

Leveraging Students' Game Culture in Education

Validating the benefits of utilising videogames
to inform pedagogy



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CHECKPOINT.



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Executive Summary

Research Objectives

The overall challenge this research responds to is the need to increase all children's engagement with education. One solution (among many) is to work through a game-based lesson content approach, as exemplified by Checkpoint Learning Materials (CLM).

The aim of this research was to evaluate the 'engagement value-add' of CLM which, in turn, will enable greater outreach to schools of the Checkpoint materials. The sub-challenge is to work with Checkpoint to evidence the effectiveness of their Video Game culture-based learning materials, as outlined by their in-house pedagogy, in ways to support the National Curriculum in key stage 2 (years 3-6).

The project will allow Checkpoint to further develop and market their learning materials to publishers and education providers. The aim is to validate Checkpoint's pedagogy and lesson plans. It will enable Checkpoint to help design school CPD for training primary school teachers.

Key Findings

- *Teachers were overwhelmingly positive about the key stage 2 science learning materials. They praised the engagement of children who at times struggle to follow a lesson. The link to the children's game culture enabled participation across otherwise marginalised groups including minority ethnic, SEND and low socioeconomic status children.*
- *Children were overwhelmingly positive about the lesson. Over 90% agreed with the statement that the focus on videogame content helped them to learn better.*
- *Children commented that they found the lesson engaging, they learned a lot about classification and really enjoyed the use of Sonic characters to bring the content to life.*

“Children were overwhelmingly positive about the lesson. Over 90% agreed with the statement that the videogame content helped them to learn better”.



Recommendations

The following recommendations are relevant to school leadership teams, teachers and researchers:

- *Teachers and researchers should work together to create innovative instructional strategies that harness the power of gaming culture and facilitate deeper learning for students in key stage 2 science lessons and beyond.*

Our data confirms that this collaborative effort will not only contribute to the ongoing development of effective teaching practices but also inspire a new generation of students to become passionate, lifelong learners in the field of science and other subjects, especially for less confident learners.

Further research

- *We suggest a follow up study with 10-12 case study schools willing to implement Checkpoint's lessons and track progress made across student cohorts to measure the value of gaming culture as an inclusive approach to learning that spans and unites students from diverse socio-economic and cultural backgrounds.*
- *Continue to explore the long-term effects of incorporating gaming culture elements into primary education, as well as identifying best practices and potential challenges associated with their implementation including school's financial constraints and time constraints.*

Introduction

The aim of the study was to understand the pedagogy behind Checkpoint's prepared lesson materials and evaluate feedback on any perceived enhanced classroom learning that takes place. The outcomes from this project have the potential to strengthen Checkpoint's learning materials and evidence their potential to deliver better learning outcomes to more schools and centres of learning for young people.

Using a qualitative method of inquiry, research was conducted with five classroom teachers in four schools who delivered the key stage 2 science lesson on classification. We also gathered questionnaire data from the majority of the children who participated in the lesson in each school.



Context

Gaming culture has become an integral part of many children's lives, as videogames have progressed from an occasional activity to a mainstream form of entertainment (Hamlen, 2011). Children often dedicate a considerable amount of time to playing videogames, with some studies estimating that the average young person accumulates more than 10,000 hours of gaming by the age of 21 (McGonigal, 2011). According to a recent report by Ofcom (2023), the UK's communications regulator, nine out of 10 children play videogames. This figure includes both primary and secondary school-aged children with many spending several hours per week to this activity. Therefore, the concept of gaming culture has evolved alongside the growing integration of videogames into mainstream culture over time (Hewett, 2022). The widespread popularity of videogames can be attributed to several factors, such as the immersive nature of gaming experiences, the increased sophistication and realism of game graphics, and the sense of achievement and emotional reward that games can provide (Vorderer et al., 2004).

Additionally, gaming culture has been further enhanced by the rise of online gaming, which provides young people the opportunity to connect with others around the world from diverse cultural contexts and engage in collaborative and competitive games (Granic et al., 2014). As gaming culture has become increasingly prevalent in children's lives, teachers and researchers have begun to explore the potential educational benefits of videogames and their impact on learning (Gee, 2007; Prensky, 2003). Some studies have demonstrated that videogames can improve cognitive skills; such as problem-solving and critical thinking, as well as enhance motivation and engagement in learning (Adachi and Willoughby, 2013; Wouters et al., 2013). This has led to a growing interest in understanding the elements of gaming culture that can be effectively incorporated into teaching and learning to create more engaging learning experiences for students (Kapp, 2012). Indeed, the UK's Conservative government introduced a Videogames Research Framework in May 2023 signalling the political commitment to better understand 'how videogames have impacted individuals, consumers, communities, industries and societies' (Rodden, 2023).

This research started with an examination of the existing research on incorporating students' gaming culture in primary education, with a special focus on key stage 2 (KS2) science lessons, without directly promoting the use of games in the classroom. Gee (2013) argues that games embody many of the features that teachers should seek out when designing educational resources. In addition, he emphasised that while games embodied many of these features, this was not meant as an invitation to teachers to turn classroom activities into games (Gee, 2013). Key Stage 2 (KS2) is the second stage of primary education for children aged 7 to 11 and aims to foster their understanding of scientific concepts and develop essential scientific skills (DfE, 2013). Integrating elements of gaming culture into science lessons can potentially enhance students' learning experience by addressing their interests, motivations, and diverse learning needs (Sung and Hwang, 2013). This is relevant to our research, which focuses on how students used their game culture to access and engage with the content of science lesson on classification using characters from videogames featuring Sonic The Hedgehog.

Existing studies confirm that adaptive teaching can lead to more effective and engaging science lessons, as students are challenged at an appropriate level and receive support tailored to their specific learning needs (Pane et al., 2017). By incorporating a variety of instructional strategies found in videogames, such as differentiated instruction and flexible grouping, teachers can create a more inclusive and responsive learning environment that caters to the diverse needs and abilities of their students (Tomlinson, 2014). Furthermore, personalised learning experiences can foster a sense of autonomy in students, as they are empowered to take ownership of their learning (Patall *et al.*, 2008).

The Research

This report is based on a project conducted between January and July 2023 in the London Boroughs of Hillingdon and Hammersmith and Fulham. The underpinning study employed a qualitative approach and data were collected in two stages.

Stage 1: five interviews with classroom teachers in four schools directly after they had delivered the key stage two science lesson on classification. Four of the teachers were female, one was male and they are all from differing ethnic backgrounds.

Stage 2: questionnaires with children participating in the lesson in each of the four schools. Students were asked straight after the lesson to reflect on what they liked and what they found interesting.

The following table provides an overview of the demographic features of each school:

	St Georges School	Five Bridges School	Blue Dragon School	Beechwood School
Local authority	Hillingdon	Hillingdon	Hillingdon	Hammersmith & Fulham
Type of school	Academy sponsor-led	Academy sponsor-led	Academy sponsor-led	Maintained
Ofsted Rating	Good	Good	Outstanding	Good
Number of students	359	832	260	215
EAL Students	The proportion of pupils from minority ethnic groups and who speak English as an additional language is above average.	Over three quarters of the pupils are from ethnic minority heritages and nearly a quarter from White British backgrounds. The proportion of pupils who speak English as an additional language is well above average.	The proportion of pupils from minority ethnic groups is above the national average. The majority of pupils speak English as their first language.	Most pupils are from a wide range of minority ethnic heritages. The proportion of pupils who speak English as an additional language is higher than average.

	St Georges School	Five Bridges School	Blue Dragon School	Beechwood School
PP Students	The proportion of pupils eligible for the pupil premium funding is above the national average.	The proportion of pupils eligible for the pupil premium, which provides additional funding for children in local authority care and pupils entitled to free school meals, is well above average.	The number of pupils eligible for free school meals is lower than average	The proportion of pupils who are eligible for pupil premium funding is much higher than average.
SEN Students	The proportion of pupils with SEND is lower than that of other schools nationally.	The proportion of disabled pupils and those with special educational needs supported through school action is average. The number of pupils who are supported through school action plus and who have a statement of special educational needs is below average.	The proportion of pupils who have special educational needs and/or disabilities is average.	The proportion of pupils who have special educational needs and/or disabilities varies from year to year and is currently above average.
Schools' performance	The school meets the government's floor standard pupils' attainment and progress).	The school meets the current government's floor standards, which set the minimum expectations for pupils' attainment and progress.		The school meets the government's current floor standard school care provisions, which set the minimum expectations for pupils' attainment and progress in reading, writing and mathematics by the end of Year 6.

The following table provides an overview of Teachers' professional experience:

Teacher name	School name	Teaching experience	Enjoyment of teaching	Challenges of teaching
Mrs Chaudry	St Georges School 1	23 years	<i>'I learned a lot. They are in fact encyclopaedic'</i>	<i>'Paperwork is one of the challenges that I would say is major'</i>
Mr Kaur	St Georges School 1	2 years	<i>'Relationships with the children and the parents'</i>	<i>'The different needs that each child and parent has'</i>
Mrs Tollit	Five bridges School 2	7 years	<i>'When children actually understand the learning'</i>	<i>'It's attitude towards learning that they have, them not having aspirations'</i>
Mrs Jamieson	Blue Dragon School 3	5 years	<i>'That moment when it clicks in their head'</i>	<i>'Admin, it's the admin outside of teaching at the moment'</i>
Mrs Davies	Beechwood School 4	11 years	<i>'Working with the children, and helping them to get new knowledge'</i>	<i>'Massive challenges with funding and finances. Parents are challenging, as well'</i>

Ethics

Participation in the research was entirely voluntary and the informed consent of all participants was sought prior to the interviews. Those who took part in the research were assured that their comments would be treated in confidence and any quotes used would be anonymised. The research complies with the ethical protocols set out by the British Education Research Association (BERA) (2018) revised ethical guidelines; the BSA (2017) ethical guidelines; and Brunel University London's ethical guidelines.

The findings are presented below and organised around the teachers' experiences and then the students' experiences.

Findings from teachers

Improved engagement

All of the teachers cited the positive aspects of the learning material, in particular in terms of improved engagement and focus through the duration of the lesson:

"Definitely, when we started to talk about the character straight-away, they were engaged from the start, they loved it. They loved the fact that it's something that is in everyday life, especially the boys, they realise, okay, yes, that's different." (Mr Kaur, St Georges)

"It grabbed their attention, which was amazing. I think teamwork, they worked really well, the communication with them was really well, and they were all focused. Yeah. In the afternoon lessons, especially in the afternoon." (Mrs Chaudry, St Georges)

"I've got my autistic child there, he was engaged throughout the lesson, he wants to know, he was talking, he was asking questions and asking for more ideas. So I really like that. Yeah, I think the engagement was there. It really was highlighted."
(Mrs Jamieson, Blue Dragon)

"They definitely enjoyed it because it was the Sonic characters. Definitely."
(Mrs Davies, Beechwood)

The stuff with the characters, they loved that! Yeah. And I think that what they're talking about is those unique characteristics, which I think that was really helpful."
(Mrs Tollit, Five Bridges)

Reference in the learning materials to the Sonic characters was cited as a key feature in the improved engagement experienced by the students. Existing research suggests that the immersive and engaging nature of games has been shown to positively influence children's cognitive processes, leading to enhanced learning experiences (Kiili, 2005; Shaffer, 2006). While the use of actual games in the classroom has attracted some mixed attention, researchers emphasise the importance of recognising and understanding the various features of gaming culture that can be effectively incorporated into the learning process (Kapp, 2012). As our study shows, by focusing on the underlying principles and mechanism that make games engaging, such as the characters, game mechanics and play styles – learning through play, teachers can utilise learning resources that promote critical thinking, problem-solving, collaboration and motivation and, adaptive and personalised learning (Gee, 2007; Squire, 2008), without necessarily relying on the use of videogames themselves (Barab et al., 2009; Prensky, 2001) to positive effect.

Research has also shown that gaming culture can improve children's cognitive skills such as problem-solving and critical thinking (Adachi and Willoughby, 2013; Wouters et al., 2013). Videogames often require players to strategise, analyse complex situations, and adapt to changing circumstances, which can promote the development of higher-order thinking skills (Granic et al., 2014) which can be applied to classroom learning as transferable skills. Our data confirms that drawing on students' gaming culture created a space for collaborative and social learning (Steinkuehler and Duncan, 2008). The data from our teacher interviews highlights that incorporating these aspects into educational settings can foster cooperation, communication, and teamwork among students, ultimately enhancing their social skills and collaborative problem-solving abilities (Sung and Hwang, 2013). Our findings resonate with those from a recent study conducted by Hewett et al. (2020) who found that videogames 'help students learn to problem-solve, improve their research skills, be resourceful, multi-task, and develop their social skills through teamwork' (Hewett et al., 2020, p. 361) which contributes to their educational learning.

Potential areas for further development

The aim of this research was to better understand areas that would benefit from further development. Supporting and meeting the needs of students with SEND was identified by two teachers based in the same school, as follows:

"Maybe Special Needs SEN needs, need to be incorporated into the lesson plan. How am I going to challenge certain kids in the classroom? I said, we're very fortunate in my class that everyone can get on. But if I have certain needs specifically my last year's one, how am I going to cater to those?" (Mr Kaur, St Georges)

"So, some children require extra scaffolding than the others, because everybody was doing the similar thing. That is where, you know, the focus might have lacked, because I have special education needs. So, I have to target to their level. We usually adapt the resources to match their level so not everybody works at a level of year five, you have ups and downs. So, to adjust the lesson according to them ". (Mrs Chaudry, St Georges)

These findings suggest some further refinement of the material to ensure differentiation across ability levels would enhance the inclusivity of the lesson for all learners. Indeed, videogames often adapt to the ability of the player, offering personalised learning experiences that challenge and engage learners at the appropriate level of difficulty (Sitzmann, 2011). Incorporating such a differentiated or adaptive learning approaches inspired by gaming culture, could enable teachers to tailor instructions to meet students' individual needs, leading to a more engaging learning experience for all (Pane et al., 2017).

Overall experience

We asked our teachers if they would recommend Checkpoint's learning materials to their Senior Leadership Team (SLTs) for purchase and all five teachers responded positively:

"Definitely. It was something that we can use as a basis, and then we can adapt it to each need of various classroom. So, it would be something we recommend".

(Mr Kaur, St Georges)

"Yes absolutely, absolutely... We can adapt the material, but you know when you have to basic structure, it's just adapting. So, something like that, we would love to have it".

(Mrs Chaudry, St Georges)

"Yes, definitely yes because it hooks them. It's straight in there. As soon as they came in, they saw the three characters and they were like Oh WOW".

(Mrs Jamieson, Blue Dragon)

"Yes, absolutely yeah. Yes. I think the children really enjoyed it".

(Mrs Davies, Beechwood)

"Yes, I would. Like I said, I would just need to go back and have a look at... we always, we have the national curriculum, but we always kind of want to extend their learning".

(Mrs Tollit, Five Bridges)

Many videogames offer adaptive learning experiences, adjusting the level of difficulty based on the player's performance. Our findings lead us to contend that teachers can adopt a similar approach in the classroom by using formative assessments and adaptive teaching to tailor the activity according to individual students' needs, ability, and progress (Sitzmann, 2011). To ensure the continuing effectiveness of drawing on student's game culture, teachers must regularly assess students' understanding of science concepts which can be done through quizzes, discussions, and observations, teachers can identify areas where individual students may require additional support (Black and Wiliam, 2009) to adapt the teaching and learning to the students' ability.

Findings from students

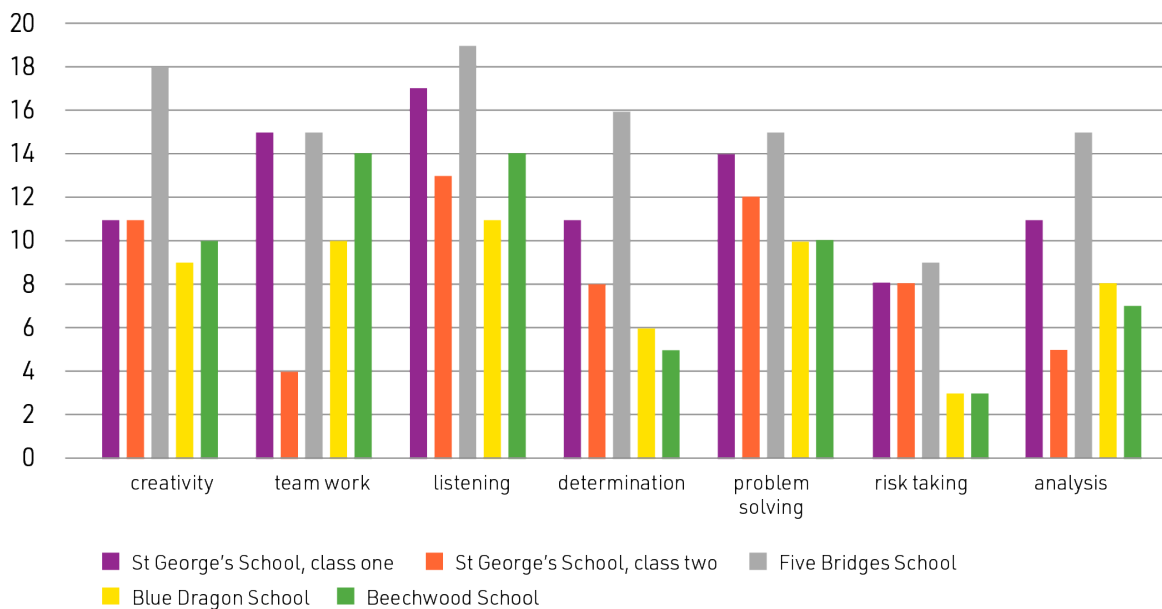
Students were asked to complete a questionnaire based on their experience of the Checkpoint lesson. The following table summarises their responses to the statements noted in the first column of the table:

	St Georges School, Class One	St Georges School, Class Two	Five Bridges School	Blue Dragon School	Beechwood School	Totals
Number of students in class	23	20	25	13	21	102 students
Number of students agreed the lesson helped them learn better	21	18	23	12	17	92.8% agreed
Number of students agreed the content made them more confident	20	16	20	8	17	82.6% agreed
Number of students agreed they were engaged in the learning	22	15	22	11	16	87.7% agreed

Our positive findings from the students suggest that drawing on students' game culture in science lessons by incorporating elements not explored but including points, badges, and challenges can motivate students and encourage engagement (Dicheva et al., 2015). These game mechanics provide a sense of achievement and recognition, fostering intrinsic motivation and promoting a positive learning experience (Hamari et al., 2014). The positive engagement and increased sense of confidence reported by the participants suggest that their motivation was stimulated through participating in the lesson.

The table below highlights the distribution of key skills students gained from the lesson, grouped by individual skills as they appeared in the questionnaire:

Development of Learning Skills



The chart confirms the range of skills gained through participation in the lesson, with creativity (59), listening (74) and problem solving (61) scoring highest. There is some differentiation at the school level with Five Bridges School scoring the highest in all skill areas.

To better understand these perceptions of skills gained the questionnaire also asked students to note 'what they found interesting about the lesson.' A sample of responses representative of the cohort in each school is as follows:

"I loved the animals". (St Georges School)

*"I cannot choose because it was interesting throughout the whole lesson".
(St Georges School)*

"When we had to sort animals in classification keys". (St Georges School)

"How to analyse". (Five Bridges School)

"The classification and scientific names of the animals". (Five Bridges School)

"Discovering the scientific names". (Five Bridges School)

"The characters of a video game". (Five Bridges School)

"I learned many new words". (Blue Dragon School)

"Listening, teamwork". (Blue Dragon School)

*"How they used video game characters in the lesson to teach me about animals".
(Blue Dragon School)*

"A classification sheet". (Beechwood School)

"Using videogame content". (Beechwood School)

"That Knuckles is an echidna". (Beechwood School)

In response to the question 'what was the most useful thing you learnt today' the following sample of responses representative of the cohort in each school is as follows:

*"The most useful thing I learnt was how to make my own classification".
(St Georges School)*

*"The most useful thing I learnt was the data table because I never knew how to use it".
(St Georges School)*

*"The classification key was useful to be honest because you know how to sort and group".
(St Georges School)*

"How to classify animals". (Five Bridges School)

"I could classify plants or animals for science". (Five Bridges School)

"Learning about habitats". (Five Bridges School)

"I might use it if I become a scientist". (Blue Dragon School)

*"We could explore different animals which had invertebrates and vertebrates".
(Blue Dragon School)*

"The differences of different characters – classification". (Beechwood School)

"Say what type of animals were from the Sonic movie". (Beechwood School)

"How to sort things out into groups". (Beechwood School)

The responses to these two questions suggest that incorporating gaming culture elements in the classroom can lead to a more enriching learning experience for students, transforming the way they engage with and understand scientific concepts. Teachers can potentially foster a deeper connection between students and the subject matter when bringing the excitement and challenges of videogames into the learning process, ultimately promoting a lasting interest in science education.

Conclusion

Our findings suggest that game culture might be a key element of students' cultural wealth and that it has appeal to almost all students. Incorporating elements of gaming culture into primary education, specifically key stage 2 science lessons has the potential to enhance student engagement, motivation, and learning outcomes. Tapping into the interests and passions of students, teachers can create more captivating and meaningful learning experiences that resonate with their students' lived experiences.

Teachers highlighted the need to adapt the resources for SEN and economically disadvantaged, but no concern was explicitly raised for any other characteristic. Teachers can create more engaging and inclusive learning environments by understanding and leveraging key aspects of gaming culture, quest-based learning, collaboration, adaptive teaching, and feedback. These gaming-inspired strategies can not only spark students' curiosity and excitement but also help them develop further the essential skills acquired through playing videogames, such as critical thinking, problem-solving, and teamwork.

To take the work forward, the key focus will be to better understand how drawing on students' game culture, not just in science lessons but across the curriculum, has the capacity to transect students diverse cultural, social and economic backgrounds to create more inclusive classroom environments. By drawing on this relatively untapped knowledge, we want to understand the benefits to the whole school community. Thus, any future research should continue to explore the long-term effects of incorporating gaming culture elements into primary education across the socio economic and cultural spectrum, as well as identifying best practices and potential challenges associated with their implementation.



“These gaming-inspired strategies can not only spark students' curiosity and excitement but also help them develop further the essential skills acquired through playing videogames, such as critical thinking, problem-solving, and teamwork.”

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Appendices

Appendix 1: Participant Consent Form

Checkpoint classroom evaluation

Dr Kate Hoskins

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN (TBC)

The participant (or their legal representative) should complete the whole of this sheet.		
	YES	NO
Have you read the Participant Information Sheet?	<input type="checkbox"/>	<input type="checkbox"/>
Have you had an opportunity to ask questions and discuss this study (via email/phone)?	<input type="checkbox"/>	<input type="checkbox"/>
Have you received satisfactory answers to all your questions (via email/phone)?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that you will not be referred to by name in any report concerning this study?	<input type="checkbox"/>	<input type="checkbox"/>
Do you understand that:		
• You are free to withdraw from this study at any time?	<input type="checkbox"/>	<input type="checkbox"/>
• You do not have to give any reason for withdrawing?	<input type="checkbox"/>	<input type="checkbox"/>
• You can withdraw your data any time up to the day of the arranged focus group interview?	<input type="checkbox"/>	<input type="checkbox"/>
I agree to my focus group interview being audio recorded and for anonymised transcripts to be made.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to the use of non-attributable quotes when the study is written up or published.	<input type="checkbox"/>	<input type="checkbox"/>
The procedures regarding confidentiality have been explained to me.	<input type="checkbox"/>	<input type="checkbox"/>
I agree that my anonymised data can be stored and shared with other researchers for use in future projects.	<input type="checkbox"/>	<input type="checkbox"/>
I agree to take part in this study.	<input type="checkbox"/>	<input type="checkbox"/>

Signature of research participant:	
Print name:	Date:

Appendix 2: Participant Information Sheet

Checkpoint classroom evaluation

Invitation Paragraph

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

What is the purpose of the study?

The aim of the project is to work with Checkpoint magazine to evidence the effectiveness of their Video Game-based learning materials in ways to support of the National Curriculum. The project will allow the project team to further develop and market their learning materials to publishers and education providers. It will enable Checkpoint to help design school CPD for training teachers.

Why have I been invited to participate?

You have been invited to participate as you teach KS2 children. We would value your input as an experienced teaching professional into our project.

Do I have to take part?

As participation is entirely voluntary, it is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time up until the day of the lesson and subsequent interview, without having to give a reason. You are welcome to withdraw from the research at any time and are free to withdraw your data before it becomes anonymised (by 31 July 2023) without having to give a reason.

What will happen to me if I take part?

You will be asked to teach a 90 minute science lesson using Checkpoint's learning materials. All learning materials will be provided. You will then be interviewed to discuss your views and experiences of the strengths and weaknesses of the lesson. The interview will take place face to face at the school.

Are there any lifestyle restrictions?

There are no lifestyle restrictions associated with this research.

What are the possible disadvantages and risks of taking part?

There are no anticipated disadvantages or risks associated with taking part in this research. However, if during the course of the research evidence of harm or misconduct come to light, then it may be necessary to break confidentiality. The research team will tell you at the time if I think we need to do this, and will let you know what will happen next.

What are the possible benefits of taking part?

Taking part will enable you to further reflect upon and share your thoughts about Checkpoint's learning materials in terms of the strength and limitations of the lesson plans you teach.

Will my taking part in this study be kept confidential?

Confidentiality will be assured with one exception, e.g. if during the course of the research evidence of harm or misconduct come to light, then it may be necessary to break confidentiality. The research team will tell you at the time if I think we need to do this, and let you know what will happen next.

Will I be recorded, and how will the recording be used?

The interview will be audio-recorded and will be kept securely. Once the interview has been transcribed and pseudonyms used to protect individual identity the audio recordings will be deleted/erased.

What will happen to the results of the research study?

The results of this research will be evaluated and shared with the research team. We will publish a report and academic article based on the findings. You will not be identified in any report or publication.

Who is organising and funding the research?

This research is funded by Brunel University London. Dr Kate Hoskins is leading the project.

What are the indemnity arrangements?

Brunel University London provides appropriate insurance cover for research which has received ethical approval

Who has reviewed the study?

This study has been reviewed by the College of Business, Arts and Social Sciences Research Ethics Committee.

Research Integrity

Brunel University London is committed to compliance with the Universities UK [Research Integrity Concordat](#). You are entitled to expect the highest level of integrity from the researchers during the course of this research.

Contact for further information

Dr Kate Hoskins (kate.hoskins@brunel.ac.uk)

Contact for complaints

For complaints, please contact the Chair of the Research Ethics Committee: Cbass-ethics@brunel.ac.uk".

Appendix 3: Aide Memoire

Professional experience questions

- 1) How long have you been teaching?
- 2) What do you enjoy most about the job?
- 3) What are the challenging aspects?

Checkpoint lesson questions

- 1) Describe your impressions of the lesson plan from the materials provided.
- 2) What did the children most enjoy?
- 3) In what ways, if any, did you notice improved focus and/or engagement from the children?
- 4) What needs further development in this lesson plan? Why?
- 5) How does the lesson speak to the curriculum requirements for science?
- 6) Please comment on the pace of the lesson
- 7) Please comment on the range of activities included
- 8) Would you recommend these learning materials to your SLT? Why, why not?
- 9) Any other comments on the lesson or the materials?

Appendix 4: Student Questionnaire

What did you like most about what your teacher did today?

Think about what they said and what they did.

What did you like most about what you studied today?

Think about the activities you did and the resources.

What was different about your lesson today?

Think about how you normally learn.

What were you learning about today?

Think about the new knowledge you gained or skills you developed.

What did you find most interesting about the lesson?

Think about the teaching, the new knowledge you gained or skills you developed.

What was the most useful thing you learnt today?

Think about how you would use what you learnt today in real life.

What one thing would you be excited to share with someone else about today's lesson?

- Choose the statement you most agree with:

Using videogame content helped me to learn better

Using videogame content did not help me to learn better

- Choose the statement you most agree with:

Using videogame content made me more confident about learning

Using videogame content did not make me more confident about learning

- Choose the statement you most agree with:

I was very engaged in my learning

I was not very engaged in my learning

- Tick all the statements you agree with:

I developed the following learning skills:

creativity

team working

listening

determination

YES/NO questions

I felt part of the learning process

I felt what I was learning about mattered

I understood why I was learning

I felt valued in the lesson

I was excited by the learning

I thought about how I was learning

I would like to use videogame content in my lessons again

Have we missed anything out? What would you like to say?

ⁱ Half the class were out on activities.