there were male students[11]. For the Performing and Expressive Arts GCSE the disparity is even higher, with 574 boys sitting the GCSE in 2018 compared to 8,777 girls. The creative subjects appeal to the female students, in a way that the STEM subjects have been unable to do so. The gender disparity within STEM subjects was investigated in a DfE Research Report which stated that girls have a lower expectation of success in STEM subjects as compared to boys. Wang (2013)[12] suggested that girls have a 'poor STEM self-concept' in that they are less likely to feel they are capable of studying this subject successfully. Societal stereotypes about STEM and gender are likely to play a role here. The same DfE report makes a cross-domain comparison, suggesting that it is more common for girls to demonstrate high verbal abilities and so they are more likely to be drawn in other directions.

> "Teaching for creativity should be practised across the curriculum and accessed by all. It should not be confined to certain subjects; creativity in science is different to creativity in drama, but is valuable in both."

Durham Commission on Creativity and Education[13]

When creative thinking is encouraged by teachers across all subject disciplines it opens the possibility for students to use their knowledge and skills gathered from a range of learning opportunities to be creative. A student's ability to be creative and apply creative problem solving techniques will benefit their ability to succeed when entering the workforce regardless of which sector they choose to enter.

The same is true for digital skills. There is no workplace environment that has not been impacted by technology in some way. Traditionally creative disciplines such as, architecture, design, music, animation and fashion have all been impacted by and are now heavily technology based. Computer Aided Design is a core aspect of the work environment for many design based sectors. Music, is edited digitally, regardless of whether you are releasing music as an artist, or incorporating soundtracks and sound effects within a video game.

Bringing digital skills and creativity together just makes sense. Both go hand in hand and are an integral part of human innovation and evolution. The evidence indicates that a fusion of the two seemingly disparate areas of education holds the potential to close the gender gap we see in the uptake of GCSE qualifications.

We are doing our students a great disservice if we do not allow them the opportunity to develop these skills and capabilities in a way that is more in tune with real life application. This is especially true when you take into account the growth of Artificial Intelligence and its increasing impact on our daily lives. Our ability to use technology creatively to shape tomorrow's world is a distinctly human trait and it needs to be nurtured amongst the next generation to help them reach their potential and thrive in the world of work.

What does Digital Creativity mean?

Creativity is a unique human competence. Creativity harnesses the human imagination to produce innovation. It may be driven by curiosity, the need to solve a given problem, as an exploratory medium or for its own novelty. Creativity allows us to break with old routines and create new outputs. Creativity has driven human innovation and progress; and in today's ever-changing reality it continues to play a fundamental role in human development.

Digital Creativity allows us to combine our human creativity with the new digital tools of today. More specifically, it refers to the use of digital technologies and tools to generate or express creative ideas or concepts. Digital creativity encompasses a wide range of activities, which will include game development, art, animation, music, filmmaking and more. Digital creativity may leverage the use of one or more digital mediums, including the use of both computers, software applications, mixed reality technology and perhaps even non-digital material to create innovative work. Digital Creativity is the intersection of the creative arts, design and digital technologies and it empowers individuals to explore their creative potential, expressing themselves in new and unique ways owing to the ever-evolving technological landscape.

Why introduce a Digital Creativity GCSE?

1. **Addressing Curriculum Gaps:** There is currently a vacuum within the Key Stage 4 GCSE provision and structure.

We teach students about the principles underlying modern technology. They learn how a computer works, but what we fail to teach them is how to harness the technology. It is somewhat akin to teaching students how a car works, enabling them to perhaps even build their own from scratch; but without teaching them how to actually drive it, be inspired by it and visualise the next phase of its evolution.

The Computer Science GCSE was very much needed, and its success should be celebrated. However, we are missing its counterpart. We have a course that focuses on the underpinning discipline behind the technology; what we now need is a course that focuses on how we can use that technology in creative new ways.

2. **Enhancing Creativity in Education:** There is a distinct lack of creativity within the curriculum.

Our emphasis on rigid assessment structures has resulted in less time for students to develop their creative skills. The Durham Commission on Creativity and Education[14] looked at the role of creativity in education and expressed the importance of creativity being practiced across the curriculum, accessible by all. We have a common misconception that creativity is confined to the creative subjects such as drama; but the truth is far from it. Video games clearly demonstrate how science and technology combined with art and creativity create compelling immersive experiences that have the capacity to drive human development forward. Technology such as artificial intelligence and virtual reality was first harnessed by the video game industry.

3. **Driving Innovation and Economic Growth:** Creativity is a fundamental human competence required for future growth.

It is a fundamental human competency that is listed as one of the top skills required by employers by the World Economic Forum. Their latest 'The Future of Jobs Report 2023'[15] found that technology adoption is going to remain a key driver of business transformation over the next five years. Alongside this they stated that analytical and creative thinking are going to be the top two skills needed by employees, especially given the rise of artificial intelligence. This applies across sectors and is not just limited to the video games and creative digital industries.

4. **Supporting the Creative Digital Industries:** The GCSE would help to address skills shortages in the sector.

The video games industry has consistently reported that graduates and entry level candidates lack the necessary skills required by employers. What is being referred to here is not just outdated knowledge on digital tools and technologies but also their cognitive skills and competencies.

The ability to work in a team, to communicate effectively and present your ideas, resilience, collaboration and more. Given the current landscape for computing education, FE and HE providers have to begin the student learning journey at the most basic level, in order to ensure everyone develops at least the foundational skills. Courses have a limited timeframe and therefore it stands to reason that educators can only make so much progress as a result. This is not too dissimilar to the situation we had when we introduced the computing curriculum. Prior to 2014, many students were not meeting concepts such as data representation or programming until they were at GCSE or A Level. With the introduction of the computing curriculum students are being introduced to these foundational concepts at a far younger age. This subsequently results in students with a greater degree of technical skills by the time they finish their GCSE or A Level qualifications. If we apply the same principles to teaching games design, it is only logical that we would see a better skilled graduate if the foundational teaching began significantly earlier.

This is a pipeline issue that begins at school. By tackling the root cause, you create a student body that has had the opportunity to develop a range of cognitive and technical skills, thereby increasing the skillset of the students entering FE courses and subsequently HE courses. As a result, entry level job applicants are higher skilled, more resilient and more likely to have the cognitive competencies that employers are looking for. The immediate economic benefit is an upskilled workforce resulting in a greater ingenuity and diversity of games.

5. **Integrating Art and Science:** By incorporating the study of video games in education, students can learn about the power of bringing art and science together.

By teaching the fundamental principles behind digital creativity and enabling students to explore these using the vehicle of video games we can demonstrate the power of combining art and science. In education these are often taught in isolation and considered separate educational pathways. A Digital Creativity GCSE would enable these two worlds to be brought together under a single umbrella. This would result in a multitude of benefits and be more reflective of industry practices, better preparing students to thrive and flourish in the modern world regardless of which career path they choose to pursue.

6. **Empowering Digital Creators:** Digital interactive and immersive experiences are a rapidly evolving area of technology and so we need to teach our students to be its creators and not just consumers.

Over the past decade, society has increased its use of digital experiences and using multiple devices for a range of passive and interactive entertainment is commonplace. According to Ofcom's Online Nation 2023 report, 56% of UK adults aged 16+ and 91% of 3-15-year-olds play games on devices that are either online or offline[16]. There is also a large body of research that talks about the positive impact of video games in educational settings.

As the sector continues to evolve, so do the learning opportunities. Ensuring students engage and interact with the technology and teaching them to harness its potential encourages more of them to become creators rather than just the consumers. It would be remiss of us if we did not capitalise on the growth of technology for the betterment of the next generation of talent.

7. **Encourage greater uptake of computing related qualifications:** Integrating digital creativity will enable us to significantly increase the number of females taking a computing related qualification.

Evidence from the recent Kemp et al. (2024) research clearly points to a recent decline in the number of females taking computing related qualifications in Key Stage 4. The lack of opportunity for students to 'make' things with technology has been cited as one of the key factors behind this. This research supports Ukie's own findings during our consultation work. By incorporating creativity and arts with science and technology and by contextualising the delivery of the subject within the real world, we can not only engage more female students but drastically increase the uptake of students taking a computing related qualification at all. A Digital Creativity GCSE will be able to help alleviate some of the issues we see as a result of the current landscape. Having two pathways at Key Stage 4 will result in the delivery of a broader and more balanced Key Stage 3 curriculum, with equal focus on all strands of Computing; rather than the heavy emphasis it currently has on computer science in most schools.

Qualification Aims & Objectives

The aims and objectives of this qualification are to enable students to:

1) Understand and apply the principles of computer science and design creatively to solve real world problems.
2) Develop key thinking skills in creativity, design and innovation, problem solving, logic and analysis.
3) Develop 21st Century Learning skills, including collaboration and team working, communication, entrepreneurship and wider critical thinking.
4) Provide an alternative GCSE pathway for students interested in being creative with technology but are not interested in the Computer Science GCSE.
5) Develop foundational skills required for video games development, animation and design sectors.
6) Develop foundational knowledge and skills in creating digital solutions for use across a variety of mediums.
7) Use current technology creatively in order to benefit wider workplace environments.
8) Stimulate interest in Science, Technology, Engineering, Art and Mathematics (STEAM).
9) Stimulate interest in a career in video games, animation, design, or other careers within the creative digital sector.
10) Make better informed choices for post 16 courses, when considering their onward educational and career pathways.
11) Have a foundational understanding of the pathway for entry into video games and wider creative digital sectors.

Proposed subject content

It is proposed that this qualification is built upon the three core pillars of Audio, Visual and Creative Design Thinking. Most creative digital work incorporates the use of audio or visual assets or a combination of both. Creativity and design thinking underpin all development.

Computational Thinking processes are part of the fabric of computing education; indeed computational thinking is applied when following creative and design processes. Therefore, for the purposes of this GCSE it should be considered to be part of the Creativity and Design Thinking pillar. For example, part of the ideation process for developing a new asset may be to explore existing solutions and breaking them down into their component parts in order to help build your own ideas. Or when a game is being developed, it is common for different parts of the game to be developed by different teams. The game itself is broken down into its component parts, be that different game levels, audio and visual assets or programming the mechanics. In both cases, the computational thinking aspect of decomposition is being applied here to make problem solving easier.

By focusing on these three pillars students can learn about the integration and evolution of digital assets and technologies. They will be able to learn about the creative digital industries and careers in a way that is far more reflective of how industry works rather than in isolation.

This point can be illustrated if we chart the journey of a simple sketch for a character. It may begin life as a pencil drawing, which is then digitised. Initially, the digital 2D image may feature as a still image in a children's book, on digital artwork or other such output. We may then choose to animate the character, potentially creating a 2D animated sequence, which is released as a children's cartoon. The same animated character and sequence may then be programmed with game mechanics to get used in a video game. If the same IP is being released across multiple mediums, then it is likely that where possible the same digital assets will be repurposed and further refined and edited. In this example, we have already touched upon a number of sectors within the creative digital industries, namely, Video Games, Animation and VfX, TV, Marketing and Publishing. Considering a well-known IP illustrates this point even further, if you take into consideration the many diverse ways the Harry Potter brand has been utilised for example.

Similar journeys can be charted for audio assets. Each journey is underpinned by creativity and creative thinking and the application of design principles. This GCSE should enable students to be able to explore their digital creativity skills across mediums, considering varying contexts and do so in a way that is practical and embedded in the application of creativity and design.

In essence, students should be able to experience and manipulate audio and visual assets using a range of digital mediums and for a range of purposes. They should not shy away from the latest developments in technology, rather they should be given the opportunity to embrace it, understand it and learn how to use it to enhance their work. One example here is of course the recent developments in Artificial Intelligence and in particular Generative AI. Teaching students how they can use Generative AI models to help scaffold their design and ideation process can help kickstart their own creativity.

Interweaving creative design principles with a forward looking use of current technology will not only instill students with greater confidence in their own abilities but also develop within them an innovative and creative problem solving mindest.

This qualification is designed to provide foundational knowledge to support future career pathways, therefore touching upon the business management side of this would also help provid essential real-world context. It is important for students to be able to connect their learning with their real world experiences and future aspirations. Integrating and interweaving careers education as part of the wholistic delivery of this qualification is therefore an essential component. There are numerous ways that the pillars can be used to shape the qualification structure. Outlined below is one possible suggestion for consideration.

Example Qualification Structure

Area	Learning	Amplification
1. Creative Practice	1. Creative theory 2. Value of creative skills 3. Ideation 4. Storytelling 5. Critical thinking and problem solving 6. Deconstructing ideas 7. Creative strategy and the design process 8. Computational thinking as a problem-solving process 9. Risk and the value of failure 10. The impact of AI on creative processes	• Express knowledge of the creative process and why that is a valuable skill for future work and life. • Develop and demonstrate important related skills, such as critical thinking, problem solving and resilience. • Understand the value of experimentation and risk • Apply the creative process through various scenarios. • Understand and able to apply computational thinking skills to support ideation, design and problem solving. • Introductory understanding of basic design theory, game design principles and prototyping.
2. Digital Creativity	1. Creativity in creative digital sectors 2. Creativity in digital processes 3. Creativity in the digital workplace 4. Creativity in digital business practice 5. Creativity, ethics and copyright 6. Creativity and future tech 7. Creativity and AI	1. Understand how creativity is realised via digital technology in sectors such as video games, film/TV, VFX, graphics, music, design, software etc. 2. Understand the operation of digital applications/ processes through which creativity is expressed (e.g. software and hardware) in the above sectors. 3. Express knowledge of creative workplace practice in the above sectors (e.g. sector practices, teamworking, roles and responsibilities). 4. Understand how creativity is linked to entrepreneurial practice. 5. Understand the wider issues of ownership, copyright and ethics in creative works. 6. Assess how future tech and AI may affect creative practice in the above sectors. 7. Explore the use of AI to scaffold creative practices, taking responsible and ethical use into consideration.
3. Creative Digital Project	1. Create and/or develop a product/service using digital technology which includes: a. Creative practice b. Sector-specific technical skills c. Application of ideation, design, asset creation, development processes d. Critical thinking and problem solving e. Reflection on the success of the project in relation to creative practice.	Apply creative practice to create and/or develop a product/service using digital technology. The project must be realistic in its scope and suitable for Level 2 learning and may include: • A video game idea, asset, level etc. • A film/TV asset • An animation/VFX asset • A music track edit • A graphic asset • A product/architectural asset • Development and editing of a piece of creative writing

When shaping the qualification, it is important to try and strike a balance between incorporating relevant industry skills and practices, whilst understanding the current limitations of schools to ensure that students are provided with a good set of foundational skills and knowledge. The qualification aims to not just help develop creative digital skills amongst learners, but also be a springboard to support onward learning.

At first glance, there may be an interpretation that schools will need high specification computers with high end industry standard software installed to undertake this qualification. While it is undeniable that such resourcing would be ideal, it is also true that this will not be feasible for most schools. Years of underfunding in education has led to many schools having inadequate IT systems that are unable to fully implement the latest changes in technology. Issues with poor resourcing are further exacerbated by a lack of enough specialist teachers. Whilst these are systemic issues that need to be addressed on a larger scale, they do not prevent the implementation of a Digital Creativity GCSE.

Digital Schoolhouse has successfully proven that you do not need access to expensive resources to provide students with a good set of creative digital skills. There are numerous open-source packages such as Blender for example, that will enable students to develop high quality animations. Likewise, game development environments such as Construct 3 and GameMaker provide limited free access that will enable students to develop the games that they need. Digital Schoolhouse has already published a multitude of free lesson plans and resources (digitalschoolhouse.org.uk/resources) that support the teaching of computer science and digital creativity, each one accessible freely to schools regardless of their device specifications.

The importance of coursework

This qualification aims to support the development of student's knowledge, skills and understanding of the creative and practical application of computing and technology. It is therefore of fundamental importance that they get adequate time to develop a range of practical skills. This GCSE should have the same allotted number of Guided Learning Hours (GLH) on school timetables as its Computer Science counterpart. The proportion of time devoted to the development of the technical skills should be proportionate to enable students to develop foundational skills in a range of applications and technologies.

Likewise, the assessment structures need to reflect the practical nature of the subject. It would be artificial to expect students to demonstrate their digital creativity skills using solely written examinations. While some theoretical and conceptual principles may well be examinable through a written paper, it is envisaged that a practical task undertaken over a larger period of time would be a more apt form of assessment. This may be evidenced through portfolio development or a more project based coursework piece. Its assessment weighting should also be significant (and make up no less than 20% of the overall grade), to enable teachers to be able to dedicate adequate teaching time towards it.

The importance of interwoven careers education

This is a qualification that is designed to provide students with foundational skills and insights into the creative digital sectors. Knowledge and insights about the industries should be interwoven throughout the delivery of the course when it is natural for it to occur. It is important to help students make the connection between the work they are doing and its link back to career practices within industry. So, for example, when they are working on ideation and storytelling, it would be natural to talk about the role that narrative designers play in game development and film making for example. Likewise, when students are creating their digital prototype, an authentic way of teaching this would be where possible to try and replicate relevant industry practices.

Industry insights and collaboration could be done through a variety of means, from working with local businesses to using resources and tools available online. Schools and educational institutions can work with initiatives such as Ukie's own Digital Schoolhouse or Video Games Ambassadors programme or participate in competitions and events such as BAFTA Young Game Designers to enable students to benefit from industry collaborations. Such collaborations can play a key role in providing an enriching and fulfilling educational experience, enabling students to be better informed about their onward career pathway.

While each student will need to experience each strand of the specification, team working, and collaboration should form part of standard practice. Working together on a single project, sharing ideas and feedback, cross-disciplinary teams will be a much more effective and impactful way of delivering this qualification. It is not an authentic experience for a solo individual to conceptualise, design, develop and publish a game or produce a film entirely themselves with no outside input or source of inspiration. Although this does happen, it is far more likely that creative digital outputs are developed by teams of people. Therefore, efforts should be made to replicate this practice as part of the qualification delivery.

This range of cognitive 21st Century Learning Skills take time to develop and needs to be built into school curriculums with pre-GCSE age students. By building in opportunities for practice and development within the subject specification and assessment structure we can ensure students are entering post-16 education with a higher skillset than they were previously.

Conclusions and next steps

The current landscape of computing education in the UK highlights a significant gap in the curriculum, particularly at Key Stage 4. While foundational subjects like Computer Science are crucial, they fall short in fostering creativity and practical application skills. The heavy focus on theoretical knowledge and programming in the Computer Science GCSE deters many students, especially when compared to more flexible and creative pathways. However, the OCR Creative iMedia qualification, despite its potential to bridge this gap, remains limited in its reach and acceptance due to its vocational nature and societal perceptions.

The decline in creative subjects in schools, coupled with the rapid growth of the creative industries, particularly the video games sector, underscores the need for a curriculum that integrates digital skills and creativity. Introducing a Digital Creativity GCSE would address this vacuum, providing a balanced approach that combines technical knowledge with creative application. It is a qualification that would suitably complement a renewed and increased emphasis on Digital Skills (also referred to as digital literacy) that is consistently delivered to a high standard across all schools in the UK. This would not only better prepare students for future careers in digital and creative industries but also equip them with essential 21st-century skills that will benefit them regardless of which career pathway they opt to pursue.

The Digital Creativity GCSE should be an essential part of coherent pathways to many jobs. Games, Animation, and Visual Effects have many roles in common with similar skill sets, and it will be important for 14 to 16 year olds to realise that their skills will be transferable, not just between these closely related sub-sectors, but also across the wider creative industries and in the creative economy as a whole. Digital Creativity skills are not just utilised in media and entertainment, but are also essential in areas such as architectural visualization, product design, medical simulations and training, autonomous vehicles, advertising and big data presentation. The Digital Creativity GCSE qualification would be a fundamental building block to support many careers in the government's priority sectors.

It will also be important for the GCSE to dovetail with existing and future provision at Level 3. For example, it would be a good feeder for the AIM Extended Diploma in Games, Animation and Visual Effects Skills which is championed and supported by employers through the NextGen Skills Academy network of FE colleges, and provides progression to both university and apprenticeships. The UAL Level 3 Extended Diploma in Creative Media Production and Technology is another course that would benefit from receiving students that are already proficient in Digital Creativity at Level 2. The Digital Creativity GCSE is a qualification that would provide the perfect skillset for not just an array of vocational digital qualifications, but also potentially a supporting A-Level Digital Creativity qualification.

Next Steps

Ukie will collaborate with educational experts, industry professionals, and policymakers and seek to support the advocacy and design of a comprehensive Digital Creativity GCSE that balances theoretical knowledge with practical skills. We will aim to ensure the curriculum covers key areas such as audio, visual, and creative design thinking, providing students with a broad understanding of the digital creative process.

We recognise that there is a systemic crisis within education at the moment. There is a shortage of teachers, that is even more profound when you examine the need for

a qualification. Additionally, schools are dealing with years of under-funding and many have poor resources, and older machines with lower specifications that will be incapable of running high-end software. The socioeconomic impact of the digital divide in schools is real, and it will need to be addressed if we are going to see significant positive change in school resources and equality of high-quality educational provision for all students across the country, regardless of where they live.

Ukie will endeavour to work with wider stakeholders, the DfE, OfQUAL and Examination Bodies to develop the Digital Creativity GCSE qualification and support with pilot programs and rollout to ensure the qualification becomes a viable and mainstream alternative pathway to the current Computer Science GCSE. Through our Digital Schoolhouse programme, we will support the development of teacher resources and training enabling educators to deliver the proposed qualification within their existing provision of resources.

By taking these steps, we can create a more inclusive and comprehensive computing curriculum at Key Stage 4 that not only meets the academic needs of students but also nurtures their creative potential and prepares them for future technological advancements. This approach will ensure that our education system remains relevant and responsive to the evolving demands of the digital age.

Contributors

This paper has been developed in extensive consultation with a range of stakeholders, including the video games industry, via the Ukie membership and educators through our Digital Schoolhouse and Ukie Students networks.

All efforts have been made to ensure that the proposal outlined in this paper meets the needs of young people and will work with the priorities and practices outlined by the education and creative digital sector. Ukie would like to thank all individuals who contributed to our work, some of whom include:

- Adam Procter, Course Leader, University of Southampton
- Anna Kopycinska, Computing Teacher
- Chris Lovell, Computing Teacher, Ashfold School
- Claire Gryspreedt, Computing Teacher, Lodge Park Academy
- Craig Wilson, STEM Coordinator, Newcastle United Foundation
- Dave Cross, Curriculum Leader for Computer Science, North Liverpool Academy
- Dr Yota Dimitriadi, Professor of Computing Education, Institute of Education, University of Reading
- Eamonn O'Hare, Director of IT, St Malachy's High School
- Edward Egerejiz, Kingsmead School
- Emma Smith, Founder & CEO, Hestia Talent
- Gareth Shaw, Founder & Educator, Ballymena Website Design
- Gustavo Herrera, Ukie board member representing Nintendo
- James Butcher, Education Development Manager, Epic Games
- Jane Adamson, Education Consultant, Knetic Education
- Jonathan Sidaway, Computing Teacher, Ron Dearing UTC
- Laura Donaghy, Education & Community Manager, Scirra
- Lewis Kay, Founder, Esports Youth Club
- Marion Barrie, Lecturer, Fife College
- Martin Smith, Careers Leader, Access Creative College
- Nasser Masri, Computing Teacher, Brentford School for Girls
- Neil Hatton, Chief Executive, UK Screen Alliance
- Rob Griffiths, Programme Leader for Games Dev Year 2 and Esports, Grwp Llandrillo Menai
- Robert Dowell, Education Guide, National Museum of Computing
- Ryan Locke, Head of Centre for Excellence in Games, Abertay University
- Shane McVeigh, Teacher, Holy Trinity College
- Simon Thorpe, Head of Curriculum - Digital and Computing, South Devon College
- Stacey Jenkins, Subject Lead, Langley Grammar School


Visitor
Visitor
Visitor
Shahnaila

References

[1] Royal Society, 2012, 'Shut down or restart?', https://royalsociety.org/news-resources/projects/computing-in-schools/report/

[2] BCS (2021), BCS Landscape Review, https://www.bcs.org/media/8665/landscape-review-computing-report.pdf

[3] Parliament UK, 2016, Select Committee on Social Mobility, Overlooked and left behind: improving the transition from school to work for the majority of young people, https://publications.parliament.uk/pa/ld201516/ldselect/ldsocmob/120/12008.htm

[4] Kemp, P. E. J., Wong, B., Hamer, J. M., & Copsey-Blake, M. (2024). The future of computing for education: Considerations for policy, curriculum and practice. King's College London and University of Reading. https://www.kcl.ac.uk/scaricomputing

[5] Kemp, P. E. J., Wong, B., Hamer, J. M., & Copsey-Blake, M. (2024). The future of computing for education: Considerations for policy, curriculum and practice. King's College London and University of Reading. https://www.kcl.ac.uk/scaricomputing

[6] House of Lords Library, 2024, Contribution of the arts to society and the economy, https://lordslibrary.parliament.uk/contribution-of-the-arts-to-society-and-the-economy/

[7] Economist Impact, 2021, Creative Industries: Trade challenges and opportunities post pandemic, https://impact.economist.com/perspectives/economic-development/creative-industries-trade-challenges-and-opportunities-post-pandemic

[8] Ukie, 2024, 2023 Video Game Industry Valuation, https://ukie.org.uk/news/2024/04/2023VideoGameIndustryValuation

[9] FT Education Datalab, 2024, How has access to creative subjects changed over time?, https://ffteducationdatalab.org.uk/2024/03/how-has-access-to-creative-subjects-changed-over-time/

[10] Campaign for the Arts, 2023, Huge decline in arts subjects worsens at GCSE and A-level, https://www.campaignforthearts.org/news/huge-decline-in-arts-subjects-worsens-at-gcse-and-a-level/

[11] Arts Professional, 2019, Decline in creative GCSEs continues, https://www.artsprofessional.co.uk/news/decline-creative-gcses-continues

[12] Wang, X. (2013). Why Students Choose STEM Majors: Motivation, High School Learning, and Postsecondary Context of Support. American Educational Research Journal, 50(5), 1081-1121. DOI: 10.3102/0002831213488622., https://www.insidehighered.com/sites/default/files/files/Wang%20AERJ%20Oct%202013.pdf

[13] Durham Commission on Creativity and Education, 2019, Durham University and Arts Council England, https://www.artscouncil.org.uk/durham-commission-creativity-and-education

[14] Durham Commission on Creativity and Education, 2019, Durham University and Arts Council England, https://www.artscouncil.org.uk/durham-commission-creativity-and-education

[15] The Future of Jobs Report, 2023, World Economic Forum, https://www.weforum.org/publications/the-future-of-jobs-report-2023/

[16] Ofcom, 2023, Online Nation 2023 Report, https://www.ofcom.org.uk/research-and-data/online-research/online-nation

About Us

Education for everyone. Inspiring all ages, at every level. Ukie provides services for education, fostering the next generation of games talent. Through our flagship initiatives; Digital Schoolhouse, Ukie Students and Video Games Ambassadors, we nurture aspiring young people in their early years, through to further education, higher education and as they start their career.

Ukie is a not-for-profit trade body that represents the UK games and interactive entertainment industry. Its mission is to supercharge the future of the UK video games and interactive entertainment industry.

It represents over 700 businesses working across the UK, including game developers, publishers, platforms and service providers. It supports companies through business support programmes, political engagement, speaking with the media on behalf of the sector and running education initiatives to boost the industry talent pipeline.

Ukie also powers a series of programs and campaigns including **Digital Schoolhouse**, together with Nintendo UK, which uses play-based learning to engage the next generation of pupils and teachers with the computing curriculum, **Ask About Games**, helping parents navigate the world of video games, and **#RaiseTheGame**, our campaign to improve equality, diversity and inclusion in the industry. All our work is backed and supported by the video games industry.

Website: www.ukie.org.uk
Contact: press@ukie.org.uk

Contact Us

Shahneila Saeed
Director of Digital Schoolhouse, Head of Education
shahneila@ukie.org.uk

ukie

YouTube

+44 020 7534 0580 | hello@ukie.org.uk

www.ukie.org.uk