



Lockwood, Hannah (2020) *Can S2 pupils' motivation in learning History be improved by using Virtual Reality?* [MEd].

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University of Glasgow | School of Education

Can S2 pupils' motivation in learning History be improved by using Virtual Reality?

MEd Professional Practice

August 2020

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Abstract

‘Motivation is the force which provides the impetus for human behaviour, causing individuals to initiate and sustain goal-directed actions.’ (Alkaabi et al., 2017: p.193). This definition succinctly explains why motivation has been an important area of research within the education community. Motivated pupils are likely to be more engaged, show less behaviour issues and are more likely to achieve their academic potential. However there is currently a problem with motivation in schools, particularly those in poor socio-economic areas (Scottish Parliament Information Centre, 2016).

Virtual Reality (VR) is a rapidly developing technology and its benefits for education are only starting to be understood. However, it is still in its infancy in terms of classroom use and the research surrounding it is limited, particularly in History teaching. Although there is research to suggest that using VR in classrooms could improve motivation among pupils, there is not a consensus in the literature surrounding it.

Therefore, this enquiry set out to examine the motivation of S2 pupils in learning History and whether it could be improved by using VR in the classroom. It planned to use a mixed method approach within an interpretivist paradigm, using pre-and post-intervention questionnaires and group interviews. The intervention itself involved participants undertaking a four-week course on ‘Civil Rights’ with VR experiences regularly built in. However, the closure of schools due to Covid-19 meant that the data collection and intervention could not take place.

All conclusions, then, are based on the research from the literature review. Although this does suggest that VR could improve pupil motivation, the findings are not unanimous. More research is needed in this area and it is hoped once schools re-open, this enquiry will be completed.

Permission to Consult

This dissertation is available for any individual(s) who may wish to access it.

Abbreviations

VR- Virtual Reality

AR- Augmented Reality

AV- Augmented Virtuality

MR- Mixed Reality

PLS- Plain Language Statement

EAF- Ethics Approval Form

BERA- British Educational Research Association

GTCS- General Teaching Council for Scotland

ICT- Information and Communications Technology

CHAPTER 1: INTRODUCTION, BACKGROUND AND RATIONAL

Practitioner enquiry

Engaging in practitioner enquiry is one of the GTCS Standards and is therefore a requirement for any teacher. This can be seen in Standard 2.3.2, specifically:

‘know how to engage critically in enquiry, research and evaluation individually or collaboratively, and apply this in order to improve teaching and learning.’ (GTCS, 2012: p.12).

However, engaging in practitioner enquiry should not stop once registration is complete. ‘Enquiry and Research’ is one of the Key Areas outlined in the GTCS Standards for Career-Long Professional Learning. Therefore, engaging in practitioner enquiry is a crucial element of improving professional practice within the classroom.

Why this enquiry?

Motivation

Motivation is key for many aspects of a productive classroom and without it pupils are unlikely to achieve their full potential or engage in activities fully. Disaffection or disengagement from school is a problem for most Western countries, although Head (2013) argues it is hard to define. A simple way of defining it is through pupil engagement or enjoyment. A study of 3000 pupils in England highlighted that 19% of Year 8 pupils (S1) and 27% of Year 10 pupils (S3) were constantly bored in school (quoted in Harris and Haydn, 2006). There are a range of factors that can impact motivation; classroom based, whole school or even community based. There can also be internal or external motives (Alkaabi et al., 2017).

Motivation, or the lack of motivation, is a problem in my current school. Pupils often do tasks or activities as quickly or as basically as they can. When pushed to do more, the response is often ‘That’s effort’ or ‘Why should I? I’ve finished it’. This is partly down to the socio-economic context of the school; it is in one of the most deprived areas of Aberdeen and in the bottom 10-20% most deprived areas in Scotland (Aberdeen City Council, 2016). There are connections between deprivation and disaffection or non-attendance at school (Head, 2013). Pupils in the school rarely ‘dream big’ and do not see education as important. Sime suggests

that 'children from disadvantaged areas can be drawn into a defeatist attitude' and so do not aim high (2013: p.869). This can be seen in the results of a 2019 survey, ranking Scottish secondary schools using the percentage of school leavers going into positive destinations. Only 71% of pupils from my school ended up in further education, work or an apprenticeship - this is the lowest rate in Scotland (Schofield, 2019).

Another league table of Scottish schools had a big impact on the motivation of our pupils, as we were named the worst performing school in Scotland (McLaughlin, 2019). This led to a big increase in pupils believing that because they go to a certain school they will never be able to achieve, so there is no point in trying. Baker and Robinson (2017) argue that underperformance in school is often not down to low ability, but actually because of a lack of effort. This can certainly be seen in the attitude of pupils within my school. Our low ranking has also led to the belief that the school has fewer resources or opportunities than other schools. This is a problem that Sime (2013: p.866) acknowledges when she states that pupils from poor socio-economic backgrounds 'accept that they are not going to get the same quality of education or have the same outcomes as their non-deprived peers'.

Virtual Reality (VR)

The Scottish Attainment Challenge is a national initiative by the Scottish Government aiming to close the economic attainment gap. This includes a focus on using 'creative and innovative projects that will raise attainment for children and young people experiencing socio economic disadvantage' (Education Scotland, 2019). As part of this there has been a focus on using digital technologies in classrooms. One of the reasons for this is due to the rise of smartphones (Buchner and Zumbach, 2018). An EU report (2015) found that in Europe 75% of adults aged 16-29 used the internet on their phone. This does not just have an impact on education in general but also has specific benefits for History teaching. Phillips (2002: p.135) argues 'Perhaps no other innovation in recent years has had greater potential to revolutionise the way we find out about the past than the Internet'. Pupils no longer need to use their imagination - they can actually see historical images and artifacts. This is taken a step further with VR as this technology allows pupils to 'drop' into historical settings and see what life was like.

The rise of smartphones has also had a big impact on the development, use and price of technology making VR more accessible and some schools have been trialling VR in the classroom. In 2018 East Renfrewshire Council invested £250,000 in more than 900 VR

devices and Dundee City Council have been using the free *Google Cardboard* software (Alexander, 2018).

I hope this research will have both a local impact (on my school and my own practice) and an impact within the field of History teaching. Using VR to improve motivation is still an under-researched area: a brief search for ‘motivation’ using *The Curriculum Journal* gets 450 results. Adding ‘virtual reality’ to this and the results drop to 30 (*Appendix 8*). Clearly this is an area that needs more exploration.

Research Questions

Three research questions will be addressed as part of this enquiry:

1. What motivates pupils and how motivated are they in their learning in general?
2. How motivated are pupils in learning History?
3. Can VR change and improve pupils’ motivation?

The Intervention

The first phase of the research will involve pre-intervention data collection from the participants in the form of group interviews and individual questionnaires (*Appendix 5* and *6*). They will be split into three groups of ten pupils for the interviews, as this is the maximum suggested by Krueger and Casey (2000). This is to maximise the opportunity to reach saturation of ideas, to identify patterns and trends that can be used in the data analysis and to aid participant contribution (Krueger and Casey, 2000; Biddulph and Adey, 2003). These data collection methods will be completed during the pupils’ timetabled History lessons.

Over the following four weeks, pupils will participate in lessons learning about the Civil Rights Movement in the USA. Each week one lesson will use VR through the app *Google Expeditions*. Not only is this software free but ‘it provides a communal, multi-user experience’ and is good for classrooms (Bowen, 2018: p.4). The specific expedition chosen is called ‘The Civil Rights Movement’ and pupils will be required to download this before the VR lessons. Using this software pupils will be able to explore various locations in the USA associated with key moments in the Civil Rights Movement. In *Appendix 13* there are screenshots showing what pupils will be able to see and how they can explore each location.

To complement the software and complete the VR experience, Google Cardboard headsets (*Appendix 13*) will be used. These are cheap and can be made within the school by the Technology Department using a free template provided by Google (*Appendix 7*).

Once the intervention is completed, pupils will take part in the second phase of research, the post-intervention data collection methods. Pupils will be required to complete the same questionnaire again and will take part in group interviews, with the same groups as before.

Participants

There will be 30 participants involved in this enquiry, all recruited from the same second year class. Recruitment is the ‘most challenging aspect of research with teens’ according to Bassett et al. (2008: p.121), but hopefully this will be reduced as the pupils already have a pre-existing relationship with the researcher/teacher. Pupils will be given a Plain Language Statement (PLS - *Appendix 2*) and asked to sign a consent form (*Appendix 3*) before the enquiry can take place. Parents and guardians will also be given a copy of the PLS and asked to sign a consent form (*Appendix 4*). Pupils can only participate if both consent forms are returned.

Consequences of Covid-19

Because of Covid-19, schools were closed at the end of the school day on 20th March 2020 and it was later announced by the Scottish Government that schools would not reopen until the 11th August 2020 (BBC, 2020). As this enquiry was to be conducted during May 2020 there was no possible way of going forward with the research. Therefore, this dissertation includes all the research up to the point of carrying out the enquiry.

CHAPTER 2: LITERATURE REVIEW

Search strategy

To find, screen and record relevant literature for this review several different databases were used, along with a range of key search words to refine and narrow the focus of the search. Punch's (2009) method for screening the results to find relevant literature was used. This system of selecting and summarising the literature involves sorting the relevant results into three main categories, those: centrally relevant to the enquiry, marginally relevant and of background relevance. A synthesised matrix was used to record and organise these results (*Appendix 8*). The number of saved results in the final column shows the total for all three categories. This system was used during the search process, but also throughout the writing of the literature review.

The four main databases that were used for this search were: *The University of Glasgow Library*, *The Curriculum Journal*, *The British Educational Research Journal* and the *Eric Institute of Educational Sciences*. The same key words were used in searches on each of the databases although, due to their nature, some databases required a narrower focus. This can be seen in the searches on *The University of Glasgow Library*, which is not specific to education and so needed the addition of 'education' to highlight the more relevant literature.

All the searches started off with a wide focus, simply 'motivation' and then this was narrowed to include 'history', then 'virtual reality' and finally all three main search terms. As can be seen in the results there is a large amount of literature surrounding motivation in many different fields (often unrelated to education and classroom teaching). The first search simply using 'motivation' on *The University of Glasgow Library* main catalogue was too large even to apply Punch's (2009) method of screening the results, as the vast majority had no relevance to this enquiry. On all the databases the search for 'motivation' produced the largest number of results, although again most results were not relevant. By narrowing the search using the key terms of 'history' and 'virtual reality', the results became more centrally relevant (Punch, 2009).

Another problem discovered when screening the search results, was that one of the key terms 'history' can have other meanings other than teaching. Many of the results under this search produced literature on the 'history of motivation' or the 'history of education strategies', for example. After screening these were generally found to be of background relevance only or

of no relevance at all. When searching *The University of Glasgow Library* main catalogue, the search term 'education' was changed to 'teaching'. Although this significantly reduced the number of results, the number of saved relevant results was less. When this was tried on the other databases, there was no difference in the search results and so this has not been included in the synthesised matrix.

Clearly the narrowest point of the search was when all the key terms were used. For each of the databases, this led to only one or no saved results. This highlights where the main gap in the literature is.

What motivates pupils and how motivated are they in their learning in general?

How motivated are pupils?

'To be motivated means to be moved to something' (Ryan and Deci, 2000: p.54). However, one of the biggest problems in education today is declining academic motivation among pupils (Legault et al., 2006; Riley and Docking, 2004). This is particularly seen in pupils from poor socio-economic backgrounds, as a Scottish Parliament briefing shows that only one-third of disadvantaged pupils feel motivated and resilient in school (Scottish Parliament Information Centre, 2016). The Scottish Government (2007: v) acknowledge that pupils 'may not be motivated by learning opportunities' and this can lead to non-engagement.

There is consensus in the literature surrounding motivation about the problems unmotivated pupils face. Feelings of frustration (at themselves and teachers), limited productivity, lacking effort and poor academic performance are regularly cited as problems arising from demotivated pupils (Legault et al., 2006; Riley and Docking, 2004; Murtagh, 2014; Serio et al., 2013). Banegas (2019) also argues that unmotivated pupils can lead to unmotivated teachers, which can create a vicious cycle of demotivation. Birchinall (2013) suggests that teachers who are motivated are more effective in planning engaging lessons.

The issues surrounding demotivated pupils have led to an increase in policy implementation in this area. The Scottish Government (2007; 2017) have included motivation and engagement strategies in their policies to improve attendance, as data shows attendance declines once pupils attend secondary school. They see motivating pupils as key to increasing attendance and reducing exclusions and believe 'pupil motivation is a key issue in attendance at school and engagement with learning' (The Scottish Government, 2007: p.25).

What motivates pupils?

It is not only how motivated a pupil is that is important, but also where that motivation comes from (Ryan and Deci, 2000). Murtagh (2014) argues that this is the most significant factor in motivating pupils, as where they attribute their success in learning (themselves or something else) is key. This leads to the main discussion in the literature about motivation, which compares the benefits of intrinsic motivation against extrinsic motivation (Self-Determination Theory). Essentially when you are intrinsically motivated you do something because you want to and it appeals to you (because it is fun, challenging or engaging). An extrinsically motivated person does things for an external reason, for example parental pressure or desire to achieve certain grades to become a doctor. Ryan and Deci (2000) suggest that the main difference is that for intrinsic motivation the activity itself is the reward, while for extrinsic motivation there is a reward for successfully completing the activity. Generally, intrinsic motivation is seen as the most productive type of motivation, as the motivation comes from the 'self' and is therefore longer lasting (Alkaabi et al., 2017; Ryan and Deci, 2000; Legault et al., 2006).

Nevertheless several studies would disagree with this idea. Although describing intrinsic motivation as 'a natural catalyst for learning and achievement', Garon-Carrier et al. (2016: p.165) discovered that intrinsic motivation did not improve pupils' attainment in mathematics. Even when a pupil is extrinsically motivated, if they value the task or outcome it is still a positive and powerful form of motivation (Ryan and Deci, 2000; Legault et al., 2006). Therefore, it is important to also consider where motivation is coming from and whether it is positive in the long term.

Although there is debate surrounding the benefits of intrinsic and extrinsic motivation, there is a consensus in the literature about how to motivate pupils. Improving pupils' feelings of competence; their belief in their ability to succeed; their sense of autonomy and freedom to choose, and giving positive feedback are regularly given as ways to increase motivation (Ryan and Deci, 2000; Garon-Carrier et al., 2016; Baker and Robinson, 2017; Legault et al., 2006; Alkaabi et al., 2017; Buchner and Zumbach, 2018). However, pupils also need to believe they can put in the required effort to achieve, otherwise they will become demotivated (Alkaabi et al., 2017). 'Academic detachment results from a lack of ability or desire to exert effort' (Legault et al., 2006: p.568). Underlining all these issues is the need to

listen to learners and their needs, which Banegas (2019) argues is the key to improving motivation and engagement in pupils.

Yet there is also debate in the literature about whether specific teaching strategies increase or decrease motivation. In their study of disaffected pupils, Riley and Docking found that pupils who were demotivated in their learning said it was because of a ‘frustration with traditional styles and methods of teaching’ (2004: p.168). Birchinall (2013) also highlights the importance of using engaging teaching strategies to improve motivation, though links this to creating a stimulating environment. Although they believe the teaching and learning environment is important, Alkaabi et al. (2017) believe it is more important for it to be positive, otherwise motivation will not flourish. However, Baker and Robinson (2017: p.161) found in their study that the approach chosen by the teacher had no impact on pupils’ motivation, though they do acknowledge that ‘good teaching’ was important. Although they would disagree with those findings, Riley and Docking (2004) agree that teachers make a big difference to how motivated pupils feel towards school and learning and that this is particularly the case in disadvantaged areas.

How motivated are pupils in learning History?

History as a subject area is one that is regularly discussed in politics and the press worldwide, and Hillis (2010) argues it has attracted more attention than any other subject. However, this interest has not necessarily turned into much educational research and enquiry. The majority of the research acknowledges the highly politicised nature of the History curriculum in the USA, England (Foster, 1998) and particularly in Scotland since devolution (Hillis, 2010; Smith, 2016; Smith 2018; Haydn, 2011b; McLennan, 2013). However, these political discussions have focused on the content taught as part of the History curriculum, not on pupils’ enjoyment of the subject.

What is clear from the research into pupils’ enjoyment of History, is that the content is of lesser importance to pupils than how it is taught. In Harris and Haydn’s (2006: p.315) study, they discovered ‘that how pupils are taught appears to matter more than what they are taught’. Head (2013) showed similar findings in his enquiry into disaffection in schools, as pupils stated it was how a subject was taught, not the curriculum itself, that caused them not to attend. However not all the research highlights the importance of teaching strategies, as Baker and Robinson (2017: p.150) found that ‘the type of instruction does not impact student

motivation'. Nevertheless, they do admit that these findings are contrary to most of the studies conducted in this area of research.

Various studies highlight teaching strategies that pupils enjoy, across the curriculum as well as in History. Interactive approaches were popular, though Harris and Haydn (2006) found this was mainly in younger pupils. Strategies included: group and teamwork; discussions; practical learning; role play and investigative work (Biddulph and Adey, 2003; Harris and Haydn, 2006). However, Harris and Haydn (2006) also showed that while teachers were aware of which teaching strategies were more enjoyable for pupils, they were not universally adopted.

So how is History generally taught? Bowen (2018) argues that the traditional way to teach Social Studies (including History) is through lecture and note taking. In their study on using Living History, Pond and Childs (1995) found it improved pupils' knowledge and understanding of time periods. Although clearly an active style of learning, their study found limited impact on pupil motivation. Literacy is a key element of History, particularly essay writing, and Harris and Haydn (2006: p.329) argue that 'there is a need for balance' when it comes to teaching strategies. This statement is mirrored by Goksu and Somen (2019: p.271) on teaching using Local History, arguing that the 'entertainment aspect of [a]...teaching activity should be kept behind that teaching aspect'. Both these studies suggest that the core element of the subject should not be lost to pupil enjoyment. However, while Bowen (2018) argues that traditional teaching methods result in poor academic motivation, Harris and Haydn (2006) found the opposite in their study. Although they did find certain activities that pupils preferred, they also found that the popularity of History across different schools was not consistent with these teaching methods. Therefore they determined that traditional approaches could increase enthusiasm for History.

The use of technology in History teaching is a limited, and contradictory, area of research. As already discussed literacy is a core element of History teaching, but Mountford (2011) argues this should also include ICT literacy as well. However there is debate as to the effectiveness (and popularity) of using technology in History lessons. In their study Biddulph and Adey (2003) found that in the schools where ICT was used in History lessons, pupils reported more enjoyment. Yet Harris and Haydn (2006: p.322) found that the use of ICT did 'not feature highly' in pupils' descriptions of a good lesson, although when it was mentioned only three comments were negative. An Ofsted report (quoted in Haydn, 2011a: p.236) found that

'lessons where new technology was used were on average less satisfactory than lessons without ICT'. One of the reasons for this is the uneven use of digital technologies across schools. This can be because of time and cost, but Hillis (2010) argues it is more to do with teacher confidence in new technology. Bowen (2018) would agree with this, as she argues that teachers are reluctant to use technology, particularly in History classrooms. Haydn (2011a: p.241) argues that if History teachers do not embrace ICT then they are missing out on opportunities as 'ICT interventions should build on these [digital] skills to engage pupils and motivate them'.

Although the research into pupils' motivation in History is limited, what does come across is that History is a popular subject (McLennan, 2013; Harris and Haydn, 2006). Although this is clearly not universal, Harris and Haydn (2006) discovered that pupils who found History a negative experience said it was boring. While these pupils did not say why they found the subject boring, it could be to do with their expectations. Generally, pupils expect History to be a difficult subject with high levels of reading and writing and with limited practical elements (Biddulph and Adey, 2003). Again, this highlights the importance of how History is taught rather than the curriculum. Although literacy is a key element of History education, this should include digital literacy and could be taught using a variety of teaching approaches. The 'potential therefore exists to counteract issues of disaffection through examining not just what pupils learn but also how they are taught' (Harris and Hayden, 2006: p.331).

Can VR change and improve pupils' motivation?

Over the last few decades new technologies have been increasingly used in education, from the rise of computers, whiteboards and, more recently, smartphone use. From 1996 to 2005, the UK Government spent £3.5 billion on a national strategy to improve ICT use in schools (Hurd, 2009), believing that it would transform learning and improve exam results (Lewin et al., 2003). While the Scottish Government produced their *Digital and Learning Teaching Strategy for Scotland* in 2016, clearly highlighting the importance of using technology in the classroom:

'If used effectively and appropriately, digital technology can enhance learning and teaching, equip our children and young people with vital digital skills and crucially, it can lead to improved educational outcomes.' (The Scottish Government, 2016: p.3).

Many research studies argue that using technology in education will improve overall academic outcomes for students, through improving the quality of teaching and learning (Luschei, 2014; Nincarean et al., 2013). One of the reasons for this focus on digital technology is its constantly developing nature. Nincarean et al. (2013: p.657) argue that ‘the rapid evolution of technology has changed the face of education’, a statement Johnson et al. (2010) would agree with. It is this development that has led to VR being used in education, particularly the development and use of smartphones. ‘We are riding the crest of a technological wave’ (Yuen et al., 2011: p.119).

As mobile and smartphone devices have developed, VR applications have become more common, accessible and affordable (Serio et al., 2013; Nincarean et al., 2013; Johnson et al., 2010; Yuen et al., 2011). In 2012, around 197 million smartphones (with VR capabilities) were bought around the world, twice the amount bought in 2010 (Dunleavy and Dede, 2014). Data released in 2019 shows that 96% of 16-24 years olds in Britain own a smartphone device (Statista, 2019). Consequently, almost every secondary school pupil now owns a smartphone and the age at which they are getting one for the first time is also dropping (Johnson et al., 2010).

A common theme throughout the literature is that, whilst pupils increasingly have a ‘rich experience’ of digital technology at home (Lewin et al., 2003: p.28), through either gaming or smartphone use, this is not necessarily reflected in their school experience (Loveless, 2003; Hurd, 2009). However, Arifin et al. (2018) would disagree arguing that VR worlds are ‘widely used’ in education, which might suggest that the benefits of this technology are starting to be recognised by teachers. One of the reasons for the low uptake of new technologies in the classroom is possibly due to the ‘dearth of research’ into this area (Bowen, 2018: p.9). There are very few studies looking into the potential of VR for education (Spector et al., 2013; Serio et al., 2013), particularly its costs vs. benefits (Luschei, 2014). As the advantages for VR and smartphone use in education are still unclear, the over-riding feeling by teachers and schools seem to be one of ‘concern about misuse’ (Johnson et al., 2010: p.23).

What is VR?

Before delving into the research into VR and education, it is first important to outline what is meant by VR and its associated technologies. Bowen (2018: p.2) defines VR as ‘a computer generated, three-dimensional environment that creates a feeling of presence for users, as they

explore a simulated environment'. However, this is only part of a more complicated picture of virtual environments. The majority of literature in this area use Milgram and Kishino's *Virtuality Continuum* (Appendix 9) to define the differences in these virtual environments and how they are related (Buchner and Zumbach, 2018; Yuen et al., 2011; Santos et al., 2016; Serio et al., 2013).

Using the *Continuum*, VR is an environment that is totally simulated by technology, while in Mixed Reality (MR) both real and virtual environments coexist at the same time. Augmented Virtuality (AV) is where a real environment is placed into a computer-generated environment, while AR is a computer-generated object placed onto a real environment (Milgram and Kishino, 1994). AR and VR are closely related as they are both 'interactive, immersive' and use navigation (Yuen et al., 2011: p.121; Serio et al., 2013). Because of the lack of research into VR use in the classroom, studies in AR will also be included in this literature review due to the similarities of its technology and uses.

VR and education

Although the research into VR use in education is limited, what it does highlight is the potential benefits this technology has for education. Buchner and Zumbach (2018: p.56) believe that AR 'can have a positive impact for learning' and this sentiment is reflected across different studies. For example, Aziz et al. (2012: p.333) argue that 'technology has definitely enhanced the learning process', while pupils who have access to digital technologies and VR as part of their learning have been shown to outperform pupils who do not (Luschei, 2014; Yong, 2015).

One benefit found is the students' ability to transfer knowledge from the virtual world to real world environments with relative ease (Yuen et al., 2011; Dunleavy and Dede, 2014). Bowen (2018: p.8) argues that students gain a deeper knowledge and understanding of the subject studied because they can 'drive their own learning process'. Along with teamwork, students taking personal responsibility for their own learning was a benefit also highlighted by Braund and Reiss (2006). Increased content understanding, long term memory retention, improved teamwork and physical performance are all benefits of AR cited by Radu (2014). Although their study was small, Kaufmann et al. (2000) found that VR could be easily integrated into classroom teaching and learning without having to change the curriculum. However, Lewin et al. (2003: p.24) suggest the opposite is true and that curriculum reform is essential to 'maximise the potential of technology'.

Using VR and AR in the classroom allows for an immersive and contextual experience (Johnson et al., 2010). Lewin et al. (2003) agree that technology can allow students to extend their learning outwith traditional educational boundaries. One reason why VR is beneficial for enhancing students' learning is that the 3D objects and scenes they experience 'enhances, enriches and complements the mental pictures that students form in their minds' (Kaufmann et al., 2000: p.264).

However, what is also clear from the literature is that simply using a new digital technology does not automatically improve learning: how it is used and implemented is just as important (Spector et al. 2014). Luschei (2014: p.246) argues the 'purposes and contexts of technology use' can have a big impact on its effectiveness, while Carmichael and Procter (2006) believe when introducing new technology the focus should be on improving classroom practice of teachers. Radu (2014) argues one of the big problems with using AR successfully is ineffective classroom integration. Dunleavy and Dede (2014) agree, suggesting that a skilled teacher is key for AR to be successfully implemented in the classroom.

There are additional problems associated with introducing VR into the classroom.

Unfamiliarity and lack of confidence with the technology was cited for both teachers and students in a variety of studies (Arifin et al., 2018; Lewin et al., 2003; Carmichael and Procter, 2006; Hurd, 2009). Other problems included time constraints and budget restrictions (Santos et al., 2016; Hurd, 2009); attention tunnelling (when students are so focused on the experience, they ignore important aspects of the task) and usability difficulties (Radu, 2014). Aziz et al. (2012) found that as VR requires the use of devices such as smartphones, problems with battery life of devices and the connectivity of devices (to networks and internet) impacted the success of their study. Another problem Serio et al. (2013) found was the 'novelty effect' of introducing a new piece of technology like VR. This could potentially increase pupil engagement, but not because of the activity itself, simply because it was new and exciting.

VR and motivation

Although VR is generally seen as beneficial to teaching and learning, several studies suggest this might not always be in terms of content knowledge and understanding. Both Braund and Reiss (2006) and Hurd (2009) suggest that the positive motivational effects of VR are more important than the knowledge gained. In their study in a Science classroom, Braund and Reiss (2006: p.220) found that VR might not improve pupils' knowledge and understanding

(compared to traditional teaching methods) but provides ‘future engagement with Science and therefore is helping raise levels of scientific literacy’. Teachers are introducing digital technologies into their teaching to gain the attention of pupils and to motivate class participation (Santos et al., 2016). However Nincarean et al. (2013: p.658) suggest that this is not new and that technology has ‘always held a great promise for increasing student engagement’.

There are various reasons why using VR can improve pupils’ motivation. Aziz et al. (2012: p.337) argue that AR ‘heightens the excitement of the learning experience and make it more engaging’. VR can relate to students’ interests outside school (for example in gaming and entertainment) and this leads them to be more engaged (Serio et al., 2013). Santos et al. (2016) suggest that the reason AR is successful is because it provides a different learning experience for pupils and that this can improve attention and satisfaction, a sentiment Radu (2014) agrees with. As previously discussed, 3D virtual worlds are immersive and interactive, which enhances student motivation (Serio et al., 2013). Radu (2014) highlights the importance of the physical aspect of using AR technology, which boosts enthusiasm and engagement.

There are several studies that suggest that VR can improve the motivation of pupils. In their study of pupils in Malaysia, Aziz et al. (2012) found that pupils were more motivated and confident when using AR, particularly pupils who were usually quiet in class. In a study of VR in Maths and Geometry education, a student participating stated they found VR ‘highly motivating and very interesting’, however they also did not think it could replace traditional teaching and should be used in addition to more established methods (Kaufmann et al., 2000: p.272). Serio et al. (2013) found in their study of AR use in a visual arts course that students who used AR were more motivated, though only slightly. The use of AR held students’ attention for longer periods of time and the activities were described as enjoyable and appealing. A variety of other studies found that VR (and associated technologies such as AR and interactive gaming) improved motivation in students who use it, compared to students who did not (Nincarean et al., 2013; Yong, 2015; Dunleavy and Ded, 2014; Buchner and Zumbach, 2018; Bowen, 2018).

Although there are issues with using VR in education, several studies found that these issues did not impact students’ motivation when using digital technologies. As VR is still developing there can be lower standards in terms of user experience. Serio et al. (2013:

p.594) discovered that technical problems did not ‘diminish the enthusiasm of students’ when using AR. Radu (2014) also found that students were more motivated when using AR technology, even if it was more difficult than the activities not using it. However, Arifin et al. (2018) argue that the user’s experience is important to achieve high engagement when using AR, and that it still needs to be improved.

VR, motivation and History

There are very few studies that look specifically at using VR in History teaching; however those that have, have found an increase in pupil motivation. Bowen’s (2018: iv) study on using VR with History students in an economically challenged area in the USA, found that ‘students using VR scored significantly higher than students participating in traditional instruction on both their academic achievement and motivation’. While their study used AR, Buchner and Zumbach’s (2018) had similar findings, showing that the technology promoted intrinsic motivation in pupils compared to a control group.

Although not based on using VR, Pond and Child (1995) found in their study on using Living History that the activities increased pupils’ engagement. This was due to the ‘attempt to place the participant in the situation by reconstructing the circumstances and physical surroundings of the event and period’ (Pond and Child, 1995: p.50). This has clear links to using VR, which also attempts to immerse the participant in a historical context and environment. Green et al. (2014) argue that pupils who engage in ‘doing History’, do not just gain historical content knowledge, but also develop key historical thinking skills. By using digital media and technology, pupils are more actively engaged in analysing and interpreting historical events, artifacts and sources. However, they also argue that they are only useful when used effectively by the teacher.

It might be that VR can increase motivation in learning, but not specifically learning in History. Serio et al. (2013) found that using AR technology did not increase motivation and interest in the subject area, just in the tasks and activities themselves. Clearly more research in this area is needed.

Findings and conclusions

Although motivation is a huge area of educational research, research into the use of VR in the classroom is still in its early stages. This is particularly the case in History teaching.

There is much debate over how motivation can be improved (Alkaabi et al., 2017). Baker and Robinson (2017) discovered that students' motivation did not change with different types of instruction, nor did their motivation impact their academic performance. Their study found that it was the pupils' learning styles that had an impact on their motivation.

However, Bowen (2018: iv) discovered that students using VR 'scored significantly higher than students participating in traditional instruction on both their academic achievement and motivation'. This would therefore suggest that changing the type of instruction can have an impact on motivation. Buchner and Zumbach's (2018) research supports this, as they found that using AR in the History classroom had a positive impact on promoting intrinsic motivation.

It is also clear from the literature reviewed that it is not simply as easy as introducing VR into the classroom, but that how it is introduced and used is important. Although Luschei (2014: p.247) argues digital technology should 'enhance learning' it must be 'put to use effectively to have a positive effect'. However, Spector et al. (2014) suggest that introducing new technology always carries some unknown factors and risk. So, although generally VR use was a positive introduction to the classroom, it was not without its problems and it was not always clear from the research why this was.

There is therefore room for more research on using VR versus traditional instruction to increase motivation, particularly in real classroom environments. What the literature has highlighted is that there is a gap in the research concerning motivation, History and VR together. This enquiry hopes to bridge this gap and will hopefully build up a wider picture of what motivates pupils in the school, in the History classroom specifically and whether VR can be used as a tool to increase pupil motivation.

CHAPTER 3: METHODOLOGY

Methodology: what is it?

‘While much writing about guidelines for action research makes it sound rather neat and tidy, the reality of schools is much messier.’ (Herr and Anderson, 2008: p.384)

This statement makes it clear why it is important to have set out a clear methodology before starting any educational enquiry or research. Without it, it would be difficult to create clear findings and conclusions. Methodology is the theory behind the methods and approaches used in an enquiry (Punch and Oancea, 2014). It is the techniques used to identify, select, process and analyse information. These range from the data collection methods to the methods of analysis and the paradigm underlining it all. Noffke (2008: p.430) argues that ‘theory is integrally connected to practice’ because it helps teachers and researchers think about ‘what to do’ and how to act.

Anderson and Arsenault (1998: p.172) state that any data generated needs to be ‘worthwhile information for the purpose’ and that the methods and approaches chosen are key to this. This is reflected by Cohen et al. (2018: p.285) who believe that:

‘Selecting research approaches is not a matter simply of preference, arbitrary or automatic decision making, but, like other aspects of research, is a deliberative process in which the key is the application of the notion of fitness for purpose.’

Issues of validity, trustworthiness and reliability when thinking about methodology are also important, as they can affect the impact an enquiry has on future research and policy decisions (Boudah, 2011). Can a similar study produce the same results? Is it credible and does it provide accurate and appropriate findings? However Cohen et al. (2018: p.245) argue that ‘threats to validity and reliability can never be erased completely’, though by acknowledging them and giving them attention, they can be limited.

Two main empirical approaches

‘There has never been one way of thinking about how research should find its way into practice’ (Schoonmaker, 2007: p.267). This was highlighted during the ‘paradigm wars’ of the 1980s between the two main empirical approaches to research: positivism and interpretivism. Although they both have critics and supporters, what is now considered key to

both paradigms is the focus on the teacher and how to capture the complexity of teaching in a classroom (Schoonmaker, 2007; Cochran-Smith and Lytle, 1990).

Positivist

Research within the positivist paradigm aims to find the absolute truth about the world, by establishing a hypothesis and then verifying this through deductive reasoning and logical data collection. Cochran-Smith and Lytle (1990) use a five-step process to highlight this (*Appendix 10*), emphasising the actions of teachers and their direct impact on pupils which can then be replicated in other classrooms. Campbell et al. (2004: p.3) describe it as a ‘common-sense view’ and Ball (1995) agrees that research is often only deemed useful and valid when it has concrete outcomes.

However, there are problems associated with this paradigm. As it is based on observations, the assumptions of the researcher are ingrained. Deductive reasoning can lead to creating valid, but untrue, conclusions as it tries to move from a focus on ‘all’ to ‘some’ (Campbell et al., 2004). This is described by Herr and Anderson (2008) as ‘superficial problem-solving’. One final problem is that often research within this paradigm comes from researchers who are not currently involved in day-to-day teaching; therefore the research forgets to include classroom complexities (Cochran-Smith and Lytle, 1990).

Interpretivist

The interpretivist paradigm is based on the experiences and behaviours of people and their situations, to gain an understanding of the world. It generally uses inductive reasoning (*Appendix 10*).

‘Research from these perspectives presumes that teaching is a highly complex, context-specific, interactive activity in which differences across classrooms, schools, and communities are critically important. Interpretive research provides detailed, descriptive accounts of customary school and classroom events that shed light on their meanings for the participants involved.’ (Cochran-Smith and Lytle, 1990: p.3)

Klehr (2012: p.125) argues that this paradigm framework is focused on interactions rather than definitive answers: ‘more about problem posing as it is about problem solving’. Instead of searching for absolute truths, it is subjective and context based.

This has led to criticisms of this paradigm. Because any findings are specific to the context in which they were found, there is no way of judging if they would work outside this context (Campbell et al., 2004). Klehr (2012: p.125) also acknowledges that critics of interpretivism argue that it ‘runs the risk of being undisciplined and all over the map’.

Positioning this research

Based on these definitions, this enquiry will be conducted within an interpretivist paradigm. This is because it is based on the experiences, behaviours and motivations of the pupils within my context, which will not necessarily transfer to other situations. It is not looking to verify a hypothesis, simply to interpret and uncover the world in which it is being undertaken. It was also chosen based on ontological and epistemological assumptions, as Murry and Lawrence (2013) state these have implications for the methods chosen. These assumptions are that our experiences of the world are subjective, different and context specific. Therefore, this paradigm will determine the methods chosen for this enquiry, as the data collected will not be generalisable and will be contextual. The data collection methods will be used to examine the experiences of the participants in detail.

However, this enquiry has also taken a pragmatic approach, rather than a paradigm driven approach, beginning with the research questions and choosing the paradigm and methods based on them. Punch and Oancea (2014: p.26) argue that it is important for the research questions and methods to closely match and the best way to achieve this close fit is for the ‘methods to follow from questions’. Based on the research questions, this enquiry has taken an interpretivist approach and the methods will be chosen to align with this paradigm.

Methods

What data will be collected?

When using an empirical approach to research, there are two main data collection methods: quantitative and qualitative data collection. It is clear when reading the literature on methodology that there is debate over which method of collecting data is more beneficial to education research, particularly when thinking about issues of reliability and validity.

Baumfield et al. (2008) simply define quantitative data as number based (for example test

scores) and qualitative data as word based (interviews). This could also be explained as what happened (quantitative) and why it happened (qualitative). However not all methods of data collection fit easily into one description, for example questionnaires can be both quantitative and qualitative, depending on the type of questions asked.

Traditionally quantitative data collection was the preferential method, as it was more 'scientific', reliable and was easier to repeat. However, Kleur (2012: p.122) argues that qualitative research includes practices and principles that 'are at the heart of teacher research'. Spencer et al. (2003) agrees with this, arguing that qualitative research can provide an in-depth insight into the experiences and perspectives of the participants, which can be missing from quantitative research. One of the biggest criticisms of quantitative research methods is that it can strip the data of the context and personal elements of the situation in which it was collected (Punch and Oancea, 2014).

However, increasingly there has been a move towards a mixed methods approach. This is 'the best of both worlds', as it combines the strengths of each method, as well as compensating for the weaknesses of each (Punch and Oancea, 2014). Baumfield et al. (2008: p.23) believe there should be a 'flexible relationship' between the two methods, while Kleur (2012: p.123) suggests that both methods strongly 'complement' each other. However, Flick (2017) urges caution and argues that a mixed methods approach has its own limitations, one being that the researcher may be less familiar with both methods and so may not follow the research principles fully.

This enquiry will use a mixed method approach, though the limitations proposed by Flick (2017) will be taken into consideration. By using a mixed method approach, triangulation of data will occur. Price and Kirkwood (2014) argue that one benefit of triangulating data is that multiple perspectives will be revealed and that there is an increase in confidence in the data collected. Punch and Oancea (2014: p.115) argue that an empirical study can 'combine both types of data in any proportions' and so there will not be an equal balance between the two methods, with a greater focus on qualitative data. This is because the main aim of this enquiry is understanding the motivations of pupils and how it can be increased, which needs in-depth research into the participants' experiences and perspectives (Spencer et al., 2003). Two types of data collection will be used: group interviews (qualitative) and questionnaires (quantitative and qualitative). Punch and Oancea (2014) argue that using interviews with surveys or questionnaires is becoming 'increasingly common', as they can 'flesh out' opinions. This will

be done pre- and post- intervention. The same questionnaire will be used both times and the group interviews will use the same base questions to focus the discussion, though as these are semi-structured interviews there will be some variation depending on the participants responses (*Appendix 5 and 6*). This is to allow for direct comparisons to be made and therefore the success of the intervention on pupils' motivation will be assessed.

Analysis of data collection methods

Questionnaires (Appendix 5)

Although generally considered a quantitative method of data collection, there is a growing consensus in the literature that questionnaires can also form part of a qualitative data collection method and provide useful, contextual information (Spencer et al., 2003; Webb et al., 1995). This is down to the types of questions asked, whether open-ended or multiple-choice. To collect data that is statistically reliable, but also to obtain answers that are focused and therefore provide clear results, Anderson and Arsenault (1998) believe that multiple choice or fill-in-the-blank questions are best. They argue that 'most straightforward multiple-choice questions are answered consistently' (1998: p.173). Yet to gain detailed, rich qualitative data, Menter et al. (2011) suggest using open-ended questions. These can provide important contextual information that multiple choice questions can miss. However, Menter et al. (2011) note that these types of questions are harder to analyse. According to Gilchrist (2018) both types of questions should be used, as they can provide different types of data and so complement each other. For this enquiry, this method of mixing question types will be used. Providing a variety of open questions and 'rate' or 'scale' based questions, should enable a range of qualitative and quantitative data to be collected. For example, questions 4-8 and 10-16 on the *Questionnaire (Appendix 5)* are solely rate based questions and so will collect quantitative data, while others ask for written responses and so are qualitative. These should help to show how motivated pupils are in their learning and in History, and so answer all three research questions. However, Anderson and Arsenault (1998: p.173) urge caution when incorporating scales into questionnaires, as they can be 'sensitive to the subjects' moods'. This will need to be considered when analysing the data.

It is important that the questions used in a questionnaire are clear in order to collect valid data. Difficulties with participants understanding what the questions are asking was a limitation of questionnaires highlighted several times (Anderson and Arsenault, 2005; Menter et al., 2011). When the questionnaires are being completed, it will be important for all the

questions to be verbally explained, to limit misunderstandings and hopefully make the data more reliable.

Punch (2009) also argues it is useful to map out what information is required from a questionnaire, moving from the general to the more specific. Depending on what the researcher is after, different questions will be asked which might fall under either data collection method. 'Developing sharp general research questions is an essential step in constructing a questionnaire' (Anderson and Arsenault, 1998: p.180). It is clearly important, therefore, to consider the enquiry research questions when developing questions for questionnaires. For this enquiry, the questionnaires will be used to answer all three research aims. As Punch (2009) suggests, they have been built around a framework: leading from the wider research aim of how motivated are pupils in school, to the more specific aims of their motivation in learning History and their motivations towards using VR and technology in their learning. Gilchrist (2018) argues that questionnaires can be a useful tool in getting pupils to talk about their attitudes towards their learning. Several studies researching pupil motivation have used questionnaires to collect data, showing how useful they can be to gather information surrounding more complex issues (Harris and Haydn, 2006; Baker and Robinson, 2017; Buchner and Zumbach, 2018).

There are other benefits to using questionnaires, mainly that they are a simple, quick and cheap way of collecting reliable data (Menter et al., 2011; Anderson and Arsenault, 1998). However, as with all data collection methods, there are limitations. Issues of correctly understanding the question have been highlighted, but there are also problems with how honestly participants answer the questions (Anderson and Arsenault, 2005; Menter et al., 2011). There are issues surrounding subconscious bias. This can be from the researcher when creating the questionnaire; the participant when they answer, or during the analysis phase (Gilchrist, 2018). To minimise this limitation, a colleague will be asked to verify the questionnaires both before and after they have been completed, although there are time and workload issues attached to this. Another limitation often found when using questionnaires is the low return rate. In their study Harris and Hayden (2006) gave out questionnaires in class and did not allow pupils to take them home, meaning they achieved a 100% return rate. Again, this can create more problems, as it uses classroom time, already over-stretched due to a full curriculum, and it can be hard to justify (Goksu and Somen, 2019). However, to maximise the data collected, the questionnaires for this enquiry will be completed during class time.

Group Interviews

Group interviews, or focus groups, are one of the most common qualitative data collection methods used in educational research (Punch and Oancea, 2014; Stewart, Shamdasani and Rook, 2011). This is because they provide rich description in the participants own words and can get to the heart of what the participants are feeling, their experiences and their understanding of their context or reality (Anderson and Arsenault, 1998; Punch and Oancea, 2014; Stewart et al., 2011; Murtagh, 2014). Punch and Oancea (2014: p.182) argue interviews are ‘one of the most powerful ways we have of understanding others’. Group interviews can be particularly effective, as participants are able to interact with each other and build on each other’s responses, therefore providing more in-depth data (Stewart et al., 2011; Krueger and Casey, 2000; Biddulph and Adey, 2003). They are also a quick, flexible and cheap way of gaining the opinions of larger groups of people (Stewart et al., 2011; Punch and Oancea, 2014), although Krueger and Casey (2000) argue they can be time-consuming and unproductive. Alkaabi et al. (2017: p.198) used interviews in their study looking at student motivation and argue they are an effective way to understand participants ‘behavioural expressions of motivation’. Using group interviews to uncover people’s motivation is a benefit cited by Krueger and Casey (2000), as they suggest that group interviews can provide greater depth in understanding for complicated topics such as motivation. Punch and Oancea (2014) agree, arguing that group situations enable people to make their motives explicit. Group interviews are therefore clearly an effective way of researching pupil motivation, and it is for these reasons that they have been chosen.

One of the first decisions when using group interviews, is whether to follow a structured or unstructured method. Structured interviews are standardised and all questions are pre-planned, therefore there is limited flexibility and less of a focus on emotional responses (Punch and Oancea, 2014). This does allow for greater reliability and validity in the data collected, however there is less depth in this data. Unstructured interviews are open-ended and there are no specific pre-planned questions. In their study of teachers’ views on using local history, Goksu and Somen (2019, p.255) used interviews in an ‘unguided way to uncover emotions and opinions’. However, although Stewart et al. (2011) suggest unstructured interviews allow the participants to discuss the topics they feel are most relevant and important, it can mean that the research needs are not met.

Punch and Oancea (2014) use a continuum of interview methods to show the range of structure used in interviews and what type of interview would suit each type of structure (*Appendix 11*). This continuum highlights that when conducting group interviews, it is best to use an unstructured or semi-structured method. This is because it is difficult to keep the interview standardised when there are multiple voices to be captured. It also does not allow for the participants to ‘bounce off’ each other (which is one of the main benefits of using group interviews) and so would constrict their answers and contributions. Punch and Oancea (2014) suggest that semi-structured interviews are the most popular form of interview, as they have flexibility and can gain in-depth responses but have pre-planned questions to guide, focus and prompt the discussion. For this reason, semi-structured interviews will be used in this enquiry and 15 questions have been created to guide the discussion, though it is expected that follow-up questions will arise naturally during the discussion (*Appendix 6*).

Although the main benefit of group interviews is the spontaneous interaction between group members (Stewart et al., 2011), this can create some issues. The personalities and behaviours of individuals in the group can influence group participation. For example, an opinionated or popular group member might influence the opinions of others and therefore cause bias, as other members might simply agree with them (Stewart et al., 2011; Krueger and Casey, 2000). In their study on pupils’ enjoyment of History, Harris and Hayden (2006) argued it was important to have a range of opinions, both positive and negative. This might be difficult to achieve if the group dynamics do not allow for it. The interviewer or moderator can also cause bias unintentionally by giving clues as to what sort of answer they are looking for and Stewart et al. (2011) argue the choice of moderator is important. They need to be able to lead the discussion, motivate the participants to respond and create a comfortable and non-judgemental space (Stewart et al., 2011; Krueger and Casey, 2000). Bassett et al. (2008) also argue that when interviewing adolescents, it is important for the participants to trust the interviewer and for the setting to be less formal, as otherwise it can create an imbalance of power. Alkaabi et al. (2017) agree, suggesting that unless the participants trust the interviewer, they will not feel comfortable sharing their emotions and experiences. In this enquiry, participants will already have an established relationship with the interviewer as their teacher so issues of trust should be minimised. However, this relationship does already contain a power imbalance and this issue will need to be considered while conducting the interviews. One way to overcome this is to make the discussion more relaxed though the body language, informal speech and self-disclosure of the interviewer (Bassett et al. 2008).

Another important consideration when conducting group interviews is the physical environment, as this can have an impact on the nature of the discussions and interactions between group members. Punch and Oancea (2014) argue that the location and time of day of the interview can have a significant influence on the quality of the data. However, for this enquiry, this issue will be constrained by the school timetable and building. One of the main problems found by Bassett et al. (2008) was finding a quiet, private space to conduct their interviews where the participants felt comfortable. Creating a comfortable atmosphere was also an important consideration for Goksu and Somen (2019) in their study of teachers' views on using Local History. For this enquiry, the interviewer's classroom will be used. This is partly due to space considerations and constraints, but also because this is an environment known to the participants and so should reduce their discomfort. Krueger and Casey (2000) suggest that it is important to think about the seating of participants in group interviews, having the most dominant by the interviewer as this might curtail their influence. The importance of seating is highlighted by Stewart et al. (2011), who argue that a circular arrangement is best as it allows for eye contact with all members of the group. For this enquiry, interviews will be set up in a circular arrangement in the hope that it will make all participants feel included and increase the contributions of all members.

It is also necessary to consider how to record group interviews, as this may have implications on the data results. Punch and Oancea (2014) argue there are benefits to using audio recording of group interviews, as this method will record all responses. However, they do note that for an hour of audio recording, there are four hours of transcribing, so it is a time-consuming method. Problems can also arise if the researcher is unsure how to use the technology (Punch and Oancea, 2014) or if the recording does not work (Krueger and Casey, 2000). Therefore, using both audio recording and written notes during interviews is essential (Krueger and Casey, 2000; Stewart et al., 2011). This will be done during all the interviews conducted as part of this enquiry, with a focus in the written notes on observational data that may not come across in the audio recording. However there can be additional issues with using audio recording to collect interview data. Krueger and Casey (2000) suggest that the device itself can restrict the 'free flow' of the discussion, with participants constantly reminded that they are being recorded. This issue was highlighted as one of the main problems that Bassett et al. (2008) found when interviewing adolescents. Although familiar with technology, the participants found the tape recorder intimidating and this restricted their contributions. To counter this, the recording device will be sat behind the interviewer once it

is introduced, so that it is not a constant reminder for participants, although this itself will create limitations as it may not pick up all responses. That is why it will be important to also take written notes throughout the interviews.

The final issue with group interviews is the participants themselves.

‘Encouraging a teenager to have a conversation in a semi-structured research interview is fraught with difficulties’ (Bassett et al., 2008: p.119).

This issue is also highlighted by Punch and Oancea (2014: p.190), who describe interviewing adolescents as a ‘particular challenge’. Adolescents are not known to be overly open in their discussions of feelings and behaviours. Bassett et al. (2008) found that in their study, when the adolescents did not engage in giving full responses, it was difficult to avoid a pattern of asking questions that only needed a one-word answer. As the participants in this enquiry are adolescents, this is an issue that will need to be given consideration. Biddulph and Adey (2003) found similar problems in their research into pupils’ experience of learning History. They suggest that if they had given the interview questions to the participants beforehand, they might have been more prepared and felt more comfortable to answer in detail. This will therefore be done in this enquiry, in the hope that it will encourage greater participation of all pupils.

Ethical requirements

As with all research, particularly research involving vulnerable groups such as children and adolescents, there are ethical requirements. Although this will be discussed in more detail later in the next chapter, some issues surrounding the ethics of the methods used to collect data are considered here. While it is important to protect all data collected, this is a specific issue with audio recording interviews. ‘Care must be taken to protect the data recorded [in interviews]’ (Punch and Oancea, 2014: p.191). Flick (2014) agrees, suggesting that new forms of data collected such as audio recordings raise issues around the privacy of participants. Consequently, once the interviews have been transcribed, the original audio recordings will be deleted. All data collected (whether interview or questionnaire) will be encrypted and stored under password protection. This will be made clear to all participants (and their guardians) through the PLS (*Appendix 2*). The PLS also highlights other ethical issues, such as confidentiality and what happens to pupils who have chosen not to take part.

Interviews with adolescents raise ethical issues around consent (Punch and Oancea, 2014) and all participants and their parent or guardian will be required to sign and return a consent form (*Appendix 3 and 4*). A key part of this consent form is the requirement to have read, understood and accepted the issues raised in the PLS. Without this understanding, participants will not be able to take part in the enquiry.

One final issue with the methods used in this enquiry is 'justifying the burden of time' (Punch and Oancea, 2014: p.190). As both data collection methods will be carried out in class time, pupils will be missing out on learning time. Again, the PLS contains contact details that parents and guardians can use if they are concerned. It also explains that, although not a guarantee, the benefits of increasing pupils' motivations in their learning should have a positive effect on their future academic achievements, thus hopefully justifying the use of class time.

CHAPTER 4: FINAL DISCUSSIONS

Data analysis

‘Research frequently ends up being messy and complicated’ (Menter et al., 2011: p.192).

Because this is often the case in educational research, it is important to follow clear data analysis methods to be able reach conclusions and findings using the data collected. Although there are differences between qualitative and quantitative data analysis, which will be discussed, there are some commonalities. The first is the need to have good data preparation and for the data analysis to be done systematically and transparently (Menter et al., 2011; Punch and Oancea, 2014). However, the most important issue when conducting any data analysis is ‘how can the analysis do justice to the participants and their perspectives?’ (Flick, 2014: p.15). This needs to be the top priority of any researcher.

Qualitative data analysis

Although analysing the qualitative data collected is clearly an important part of an enquiry, Campbell et al. (2004: p.125) argue it is often ‘clouded in mystique’ and so not transparent. This, then, can have implications for the reliability and validity of the data. Although Punch and Oancea (2014) argue there is no ‘one’ method for analysing qualitative data, the following section will try and make the process chosen for this enquiry clear.

One of the problems with analysing qualitative data, comes from the its rich, descriptive nature. As it is in the form of words, what can often happen is that researchers simply describe the data, rather than ‘applying a critical perspective’ (Menter et al., 2011: p.215). Another problem is the volume of data created when using qualitative data. One solution for both these issues, is to keep re-reading the research questions, so that the data is critiqued and focused in relation to the aims of the enquiry (Menter et al., 2011). This will be done throughout the data analysis process.

Punch and Oancea (2014) suggest that there are three main components of qualitative data analysis: data reduction, data display and drawing and verifying conclusions. The importance of reducing the data in qualitative research, whether in terms of volume or complexity, is also highlighted by Flick (2014). These different components should not be seen as separate entities but should be carried out concurrently and continuously throughout the analysis process. When analysing the data for this enquiry, an interactive model will be used to show this process (*Appendix 12*) which will clearly show the links between each of the different

components and how they interact. It will be used throughout all the stages of data analysis, though the early conclusions drawn will be in the form of propositions and will need further analysis and verification (Punch and Oancea, 2014). Data reduction and data display will be completed through coding and memoing (described later). This will also be done to find patterns and trends in the data, which is the main purpose of analysing qualitative data (Menter et al., 2011; Punch and Oancea, 2014).

Quantitative data analysis

As quantitative data analysis is numbers based, a different process is needed. 'In quantitative research, numbers are used as the unit of analysis' (Menter et al., 2011: p.199). However, as in qualitative data analysis, a lot of the process is about reducing the data to be able to summarise the findings (Punch and Oancea, 2014). Therefore, it is also important to follow a clear process that is transparent. Before coding and memoing can happen, Menter et al. (2011) suggest that five stages of data preparation need to be followed:

1. Comprehensive record keeping.
2. Data checking for accuracy.
3. Constructing a database.
4. Data cleansing.
5. Transforming the data.

This needs to be done methodically and systematically, preferably during the process of collecting the data. These stages will be followed when analysing the quantitative data produced by the questionnaires and will result in numerical databases (in the form of a table or diagram), that correspond directly to the data collection method, for example the questionnaire (Menter et al., 2011). This is done to remove any inaccuracies early on in the analysis process. Although quantitative data can be difficult to read in its 'raw' form, once presented as part of a database it can provide a summary of a large amount of data. As with qualitative data, the analysis process is conducted to find patterns in the data (Menter et al., 2011).

Coding and memoing

For both qualitative and quantitative data analysis, coding and memoing are crucial elements. They are completed after the data has been prepared, as part of the data reduction and data display phases. Coding is the process of applying a numerical value to a piece of data

(whether that is a scale on a questionnaire, or a phrase or word used repeatedly in an interview). This is to allow for a more systematic analysis procedure, but also to organise and interpret findings (Menter et al., 2011). It also helps to identify patterns and themes in the data (Punch and Oancea, 2014). Memoing is the act of writing down the ideas, relationships and patterns that are found in the data. This can be in the form of a sentence, paragraph or several pages. Punch and Oancea (2014) argue that these ‘memos’ help to find higher-level concepts and patterns than coding alone and that they act as a key link between the coding process and the development of propositions and final conclusions. Both coding and memoing will be used throughout the data analysis process, for the data produced by interviews and questionnaires.

Issues with analysing interviews and questionnaires

As seen in the discussions about analysing qualitative and quantitative data, different methods are required to analyse the data produced by interviews and questionnaires. This is partly due to the method used, but also because of the natures of the different collection methods. Flick (2014) argues that they need different types of data analysis because the data is captured differently (either through audio recording and then transcribing, or by written response). There are also issues with data analysis that are specific to each type of data collection method. They will be briefly discussed here.

When analysing interviews, the open-ended nature of responses can make it hard to summarise and interpret them (Stewart et al., 2011). This is because there is not only a large amount of data collected, but as it deals with participants behaviours, opinions and emotions this data can be complex. That is why it will be important to follow the three-component process already discussed, which will hopefully condense this data without losing the rich detail. However, Punch and Oancea (2014: p.190) argue that the analysis of interviews should also include ‘the way questions are delivered, the wording that is used and the sequence and types of questions that can be asked’. This will add an extra layer of complexity to the data analysis.

Menter et al. (2011) suggest that when analysing the data from questionnaires, an archival system is important. This is done so that the original data can be used to trace findings, patterns and conclusions. It can also be useful when checking the accuracy of these findings. This system will be set up as part of the initial data preparation phase.

Limitations

All research has limitations and this enquiry is no different. The main limitations facing this enquiry are its small-scale; issues relating to the data collection methods; problems associated with using VR and the issue of Covid-19.

Small-scale enquiry

This is a small-scale enquiry, which a lot of educational research studies are. If an enquiry is small scale it might not be representative of the whole population (Stewart et al., 2011).

Nutley et al. (2013: p.9) agree with this sentiment, as they argue that ‘uncertainty is likely to arise about whether a practice that is said to work well in one context will work in another’.

In her study of using VR to increase pupil motivation, Bowen (2018) found that the small sample size was a limitation for her research. This will need to be considered when discussing the findings of this enquiry, as any results will only be completely relevant to the context in which they were collected.

Limitations of methods

Some limitations of the chosen methods have already been discussed in the analysis of the data collection methods. However, there are other limitations of the methods that need to be considered for this enquiry.

The limitations surrounding the social interactions of group interviews have already been referred to. There is an issue with ‘group culture and dynamics and in achieving balance in the group interactions’ (Punch and Oancea, 2014: p.186), however this is not necessarily a big constraint as Krueger and Casey (2000) suggest that not all participants need to contribute the same amount; they simply need to be able to share their opinions if they are different.

When conducting the interviews, it will be important to make sure that all participants have the opportunity to speak but also to think about the grouping of participants so that the groups are mixed and there is a balance of personalities. Although this will be time consuming, it will allow for better interaction between group members and will hopefully reduce the issues concerning group dynamics.

Other limitations of group interviews that were highlighted were: interview bias (of participants and interviewer); the accuracy of participants’ memories; the accuracy with which participants can describe their motivation; the dishonesty and self-deception of participants, and social desirability within the group (Punch and Oancea, 2014; Alkaabi et al.,

2017). Issues of honesty and bias were also highlighted as drawbacks of questionnaires (Menter et al., 2011; Anderson and Arsenault, 2005; Gilchrist, 2018). The ability of the interviewer to guide the group, keeping the interview focused without pushing for certain responses, can present similar issues (Krueger and Casey, 2000). However, by providing base questions to guide and focus the interview (*Appendix 6*) this limitation will be small. When analysing the data (from both interviews and questionnaires), it will be crucial to remember that the participants may not have responded accurately or honestly.

‘The more difficult problem concerns the correspondence between verbal responses and behaviour, the relationship between what people say, what they do and what they say they do, and the assumption that language is a good indicator of thought and action.’ (Punch and Oancea, 2014: p.192)

Although it may not be intentional, this can be a big weakness of the data collected.

Finally, there are limitations with interview data itself, as it is ‘never simply raw, but...always situated and textual’ (Punch and Oancea, 2014: p.191). This means that the results will be relevant to that group of people at that time but may not represent other groups, even those in a similar context. Murtagh (2014) describes this as the problem of generalisation, arguing that the findings of a particular study might not be relevant to wider groups. However, Stewart et al. (2011) argue that, although group members might not be representative of the larger population, this is not a ‘fatal flaw’. This limitation is not specific to interviews but will also be relevant to the data collected in the questionnaires; the findings from both methods can only represent that one group being interviewed or questioned. One way to counter this is to conduct several group interviews until you reach ‘saturation of ideas’ (Krueger and Casey, 2000). Although not dispelling this limitation, repetition of group interviews can reduce it. Consequently, there will be three groups interviewed as part of this enquiry, as Krueger and Casey suggest that interviewing three groups should lead to saturation.

Limitations of VR

While researching VR and motivation in History for the literature review, a variety of limitations of using this technology were highlighted. Although not studying VR, Goksu and Somen (2019) were studying interventions in History teaching. They found that drawbacks included: financial, lack of time, resources, limited opportunities and an intense curriculum. Financial issues were the most common problem with regard to VR use. Bowen (2018) found

that both the software and hardware costs were big barriers to schools introducing VR regularly into their curriculum. In terms of software costs, this issue is reduced for this enquiry by using free software (for example *Google Expeditions*). However, there are still issues surrounding hardware costs. Although *Google Expeditions* works alongside *Google Cardboard*, which is a cheap version of a VR headset, to buy a full class set of 30 is still more expensive than many schools and departments can afford. One way of reducing this cost is to try and get them made in school, as Google provide a free template (*Appendix 7*), although this does require there to be good links and relationships with the Technology Department in school.

Another limitation of this enquiry again links to the devices that pupils will need to have in order to use VR. By using a mobile phone app (*Google Expeditions*), costs are reduced, but this does require all pupils taking part in the enquiry to have access to a smartphone.

Although, as seen in the literature review, a very high percentage of pupils own a smartphone, this is not a guarantee. This limitation can be minimised by ensuring the pupils work in groups, as they will be in this enquiry, and resulting in fewer devices being required. In their study using VR in Malaysian schools, Aziz et al. (2012) found other problems such as the limited battery power of devices and the access to WiFi. To combat this, pupils will be asked to make sure their phones have been fully charged at home, although a charger will be available in those circumstances where this is not possible.

A final limitation associated with VR is the ‘novelty effect that can be acting as a disturbing factor’ (Serio et al., 2013: p.595). Pupils might show an increase in their motivation towards learning History, simply because using VR is a new and exciting piece of technology. Further research will be required to see whether VR has a long-term impact, or whether the novelty effect (and therefore motivation) of using VR will wear off with repeated use.

Covid-19

One major limitation of this enquiry is that, due to world events, the enquiry itself was unable to go ahead. Because of Covid-19, schools were closed at the end of the school day on 20th March 2020. It was later announced by the Scottish Government that schools would not reopen until 11th August 2020 (BBC, 2020). As this enquiry was to be conducted during May 2020, there was no possible way of going forward with the research. Although findings and conclusions can be drawn from the literature review, it is noted that this mainly found gaps in

the research and therefore no definitive conclusions can be formulated. Once the pandemic is over and pupils can return to schools it is hoped that the research can be completed.

Ethics

It is important that all research is conducted ethically, with any potential issues that might cause harm (whether physical, psychological or social) clearly highlighted and resolved before starting. Cohen et al. (2018) argue that ethical decisions ‘run throughout the entire research process’, a view supported by Anderson et al. (2007) who suggest that ethical research should also address issues as they arise. This enquiry will be conducted in line with ethical codes of practice, including the British Educational Research Association (BERA) *Ethical Guidelines*, the UNICEF *International Charter for Ethical Research Involving Children* and the University of Glasgow School of Education ethical guidance, to whom an *Ethics Approval Form* (EAF) was submitted (*Appendix 1*). This is particularly important when researching as a classroom teacher, as this throws up specific ethical issues surrounding relationships, informed consent and anonymity. Anderson et al. (2007) argue that using professional judgement is crucial for teachers conducting research and Zeni (1998: p.13) suggests this is because this type of research is not detached from the researcher: ‘a teacher inevitably causes this to happen’. These issues will all be addressed in this section, along with a discussion of the main ethical risks of this enquiry.

Ethical risks

All research has risk, but part of conducting ethical research is to acknowledge and minimise this risk as far as possible. In making the decision to do the research, all possible risks should be balanced against the potential benefits (Anderson et al., 2007; Cohen et al., 2018). Often these risks are based on the local context and can be risks for the participants, researchers and community (Anderson et al., 2007). The research for this enquiry is considered high risk, as it involves a vulnerable group (children and young people). To minimise the risks associated, all safe-guarding protocols and school policies will be followed. For more detail, see the EAF (*Appendix 1*) sections 2.1 and 24.

Relationships

UNICEF claims ‘relationships are at the core of ethical research’ (Graham et al., 2013: p.13). Although this is true of all research, it is particularly an issue for teachers conducting research

in their own classrooms. This is because the participants are more than subjects for teachers, they have pre-existing relationships that will continue after the research is over (Zeni, 1998; Anderson et al., 2007). This can have a positive impact on the research, as pupils already trust the ‘researcher’ (as their teacher) and Mockler (2007) suggests trust is crucial to the researcher-participant relationship. Anderson et al. (2007) see established relationships as a strength, though they do acknowledge that the hierarchical nature of the relationship can cause issues. Teachers (and therefore the researcher) have a position of power and authority over their pupils (participants) and this can have the ‘appearance of duress’ (Bournot-Tries and Belanger, 2005: p.208; Cohen et al., 2007). Pupils may feel they have to take part in the research, as there might be negative consequences for their established relationship with their teacher. Cohen et al. (2007) state that the choice to participate must be genuinely free, and so pupils need to be convinced that there will be no negative consequences for their relationships, which Zeni (1998: p.18) suggests can be achieved through ‘open communication’. This will be made clear to pupils through the consent form and PLS (*Appendix 3* and *2*), as well as through classroom discussions. See section 16 in the EAF (*Appendix 1*) for more details.

Informed consent

It is always important to get informed consent from participants before starting an enquiry. It is highlighted as a core ethical principle by UNICEF and is one of the seven statements in their Ethical Charter: ‘Research must always obtain children’s informed and ongoing consent.’ (Graham et al., 2013: p.21). The concept of ‘ongoing consent’ is important. Anderson et al. (2007) argue that consent cannot be static, as it is impossible to know where the research will go at the beginning and so there should be an ongoing discussion around participation. Cohen et al. (2018: p.122) suggest that ‘informed consent implies informed refusal’. The BERA Ethical Guidelines also emphasise the importance of getting voluntary informed consent from participants (BERA, 2018). However, when the researcher is also the participants’ teacher there are further issues around informed consent. As already discussed, the imbalance of power in the teacher-pupil relationship can cause problems; pupils might feel pressured to consent/participate because they worry it will affect their relationships with the teacher, or their peers (Anderson et al., 2007; Cohen et al., 2018; Malone, 2003; Mockler, 2007). This fear can also stop pupils from withdrawing from the study, even if this is offered to them (Malone, 2003). Bournot-Trites and Belanger (2005: p.208) state:

‘The dual roles and responsibilities of teacher-researchers not only try their loyalties but also make it difficult for them to obtain free and informed consent from their subjects, their students’.

To minimise these issues, several steps have been taken. All pupils and parents will be offered a copy of the PLS (*Appendix 2*) before signing their consent forms (*Appendix 3* and *4*), both of which are required for participation. Child friendly language has been used when preparing these, to maximise understanding. The statement will also be read aloud for pupils and they will be given the opportunity to ask any questions or discuss any issues they might have. It will also be made clear that participation is voluntary, and alternative provisions will be put in place if they do not consent. For more details see section 16 and 20 of the EAF (*Appendix 1*).

Anonymity and confidentiality

One of the biggest ethical concerns for participants surrounds anonymity and confidentiality. Qualitative research can particularly invade the privacy of participants (Cohen et al., 2018). Sharpe (2009: p.100) argues ‘an ethical approach observing the privacy, anonymity and confidentiality of individuals is paramount’. However, Tilley et al. (2011) and Malone (2003) both highlight the difficulty of promising anonymity, especially at the dissemination stage. This can be because of the localised setting of the research, or simply because internet search engines are now much more sophisticated. Although individual participants might not be identifiable, the school or class might be. The BERA Ethical Guidelines (2018) state the importance of providing anonymity, while acknowledging the issues with this. There is also an issue surrounding access to data, particularly as most of it will be digital data. Punch and Oancea (2014) suggest using encryption and argue that working with digital data is a skill researchers need to learn. In this enquiry confidentiality will be provided by anonymising samples and data; however it will also be made clear to pupils that confidentiality is impossible to guarantee. Digital files will be password protected and encrypted. Sections 7.2, 8, 9 and 10 of the EAF (*Appendix 1*) discuss this in more detail.

Dissemination Strategies

Why disseminate research?

For any research enquiry it is important to consider how to share the results and this is

particularly an issue to consider for teacher-researchers. Often teachers conducting research in their classrooms feel their findings may only be relevant to their own practice, which has led to them being unrepresented as producers of research and who are therefore mainly seen as consumers of it (Menter et al., 2011). However, there are many benefits to disseminating the results of a practitioner enquiry, one being to 'address the deficit of studies that connect strongly with teachers' classroom practice' (Menter et al., 2011: p.229). Baumfield et al. (2017) argue that sharing the findings of an enquiry can help to clarify thoughts and apply a more critical understanding to the results, which Menter et al. (2011: p.225) agree with, describing the process as 'educative'. Other positives of sharing practitioner enquiry research include providing evidence for policy or school changes and encouraging professional dialogue within schools or networks to try new ideas (Menter et al., 2011; Baumfield et al., 2017).

Who is the audience?

One of the first questions to consider for dissemination is: who is the audience? When considering the audience, Cohen et al. (2018) argue it is important to think about the possible effects reporting the results may have on them. For example, if the pupil participants are involved, will they discover sensitive information or react badly to the results?

As a dissertation, the first obvious audience are the *University of Glasgow* tutors. By extension, this research also has potential interest for the wider education academic community, especially as it is an under-researched area. However, as discussed above, it is important to share practitioner research with other practitioners. Therefore, the subsequent audience would be the teachers within the school and then wider dissemination among the teaching community. Although this research has been focused within the History subject curriculum, the results could be beneficial across the curriculum. Menter et al. (2011: p.227) argue that another benefit to sharing research with fellow teachers is that it is exposed to 'critical deliberation'. Finally, there are those involved in the enquiry from the local community who might be interested in the results, from the pupils to parents and guardians.

Strategies for dissemination

There are various different ways to disseminate the results of a practitioner enquiry, from oral and print to digital media (Menter et al., 2011) and these might change depending on the audience. Across the literature it is clear that it is important to consider who and how research is shared, as Cohen et al. (2018: p.140) emphasise that once 'research is in the public domain,

they [researchers] have no control over how it will be used'. Therefore, the findings of this enquiry will first be shared locally and then more publicly, following the suggesting of Baumfield et al. (2017) to start with the village before gradually widening the circle of dissemination to the world. Cohen et al. (2018) also argue that it is important to make clear to any audience that they are hearing an interpretation of the findings, and this will also be done throughout all the dissemination strategies.

Following on from the *University of Glasgow* tutors, the first way this research will be shared will be with the teachers in the school. This will be done in three phases. First informally in a Humanities Faculty meeting (where this research took place), using a poster to display the initial findings and conclusions which will allow for a curriculum focused critical analysis. Next through a whole-school presentation at an in-service event or whole-school meeting, where information will be shared more formally through a presentation and short written report. This type of event can allow for quick dissemination of findings (Menter et al., 2011). And finally, through the cross-curricular Teaching and Learning Groups in the school, which will again be more informal and will hopefully allow for greater discussion and possible repetition of the study in different curriculum areas. Baumfield et al. (2017) argue that to increase collegiate collaboration, it is important to make the processes and production of results clear, not simply the findings.

As this study is of specific interest to History teaching, the next stage would be to share the results with the local History teachers network, again through a more formal presentation followed by informal discussion at a network event. This will be important to see curriculum specific reactions and analysis of the research, as well as for the uptake of the research evidence (Baumfield et al., 2017). This would then be followed by wider dissemination among History teachers through digital media platforms: Facebook and Twitter.

Finally, it is important to share the results with the pupils who participated and their parents or guardians and this was promised as part of their consenting to be involved in the enquiry (*Appendix 3 and 4*). For pupils, the findings will be shared with them during a normal lesson. It will be important to adapt the language used and how the findings are discussed for this session, as it needs to be easily digestible for them. A short, unacademic report will be created to send home for parents. They will also be offered the chance to attend a short presentation of the results at the relevant Parents' Evening. Again, consideration will be taken to adapt the presentation style for the audience and so a poster will be used to present the

results here. Cohen et al. (2018: p.139) argue that the results need to be in a format that the relevant audience can ‘access and understand’.

Ethical issues

Although ethical issues have been discussed in more detail elsewhere, there are some relevant to the process of dissemination. Along with issues of confidentiality, anonymity, traceability and consent that have been discussed previously, it is important that the results are reported:

‘fairly, credibly and accurately, without misrepresentation, unfair selectivity...untenable claims, exaggeration or understatement, bias and under-reporting or over-reporting certain findings to the detriment of a more balanced and fair view.’ (Cohen et al., 2018: p.139).

These issues will be taken into account and acknowledged when disseminating the findings of this enquiry.

CHAPTER 5: CONCLUSIONS AND NEXT STEPS

This enquiry set out to examine if VR could be used to improve the motivation of S2 pupils when learning History. However, the data collection and intervention were unable to go ahead due to Covid-19. Therefore, the conclusions came from the findings of the literature review and are structured around the three research questions.

What motivates pupils and how motivated are they in their learning in general?

This was the first question that was hoped to be answered, using the pre-intervention questionnaire and group interviews. Research from policy suggests that there is a problem in Scottish schools in terms of pupil motivation, particularly those in poor socio-economic backgrounds. Only one-third of disadvantaged pupils feel motivated and resilient in school (Scottish Parliament Information Centre, 2016) and several national policies have been implemented to increase motivation in pupils, highlighting its importance to the Scottish Government, but also showing that there are issues (The Scottish Government, 2007; 2017). Several other studies also found problems with declining academic motivation in pupils, showing that it is a clear problem in education currently (Legault et al., 2006; Riley and Docking, 2004).

It was also important to find out what (if anything) motivated pupils. In the literature there was debate surrounding the importance of intrinsic (internal) against extrinsic (external) motivation, with both showing benefits and drawbacks to improving pupil motivation. This debate was also found when researching specific teaching strategies to improve motivation. Multiple studies found 'traditional' teaching methods decreased motivation (Riley and Docking, 2004; Birchinall, 2013), yet Baker and Robinson (2017) found teaching methods had no impact on the motivation of pupils studied. Therefore, there was no clear way in the literature to definitively improve pupil motivation.

How motivated are pupils in learning History?

The second research question would also have been answered using the pre-intervention questionnaires and group interviews. Although the research into pupil motivation in History is limited, what does come across in the literature is that History is a popular subject (Harris

and Haydn, 2006; McLennan, 2013), though it can also be seen as difficult and boring (Biddulph and Adey, 2003; Harris and Haydn, 2006). However, there was again debate about what teaching strategies in History improved motivation. While Bowen (2018) argues that traditional teaching methods result in poor motivation, Harris and Haydn (2006) found the opposite. Several studies also found that ‘active’ learning in History did not improve motivation (Pond and Childs, 1995; Goksu and Somen, 2019). There was also debate surrounding effectiveness of ICT use to improve motivation in History learning. Biddulph and Adey (2003) found it did increase motivation, yet Harris and Haydn (2006) found pupils did not value it highly when describing their enjoyment of History lessons. Again, the literature is unclear though it does highlight that this is an under-researched area.

Can VR change and improve pupils’ motivation?

This final research question would have been answered by the post-intervention questionnaires and group interviews. Although there have been few studies carried out in this area, what has been done does suggest that VR use could improve pupil motivation. Bowen (2018) and Buchner and Zumbach (2018) both discovered that VR and AR had positive impacts on pupils’ motivation for learning History. This is supported by Luschei (2014), who argues that new technology can have a positive effect on learning and motivation. However, Spector et al. suggest that introducing new technology always carries some unknown factors and risk, while Baker and Robinson (2017) discovered that students’ motivation did not change with different types of instruction. So, although from the studies generally VR use was a positive introduction to the classroom, it was not without its problems and it was not always clear from the research why this was. There were also limitations surrounding introducing VR to the classroom, mainly focused on cost and access to technology.

Next Steps

Although there is some suggestion that VR could increase pupil motivation in learning History, this is not clear from the literature on it. Therefore, it is important that more research is conducted in this area to fully understand the impact VR can have. I hope that once the schools return, this enquiry will be finally completed and the results added to the growing literature in this area. It is also my hope that, through dissemination, this planned enquiry will

inspire other teachers (in History and other curriculum areas) to investigate using VR in their own classrooms to improve motivation and learning. It is through practitioner enquiry that teachers can create change and challenge in their classrooms and indeed it is 'key to understanding, improving, and empowering communities, schools, teachers, parents, and students' (Mertler, 2019: p.1).

Appendix 1: Ethics Approval Form



Undergraduate and Postgraduate Taught Student Application form for ethical approval

College Ethics Committee for Non-Clinical Research Involving Human Subjects

Before completing this form, you should refer to the guidance notes available at:

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduateandtaughtstudents/>

And

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/informationforapplicants/>

This application form should be typed, and submitted electronically. **All questions must be answered.** “Not applicable” is a satisfactory answer where appropriate.

Applications should be submitted *at least 4 weeks in advance* of the intended start date for the data collection to allow time for review and any amendments that may be required.

Send to relevant School Ethics Forum (SEF) via email to School ethics administrative contact. See contact details on College ethics website:

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/committee/ethicscontacts/>

1 APPLICANT DETAILS

Student I.D.	1100022		
Name of Applicant	Hannah Lockwood		
School/Subject	Northfield Academy/ History		
Project Title	Can S2 History pupils' motivation be improved by using Virtual Reality?		
Undergraduate	<input type="checkbox"/>	Postgraduate Taught	X <input type="checkbox"/> X
(Programme Convenors Only)			
Full Course Project within a PGT or UG Programme	<input type="checkbox"/>		

1.1 Degree/Programme Title: *All student applicants*

PGDE with Professional Practice

2 ETHICAL RISKS: The application will NOT be considered if this section is blank or incomplete or unsigned (in some form), both 2.1 and 2.2 must be completed by all Supervisors.

RISK ASSESSMENT: Is this application considered to be a low risk or a high risk application?

Refer to **Risk Guidance Document** on College ethics webpages for clarification.
<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduateandtaughtstudents/>

HIGH RISK X LOW RISK

2.1 Explain specifically why the low or high risk distinction has been made.

This application is considered to be high risk, using the criteria set out in the ‘Risk Guidance Document’ on the College ethics website. This is because the research undertaken will involve children and young people. It will be important to make sure all safe-guarding protocols are followed, specifically surrounding confidentiality and data handling (see 8.1 for more details). However, none of the other topics listed in the ‘Risk Guidance Document’ will be covered at all and all data collection and interventions will be carried out within the school, following all school policies.

2.2 Risk Assessment Comments from Supervisor

Comment on the research ethics risks involved in the project. It should be clear from the comments provided that the potential risks have been considered and information provided on what they are, with evidence of what is to be implemented to mitigate these.

--

Declaration: I have checked this application and approve it for submission for review to the Ethics Committee.

Supervisor's Name :

Date:

3 RESEARCHERS

All Researcher(s) including research assistants and transcribers (*where appropriate*)

Title and Surname	First Name	Phone	Email (<i>This should normally be a University of Glasgow email address</i>)
Lockwood	Hannah	07432104515	11000221@student.gla.ac.uk

All Supervisor(s) Principal First (*where applicable*)

Title and Surname	First Name	Phone	Email (<i>This should normally be a University of Glasgow email address</i>)
Greenlay	Stacey		stacey.greenlay@glasgow.ac.uk

4 EXTERNAL FUNDING DETAILS

Note. If this project is externally funded, please provide the name of the sponsor or funding body.

N/A

5 PROJECT DETAILS

Start Date for Data Collection: 04/05/2020

(NB: This refers to data collection for the research covered in this application. **This must be at least 4 weeks from the date of application submission.**)

Proposed End Date of Research Project: 26/08/2020

(NB: This date should be when you expect to have completed the full project and published the results e.g. date of award, allow time for possible retrieval if required.)

6 JUSTIFICATION FOR THE RESEARCH

Why is this research significant to the wider community? What might be the impact on your practice or the practice of others? *Outline the reasons which lead you to be satisfied that the possible benefits to researchers; participants and others to be gained from the project justify any risks or discomfort involved.*

Engaging in practitioner enquiry is one of the GTCS Standards for Full Registration and is therefore a requirement for any teacher. This can be seen in Standard 2.3.2: 'Have knowledge and understanding of the importance of research and engagement in professional enquiry', specifically the professional action of:

'know[ing] how to engage critically in enquiry, research and evaluation individually or collaboratively, and apply this in order to improve teaching and learning.' (GTCS, 2012, p.12).

However, engaging in practitioner enquiry should not stop once registration is complete. 'Enquiry and Research' is one of the Key Areas outlined in the GTCS Standards for Career-Long Professional Learning, and the professional action quoted below is specifically relevant to this enquiry:

'develop[ing] and apply[ing] expertise, knowledge, understanding and skills to engage in practitioner enquiry to inform pedagogy, learning and subject knowledge' (GTCS, 2012, p. 10)

Therefore, it is clear that engaging in practitioner enquiry is a crucial element of improving professional practice within the classroom, but also to gain skills and knowledge that can be useful in all areas of teaching.

Motivation is key for many aspects of a productive classroom, without it pupils are unlikely to achieve their full potential or engage in activities to the best of their ability. There are a range of factors that can impact motivation; classroom based, whole school or even community based. There can also be internal or external motives (Alkaabi et al., 2017).

Motivation, or the lack of motivation, is a problem in my current school. Pupils often do tasks or activities as quickly or as basically as they can. When pushed to do more, the response is often 'That's effort' or 'Why should I? I've finished it'. This is partly down to the socio-economic context of the school; it is in one of the most deprived areas of Aberdeen and in the bottom 10-20% most deprived areas in Scotland (Aberdeen City Council, 2016). Pupils in the school do not often 'dream big' and do not see education as an important step. This can be seen in the results of a 2019 survey, ranking Scottish

secondary schools using the percentage of school leavers going into positive destinations. Only 71% of pupils from my school ended up in further education, work or an apprenticeship- this is the lowest rate in Scotland (Schofield, 2019).

Another Scottish schools league table had a big impact on the motivation of our pupils, as we were named the worst performing school in Scotland (McLaughlin, 2019). This led to a big increase in pupils believing there was no point; because they go to a certain school, they will never be able to achieve, so there is no point in trying. This has also led to the belief that the school has less resources or opportunities than other schools

The Scottish Attainment Challenge is a national initiative by the Scottish Government aiming to ‘achieve equity in educational outcomes, with a particular focus on closing the poverty-related attainment gap’ (Education Scotland, 2019). This includes funding for schools, but also a focus on using ‘creative and innovative projects that will raise attainment for children and young people experiencing socio economic disadvantage’ (Education Scotland, 2019). As part of this, there has been a focus on using digital technologies- increasing the use of ICT in classrooms. Some schools have been trialling virtual reality in the classroom. In 2018 East Renfrewshire Council invested £250,000 in more than 900 VR devices and Dundee City Council have been using the free ‘Google Cardboard’ software (Alexander, 2018).

I am hoping for several outcomes from this research: that it will have a local impact (on my school and my own practice), and an impact within the field of secondary school History teaching. Using virtual reality to improve motivation is still an under-researched area: a brief search for ‘motivation’ using *The Curriculum Journal* gets 450 results. Adding ‘virtual reality’ to this and the results drop to 30. Clearly this is an area that needs more exploration, particularly within my subject area. It will also be useful in a local context- it will impact my own practice and whether I use virtual reality in the future. However, I hope the research into our pupils’ motivation will be useful to my colleagues and will make an impact on their practice as well.

Aberdeen City Council. (2016) *Deprivation in Aberdeen City. An Analysis of the Scottish Index of Multiple Deprivation 2016*. Report number: 5.

Alkaabi, A., Alkaabi, W. & Vyver, G. (2017) Researching Student Motivation. *Contemporary Issues in Education Research*. 10 (3), 193-202.

Alexander, M. (2018) ‘Should virtual reality be at the heart of education in Scotland’s schools?’, *The Courier*, 26 March. Available from: <https://www.thecourier.co.uk/fp/news/scotland/621642/should-virtual-reality-be-at-the-heart-of-education-in-scotlands-schools/> [Accessed 1st February 2020].

Education Scotland. (2019) *The Universal Offer*. Available from: <https://education.gov.scot/education-scotland/what-we-do/delivering-the-scottish-attainment-challenge/the-universal-offer/> [Accessed 1st February 2020].

The General Teaching Council for Scotland [GTCS]. (2012) *The Standard for Career-Long Professional Learning: supporting the development of teacher professional learning*. Available from: <http://www.gtcs.org.uk/web/FILES/the-standards/standard-for-career-long-professional-learning-1212.pdf> [Accessed 13th April 2020]

The General Teaching Council for Scotland [GTCS]. (2012) *The Standards for Registration: mandatory requirements for Registration with the General Teaching Council for Scotland*. Available from:

<http://www.gtcs.org.uk/web/FILES/the-standards/standards-for-registration-1212.pdf> [Accessed 13th April 2020].

McLaughlin, M. (2019) ‘Scottish school league tables 2019: Edinburgh schools worst at hitting exam targets’, *The Times*, 20 March. Available from: <https://www.thetimes.co.uk/edition/scotland/scottish-school-league-tables-2019-edinburgh-schools-worst-at-hitting-exam-targets-7sv66fr28> [Accessed 1st February 2020].

Schofield, C. (2019) ‘The 24 schools in Scotland with the lowest rate for getting pupils into work, training or further study’, *The Scotsman*, 27 March. Available from: <https://www.scotsman.com/news/education/the-24-schools-in-scotland-with-the-lowest-rate-for-getting-pupils-into-work-training-or-further-study-1-4896964> [Accessed 1st February 2020].

7 RESEARCH METHODOLOGY AND DATA COLLECTION

7.1 Method of data collection (Tick as many as apply)

<p>Face to face or telephone interview (<i>provide a copy of the interview themes in a separate document. This does not need to be an exact list of questions but does need to provide sufficient detail to enable reviewers to form a clear view of the project and its ethical implications.</i>)</p>	<input type="checkbox"/>
<p>Focus group (<i>provide details of themes or questions in a separate document. This does not need to be an exact list of questions but does need to provide sufficient detail to enable reviewers to form a clear view of the project and its ethical implications. Also information on recording format</i>)</p>	<input checked="" type="checkbox"/>
<p>Audio or video-recording interviewees or events. Details should be provided, either in theme/question information or separately. (<i>Ensure that permission is evidenced on the consent form</i>)</p>	<input type="checkbox"/>
<p>Questionnaire (<i>provide a copy of at least indicative questions in a separate document, final questions must be submitted as an amendment if not provided in initial application</i>)</p>	<input checked="" type="checkbox"/>

	<input type="checkbox"/>
Online questionnaire (<i>provide the address/ or electronic copy in a separate document if not yet available online</i>) http://	<input type="checkbox"/>
Participant observation (<i>provide an observation proforma in a separate document</i>)	<input type="checkbox"/>
Other methodology (<i>please provide details here – maximum 50 words</i>)	<input type="checkbox"/>

7.2 RESEARCH METHODS

Please explain the reason for the particular chosen method, the estimated time commitment required of participants and how the data will be analysed. Ensure that you include reference to methods of providing confidentiality as you indicate below in section 8.1

Pre and post intervention questionnaires

- Questionnaires are a quick and simple way of collecting data, but they can also be flexible and collect a wide range of data (Menter et al., 2011). Using pre and post questionnaires should provide some quantitative data on any changes in pupil motivation. However, it is important that the questions are clear and will provide valid data for the enquiry. Anderson and Arsenault believe that multiple choice or fill-in-the-blank questions are best, in terms of statistical reliability and getting focused answers and results (1998). I will try and use a mixture of these, but also include some ‘open’ questions. Although these are more complex to analyse, Menter et al. suggest that they can add rich qualitative data for an enquiry (2011). However there are limitations to questionnaires, particularly how honestly the questions are answered but also whether the participants even understand the questions (Anderson and Arsenault, 1998; Menter et al., 2011). These will be important to consider when analysing the data collected. The data will be analysed by coding the results. The questionnaires will be completed during class time.

As the research into methods shows, questionnaires should be short and focused and so should only take 10-15 minutes for the participants to complete. Confidentiality will be provided by anonymising samples and data, for example all questionnaires will be anonymous from the start and pupils will not be asked to put their names on them. However, participants will be made aware that confidentiality may be impossible to guarantee as the research will be based in one school and in one class within the school. Although specific pupils will not be able to be identified, their class may be. If I wish to use any specific quotes, I will only do this with written permission (included as part of the consent form).

Pre and post intervention focus groups/group interviews

- Punch states that interviews are the most common way to collect qualitative data. He argues they are a good way of ‘accessing people’s perceptions, meanings, definitions of situations and constructs of reality’ (2009: 144). There are a variety of ways of conducting a group interview: structured, semi-structured or unstructured. I am planning on using a semi-structured approach, with a few pre-planned questions that will hopefully facilitate debate and discussion. This method should allow the pupils to feel more comfortable in the situation and therefore give more honest answers. It will also mean that I am not leading them to the answers I would like but giving them a space to share their thoughts, with a bit of guidance. By using pre and post intervention interviews, I should gain a good understanding of how pupils’ feelings and motivations have changed. One of the main problems with focus groups is the large amount of data to be sorted through. I will record the interviews, transcribe them and then analyse them by using key words to highlight and select the most important and relevant aspects of the discussion. One way of keeping the amount of data collected manageable will be to make sure that the interviews are not too long. Limiting them to 30 minutes will allow enough time for pupils to feel comfortable and to have said everything they wish, while also making sure that they are focused. Confidentiality will be provided by anonymising samples and data, for example when transcribing the interviews pupils’ will not be identified and named. However, participants will be made aware that confidentiality may be impossible to guarantee as the research will be based in one school and in one class within the school. The Local Authority and the Headteacher may also wish to review the research, and again this will have an impact on confidentiality that pupils and parents will be made aware of as part of the consent form. If there is a need to refer to a pupil, they will be referred to by pseudonym in any publication arising from the research. If I wish to use any specific quotes, I will only do this with written permission (included as part of the consent form).

Menter, J., Elliot, D., Hulme, M., Lewin, J., Lowden, K. & Hall, J. (2011). *A Guide to Practitioner Research in Education*. London, Sage.

Punch, K. (2009) *Introduction to Research Methods in Education*. London, SAGE.

8 CONFIDENTIALITY & DATA HANDLING

8.1 Will the research involve:

**You should select all options that apply to your (different) research methods (insert the name of the method in shaded box at top of each column, e.g. interview / questionnaire) and make clear in section 7.2 above how these will be applied.*

<i>DEGREE OF ANONYMITY</i>	Focus group	Questionnaire
De-identified samples or data (i.e. a reversible process whereby identifiers are replaced by a code, to which the researcher retains the key, in a secure location)?	<input type="checkbox"/>	<input type="checkbox"/>
Anonymised samples or data (i.e. an irreversible process whereby identifiers are removed from data and replaced by a code, with no record retained of how the code relates to the identifiers. It is then impossible to identify the individual to whom the sample of information relates)?	X <input type="checkbox"/>	X <input type="checkbox"/>
Complete anonymity of participants (i.e. researchers will not meet, or know the identity of participants, as participants are part of a random sample and are required to return responses with no form of personal identification)?	<input type="checkbox"/>	<input type="checkbox"/>
<i>USE OF NAMES</i>		
Subject being referred to by pseudonym in any publication arising from the research?	X <input type="checkbox"/>	X <input type="checkbox"/>
Participants consent to being named?	<input type="checkbox"/>	<input type="checkbox"/>
Any other methods of protecting the privacy of participants? (e.g. use of direct quotes with specific, written permission only; use of real name with specific, written permission only): <i>provide details here: use of direct quotes with specific, written permission only</i>	X <input type="checkbox"/>	X <input type="checkbox"/>

Participants being made aware that confidentiality may be impossible to guarantee; for example in the event of disclosure of harm or danger to participants or others:	<input type="checkbox"/>	<input type="checkbox"/>
Participants being made aware that confidentiality may be impossible to guarantee; for example due to size of sample, particular locations etc?	X <input type="checkbox"/>	X <input type="checkbox"/>

8.2 Which of the following methods of assuring confidentiality of data will be implemented?

**Tick all that apply*

Note: The more ethically sensitive the data, the more secure will the conditions of storage be expected to be.

Location of Storage Storage at University of Glasgow	<input type="checkbox"/>
Stored at another site <i>Northfield Academy, Granitehill Place, Aberdeen, AB16 7AU</i>	X <input type="checkbox"/>
Paper Data to be kept secure in locked room/facility/ cabinet	X <input type="checkbox"/>
Data and identifiers to be kept secure in locked room/facility/ cabinet	X <input type="checkbox"/>
Electronic Access to computer files to be available by password only. The files will be encrypted and stored on the Glasgow University OneDrive which is GDPR compliant.	X <input type="checkbox"/>
Other	X <input type="checkbox"/>

Any other method of securing confidentiality of data in storage:

provide details here:

The data collected as part of this study and the identities of the participants will be kept separately.

9 ACCESS TO DATA

9.1 Access by named researcher(s) and, where applicable, supervisor(s), examiner(s), research assistants, transcribers.

X

9.2 Access by people **OTHER** than named researcher(s)/Supervisor(s), examiner(s), research assistants, transcribers.

X

Please explain by whom and for what purpose:

Some of the research data will be co-owned by the school, for example work produced by pupils as part of the enquiry, and therefore other staff members at the school might naturally access it. The Headteacher may also request to access the data.

10 RETENTION AND DISPOSAL OF PERSONAL DATA *

Please explain and as appropriate justify your proposals for retention and/or disposal of any personal data to be collected. (*for example names, addresses, contact information*)

It is normally appropriate to destroy the personal data at the end of the research project, if you do not intend to do so, you must provide **substantial** reasons in the box below.

Do you intend to destroy the personal data collected?

YES NO

If no, provide your reasons here:

N/A

* ‘personal data’ means any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person;” Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 Chapter 1, Article 4, Definitions

The Data Protection Act 1998 was replaced by the General Data Protection Regulation (GDPR) on 25 May 2018.

Further information on the GDPR is available on the webpages of the UofG Data Protection and Freedom of Information Office: <https://www.gla.ac.uk/myglasgow/dpfoioffice/gdpr/#>

11 RETENTION AND DISPOSAL OF RESEARCH DATA

Please explain and as appropriate justify your proposals for retention and/or disposal of research data to be collected.

It is normally appropriate to destroy the research data at the end of the research project, if you do not intend to do so, you must provide **substantial** reasons in the box below.

Do you intend to destroy the research data collected?

YES NO

If no, provide your reasons here:

Any naturally occurring data (for example classwork) will not be destroyed. However other data (such as questionnaires for interview recordings) will be deleted.

12 DISSEMINATION OF RESULTS

12.1 Results will be made available to **PARTICIPANTS** as: *(Tick all that apply)*

Note: Intended method of dissemination ought normally to take account of the age, capacities and situation of participants.

Written summary of results to all if requested <input type="checkbox"/> X	Presentation to representative participants (<i>e.g. CEO, school principal</i>) <input checked="" type="checkbox"/>
Verbal presentation to all (information session, debriefing etc) <input type="checkbox"/>	Other or None of the Above <input type="checkbox"/> <i>Please explain here:</i>

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12.2 Results will be made available to **PEERS AND/OR COLLEAGUES** as: (*Tick all that apply*)

Dissertation <input checked="" type="checkbox"/>	Journal articles <input checked="" type="checkbox"/>
Thesis (<i>e.g. PhD</i>), <input type="checkbox"/>	Book <input type="checkbox"/>
Submission <input checked="" type="checkbox"/>	Conference Papers <input type="checkbox"/>
Other or None of the Above <input type="checkbox"/> <i>Please explain here:</i>	

13 PARTICIPANTS

13.1 Explain how you intend to recruit participants. Provide as much detail as you can about each different age/type of group as mentioned in 3.7b

Participants will be recruited from one S2 class within Northfield Academy (called 2M2). These pupils will be 12/13 years old. I am currently their teacher and will have been teaching them for nearly two years by the time of the intervention. I therefore have an established relationship with them. Only one class has been chosen to keep the sample size small and manageable. A presentation will be given to pupils in class outlining the proposed project and any advantages and disadvantages. A plain language statement and consent form will be given to pupils to complete. There will be a separate consent form sent home for parents, along with the plain language statement.

13.2 Target Participant Group (Please indicate the targeted participant group by ticking all boxes that apply)

Students or Staff of the University <input type="checkbox"/>	Adults (<i>over 18 years old and competent to give consent</i>) <input type="checkbox"/>
Children/legal minors (<i>under 18 years old</i>) <input checked="" type="checkbox"/>	Adults (<i>over 18 years who may not be competent to give consent</i>) <input type="checkbox"/>
Young people aged 16-17 years <input type="checkbox"/>	

If you require information on the age of legal capacity please refer to the Age of Legal Capacity (Scotland) Act 1991 available at:

<http://www.legislation.gov.uk/ukpga/1991/50/contents>

14 INCENTIVES

If payment or any other incentive (such as a gift or free services) will be made to any participants please specify the source and the amount of payment to be made and/or the source, nature and where applicable the approximate monetary value of the gift or free service to be used.

Please explain the justification for offering payment or other incentive.

No payment or incentives will be given.

15 NUMBER OF PARTICIPANTS (give details of different age and types of groups involved)

Approximately 30 participants, all 12/13 years old from one S2 class (2M2) at Northfield Academy.

16 DEPENDENT RELATIONSHIP

Are any of the participants in a dependent relationship with any of the investigators, particularly those involved in recruiting for or conducting the project? (*For example, a school pupil is in a dependent relationship with their teacher. Other examples of a dependent relationship include student/lecturer; patient/doctor; employee/employer*)

YES X NO

If YES, explain the relationship and the steps to be taken by the investigators to ensure that the subject's participation is purely voluntary and not influenced by the relationship in any way.

Pupil- teacher relationship.

While recruiting pupils to be participants it will be made clear that participation is voluntary, that participating will have no impact on their level within the subject or their ability to take it next year. Any pupils who do not wish to participate (or their parents do not wish it) will be provided with similar work, just without their results/data being recorded. They will also not participate in the focus group interviews, or complete questionnaires.

17 LOCATION OF RESEARCH

University of Glasgow	<input type="checkbox"/>
Outside Location <i>Northfield Academy, Granitehill Place, Aberdeen, AB16 7AU</i> <i>Classroom D22</i>	X <input type="checkbox"/>

18 PERMISSION TO ACCESS PARTICIPANTS

18.1 Permissions/Access

Permission is normally required to gain access to research participants within an organisation (e.g. Private Company; school; Local Authority; Voluntary Organisation; Overseas institution, Academic institution, including GU.)

Is this type of permission **applicable** to this application? YES X
NO

If Yes:

Is evidence of this permission **provided with** this application?

YES NO

OR is it to follow?

YES NO

(If this is the case, this must be forwarded to Ethics Administrator as soon as it is available.)

If No:

Please explain any reason why you do not require permission to gain access to research participants.

N/A

18.2 Does this application involve contacting University of Glasgow students directly (specifically either via email or within classes) for the purposes of your research?

YES NO

If YES, separate permission to survey students needs to be obtained prior to any such survey being undertaken. Normally this permission should be sought from the **appropriate authority after** ethical approval has been granted. *(See Information for Applicants <https://www.gla.ac.uk/colleges/socialsciences/students/ethics/informationforapplicants/> for details).*

Once obtained, a copy of this permission must be forwarded to the Ethics Administrator.

Please list the student participants that you intend to contact (e.g. 12 students from TESOL course)

N/A

19 IS THIS APPLICATION BEING SUBMITTED TO ANOTHER ETHICS COMMITTEE, or has it been previously submitted to another Ethics Committee?

YES NO

If YES, please provide name and location of the ethics committee and the result of the application.

N/A

20 INFORMED CONSENT

20.1a Have you attached your Plain Language Statement (PLS) (also known as Participant Information Sheet) for participants? You must consult the guidance at: <https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduateandtaughtstudents/#d.en.412017> for information that you are required to provide in this.

The Plain Language Statement is written information in plain language that you will provide to participants to explain the project and invite their participation. Contact details for Supervisor and School Ethics Officer MUST be included.

YES NO

If No, please explain here.

N/A

20.1b Please note that a copy of this information sheet should be offered to the participant to keep unless there are specific reasons for not doing so. These must be clearly explained below

A copy will be offered to every participant to keep.

20.1c What arrangements have been made for participants who might not adequately understand verbal explanations or written information or who have special communication needs in the preparation of the Participant Information Sheet/Plain Language Statement? *(e.g. the use of child friendly language, or where English as a second language)*

[Provide details here.](#)

Child friendly language has been used when preparing the Plain Language Statement. The Statement will also be read aloud to participants and they will be given the opportunity to ask any questions about aspects they don't understand. There are a few members of the class who have English as a second language. Although they are fluent in English, there will be translated Plain Language Statements available to them if required.

21 HOW WILL INFORMED CONSENT BY INDIVIDUAL PARTICIPANTS OR GUARDIANS BE EVIDENCED?

In normal circumstances it will be expected that written evidence of informed consent will be obtained and retained, and that a formal consent form will be used: a copy of which should be should be provided.

*If written evidence of informed consent is **not** to be obtained a **substantial** justification of why not should be provided.*

(Note: Please ensure that you have checked the box for all types of consent to be used, e.g. signed consent form for interviews/ implied for questionnaires.)

Signed consent form	X <input type="checkbox"/>	Recorded verbal consent	<input type="checkbox"/>
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<p>Confirmed by Return of Survey <input checked="" type="checkbox"/> <input type="checkbox"/> (Clear agreement of consent to use participant data must be evidenced at start of survey, e.g. by tick box)</p>	<p>Other <input type="checkbox"/> <i>Provide details here:</i></p>
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Justification if written evidence of informed consent is not to be obtained and retained:

Written evidence of informed consent will be obtained and retained.

22 MONITORING

Describe how the project will be monitored to ensure that the research is being carried out as approved (e.g. give details of regular meetings/email contact).

Meeting with supervisor on the 14th March. Regular email contact and telephone meetings with the supervisor to ensure that the research is being carried out as approved.

23 HEALTH AND SAFETY

What are the potential issues of personal safety for you, other researchers or participants involved in the project and how will you manage them? (*Other than lone field work – refer to question 24.1 for this*)

The potential health and safety issues for myself and the participants involved in the project are the same as a usual classroom. No chemicals or sharp objects (e.g. scissors) will be involved in the intervention and pupils will be required to follow the normal school rules for the classroom to stay safe. The only issue might arise from using the virtual reality devices, as this means that pupils will not be able to see what is going on around them. However, this will be managed by pushing all the desks and chairs to the sides of the classroom so that pupils have nothing to bump into. Pupils will also be working in groups and only one person from each group will be wearing the device. This means that the other pupils (and myself) can watch to make sure no participants are likely to crash into something, or each other. This will be explained clearly to pupils before starting the intervention.

24 RISK

24.1 Does the activity involve lone field work, lone working or travel to unfamiliar places? (E.g. Carrying out interviews alone and off-campus) You should refer to the Risk Guidance at:

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduatestudents/#/>

NB: This does not apply to working within an institution such as a school.

YES NO

Give details here of arrangements to minimise risks pertaining to this.

N/A

24.2 How will you ensure that you minimise any possible distress caused to participants by the research process?

Any possible distress caused to participants by the research process will be minimised by explaining clearly throughout what is happening at each stage and why. For example, while conducting the questionnaires I will read through them with the class so that all pupils understand what the questions are asking. I will also make it clear that if at any point pupils feel uncomfortable they can leave the project, or part of the project. For example while conducting the focus interviews pupils might feel uncomfortable sharing their thoughts and feelings. These will be conducted in small groups (of up to five participants) and this should minimise any distress pupils feel. They will also be allowed to leave or not take part if they wish (if this action is taken, it will need to be recorded as part of the data analysis).

24.3 How would you respond if you think that the participant has become distressed by any of the issues raised by the research? (Examples of distress: emotional, psychological, economic, health)

Contact Supervisor

Contact details of support organisations provided on PLS/Information Sheet

Provide details of support organisations at interview

Any other responses you propose to provide:

Along with contacting my supervisor, I would contact the relevant people within my school. For example for a health issue first aid would be contacted or for an emotional issue the pupil's Guidance teacher, Depute Head and/or the Child Protection officer (depending on the issue). The Postgraduate Programme lead and the Course Ethics lead would also be notified.

24.4 Does this research involve any sensitive topics or vulnerable groups? You should refer to the Risk Guidance at:

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduatestudents/#d.en.412017>

YES X NO

Give details here of arrangements to minimise risks pertaining to this.

This research involves vulnerable groups, as it involves children and young people. Risks will be minimised by conducting all research in school, in a setting that is safe and that pupils are comfortable with. It will also be minimised by anonymising all participants and getting consent from participants, parents and the Head Teacher. All data will be destroyed after the project is completed.

25 PROTECTION OF VULNERABLE GROUPS

Does this project require Protection of Vulnerable Groups (PVG) clearance?

YES X NO

If Yes, evidence that this has been obtained **MUST** be provided with this application.

If PVG registration is held or an application is currently in progress, please provide details here:

PVG registration is already held from Aberdeen City Council, as required to teach at Northfield Academy. Membership number is: 1211 0703 0089 0373

The Protection of Vulnerable Groups (Scotland) Act 2007 came into effect on 28 February 2011. This replaced the previous Disclosure Scotland checking system for individuals who work with children and/or protected adults.

The University is a Registered Body under this legislation.

Please consult the University Protection of Vulnerable Groups Scheme webpages <https://www.gla.ac.uk/myglasgow/humanresources/mgrs-admin/mgr-guidance/pvgscheme/> for guidance.

Further information is available from:

<https://www.mygov.scot/disclosure-types/> (Disclosure Scotland)

26 INSURANCE

Does this research come under the exclusions to the University insurance cover for research?

YES NO

If Yes: Please explain and detail how you intend to cover the insurance needs for this research?

N/A

The University insurance cover is restricted in certain, specific circumstances, e.g., the use of hazardous materials, work overseas, research into pregnancy and conception and numbers of participants in excess of 5000. Please refer to the Insurance and Indemnity advice on the website given below. Advice or authorisation given must be included with this application.

Information may be available at this link:

<https://www.gla.ac.uk/myglasgow/finance/staffsections/insuranceandrisk/>

(If you have a problem accessing this link, please try a different browser e.g. Firefox instead of Internet Explorer.)

27 UK AND SCOTTISH GOVERNMENT LEGISLATION

Have you made yourself familiar with the requirements of the General Data Protection Regulation (GDPR) (May 2018) <https://www.gla.ac.uk/myglasgow/dpfoioffice/gdpr/> ?
This replaces the Data Protection Act (1998)

Also the Freedom of Information (Scotland) Act 2002
<http://www.itspublicknowledge.info/Law/FOISA.aspx>

YES NO

If NO please explain

N/A

See **Application Guidance Notes** available from:

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/forms/undergraduateandpostgraduate/taughtstudents/#d.en.412017> for further information.

In addition visit: <https://www.gla.ac.uk/services/dpfoioffice/> for University guidance on Data Protection.

The **Freedom of Information Act 2002** [“FOI”] provides a general right of access to most of the recorded information that is held by the University. The Act sets out a number of exemptions/exceptions to this right of access.

Declaration must be signed/completed.

The application will be returned if this not done

28 DECLARATIONS BY RESEARCHER(S) AND SUPERVISOR(S)

The application will NOT be accepted if this section is blank or incomplete

- The information contained herein is, to the best of my knowledge and belief, accurate.
- I have read the University’s current human ethics guidelines, and accept responsibility for the conduct of the procedures set out in the attached application in accordance with the guidelines, the University’s Code of Conduct for Research and any other condition laid

down by the University of Glasgow Ethics Committee and the College of Social Sciences Ethics Committee.

Full details of the University's ethics guidelines are available at:

<https://www.gla.ac.uk/research/strategy/ourpolicies/ethics/>

- I and my co-researcher(s) or supporting staff have the appropriate qualifications, experience and facilities to conduct the research set out in the attached application and to deal effectively with any emergencies and contingencies related to the research that may arise.
- I understand that **no** research work involving human participants or data collection can commence until I have been granted full ethical approval by the School Ethics Forum (UG & PGT students only).

This section MUST be completed to confirm acceptance of Code of Conduct. If there is no scanned signature then please type the names (or use GUID) and date into the boxes below.

	Signature	Date
Researcher <i>(All applicants)</i>	Hannah Lockwood 11000221	29/2/2020
Principal Supervisor		

For Supervisors – Please note that by submitting this application the supervisor confirms that:

- The student is aware of the College ethics requirements.
- The topic merits further research.
- The student has the relevant skills to begin research.
- If interviewing, the student has produced an appropriate information sheet for participants.

- The procedures for recruitment and obtaining informed consent are appropriate.

..... **END OF APPLICATION FORM**

Applications should be submitted electronically as follows:

*Send to relevant **School Ethics Forum (SEF)** via email to School ethics administrative contact. Please see contact details on College ethics website.*

<https://www.gla.ac.uk/colleges/socialsciences/students/ethics/committee/ethicscontacts/>

Important Note: **Either** student e-mails the application to their supervisor, who checks it and submits it to their local SEF contact. (*Education, Social and Political Sciences, Adam Smith Business School, Interdisciplinary Studies requires this process*) **Or** student submits the application and the supervisor sends a supporting email direct to the SEF contact

(Law allows this option)

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Appendix 2: Plain Language Statement



Title of project and researcher details

Improving pupils' motivation in History by using Virtual Reality.

Researcher: Miss H Lockwood

Supervisor: Stacey Greenlay

Programme: Master of Education

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 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 purpose of this study is to see if using **Virtual Reality** while teaching History has an impact on pupils' **motivation** in the subject. **Virtual reality** (VR) is the name for computer technology that makes a person feel like they are somewhere else. Your **motivation** for doing something is what causes you to want to do it. Improving motivation would mean you want to do something more.

Why have I been chosen?

You have been chosen to take part because your class has been picked to trial VR while in Social Subjects.

Do I have to take part?

You do not have to take part. If, after reading this, you wish not to be part of the research study you should tick the correct box on the consent form. If you don't take part, it will not impact your grades in History or your ability to take it in S3. You will simply be given slightly different work when the class take part in the study.

What will happen to me if I take part?

If you choose to take part there are a few things that will happen. You will be asked to complete a questionnaire asking you about motivation. You will also take part in a focus group. This is a discussion in class, but it will be recorded so that your answers can be remembered. In May we will study a History course and use VR several times throughout the course. Specifically, we will be using the apps 'Google Cardboard' and 'Google Experiences'. We will do this for 4 weeks. At the end you will be asked to complete another questionnaire and take part in another focus group, to see if your opinions have changed.

Will my taking part in this study be kept confidential?

Yes, your part in the study will be kept confidential. This means that no-one will know your answers to the questionnaires or from the focus groups. All the data will be destroyed after the study is complete. Although your class will not be mentioned, it might be possible for others to work out the class as this study will only be happening in one class in the school. However this is unlikely.

What will happen to the results of the research study?

The results of this study will be written up in a report. Anyone who takes part can have a copy of this report if they want one. Other teachers at the school will also get a copy if they want one. The results will also be made available to other History teachers around Scotland and will be published.

Contact for Further Information

If you have any questions about this study, you can ask me, Miss Lockwood (email HLockwood@aberdeencity.gov.uk) or my supervisor, Stacey Greenlay (email stacey.greenlay@glasgow.ac.uk).

If you have any concerns regarding the conduct of this research project, you can contact the School of Education Ethics Officer, Dr Barbara Read (email Barbara.Read@glasgow.ac.uk).

Appendix 3: Pupil Consent Form



Title of Project: Improving motivation in History by using Virtual Reality.

Name of Researcher: Hannah Lockwood

Name of Supervisor: Stacey Greenlay (University of Glasgow)

I confirm that I have read and understood the Plain Language Statement for this study and have had the opportunity to ask questions.

I understand that taking part is voluntary and that I can stop taking part at any time, without giving any reason.

I agree / do not agree (delete as applicable) to class discussions being audio-recorded.

I acknowledge that participants will be referred to by pseudonym (not their real name).

I understand that there will be no impact on my grades by taking part or not taking part in this research project.

- All names and other material likely to identify you will be anonymised (changed or deleted).
- The material will be treated as confidential and kept in secure storage at all times (e.g. locked away).
- The material will be destroyed once the project is complete.
- I agree to waive my copyright to any data collected as part of this project (e.g. other people can use the results as part of their own research projects).

- I understand that other authenticated researchers (e.g. they have to request permission) will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs (e.g. they can quote from report I write), only if they agree to preserve the confidentiality of the information as requested in this form.

I agree to take part in this research study

I do not agree to take part in this research study

Name of Participant

Signature Date

Name of Researcher

Signature Date

.....**End of consent form**

Appendix 4: Parent/Guardian Consent Form



Title of Project: Improving motivation in History by using Virtual Reality.

Name of Researcher: Hannah Lockwood

Name of Supervisor: Stacey Greenlay (University of Glasgow)

If you have any questions about this research project or how it might impact your child then please contact me by email at HLockwood@aberdeencity.gov.uk or by phoning the school on 01224 699715.

I confirm that I have read and understood the Plain Language Statement for this study and have had the opportunity to ask questions.

I understand that taking part is voluntary and that my child can stop taking part at any time, without giving any reason.

I agree / do not agree (delete as applicable) to class discussions being audio-recorded.

I acknowledge that participants will be referred to by pseudonym (not their real name).

I understand that there will be no impact on my child's grades by taking part or not taking part in this research project.

- All names and other material likely to identify your child will be anonymised (changed or deleted).
- The material will be treated as confidential and kept in secure storage at all times (e.g. locked away).
- The material will be destroyed once the project is complete.
- I agree to waive my copyright to any data collected as part of this project (e.g. other people can use the results as part of their own research projects).

- I understand that other authenticated researchers (e.g. they have to request permission) will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.
- I understand that other authenticated researchers may use my words in publications, reports, web pages, and other research outputs (e.g. they can quote from the written report), only if they agree to preserve the confidentiality of the information as requested in this form.

I agree for to take part in this research study

I do not agree forto take part in this research study

Name of Parent/carer

Signature Date

Name of Researcher

Signature Date

.....**End of consent form**

Appendix 5: Questionnaire for Motivation

1. **Do you like school?** (Please circle): YES NO

Give reasons for your answer:

2. **Which subjects do you enjoy?** (Please tick):

English	<input type="checkbox"/>	Music	<input type="checkbox"/>	French	<input type="checkbox"/>
Maths	<input type="checkbox"/>	Art	<input type="checkbox"/>	PE	<input type="checkbox"/>
Chemistry	<input type="checkbox"/>	Drama	<input type="checkbox"/>	CDT	<input type="checkbox"/>
Biology	<input type="checkbox"/>	History	<input type="checkbox"/>	Business/Admin	<input type="checkbox"/>
Physics	<input type="checkbox"/>	Geography	<input type="checkbox"/>		
Home economics	<input type="checkbox"/>	Modern Studies	<input type="checkbox"/>		
RME	<input type="checkbox"/>	PSE	<input type="checkbox"/>		

Why do you enjoy these subjects? Give reasons for your answers:

3. Think of a good lesson you've had recently. Why was it good?

The following questions are about your motivation in History. Please circle:

		1	2	3	4	5
4	In general, I find learning about History...	very boring	boring	neutral (I have no opinion on it)	interesting	very interesting
5	How much do you like learning about History?	not at all	not much	neutral	somewhat	very much
6	Is the effort it will take to do well in History worthwhile to you?	not at all	not much	neutral	somewhat	very much
7	I feel that being good at problem solving in History is important?	agree strongly	agree	neutral	disagree	strongly agree
8	How important is it to you to get good grades in History?	not at all	not much	neutral	somewhat	very much

9. If you could improve History lessons, what activities would you suggest (for example more group work, using IT and digital technology):

The following questions are about how you enjoy learning. Please tick:

	Questions	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
10	I prefer to learn by doing something in class					
11	I learn more when I study with a group					
12	I enjoy learning in class by doing experiments					
13	I learn better in class when listening to the teacher					
14	I understand things better in class when I participate in role playing					
15	I enjoying making something for a class project					
16	I enjoy classes when I can use IT and digital technology					

The following questions are about Northfield Academy:

17. Do you think you get the same opportunities as pupils at other schools?

(Please circle):

YES

NO

Give reasons for your answer:

18. Do you get the same opportunities to try new IT and digital technologies as other pupils? (Please circle):

YES

NO

Give reasons for your answer:

19. Would using IT or digital technology help you learn more? (Please circle):

YES

NO

Give reasons for your answer:

20. Do you think using IT or digital technology would increase your enjoyment of school? (Please circle):

YES

NO

Give reasons for your answer:

Appendix 6: Questions for Group Interviews






These questions are just to guide the group discussion. Other questions may be asked based on the direction the discussion takes.

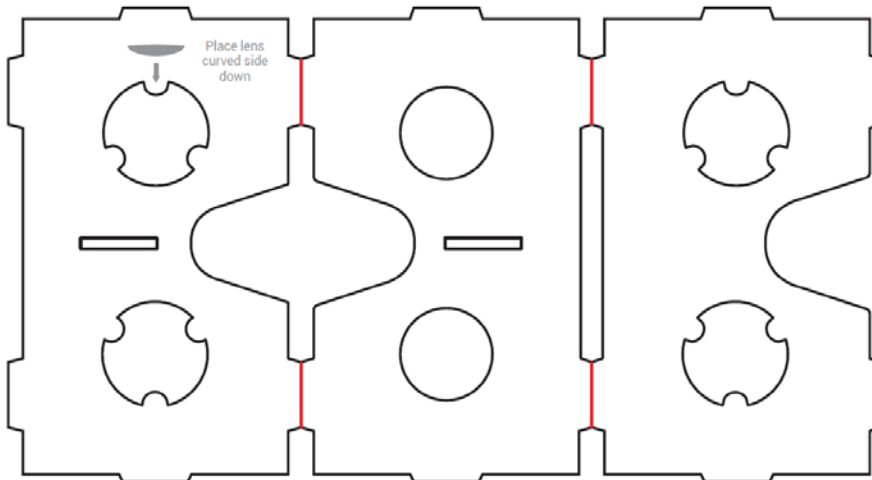
1. Do you like school? Why/why not?*
2. Do you want to do well in school?*
3. Do you think doing well in school will be important once you leave school?*
4. Is the effort required to do well worth it?*
5. What might make you work harder in school?
6. What do you think of Northfield compared to other schools? How does this make you feel?
7. Do you think you get the same opportunities to try new things as pupils in other schools? Why/why not?*
8. Do you like History? Why/why not?*
9. Do you think History is an easy or difficult subject to do well in? Why/why not?*
10. What would make History better?
11. What might make you work harder in History?
12. Do you like using IT/ digital technology in lessons?*
13. Do you get to use IT/ digital technology as much as you would like?*
14. Do you think using IT/ digital technology would make you work harder in lessons?*
15. What do you know about virtual reality (VR) and do you think using it might make a difference to how you enjoy lessons? Why/why not?

**For these questions a tally of hands for yes/no will be taken.*

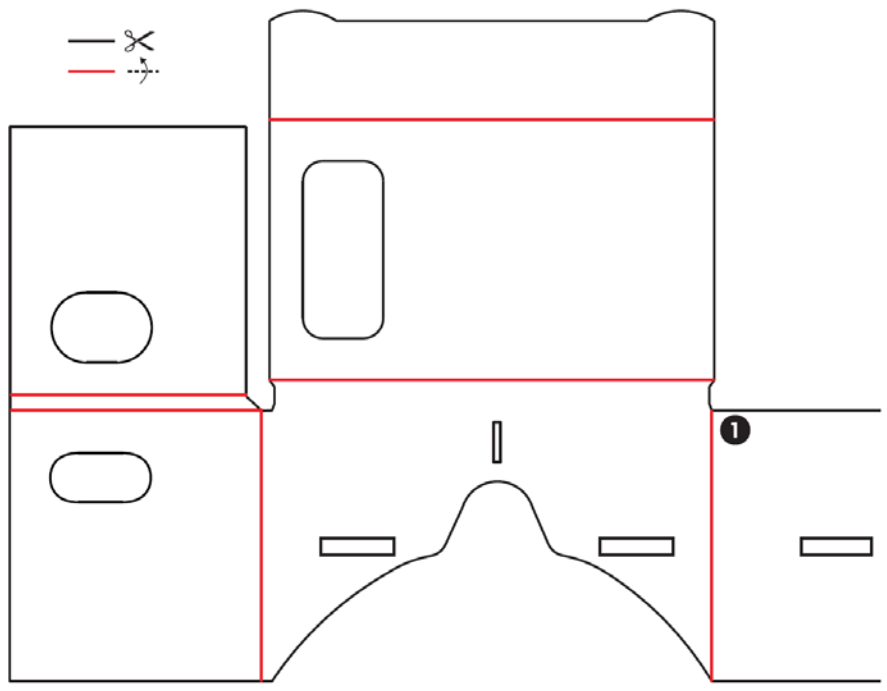
Appendix 7: Google Cardboard Template

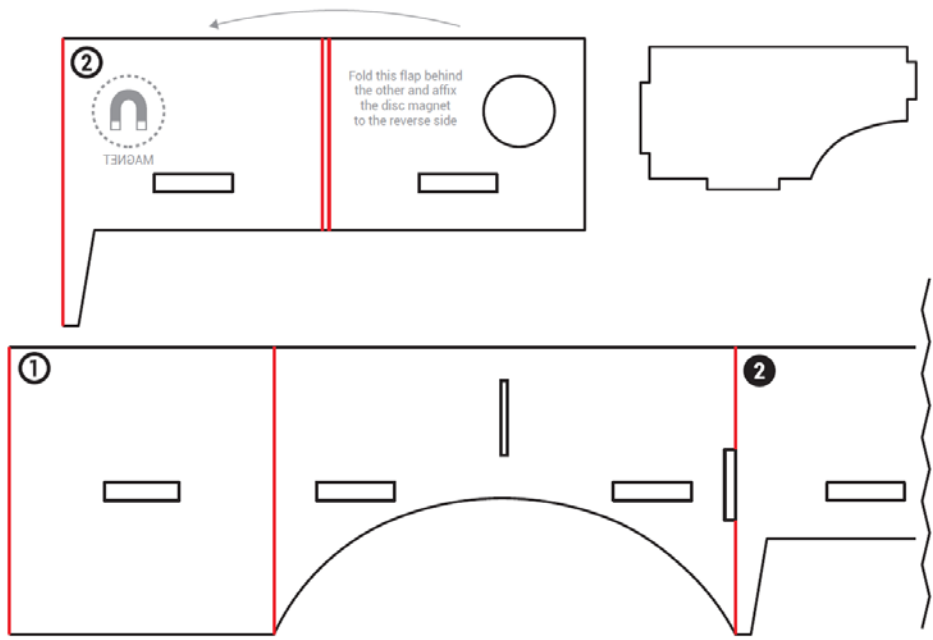
Not to scale

1.  Print the template
- 2a.  Glue the template onto cardboard
- 2b.  Glue light numbers on top of dark ones
3.  Cut out cardboard
4.  Assemble as on g.co/cardboard



Google Cardboard v1.2
Printing template



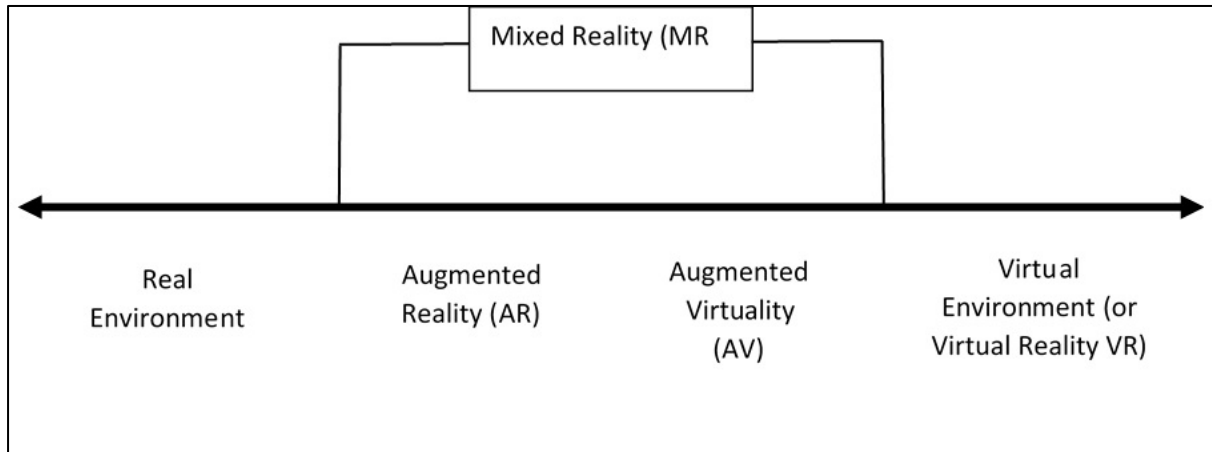


Appendix 8: Search Strategy Synthesised Matrix

Search Database/Journal	Search Words	Number of Results	Saved Results
University of Glasgow Library https://www.gla.ac.uk/myglasgow/library/	motivation	2,092,426	0
	motivation education	960,215	3
	motivation history education	423,923	8
	motivation history teaching	189,078	3 (+ 3 repeats)
	motivation virtual reality	61,980	2
	motivation virtual reality education	35,061	2 (+ 2 repeats)
	motivation virtual reality education history	18,528	1 (+ 2 repeats)
The Curriculum Journal https://www.tandfonline.com/loi/rcjo20	motivation	450	8
	motivation history	293	5 (+ 3 repeats)
	motivation virtual reality	30	7
	motivation virtual reality history	21	0
The British Educational Research Journal https://onlinelibrary.wiley.com/journal/14693518	motivation	944	4 (+ 1 repeat)
	motivation history	504	1 (+ 4 repeats)
	motivation virtual reality	41	0
Eric Institute of Educational Sciences https://eric.ed.gov/	motivation	62,948	4
	motivation history	2,239	2
	motivation virtual reality	114	3 (+ 1 repeat)
	motivation virtual reality history	241	1 (+ 4 repeats)

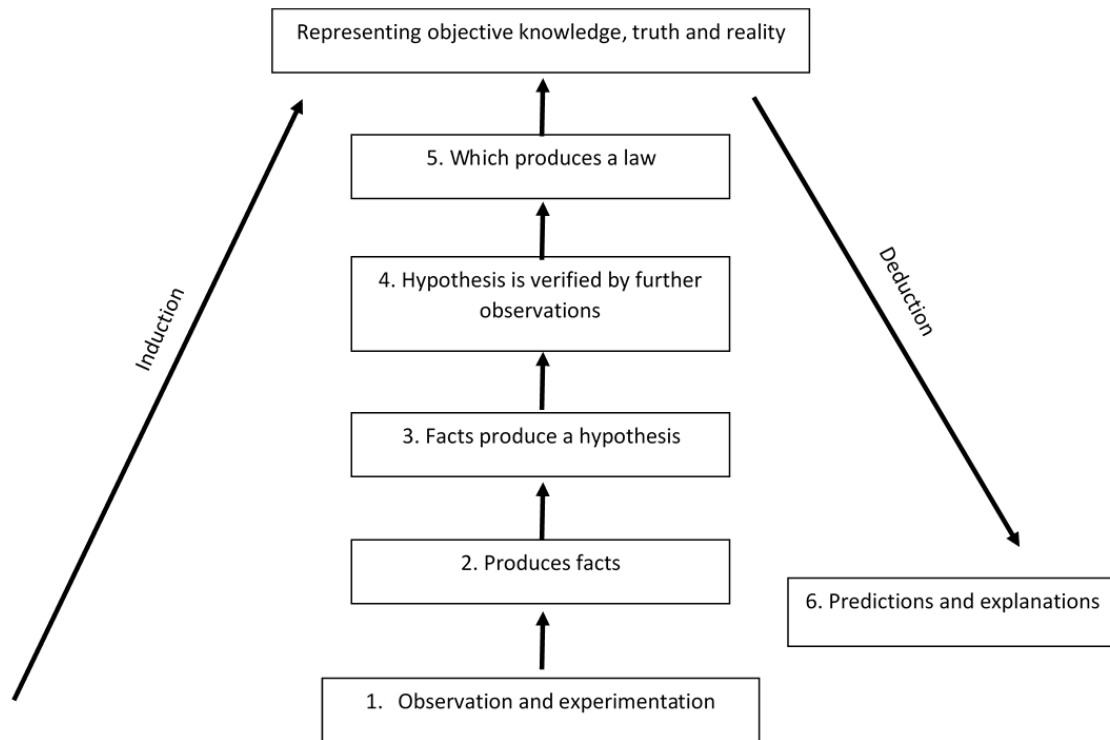
Appendix 9: *Simplified Virtuality Continuum*

Based on Milgram and Kishino, 1994



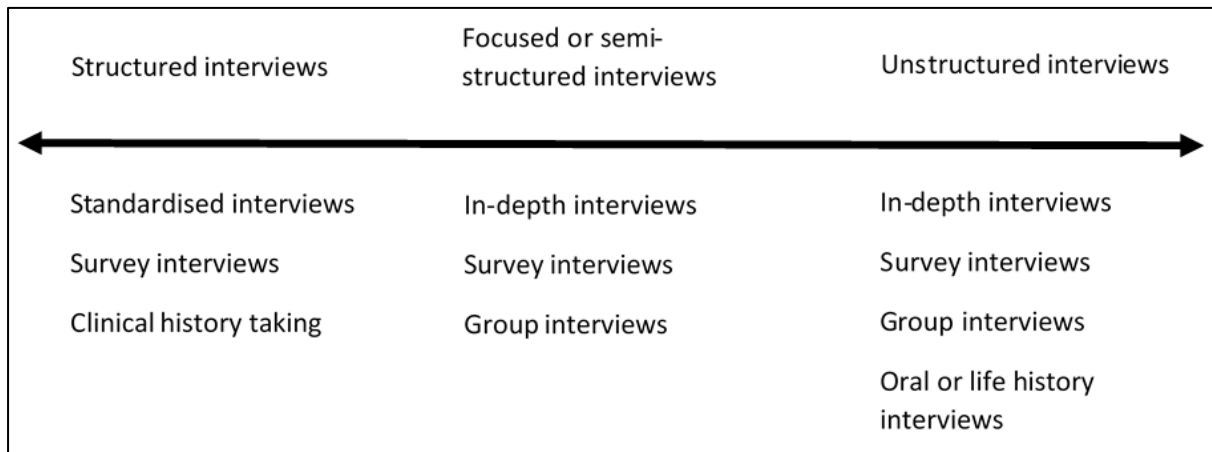
Appendix 10: Research process using a positivist paradigm

Based on Campbell, McNamara and Gilroy, 2004



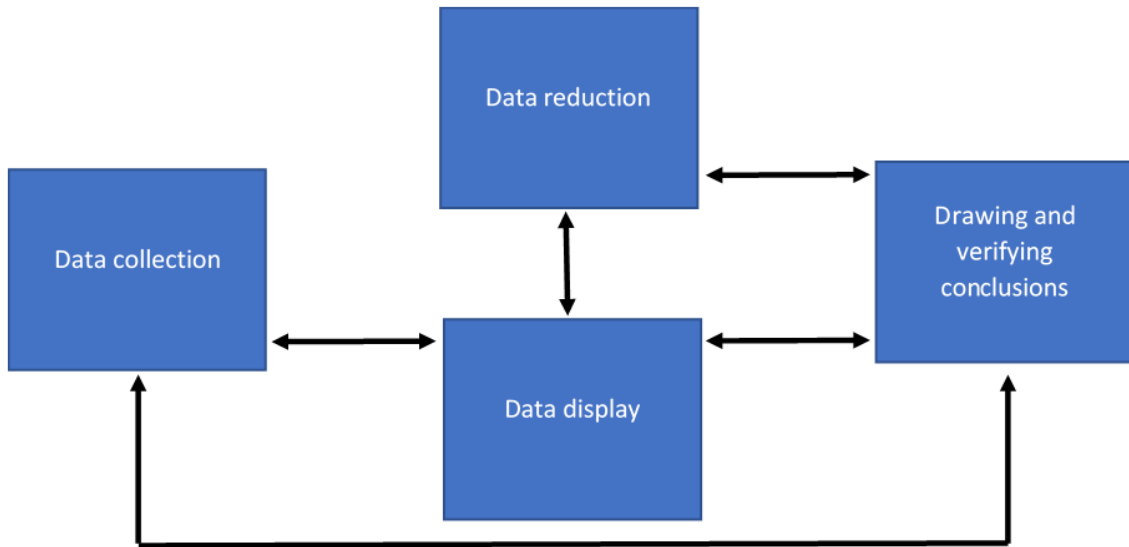
Appendix 11: Continuum of interview methods

Based on Punch and Oancea, 2014



Appendix 12: Interactive model for analysing qualitative data

Based on Punch and Oancea, 2014



Appendix 13: Screenshots and pictures of Google Expeditions and Google Cardboard headset

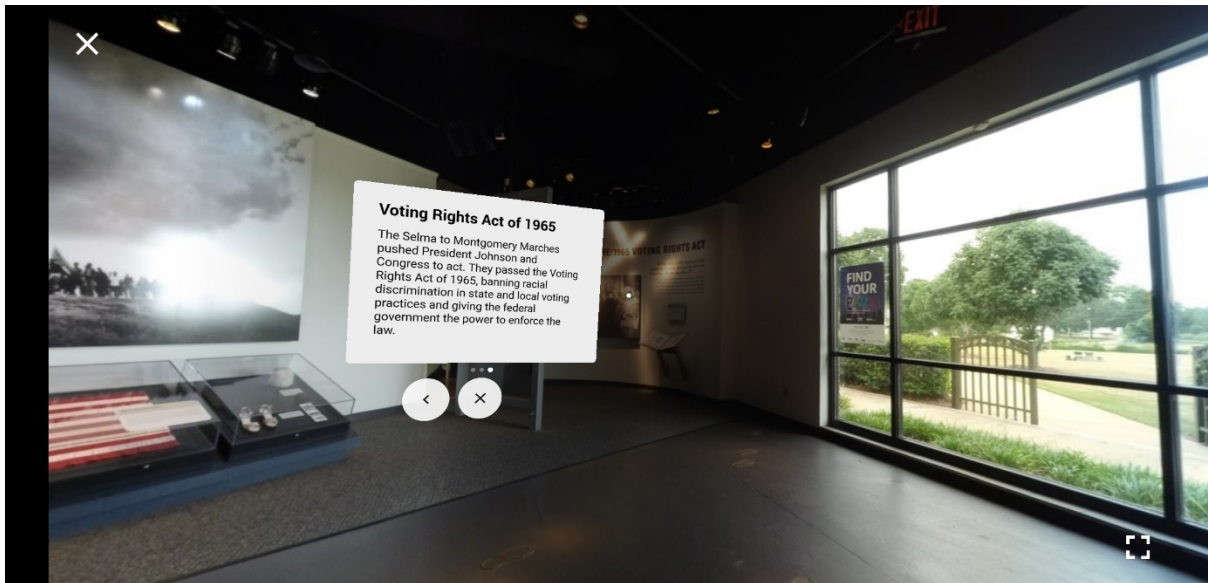
Picture 1: Pupil view through the VR headset.



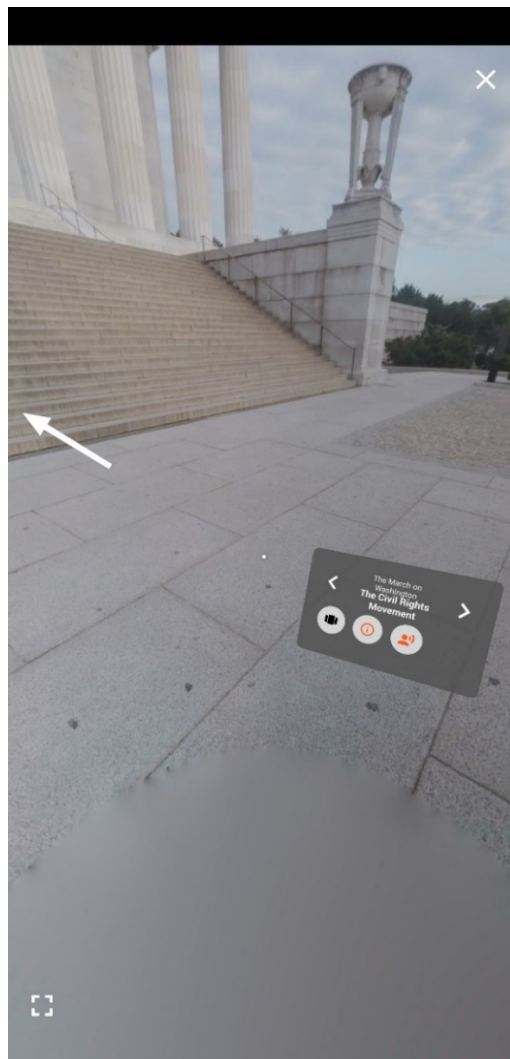
Picture 2: Pupil view, showing how information can be found.



Picture 3: Pupil view, showing the discovery of information.



Picture 4: Pupil view, showing how pupils can navigate around the VR world.



Picture 5: Homemade Google Cardboard headset.



Picture 6: Side-view, showing where the smartphone is placed.



BIBLIOGRAPHY

- Aberdeen City Council. (2016) *Deprivation in Aberdeen City. An Analysis of the Scottish Index of Multiple Deprivation 2016*. Report number: 5.
- Alkaabi, A., Alkaabi, W. & Vyver, G. (2017) Researching Student Motivation. *Contemporary Issues in Education Research*. 10 (3), 193-202.
- Alexander, M. (2018) 'Should virtual reality be at the heart of education in Scotland's schools?', *The Courier*, 26 March. Available from: <https://www.thecourier.co.uk/fp/news/scotland/621642/should-virtual-reality-be-at-the-heart-of-education-in-scotlands-schools/> [Accessed 1st February 2020].
- Anderson, G. & Arsenault, N. (1998) *Fundamentals of Educational Research*. London, The Falmer Press.
- Anderson, G., Herr, K. & Nihlen, A. (2007) *Studying Your Own School: An Educator's Guide to Practitioner Action Research*. Thousand Oaks, Corwin Press.
- Arifin, Y., Sastria, T. & Barlian, E. (2018) User Experience Metric for Augmented Reality Application: A Review. *Procedia Computer Science*. 135, 648–656.
- Aziz, K., Aziz, N., Yusof, A. & Paul, A. (2012) Potential for Providing Augmented Reality Elements in Special Education via Cloud Computing. *Procedia Engineering*. 41, 333-339.
- Baker, M. & Robinson, J. (2017) The Effects of an Experiential Approach to Learning on Student Motivation. *Journal of Agricultural Education*. 58 (3), 150-167.
- Ball, S. (1995) Intellectuals or technicians? The urgent role of theory in educational studies. *British Journal of Educational Studies*. 43 (3), 255-271.
- Banegas, D. (2019) Language curriculum transformation and motivation through action research. *The Curriculum Journal*. 30 (4), 422-440.
- Bassett, R., Beagan, B., Ristouski-Slijepcevic, S. & Chapman, G. (2008) Tough Teens. The Methodological Challenges of Interviewing Teenagers as Research Participants. *Journal of Adolescent Research*. 23 (2), 119-131.
- Baumfield, V., Hall, E. and Wall, K. (2017) *Action Research in Education: Learning Through Practitioner Enquiry*. London, SAGE.

- BBC. (2020) *Coronavirus: Scottish schools to reopen in August*. Available from: <https://www.bbc.co.uk/news/uk-scotland-52754812> [Accessed 14th June 2020].
- British Educational Research Association [BERA] (2018) *Ethical Guidelines for Educational Research*. Fourth edition. London, BERA.
- Biddulph, M. & Adey, K. (2003) Perceptions v. reality: pupils' experiences of learning in history and geography at Key Stage 4. *The Curriculum Journal*. 14 (3), 291-303.
- Birchinall, L. (2013) Case study of trainee teachers' responses to the impact on engagement and motivation in learning through a model of cross-curricular context-based learning: 'keeping fit and healthy'. *The Curriculum Journal*. 24 (1), 27-49.
- Boudah, D. (2011) *Conducting Educational Research: Guide to Completing a Major Project*. Thousand Oaks, SAGE.
- Boutnot-Trites, M. & Belanger, J. (2005) Ethical Dilemmas Facing Action Researchers. *The Journal of Educational Thought*. 39 (2), 197-215.
- Bowen, M. (2018) *Effect of Virtual Reality on Motivation and Achievement of Middle-School Students*. Doctorate. The University of Memphis.
- Braund, M. & Reiss, M. (2006) Validity and worth in the science curriculum: learning school science outside the laboratory. *The Curriculum Journal*. 17 (3), 213-228.
- Buchner, J. & Zumbach, J. (2018) Promoting Intrinsic Motivation with a Mobile Augmented Reality Learning Environment. In: Sánchez, I. & Isaias, P. (eds.) *THE 14th INTERNATIONAL CONFERENCE MOBILE LEARNING 2018 LISBON, PORTUGAL 14 - 16 APRIL, 2018*. Lisbon, IADIS Press. pp.55-61
- Campbell, A., McNamara, O. & Gilroy, P. (2004) *Practitioner Research and Professional Development in Education*. London, SAGE.
- Carmichael, P. & Procter, R. (2006) Are we there yet? teachers, schools and electronic networks. *The Curriculum Journal*. 17 (2), 167-186.
- Cochran-Smith, M. & Lytle, S. (1990) Research on Teaching and Teacher Research: The Issues That Divide. *Educational Researcher*. 19 (2), 2-11.

- Cohen, L., Manion, L. & Morrison, K. (2018) *Research Methods in Education*. Abbingdon, Oxen, Routledge.
- Dunleavy, M. & Dede, C. (2014) Augmented Reality Teaching and Learning. In: Spector, J., Merrill, M., Elen, J. & Bishop, M. (eds.) *Handbook of Research on Educational Communications and Technology*. New York, Springer, pp.735-745.
- Education Scotland. (2019) *The Universal Offer*. Available from: <https://education.gov.scot/education-scotland/what-we-do/delivering-the-scottish-attainment-challenge/the-universal-offer/> [Accessed 1st February 2020].
- Flick, U. (2014) Mapping the Field. In: Flick, U. (eds.) *The SAGE Handbook of Qualitative Data Analysis*. London, SAGE, pp.3-18.
- Flick, U. (2017) Chapter 19: Triangulation. In: Denzin, N. & Lincoln, Y. (eds.) *The SAGE Handbook of Qualitative Research*. London, SAGE.
- European Union. (2015). *Being young in Europe today*. Luxembourg, Publications Office of the European Union.
- Foster, S. (1998) Politics, parallels and perennial curriculum questions: the battle over school history in England and the United States. *The Curriculum Journal*. 9 (2), 153-164.
- Garon-Carrier, G., Boivin, M., Guay, F., Kovas, Y., Dionne, G., Lemelin, J., Séguin, J., Vitaro, F. and Tremblay, R. (2016) Intrinsic Motivation and Achievement in Mathematics in Elementary School: A Longitudinal Investigation of Their Association. *Child Development*. 87 (1), 165–175.
- The General Teaching Council for Scotland [GTCS]. (2012) *The Standard for Career-Long Professional Learning: supporting the development of teacher professional learning*. Available from: <http://www.gtcs.org.uk/web/FILES/the-standards/standard-for-career-long-professional-learning-1212.pdf> [Accessed 13th April 2020].
- The General Teaching Council for Scotland [GTCS]. (2012) *The Standards for Registration: mandatory requirements for Registration with the General Teaching Council for Scotland*. Available from: <http://www.gtcs.org.uk/web/FILES/the-standards/standards-for-registration-1212.pdf> [Accessed 13th April 2020].
- Gilchrist, G. (2018) *Practitioner enquiry: professional development with impact for teachers, schools and systems*. London, Routledge.

- Graham, A., Powell, M., Taylor, N., Anderson, D. & Fitzgerald, R. (2013). *Ethical Research Involving Children*. Florence. UNICEF Office of Research - Innocenti.
- Green, T., Ponder, J. & Donovan, L. (2014) Educational Technology in Social Studies Education. In: Spector, J., Merrill, M., Elen, J. & Bishop, M. (eds.) *Handbook of Research on Educational Communications and Technology*. New York, Springer, pp.573-582.
- Goksu, M. & Somen, T. (2019) History teachers views on using local history. *European Journal of Education Studies*. 6 (2), 253-274.
- Haydn, T. (2011a) History teaching and ICT. In: Davis, I. (eds.) *Debates in History Teaching*. London, Routledge, pp.236-248.
- Haydn, T. (2011b) Secondary history: current themes. In: Davis, I. (eds.) *Debates in History Teaching*. London, Routledge, pp.30-45
- Harris, R. & Haydn, T. (2006) Pupils' enjoyment of history: what lessons can teachers learn from their pupils. *The Curriculum Journal*. 17 (4), 315-333.
- Head, G. (2013) Disaffection with Schooling. In: Bryce, T.G.K., Humes, W.H., Gillies, D. & Kennedy, A. (eds.) *Scottish Education. Fourth Editions: Referendum*. Edinburgh, Edinburgh University Press, pp.850-859.
- Herr, K. & Anderson, G. (2008) Teacher Research and Learning Communities: A Failure to Theorize Power Relations? *Language Arts*. 85 (5), 382-391.
- Hillis, P. (2010) The position of history education in Scottish schools. *The Curriculum Journal*. 21 (2), 141-159.
- Hurd, S. (2009) Why has Computer Assisted Learning made so little impact in secondary education? Lessons from an economics and business subject case-study. *The Curriculum Journal*. 20 (2), 139-159.
- Johnson, L., Smith, R., Levine, A. & Haywood, K. (2010) *2010 Horizon Report: K-12 Edition*. Austin Texas, The New Media Consortium.
- Kaufmann, H., Schmalstieg, D. & Wagner, M. (2000) Construct3D: A Virtual Reality Application for Mathematics and Geometry Education. *Education and Information Technologies*. 5 (4), 263-276.

- Klehr, M. (2012) Qualitative Teacher Research and the Complexity of Classroom Contexts. *Theory into Practice*. 51 (2), 122-128.
- Krueger, R. & Casey, M. (2000) *Focus Groups: A Practical Guide for Applied Research*. Thousand Oaks, SAGE.
- Legault, L., Green-Demers, I. & Pelletier, L. (2006) Why Do High School Students Lack Motivation in the Classroom? Toward an Understanding of Academic Amotivation and the Role of Social Support. *Journal of Educational Psychology*. 98 (3), 567–582.
- Lewin, C., Mavers, D. & Somekh, B. (2003) Broadening access to the curriculum through using technology to link home and school: a critical analysis of reforms intended to improve students' educational attainment. *The Curriculum Journal*. 14 (1), 23-53.
- Loveless, A. (2003) Creating spaces in the primary curriculum: ICT in creative subjects. *The Curriculum Journal*. 14 (1), 5-21.
- Luschei, T. (2014) Assessing the Costs and Benefits of Educational Technology. In: Spector, J., Merrill, M., Elen, J. & Bishop, M. (eds.) *Handbook of Research on Educational Communications and Technology*. New York, Springer, pp.239-248.
- Malone, S. (2003) Ethics at home: informed consent in your own backyard. *Qualitative Studies in Education*. 16 (6), 797-815.
- McLaughlin, M. (2019) 'Scottish school league tables 2019: Edinburgh schools worst at hitting exam targets', *The Times*, 20 March. Available from: <https://www.thetimes.co.uk/edition/scotland/scottish-school-league-tables-2019-edinburgh-schools-worst-at-hitting-exam-targets-7sv66fr28> [Accessed 1st February 2020].
- McLennan, N. (2013) History Education. In: Bryce, T.G.K., Humes, W.H., Gillies, D. & Kennedy, A. (eds.) *Scottish Education. Fourth Editions: Referendum*. Edinburgh, Edinburgh University Press, pp.573-579.
- Menter, J., Elliot, D., Hulme, M., Lewin, J., Lowden, K. & Hall, J. (2011). *A Guide to Practitioner Research in Education*. London, Sage.
- Mertler, C. (2019) Introduction. In: Mertler, C. (eds.) *The Wiley Handbook of Action Research in Education*. Hoboken, John Wiley & Sons, Inc, pp.1-4.

- Milgram, P. & Kishino, F. (1994) A Taxonomy of Mixed Reality Visual Displays. *IEICE Transactions on Information Systems*. E77-D (12).
- Mockler, N. (2007) Ethics in practitioner research: dilemmas from the field. In: Campbell, A. & Groundwater-Smith, S. (eds.) *An Ethical Approach to Practitioner Research: Dealing with Issues and Dilemmas in Action Research*. London, Routledge, pp.88-89.
- Mountford, P. (2011) Literacies and the teaching and learning of history: current approaches. In: Davis, I. (eds.) *Debates in History Teaching*. London, Routledge, pp.224-235.
- Murry, L. and Lawrence, B. (2013) *Practitioner-Based Enquiry: principles for postgraduate research*. London, Routledge.
- Murtagh, L. (2014) 2014) The motivational paradox of feedback: teacher and student perceptions. *The Curriculum Journal*. 25 (4), 516-541.
- Nincarean, D., Ali, M., Halim, N. & Rahman, M. (2013) Mobile Augmented Reality: the potential for education. *Procedia - Social and Behavioral Sciences*. 103, pp. 657-664.
- Noffke, S. (2008) Research Relevancy or Research for Change? *Educational Researcher*. 37 (7), 429-431.
- Nutley, S., Powell, A., & Davis, H. (2013) *What Counts as Good Evidence?* Alliance for Useful Evidence. Available from: <http://www.alliance4usefulevidence.org/assets/What-Counts-as-Good-Evidence-WEB.pdf> [Accessed 30th November 2019].
- Phillips, R. (2002) *Reflective Teaching of History 11-18*. London, Continuum.
- Pond, M. & Childs, A. (1995) Do children learn history from 'Living History' projects? *The Curriculum Journal*. 6 (1), 47-62.
- Price, L. and Kirkwood, A. (2014) Using technology for teaching and learning in higher education: a critical review of the role of evidence in informing practice. *Higher Education Research & Development*. 33 (3), 549-564.
- Punch, K. (2009) *Introduction to Research Methods in Education*. London, SAGE.
- Punch, K. & Oancea, A. (2014) *Introduction to Research Methods in Education 2nd Edition*. London, SAGE.
- Radu, I. (2014) Augmented reality in education: a meta-review and cross-media analysis. *Pers Ubiquit Comput*. 18, 1533–1543.

Riley, K. & Docking, J. (2004) VOICES OF DISAFFECTED PUPILS: IMPLICATIONS FOR POLICY AND PRACTICE. *British Journal of Educational Studies*. 52 (2), 166-179.

Ryan, R. & Deci, E. (2000) Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*. 25, 54–67.

Santos, M., Lübke, A., Taketomi, T., Yamamoto, G., Rodrigo, M., Sander, C. & Kato, H. (2016) Augmented reality as multimedia: the case for situated vocabulary learning. *Research and Practice in Technology Enhanced Learning*. 11 (4).

Schofield, C. (2019) ‘The 24 schools in Scotland with the lowest rate for getting pupils into work, training or further study’, *The Scotsman*, 27 March. Available from: <https://www.scotsman.com/news/education/the-24-schools-in-scotland-with-the-lowest-rate-for-getting-pupils-into-work-training-or-further-study-1-4896964> [Accessed 1st February 2020].

Schoonmaker, F. (2007) One Size Doesn’t Fit All: Reopening Discussion of the Research–Practice Connection. *THEORY INTO PRACTICE*. 46 (4), 264–271.

The Scottish Government. (2006) ISBN: 978-1-78652-473-7. *ENHANCING LEARNING AND TEACHING THROUGH THE USE OF DIGITAL TECHNOLOGY A DIGITAL LEARNING AND TEACHING STRATEGY FOR SCOTLAND*. Edinburgh, APS Group Scotland.

The Scottish Government. (2007) ISBN: 978-0-7559-5546-6. *Included, Engaged and Involved Part 1: Attendance in Scottish Schools*. Edinburgh, The Scottish Government.

The Scottish Government. (2017) ISBN: 978-1-78652-135-4. *Included, Engaged and Involved Part 2: A Positive Approach to Preventing and Managing School Exclusions*. Edinburgh, APS Group Scotland.

Scottish Parliament Information Centre (SPICe). (2016) *Closing The Attainment Gap: What Can Schools Do?* SPICe Briefing 16/68. Available at: https://www.parliament.scot/ResearchBriefingsAndFactsheets/S5/SB_16-68_Closing_The_Attainment_Gap_What_Can_Schools_Do.pdf [Accessed 6th June 2020].

Serio, A., Ibáñez, M. & Kloos, C. (2013) Impact of an augmented reality system on students’ motivation for a visual art course. *Computers & Education*. 68, 586–596.

Sharp, J. (2009) *Success with your Education Research Project*. Exeter, Learning Matters.

Sime, D. (2013) Poverty and Schooling in Scotland. In: Bryce, T.G.K., Humes, W.H., Gillies, D. & Kennedy, A. (eds.) *Scottish Education. Fourth Editions: Referendum*. Edinburgh, Edinburgh University Press, pp.860-870.

Smith, J. (2016) What remains of history? Historical epistemology and historical understanding in Scotland's *Curriculum for Excellence*. *The Curriculum Journal*. 27 (4), 500-517.

Smith, J. (2018) Identity and Instrumentality: History in the Scottish School Curriculum, 1992-2017. *Historical Encounters: A journal of historical consciousness, historical cultures, and history education*. 5 (1), 31-45.

Spector, J., Merrill, M., Elen, J. & Bishop, M. (eds.) (2014) *Handbook of Research on Educational Communications and Technology*. New York, Springer.

Spencer, L., Ritchie, J., Lewis, J. & Dillon, L. (2003) ISBN: 07715 04465 8. *Quality in Qualitative Evaluation: A framework for assessing research evidence*. The Cabinet Office.

Statista. (2019) *Smartphone ownership penetration in the United Kingdom (UK) in 2012-2019, by age*. Available from: <https://www.statista.com/statistics/271851/smartphone-owners-in-the-united-kingdom-uk-by-age/> [Accessed 24th May 2020].

Stewart, D., Shamdasani, P. & Rook, D. (2011) *Focus Groups*. Thousand Oaks, SAGE.

Tilley, L. & Woodthorpe, K. (2011) Is it the end for anonymity as we know it? A critical examination of the ethical principle of anonymity in the context of 21st century demands on the qualitative researcher. *Qualitative Research*. 11 (2), 197-212.

Webb, B., Newman, D. and Cochrane, C. (1995) Using a Post-Experience Questionnaire to Measure the Quality of Student Learning in a Computer Conferencing Environment. *Higher Education Research and Development*. 14 (2), 255-267.

Yong, M. (2015) Does online game-based learning work in formal education at school? A case study of VISOLE. *The Curriculum Journal*. 26 (2), 249-267.

Yuen, S., Yaoyuneyong, G. & Johnson, E. (2011) Augmented Reality: An Overview and Five Directions for AR in Education. *Journal of Educational Technology Development and Exchange*. 4 (1), 119-140.

Zeni, J. (1998) A guide to ethical issues and action research. *Educational Action Research*. 6 (1), 9-19.