Evaluating Bubbles: An Evaluation of a New Immersive Indirect E-Contact Learning Platform

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Abstract

This thesis is an evaluation of a new online learning platform that aims to reduce prejudice. The research consists of two studies: firstly, a quantitative study with school pupils (Study 1a, N = 121) and young adults (Study 1b, N = 145) as participants and secondly, a qualitative study (Study 2, N = 79) involving school pupils, young adults and teachers. The quantitative studies explore the impact of the intervention on empathy, knowledge and social attitudes utilising t-tests, regression, mediation and moderated mediation analyses. The qualitative study utilises reflexive thematic analysis. This project was funded by the National Holocaust Centre and Museum UK (NHCM). A unique aspect of this study is the exploration of the impact of an immersive historical e-contact intervention. Statistical analyses of the quantitative study revealed that, in line with previous research, direct contact acted as a moderator on the effect of the intervention on social attitudes. The thematic analysis of the qualitative study underlines the mixed impact of the intervention and shows that although there is some promise, further development of this and similar interventions and evaluations of those interventions is necessary.

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Chapter 1: Literature Review

Abstract

This chapter includes the aims of the current research, a literature review and a description of the learning platform utilised in this intervention. The need for this research is outlined and there is a description of the current research which outlines how study 1 is split into study 1a (a quantitative study with school pupil participants) and study 1b (a quantitative study with young adult participants). This chapter will also describe how study 2 is a qualitative piece of work utilising reflexive thematic analysis to explore data gathered from focus groups and interviews with school pupils, young adults and teachers who explored the learning platform or took part in the intervention.

Aims of Current Research

This dissertation aims to evaluate a new, indirect contact intervention, Bubbles. Bubbles is an immersive historical (in the sense that the content is historical) educational e-contact learning platform designed by the National Holocaust Centre and Museum (NHCM). The research aims to establish the impact of the intervention on knowledge, empathy and social attitudes among school pupils and young adults (study 1a and study 1b) as well as explore feedback from those pupils, their teachers and young adults regarding their experiences exploring the learning platform (study 2). Intergroup contact theory informs these studies. Several years of research has found intergroup contact-based interventions to be the most effective in reducing prejudice (Pettigrew & Tropp, 2006). In more recent years, research has focused on using indirect contact as a form of intergroup contact to help reduce prejudice through interventions (e.g. Vezzail et al., 2017). This research provides a new approach to indirect contact utilising an immersive virtual learning platform and focusses on immersive virtual e-contact between groups within a historical context.

Anti-Jewish Attitudes and Behaviours[1] are a Contemporary Challenge Facing Society Today

Interventions addressing prejudice, social attitudes and anti-Jewish attitudes and behaviours are vital in the current climate of hate. Anti-Semitism can be defined as a form of

[1] Anti-Jewish behaviours and attitudes is the terminology that will frequently be used throughout this paper as opposed to anti-Jewish racism or anti-Semitism. Anti-Jewish racism is racism against Jewish people, hence the definition is similar to that of racism and involves 'the belief that humans may be divided into separate exclusive biological entities called 'races'; that there is a causal link between inherited physical traits of personality, intellect, morality and other cultural and behavioural features; and that some races are innately superior to others' (Smedley, 2024). Anti-Semitism can be defined as a form of hate, bias, and prejudice against a person from the Jewish community, leading to physical and psychological harm (Walker et al., 2024). Anti-Jewish behaviours and attitudes will be utilised more frequently in this paper to be clear what we are referring to. In cases where previous research is being citied, anti-Jewish racism or anti-Semitism may be used.

hate, bias, and prejudice against a person from the Jewish community, leading to physical and psychological harm (Walker et al., 2024). Anti-Semitism has spiked in recent years. Anti-Jewish hate incidents are defined as a malicious act against Jewish people, organizations or property. This definition comes from the Community Security Trust (CST), a charity that aims to provide safety, security and advice to the Jewish community in the UK. They recorded 1,978 anti-Jewish hate incidents between January and June in 2024 (CST, 2024). This was a sizeable increase on the 964 anti-Jewish hate incidents recorded in the first half of 2023. Anti-Jewish hate incidents recorded included damage and desecration to Jewish property (which saw a 246% rise in the time periods compared), assault (a 41% rise in the time period compared), anti-Semitism affecting people and property in education (a 119% rise in the time periods compared. Arguably the most alarming figure in this report was that anti- Jewish hate involving higher education, with student or academic victims or offenders, showed a 456% rise in this time period.

Anti-Jewish hate incidents have been on the rise in the twenty-first century. The Community Security Trust among others have reported these rises which has caused alarm among the general pupil and particularly among Jewish communities. However, anti-Jewish hate incidents and their impact remains understudied outside the US context, and the little research that has explored them suggests these rises in anti-Jewish hate incidents increase fear the most among young people (Due Enstad, 2024). Perspective-taking studies aiming to reduce anti-Jewish behaviours and attitudes are also understudied. One piece of research that did explore this found that perspective-taking studies involving participants watching a student describe their experiences of anti-Jewish hate incidents may positively impact feelings towards Jews, although these findings did not persist after 14 days (Bailard et al., 2023).

Anti-Jewish behaviours and attitudes have widespread negative effects including detrimental exclusionary consequences: for example, a recent paper exploring anti-Semitism within the American Psychological Association found that:

> Jews were systematically discriminated against within the discipline of psychology through quotas for acceptance into graduate training, discriminatory employment practices in university psychology departments, and most egregiously through the espousing of "scientific racism" including eugenics by prominent leaders in the APA … the APA continues to do little or nothing to combat it (Walker et al., 2024, p. 1).

The Relationship Between Intergroup Attitudes and Behaviours

Much research has suggested that intergroup attitudes, specifically attitudes towards minorities, manifest themselves in behaviours towards that group, whether those behaviours be discriminatory or favourable (Byrka, Grzyb & Dolinski, 2015). A study in Poland, although cautious about stating whether the findings would have good external validity, suggested that activating positive attitudes about the Jewish community resulted in more positive behavioural actions towards the Jewish community, in this case donations to charity (Byrka, Grzyb & Dolinski, 2019). Similarly, research utilising a perspective-taking task in which participants displayed more positive attitudes towards Jewish communities after watching a video displaying the effects of anti-Jewish hate incidents showed that participants displayed more positive behaviour towards Jewish people in terms of their online browsing behaviour (Bailard et al., 2023).

The Impact of Discrimination on Young People and Research on Prejudice Reduction Interventions Among Young People

A growing body of research outlines the effect of racial discrimination on the lives of children and young people, with a general consensus that they are more vulnerable to its damaging effects (Pachter & Garcia Coll, 2009). A recent systematic review of longitudinal studies examining the long-term effects of experiencing racism explored the findings of 46 studies comprised of young people aged 11-18. The results showed statistically significant associations between racial discrimination at a young age and later health outcomes including behavioural problems, such as risk-taking behaviour, health-harming behaviour and negative mental health outcomes (Cave et al., 2020).

Research has shown that children can display in-group bias. These attitudes can become apparent in a number of ways, for example when asked to assign traits to members of their own and other ethnic groups, children are often favourable towards their own ethnic group compared to the ethnic out-group (Rutland et al., 2007). One meta-analysis exploring children's intergroup attitudes and how they change with age suggested that interventions aimed at children aged 7-10 years could be particularly useful as those in late childhood find themselves in a particularly sensitive period in terms of the effect environmental factors can have on their levels of prejudice (Raabe & Beelmann, 2011). Importantly, prejudice has been suggested to be less crystalized in children, making interventions that target children and younger people crucial as they can have a greater impact before prejudicial attitudes are deeply entrenched (Rutland & Killen, 2015). Considering that the intergroup experiences children and young people have provides the basis for their intergroup attitudes, outgroup behavioural intentions and intergroup relations in adult life (Abrams & Killen, 2016), it is

crucial that psychologists focus on improving outgroup attitudes among children and young people through intergroup contact interventions.

Education Interventions to Tackle Anti-Jewish Behaviours and Attitudes

In a time where hate crime is becoming more rife, understanding the effectiveness and theoretical function of interventions aiming to reduce prejudice is vital. Educational interventions focussing on anti-Jewish behaviours and attitudes have had positive effects; taking students to Auschwitz on a school trip improved students' knowledge and understanding of both historical and contemporary human rights issues (Cowan & Maitles, 2012), and an online perspective taking intervention involving watching a video about a college student's experience of anti-Jewish hate incidents improved attitudes towards Jews. However, this particular positive impact did not persist after 14 days (Bailard et al., 2023).

The Anne Frank Trust found that over 4 years of carrying out interventions with young people their positive impact on young people's social attitudes towards Jewish people had risen by 21.9% (Goodbun, 2022). Improving social attitudes is described by the Anne Frank Trust as reducing hatred and prejudice while promoting positive attitudes, respect and responsibility towards others. They found that through their interventions young people improved social attitudes, knowledge of multiple forms of discrimination and that the more confident young people became in their personal values, the less likely they were to be a bystander when confronted by prejudice (Goodbun, 2022). One of the most innovative elements of Goodbun's research was in the development of the 'contact star', a child-friendly measure of social attitudes to various social groups. Previous versions of the contact star include the question "please think about how much you may or may not have in common with the person who is…" before going on to list several different groups including LGBTQ,

Disabled, Jewish, Muslim and Christian among others (Goodbun, 2022). The response scale for that version of the contact star ranged from 1 (nothing in common) to 4 (very much in common). The contact star is seen as a generalized measure of prejudice and referred to as a measure of social attitudes in the Anne Frank Trust impact reports. This is important, as the aim of the Anne Frank Trust is to promote cultural openness and positive attitudes to diversity and equality and the impact is not limited to social attitudes exclusively towards Jewish people, but also includes social attitudes towards other groups. The 2020-2021 impact report found Anne Frank Trust programmes resulted in 92.5% of young people progressing in their social attitudes to at least one group. Other outcomes explored included assessing whether young people improved their social attitudes to at least two groups, three groups and so on.

Intergroup Contact

Intergroup contact is contact between people who are members of different social groups (the 'ingroup' and the 'outgroup'). Intergroup contact has again and again been shown to have a significant impact on shaping children and young adults' levels of prejudice (Allport, 1954; Oskamp & Jones, 2000). The 'contact hypothesis' from Allport makes up the foundations of intergroup contact theory and states that social interactions between people from different social groups leads to more positive intergroup relations. That is given the interactions satisfy the optimal conditions: equal status between groups, cooperation in order to achieve common goals, a high degree of frequency and institutional support. Friendship potential was later added as an essential condition in a reformulating of Allport's initial theory (Pettigrew, 1998). There is abundant evidence that has upheld the effectiveness of

intergroup contact interventions in reducing prejudice (e.g., Stathi & Crisp, 2010; Pettigrew & Tropp, 2006).

Direct intergroup contact takes place when there is an interaction in real life, as opposed to a virtual interaction utilising technology, between members of different groups. For example, a Jewish student and a Muslim student discussing some artwork they have both observed in a museum space would be considered direct intergroup contact. Universities are unique in that their populations include greater diversity than the general population, therefore they provide adolescents and young adults the opportunity for interaction between groups, a form of direct intergroup contact. These opportunities are rarer in day to day life outside of university (Cameron & Turner, 2016). Indeed, face-to-face direct contact between members of different groups, although effective in reducing prejudice, can be difficult to implement during interventions, often due to an absence of diversity in different areas (Vezzali et al., 2017). Vicarious contact, extended contact and imagined contact are three forms of indirect contact that have received regular attention from social psychologists in recent years (Miles & Crisp, 2014; Vezzali et al., 2014).

Indirect contact is posited to take place when an individual is exposed to an in-group member having a positive relation with an out-group member. Indirect contact includes extended contact, for example learning that an ingroup member is friends with an outgroup member; vicarious contact, for example observing an ingroup member interact with an outgroup member and imagined contact, for example imagining oneself interacting with an outgroup member (Dovidio, Eller & Hewstone, 2011).

Indirect Contact: E-contact

E-contact can be defined as computer mediated contact involving an engagement of self in the intergroup relationship (White & Abu-Rayya, 2012). Although video calls could be described as direct contact, e-contact, for the most part, is indirect contact in the sense that it is a non-face-to-face form of contact. The last decade or so has seen a significant increase in intergroup contact research focussing on e-contact, with many positive social outcomes being found including decreases in intergroup biases and intergroup anxiety as well as increases in outgroup knowledge (White & Abu-Rayya, 2012; White et al., 2018; White, Maunder & Verrelli, 2020). Importantly, e-contact can often have a synchronous element which involves participants being able to communicate in real time through an online platform.

Relatively early interventions utilising e-contact have been shown to be effective in improving relations between Muslim and Christian high school students (White & Abu-Rayya, 2012). This intervention involved Muslim-Christian dyads working together to attempt problem-solving tasks in a real-time text-based chat room whilst in an educational setting with teachers present. Participants in the intervention condition displayed improved intergroup attitudes and increased outgroup knowledge compared to those in the control condition, in which the interaction they took part in involved students only of the same religion as themselves. Similar positive effects have been found as a result of several other text-based e-contact interventions including; reduced prejudice among Jewish and Muslim university students in Israel (Walther et al., 2015), reduced intergroup anxiety and improved contact expectancies among Protestants and Catholics in Northern Ireland (White et al., 2018) and reduced fear, anger and stereotyping toward people with schizophrenia (White, Maunder & Verrelli, 2020).

Immersive Educational E-contact

Much psychological research has highlighted the negative impact of computer games, and has failed to consider the potential positive effects such as increased problem-solving abilities games could induce in their users (Blumberg, Blades & Oates, 2013). Relatively recent research has highlighted the ability of computer game style platforms to give students the chance to experience situations that would otherwise be practically impossible in reality as one of the biggest benefits of utilising 'video' games in education settings (Susi et al., 2007; Olivier, Sterkenberg & van Rensburg, 2019). A number of recent studies on historical education exploring either 'immersive virtual reality', 'non-immersive virtual reality' or 'immersive gaming' have found that when this form of media is combined with primary source documents, that included audio narration from Holocaust survivors as well as archival photographs and footage, and direct instruction it will likely inspire historical empathy amongst users (Law, 2020; Patterson, Han & Esposito, 2022). The distinction between immersive virtual reality and non-immersive virtual reality, in research terminology, is often that immersive virtual reality requires a head set such that the user can turn their head in real life to look around within the game. The current paper considers a platform to be immersive if it places a user in a world and lets them move around freely through their in 'game' avatar. Findings on the use of immersive interventions in educational settings are mixed; there has been evidence learners are more engaged, take their work more seriously and willingly spend more time learning (Loup et al., 2016; Reiners et al., 2014; Alhalabi, 2016), however there is also evidence that learning through immersive interventions can confuse participants and distract them from the learning task (Fernandes et al., 2016).

Effect of Indirect Contact on Knowledge of Outgroups and Knowledge of Discrimination

Knowledge of the outgroup is considered to be knowledge of others' cultural traditions, cultural symbols and cultural similarities and differences between one's ingroup and one's outgroup. Knowledge of discrimination is considered knowledge of what discrimination is and recognition of the harm it can cause. Indirect contact interventions utilising media could positively impact young people's knowledge of the outgroup. One study explored the impact of watching a TV show promoting mutual respect and understanding between Israeli and Palestinian people on three groups of participants, Palestinian, Israeli and Palestinian-Israeli children. Pre and post-test interviews were conducted and children created drawings to aid their response, an attempt by researchers to measure any changes in cultural stereotypes, knowledge of cultural symbols and knowledge of cultural similarities. Although the results were mixed, with the intervention resulting in increased stereotyping amongst some participants, there was also an increase in understanding of cultural symbols and cultural similarities for some participants (Cole et al., 2003). Mixed findings have been a theme in much research regarding the impact of increased knowledge of the Holocaust on attitudes towards Jewish people. Although a study examining the responses of 1500 adults to a survey regarding the Holocaust found strong correlations between greater reported Holocaust knowledge and recognition of anti-Jewish behaviours and attitudes as a societal problem, the same research also suggested that greater Holocaust knowledge may not correlate consistently with increased openness towards certain aspects of diversity, suggesting the ways in which people learn about and understand issues of diversity may be more important to individuals' openness to diversity (Jedwab, 2010).

Early theorists suggested new knowledge about the outgroup was the driving force in how contact reduced prejudice. Indeed, a meta-analysis of more than 500 studies found

mediational effects of enhanced knowledge of the outgroup on contact interventions' effectiveness in reducing prejudice, although this mediation effect was less strong than either a reduction in anxiety about the outgroup or an increase in empathy and perspective taking (Pettigrew & Tropp, 2006). Although, this by no means suggests knowledge should be discounted in the relationship between contact and reduced prejudice.

There is little published research examining the effect of indirect contact, let alone historical educational immersive indirect e-contact, on contemporary knowledge of either discrimination or the out-group, making this a unique aspect of the current studies. This research aims to understand the extent to which the current intervention impacts historical knowledge and how this relates to contemporary knowledge and social attitudes.

Effect of Indirect Contact on Contemporary Empathy

Empathy is defined as one's capability of sharing another's emotional state, as well as then considering potential reasons for their state by stepping into the other person's shoes (Burks & Kobus, 2012). When it comes to helping build relationships, empathizing and attempting to understand the other person in question, trying to understand their situation and then reacting accordingly have been shown to be important (Leijssen, 2004). Indirect contact interventions can improve people's empathy: increases in empathy have been found, in a large meta-analysis, to be a driving mediator in the relationship between indirect contact interventions and a reduction in prejudice (Pettigrew et al., 2006). A study with Italian and immigrant elementary school children found extended contact to be associated with improved intergroup empathy, which in turn was associated with more positive outgroup attitudes, stereotypes and behavioural intentions (Vezzali et al., 2017). This study by Vezzali utilised a

moderated mediation model in what they described as “an important step in extended contact research with children, which had previously focused on moderator and mediation processes separately” (p. 45). This paper also called for future research to explore similar moderated mediation models in an attempt to understand the underlying mechanisms that are the driving force behind the impact of interventions and the conditions in which they operate. Interestingly, there were significant effects only among participants who reported low or moderate levels of previous direct contact. Another interesting aspect of this study, with implications for future research, was that Vezzali and colleagues found a large amount of research had explored the effects of extended contact on intergroup attitudes among adults, whereas a much smaller amount of research had focused on the effect among young people and children (e.g. Feddes et al, 2009; Cameron et al, 2011).

Effect of Indirect Contact on Historical Knowledge of Discrimination

Historical knowledge of discrimination can be described as having a good understanding of specific cases of discrimination in the past. There is a growing body of research paying attention to historical education and the impact it can have, especially on how to deal with controversial or sensitive issues in a climate of political polarization (Tribukait, 2021). An example of historical knowledge of discrimination would be how much one knows about and understands the discrimination of Jewish people that took place in the lead up to and during the second world war.

Importantly, there is likely considerable overlap between one’s knowledge of historical discrimination and awareness and knowledge of contemporary discrimination, as evidenced in a number of intervention studies. For example, an intervention that took

students on a trip to Auschwitz found participants displayed increased knowledge of human rights issues relating to both historical (the Holocaust) and contemporary anti-Jewish behaviours and attitudes (Cowan & Maitles, 2011). This study found that the presence of a teacher was essential for the trip to have a positive impact and not leave students conveying feelings of vulnerability. Students developed a deeper understanding of European history and seemed to apply their learning to develop an understanding of contemporary issues around prejudice and discrimination.

Relatively recent research by Cowan and Maitles (2007) explored whether Holocaust education, particularly addressing prejudice and discrimination, produces 'better', in other words more pro-social, citizens. Although the results were not completely clear cut, the group who had the opportunity to study the Holocaust at primary school had stronger positive values, were more tolerant and were more likely to understand individual responsibility towards combating racism compared to the participants who did not have the opportunity to study the Holocaust at primary school. Over time, among participants in the intervention group, attitudes towards minorities had fallen back to their initial levels. This was thought to reflect a general intolerance in British society and the media towards minorities. There was also a hostility towards British people, something the researchers suggested needed to be watched and combated. It was also posited this was due to the pupils sophisticated understanding of the oppressors and the oppressed and that in this case British people were not in the category of the oppressed.

Educational Interventions Involving Recreations of Historical Events

A study by Kisida, Goodwin and Bowen (2020) evaluated the impact of partnering arts and cultural organizations to provide arts learning opportunities. Through the performance of a play created for the evaluation involving historical artefacts from Arkansas in 1936 they investigated 'Arkansas's first people, the Arkansas Post, the Civil War, music, the important role of women in Arkansas history and the introduction of electricity to rural Arkansas'. By employing a randomized controlled trial, they explored the impact of the interactive live theatre production on engaging students in history education. They found that participants in the intervention condition demonstrated significant increases in historical knowledge and historical empathy as well as an increased interest in performing arts and an increased enthusiasm for learning about history (Kisida, Goodwin & Bowen, 2020).

As mentioned, to date there has been little research specifically exploring the effect of immersive historical indirect contact interventions on participants' historical knowledge and understanding of discrimination, making this a unique aspect of the current study. The few examples provided have not examined the effect of the knowledge-based interventions on both historical and contemporary empathy, and the relationship between the two. By exploring the impact of the intervention on historical knowledge and how any changes in historical knowledge relate to both social attitudes and contemporary knowledge this study aims to shed light on historical education involving indirect contact as a means to improving social attitudes.

Effect of Indirect Contact on Historical Empathy

Historical empathy has been researched at length over the past 30 years, however the way in which it has been operationalized, defined and promoted in classrooms has been

inconsistent, with dated conceptualizations of the construct often providing the foundations for teachers (Endacott & Brooks, 2013). This study will follow Endacott and Brooks' definition of historical empathy;

> Historical empathy is the process of a student's cognitive and affective engagement with historical figures to better understand and contextualize their lived experiences, decisions, or actions. Historical empathy involves understanding how people from the past thought, felt, made decisions, acted and faced consequences within a specific historical and social context. (p. 41)

To date, as far as this author is aware, there has been no research examining the link between indirect contact and historical empathy, let alone the impact of immersive historical educational indirect contact interventions on historical empathy. Research has, with some success, set out to explore whether historical empathy can be improved through interventions utilising Levesque's (2008) three-stage model of historical empathy: imagining, contextualising and judging. Imagining is seen as a necessary first step as students need to create a lively representation of the historical situation to be able to picture it and raise questions. Contextualisation is then fundamental to understanding the situation. Judging is considered the shifting of judgements about the situation from implicit to explicit (Wilschut & Schiphorst, 2019). The study by Wilschut and Schiphorst (2019) involved students studying primary sources including audio-visual sources and play-reading activities about two controversial historical persons, they then received contextual information about the period. Qualitative analysis found nuanced results with the majority of participants feeling they had learnt something worthwhile. However, findings led the researchers to prefer the idea that the intervention had a positive impact on 'historical perspective reconstruction' rather than 'historical perspective taking' as they suggested historical empathy may clash

with historical understanding considering it is difficult to empathize with the perpetrators of historical wrong-doings.

Research exploring students' and teachers' beliefs about historical empathy in secondary history education by conducting open ended interviews has suggested that teachers and students view historical empathy as a skill that can be learnt more easily when students have contact with an eyewitness, an opportunity to visit a historic site or classroom discussions (Bartelds, Savenije & Boxtel, 2020). The study also pointed to contextualization, awareness of one's own positionality, personal connection and historical imagination as the main building blocks of historical empathy. Personal connection can take place when an individual feels personally involved with a task because the objective or subject matter appeals to the student or because the task seems like a real-world situation (Immordino-Yang & Damasio, 2007).

Although it is difficult to find research that has linked intergroup contact theory and historical empathy, plenty of research has highlighted the importance of resources, both visual and textual, such as journal entries, that provide first-hand accounts of hardships suffered by groups of people for promoting historical empathy (Brooks, 2008; Endacott, 2010; Endacott & Brooks, 2013).

The study of immersive historical resources that encourage increased perspective taking of a social outgroup in a historical context could and should be considered a form of indirect intergroup contact. The exploration of immersive indirect e-contact as a means to develop historical empathy and in turn improve contemporary empathy and social attitudes is a unique aspect of the current studies.

How Other Literature Bases May Inform This Research

As a result of limited resources and increased pressure from policy makers regarding school curricula, there has been a decreased emphasis on teaching arts and humanities. The study by Kisida, Goodwin and Bowen (2020) is a good example of this solution in practice as they partnered arts and cultural organizations to provide arts learning opportunities. They assigned school groups to the program in an attempt to establish causal conclusions about the impact of these interventions, that were previously lacking in evidence regarding their effectiveness. They found that participants in the intervention condition demonstrated increases in historical knowledge and historical empathy as well as an increased interest in performing arts and an increased enthusiasm for learning about history.

Similar interventions combining arts with humanities have seen theatre productions take place in which students can interact with the actors in the hope that knowledge retention is increased; however, a lack of adequate evaluation makes it difficult to establish the effects. Research by Graham and Brouillette (2016), Hardiman et al, (2014) and Hardiman et al. (2019) explored the impact of arts integration in science learning on memory retention. These pieces of research all found positive outcomes of the integration including higher achievement in tests and higher knowledge retention. These pieces of research pointed to the increased collaborative engagement in learning, rehearsal, repetition, elaboration, generation, enactment, oral production, effort after meaning, emotional arousal and pictorial representation as potential mechanisms for the positive impact of learning through the arts-based interventions.

The current studies seek to determine the impact of the Bubbles platform. Firstly, studies 1a and 1b will explore the impact of the intervention on social attitudes, utilising the contact star as a social attitudes measure, this is an attempt to understand the impact of the intervention and it is expected social attitudes will improve among the intervention group. These studies (1a and 1b) will then explore whether direct contact acts as a moderator on the impact of the platform regarding its impact on social attitudes. It is expected direct contact will act as a moderator in this relationship, such that the intervention is more effective among those with lower levels of previous direct intergroup contact. Interplay between key outcome variables will be explored through mediation analyses and then moderated mediation analyses in both study 1a and 1b. The mediation analyses will consider whether the platform impacts historical knowledge and whether this is a driving force for improvements in contemporary knowledge (study 1a and 1b) and then whether the intervention impacts historical empathy (study 1a) and whether this is a driving force for improvements in contemporary empathy (study 1b). Moderated mediation analyses will insert direct contact as an expected moderator into these mediation models, placing the moderator between the independent variable (condition) and the mediator (either historical knowledge or historical empathy). These moderated mediation models aim to establish the underlying mechanisms and driving forces behind any potential impact of the intervention. Study 2 will then build on study 1 through a reflexive thematic analysis of data generated through focus groups and interviews.

Bubbles and the National Holocaust Centre and Museum

The National Holocaust Centre and Museum (NHCM) is the only UK national museum dedicated to teaching and learning about the holocaust and funded the production

and evaluation of their new learning platform Bubbles. Alongside their permanent exhibitions, including 'The Journey', they hold an extensive artefact collection including a question and answer tool with a bank of answers from Holocaust survivors that is utilised through the teaching of 'The Forever Project', a project encouraging people to challenge prejudice by connecting empathetically with Holocaust survivors and picking up knowledge that may otherwise have been lost. The NHCM is dedicated to the development of innovative education methods to teach the next generation about the Holocaust. Indeed, a statement on the museum's website reads "We need bold, creative solutions to create a counter culture, making the warnings of the Holocaust resonate with generations born long after it" (www.holocaust.org.uk).

What is 'Bubbles'?

Bubbles is a new, interactive learning platform designed by the National Holocaust Centre and Museum (NHCM). 'The Journey', a slightly older museum exhibit and online resource offered by the NHCM, provided much of the inspiration for Bubbles. The Bubbles platform utilises immersive technology to teach people about Jewish people and their family life in 1930s Berlin, and the persecution Jewish families faced in Germany before and after Kristallnacht. Bubbles provides an opportunity for users to explore a Jewish family home in that time period, interact with the objects in the home, and watch videos of interviews with Holocaust survivors. Bubbles also allows users to interact with one another and an educator in real time as users explore the platform. This means users could experience indirect contact (e-contact) with different social groups through their interaction with the home and objects in the home as well as the survivor testimonies, whilst, in theory, also experiencing direct contact with the educator and other users.

Bubbles consists of a series of rooms in a Jewish family home in 1933 Berlin. Once entering Bubbles users are guided around the space by an educator live from the NHCM, or a trained researcher. Participants are immersed in the house and are given freedom to explore and interact with the majority of the objects they can see (this involves clicking on the object so that the name and information panel associated with the object appears on screen). Survivor testimonies have been central to much of the work by the NHCM and Bubbles is no exception; upon the mantelpiece there are four pictures in frames, each of which when clicked on begins to play a video of a Holocaust survivor describing some of their experiences growing up.

In addition to this, participants can see where other participants and the educator are in Bubbles on the 'map', they can also see each other's faces through live webcams on their avatars and can interact with one another whether that be by utilising the proximity audio features and talking to one another using microphones or through the chat function. The nature of the avatars also allows users to see where other participants are and to see what they are looking at and explore together without conversing if they would prefer. One of the aims of Bubbles is to generate the back and forth dialogues museum goers have with one another whilst walking around the museum, but increasing the chances that users may talk to people from different sociocultural backgrounds to themselves. In cases where this occurs Bubbles would be facilitating direct intergroup contact. In this sense the Bubbles platform provides a space for potential direct intergroup contact between users from different backgrounds, only when those exploring the platform are from different social groups, as participants are encouraged speak to and see one another as if on a video chat call. The original aim of the

project was to pair students from different backgrounds and different schools to facilitate conversations while exploring the home in Bubbles.

However, technical problems were a common occurrence throughout the roll out of this intervention and affected the way in which the intervention was delivered. The Bubbles platform, when used to pair with other schools, was unable to run on several schools' networks and computer systems without crashing and having unmanageable glitches. This resulted in the direct contact aspect of the platform not being possible, however, the immersive indirect intergroup e-contact aspect of this intervention was still very much present. The set up differed across schools, with different schools having access to different equipment and numbers of pupils so the roll out of the evaluation could not be identical across schools. This meant there were some significant differences in how Bubbles was implemented practically. However, there were some crucial aspects of the programme that were consistent across schools. Figure 2 (see appendix) shows the exact ways in which the programme was implemented in each school, and the consistencies and inconsistencies in the intervention across schools.

This research argues that Bubbles provides a new immersive form of indirect e-contact (for participants who are not Jewish, otherwise it is indeed an immersive educational tool but the intergroup contact would not take place as there would not be contact between social groups but rather within a social group), in which participants can explore a Jewish family home learning about their traditions, cultural symbols, cultural similarities and differences as well as discrimination they have faced in the past. The aim of this dissertation is to evaluate the impact of such an intervention on a series of key outcomes: knowledge, empathy and social attitudes.

In this dissertation, I posit that the contact in this study (i.e. Bubbles) should be considered a new form of immersive historical indirect e-contact in which the individual explores the home and life of a member of a social group different to their own (i.e. a Jewish family living in Germany in the 1930s). Whilst exploring the platform the user also sees, from a unique perspective, the devastating consequences caused by the persecution of Jewish people by the Nazis. In this way, Bubbles is a form of immersive historical indirect e-contact.

When teaching young people about the lead up to the Holocaust, it is crucial to consider the learning context. 'Serious gaming' involves games being used for educational rather than amusement purposes and often involves objectives for users. 'Serious games' are a modern teaching technique that are gathering pace in their consideration as a teaching method across a range of fields (Breuer & Bente, 2010). The Bubbles platform aims to utilise opportunities new technology brings to teach about historical events in an engaging way. Bubbles has overlap with serious games in the sense that users can explore in their own time. It is important to establish whether the nature of the learning platform provides a serious space for learning rather than simply being a game in order to respect the seriousness of the topic being learnt about.

The impact of in-person art integrated interventions mentioned in the introduction, such as the study by Kisida, Goodwin and Bowen (2020), are useful to consider in relation to Bubbles. Bubbles is similar to these arts integration projects mentioned in the introduction as users have the freedom to explore their environment at their own pace, interact with objects in the house, interact with the educator, pose questions, and watch survivor testimonies whilst stepping into the shoes of the Jewish family from the past. There is also an element of a story line about Leo, the child whose family home participants are exploring, as well as the change

in the house after Kristallnacht which brings a sense of historical dramatization of real-life events; it is a different, more immersive way of learning compared to traditional textbook teaching methods.

Need for This Research

There is a great need to comprehensively evaluate interventions. Shockingly, since 2009, only 11% of published and unpublished studies experimentally tested the effects of prejudice-reduction interventions in real-world settings (Paluck, 2016). Specifically, there is a surprisingly small body of work evaluating educational outcomes of teaching to reduce anti-Jewish behaviours and attitudes (Andersson et al., 2021).

It is also crucial to continue to utilise new technology in educational settings, and combining the arts and humanities whilst doing so holds big potential for maximising students' and pupils' time, especially considering the high amount of pressure on school curricula in the current climate. Not only could this allow schools to effectively meet curriculum requirements, but it could be more effective for the students as they may be more inclined to learn through new technologies, partly as they are engaging but also as they are familiar to the students who may have played games using similar technologies.

The fact that there have been record high numbers of anti-Jewish hate incidents year on year in the UK (CST, 2024) creates an urgent need for research on interventions that could help improve social attitudes towards Jewish people. There is a particular need for research concerning interventions that target young people as participants: rather than fading away as

the population ages, some research has suggested that anti-Jewish attitudes are actually more prevalent among young people (Hersh & Royden, 2021).

It has been suggested that prejudice reduction interventions may have unexpected effects on the outlook of historically disadvantaged groups among participants, causing their perceptions of injustice and willingness to engage in collective action to reduce and their perceptions of social inequalities to decrease (Dixon et al., 2012). This could be to do with the negative evaluation of prejudice and highlights the importance of proper knowledge and understanding surrounding prejudice to be conveyed in prejudice reduction interventions. Therefore, it is particularly important for prejudice reduction interventions to be evaluated and to aim to understand how prejudice is perceived amongst participants following interventions.

The Current Research

This dissertation aims to evaluate a new, immersive educational indirect e-contact intervention, Bubbles. The research aims to establish the impact of the intervention, and the mechanisms driving this effect, on young people and emerging adults. Across three studies, the impact of Bubbles on empathy, knowledge and social attitudes will be examined. The studies will also explore the impact of this immersive educational tool, considering immersion and the indirect contact opportunities offered to participants that would otherwise be impossible as participants are placed in a historical setting virtually.

This research has theoretical implications regarding the relationship between historical learning and contemporary knowledge and understanding as well as the link

between historical empathy and contemporary empathy through moderated mediation analyses that previous research has called for. This research also adds to literature exploring whether increases in knowledge and empathy are linked to improvements in social attitudes.

There are practical implications of the current research. Firstly, this research provides insight into accessible forms of a potentially more effective historical education that could be extremely valuable to schools and students. Secondly, this research considers one potential way to exhibit Holocaust survivor testimonies utilising technology, this is particularly important as there are fewer Holocaust survivors still with us yet their stories and experiences must still be shared.

This research achieves these aims through three studies. In Study 1a quantitative methods are used to examine the impact of the intervention on empathy, knowledge and social attitudes of school pupils. Study 1b is also a quantitative study, examining the impact of the intervention among emerging adults (university students aged 18-25-year-olds). Study 1b is similar to study 1a in terms of the variables: the impact of the intervention on empathy, knowledge and social attitudes. Study 2 is a qualitative study that utilised reflexive thematic analysis to provide rich data on the impact of the intervention on participants' perspectives regarding the platform's impact on the ease of learning about the topic, whether the platform provided an insight to Jewish culture, whether the platform provided opportunity for intergroup contact as well as exploring the emotional response among participants. Thematic analysis was used to analyse themes in data collected through focus groups and interviews with pupils, students and teachers who took part in the intervention. The second study will build on the findings of the first study and be flexible in the sense that the analysis will be

data-driven allowing participants' experiences of the learning platform to be deeply considered.

Study 1a: Exploring the Impact of Bubbles on School Pupils' Social Attitudes, Historical Empathy, Historical Knowledge and Contemporary Knowledge.

Abstract

This study evaluated a historical education-based e-contact intervention utilising indirect contact in terms of its impact on reducing prejudice among school pupils (N = 121). Specifically, this study investigated the impact of the intervention on social attitudes, knowledge and empathy, compared with a control group who received no intervention. Analysis tested whether direct contact acted as a moderator on the impact of the intervention. Additional analysis involved testing historical knowledge as a mediator on the impact of the intervention on contemporary knowledge, and then direct contact as a moderator in this relationship. Results showed that the intervention did not have a significant impact on social attitudes. The mediation and moderated mediation analyses also did not have any significant results. The theoretical and practical implications of findings are discussed.

Aims of This Study

This study aims to add novel research to the field of intergroup contact theory in that it is the first evaluation of an immersive historical educational e-contact learning platform utilising moderated mediation analyses. This first study (Study 1a) focusses exclusively on young people, with school pupils from across the UK making up the 121 participants, in an attempt to help understand how Bubbles and other similar interventions could best be rolled out across schools, where there is great scope for interventions such as this one to have significant impact and reach. This study will explore the impact of Bubbles on social attitudes, historical knowledge, contemporary knowledge and historical empathy by comparing scores between an intervention and control group through a series of statistical analyses including t-tests, regression, mediation and moderated mediation.

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Hypotheses

In line with the aims of the intervention and informed by intergroup contact theory, this study tested the following hypotheses:

1) Participants in the intervention condition will have more positive social attitudes compared to participants in the control condition. The effect of the intervention will be stronger among those with lower direct contact.

2) Participants in the intervention condition will have higher historical empathy compared to participants in the control group. The positive relationship between intervention and historical empathy will be moderated by direct contact such that the positive effect of the intervention on historical empathy will be greater for those with low levels of direct contact.

3) Participants in the intervention condition will have higher historical knowledge and higher contemporary knowledge compared to participants in the control group. The positive relationship between intervention and contemporary knowledge will be mediated by heightened historical knowledge.

4) The mediation of the relationship between the intervention and contemporary knowledge by historical knowledge will be moderated by direct contact so that the positive relationship between intervention and historical knowledge will be stronger among those reporting low direct contact.

Method

The Intervention

Participants took part in the intervention in computer suites within their schools. They all logged on at the same time and then upon entry received a little information from the educator regarding the nature of the study. A dialogue to talk through had been provided to us from the educator working at the NHCM, this was to be delivered by the educator from the NHCM or, in situations where the educator couldn't be present, by the researcher. This included context and information about the house and family, for example the house being in Berlin in 1933, it belonging to a Jewish family with young children and the fact that the Nazis had control of the country. The experimental group then explored the Bubbles platform for 10 minutes. They had the opportunity to explore the room by using the arrows on the keyboard to move their avatar around, with their viewpoint changing as the avatar moved, as if they were the avatar within the platform. Participants were encouraged to explore all aspects of the learning platform, they were informed they could watch videos of the survivors' testimonies and could click on objects within the room such as the family's toys or the menorah to access an information box that told them more about the specific object they were looking at. Participants could communicate with one another, see one another through the webcams provided and speak to one another using the chat function or through the microphone in the webcams. Participants were provided with headphones to hear the survivor testimonies and also to hear each other should they wish to converse whilst exploring the platform. They would then receive information from the educator prior to the Kristallnacht change being triggered. Participants would have 5 minutes exploring the platform after the

Kristallnacht function had been triggered. The Kristallnacht function involved the screen briefly going black before the house coming back on the screen but this time it has been ransacked and destroyed as evidence of the persecution the family suffered. Immediately after finishing on the platform participants were asked to complete the survey on Qualtrics.

Participants

Schools were contacted by the NHCM and myself. Unfortunately, participant numbers were lower than expected. Although some schools were receptive, recruitment was a challenge. We speculate this was due to a combination of increased pressure on schools, including their need to keep up with the curriculum, especially after the COVID delay. There were also significant financial challenges for many families, schools and institutions across the UK during data generation, the economic hardship was brought about by the cost of living crisis. Although we initially aimed to generate data in more schools, we were able to travel to six schools whilst conducting the evaluation.

161 participants took part, recruited from 6 schools across London, Nottingham and Kent. One of the schools included was a Jewish school, to ensure this was an intergroup contact intervention we removed that school, as well as any Jewish participants, (40 participants) from analyses making the number of pupil participants 121. Of the 121 pupils included in the analyses 79 pupils were part of the experimental group and 42 were part of the control group (see Table 1). Block randomisation was used when assigning participants to a condition.

Table 1

Demographics of Participants in this Study

Demographic	Overall	Control	Experimental
		Gender	
Male	48 (40%)	12 (29%)	36 (46%)
Female	62 (51%)	26 (62%)	36 (46%)
Non-binary/ Gender fluid/ Agender	7 (6%)	1 (2%)	6 (8%)
Prefer not to say	4 (3%)	3 (7%)	1 (1%)
Age	M = 14.32, SD = 1.53	M = 13.93, SD = 0.93	M = 14.52, SD = 1.73
		Ethnicity	
White	77 (64%)	22 (52%)	55 (70%)
Mixed or multiple ethnic backgrounds	12 (10%)	4 (10%)	8 (10%)
Asian or Asian British	17 (14%)	8 (19%)	9 (11%)
Black, Black British, Caribbean or African	6 (5%)	3 (7%)	3 (4%)
Any other ethnic group	8 (7%)	4 (10%)	4 (5%)
Prefer not to say	1 (1%)	1 (2%)	-
		Religion	
Muslim	21 (17%)	11 (26%)	10 (6%)

Demographic	Overall	Control	Experimental
Hindu	1 (1%)	-	2 (1%)
Sikh	1 (1%)	1 (2%)	-
Buddhist	-	-	-
Christian	29 (24%)	12 (29%)	17 (21%)
No religion	62 (51%)	16 (38%)	46 (58%
Any other religion	-	-	-
Prefer not to say	7 (6%)	2 (5%)	5 (6%)

Note. This table shows a breakdown of the number (and percentages in brackets) of school pupil participants from different demographics.

Ethics

Informed consent was received from all participants, opt-in or opt-out letters for participants' parents to complete were used depending on the preference of each school. Letters were sent out in adequate time before the study, with at least two weeks' notice if opt-out forms were being used. The headteachers of the schools also gave their consent for the study to be conducted and all pupils were reminded that taking part was their choice and they could stop at any time. Confidentiality was important to this research throughout and this was communicated to the participants prior to them taking part in the study. Ethical approval from the University of Kent was secured before this study was conducted.

Design

Due to time constraints a pre-test was not administered in this study. Instead, this quantitative study consisted of controlled experiment with a post-test design. The survey responses of participants in the control group and the experimental group were compared to assess the impact of the intervention on the latter. The experimental group took part in the intervention and explored Bubbles before completing the survey while the control received no intervention. Classes of pupils were assigned to either the experimental or control group, by the researcher. Both groups answered the same questions in the survey.

Procedure

The experimental group took part in the intervention, while the control group, after having received the initial information about the study, did not receive the intervention and instead immediately completed the quantitative survey. All the questions included in the survey given to participants in the control group were also given to participants in the experimental group. Participants in the control group did not complete any focus groups or interviews.

The experimental and control condition took place in different classrooms. Depending on the number of classes taking part in each school, some classes had their teacher present in addition to the research team. Other classes had only their teacher present and a researcher would ‘float’ around one to two classes checking that the intervention and survey or control survey was being understood and running smoothly. A few schools had also made their IT specialist staff available and they would be on hand to help any students having technical difficulties.

Measures

Social Attitudes

Each participant completed 'The Contact Star', to assess participants social attitudes. Attitudes are considered to be judgements people make about objects, occurrences or other people. They are implicit or explicit beliefs that influence behaviour. 'The Contact Star' was developed jointly by the University of Kent and the Anne Frank Trust (Goodbun, 2015) to be used as a measure of the effectiveness of an intervention with similar goals as the one evaluated in this study. It asks participants to think about to what extent they would want to spend a lunchtime with people, whom they have never met, that are from a number of different groups. We adapted the measure to suit our study. Participants were asked about a total of 10 groups (British, Wealthy, Disabled, Muslim, Homeless, Teacher, Jewish, Christian, Refugee and German). Participants would indicate their response on a scale from 1 to 5, with 1 indicating they would 'not at all like to' spend lunch with an individual from the group in question, and 5 indicating they would 'very much like to'. A mean score of participants responses to spending their lunchtime with Jewish, Muslim and Christian people was calculated to create a score for participants' social attitudes: (Cronbach's alpha = 0.88, N = 119). These scores were grouped together to establish an overview of whether the intervention helped reduce participants' general levels of prejudice towards people of faith.

Historical knowledge

Historical knowledge was measured amongst pupils using an item adapted from Jedwab (2010), which used the ACS-Leger survey which examined the extent to which the

Canadian population had heard about or knew about the Holocaust. The item was previously used to generate data to shed light on the relationship between Holocaust knowledge and attitudes towards diversity. The adapted survey item included to measure historical knowledge was "I have good knowledge of Nazi era Germany in 1938". Participants responded on a scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). As there was only one item included no reliability score was computed.

Contemporary Knowledge

Contemporary knowledge was measured using the items; "I know a lot about prejudice and discrimination and the harm they can cause" which was adapted from the Anne Frank Trust evaluation and "I understand what anti-Jewish racism is" which was adapted from the Cowan and Maitles study (2007). These items also ranged from 1 (Strongly disagree) to 5 (Strongly agree). The original item was phrased 'Do you know what Anti-Semitism is?', the wording was changed to bring the item in line with terminology used by the NHCM. The original item was a yes/no question, we increased the sensitivity of the item by having five response items; ranging 1 = Strongly disagree to 5 = Strongly agree. A mean score from these items was calculated. As there were two measures included, the Pearson correlation coefficient was used to assess the reliability: the two items had a moderate correlation ($r = .37$, $p < .05$).

Historical Empathy

Historical empathy was measured with two items being adapted from the Scale of Ethnocultural Empathy (Wang et al., 2003). The scale of Ethnocultural Empathy is a self-

report instrument that measures empathy toward people of racial and ethnic backgrounds. Participants were asked to what extent they agree with "It is easy for me to see things from the point of view of a Jewish person in 1938" and "I understand the way a Jewish person from Germany would have felt during Nazi rule". The initial study by Wang and colleagues was particularly useful in informing our survey as they found high internal consistency and test-retest reliability estimates across three studies on the Scale of Ethnocultural Empathy. These items were given to students and pupils. A mean score of these items was calculated to give each participant a historical empathy score. As there were two measures included, the Pearson correlation coefficient was used to assess the reliability: the two items had a strong correlation ($r = .52$, $p < .05$).

Direct Contact

Direct contact was measured by asking participants "This year how many of your friends are from a different faith or ethnic group to you?". The response scale was 1 (as in one friend is from a different faith or ethnic group) to 5 (as in five friends are from a different faith or ethnic group). Although this is not a measure exclusively of contact with Jewish people, having direct contact with people from different faiths to themselves is expected to encourage people to be more open and positive about interacting with people from different faiths, as described in research on the secondary transfer effect which outlines that contact with a primary outgroup reduces prejudice toward secondary groups even if the secondary outgroup are not directly involved in the contact (Tausch et al., 2010). This is also in line with the outcome variable being a combination of participants' willingness to spend a lunchtime with people from a different faith to themselves. As there was only one item used to measure direct contact, no reliability score was computed.

Analysis Strategy

This study utilised t-tests to assess whether means of the outcome variables varied significantly between the control group and the intervention group. Correlations were explored to uncover the relationship between the key variables. Regression analysis was used to test for moderated mediation effects. Mediation analyses and moderated mediation analyses were conducted in an attempt to explore the ways in which the intervention was effective.

Results

Initial Exploration of the Data

Correlation analyses were conducted to provide an overview of the variables. The table below (Table 2) shows a correlation matrix for variables included in this study, along with mean scores for variables to help begin painting a picture of the data prior to analysis directly relating to the stated hypotheses.

Table 2

Zero Order Correlations Among Variables for School Pupils

Variable	M	SD	1.	2.	3.	4.	5.	6.
1. Intervention-control	1.65	0.48	-					
2. Direct contact	2.79	0.95	.27**	-				
3. Social attitudes	3.48	0.83	.08	.06	-			
4. Historical empathy	3.25	0.94	.07	-.03	.10	-		
5. Contemporary knowledge	4.04	0.79	.11	.14	.19*	.31**	-	
6. Historical knowledge	3.81	0.91	-.01	.09	.15	.37***	.57***	-

Note. Direct contact may range from 1 to 5; attitudes to outgroup may range from 1 to 5; Contemporary and historical empathy may range from 1 to 5; contemporary and historical knowledge may range from 1 to 5. * $p < .05$; ** $p < .01$; *** $p < .001$. M is the Mean and SD is the standard deviation.

This table shows that the mean scores for both contemporary knowledge and historical knowledge are reasonably high. This shows there is potential that there was a ceiling effect problem with these measures.

T-tests were conducted to test the hypotheses that participants in the intervention group will have more positive social attitudes (H1) and higher scores for historical empathy (H2), historical knowledge (H3) and contemporary knowledge (H3) compared to the control condition.

Table 3

Mean Differences Between Control and Experimental Group for School Pupils (standard deviations are reported in parentheses)

Variable	Control	Experimental	t-test	df
Social attitude	3.39 (0.78)	3.53 (0.86)	-0.93	89.86
Historical empathy	3.16 (0.93)	3.29 (0.95)	-0.74	140.35
Contemporary knowledge	4.23 (0.86)	4.30 (0.74)	-1.12	142.87
Historical knowledge	3.83 (0.95)	3.81 (0.9)	0.13	78.56
Direct contact	3.14 (1.03)	2.6 (0.86)	2.90**	72.24

Note. The scale ranges from 1 to 5 for all measures.

*p <.05; **p <.01; ***p <.001.

These t-tests revealed (see Table 3) that there were no significant differences in the means of the outcome variables between the control and intervention groups. There was however a significant difference between the levels of direct contact among participants in

the control and intervention group, this was a self-reported score, and the implications of this significant difference are explored in the discussion section.

Regression analyses were conducted to test the hypothesis that participants in the intervention condition will have more positive social attitudes compared with the control group, with the effect being stronger among those who had reported lower levels of direct contact (H1). Condition (intervention vs control) and level of direct contact were regressed on social attitudes. Level of direct contact and social attitudes were entered as continuous and ordinal variables, these variables were also centred within the regression. An interaction analysis was also conducted. As the hypothesis predicted direct contact to be a moderator, interactions were examined further using simple slopes analysis, regardless of whether the initial interaction was significant or not. These tests revealed that there was no significant main effect of condition, β= .16, t = 1.02, p = .311, R^2 = .013, F(2,117) = 0.746, p =.476, on pupils' social attitudes. There was also no significant main effect of direct contact, β= .08, t = 0.93, p = .355, on social attitudes. Simple slopes analysis also found no significant interactions between condition and direct contact on social attitudes at 1 standard deviation below the mean, the mean and 1 standard deviation above the mean of direct contact.

A regression analysis was again utilised to test the hypothesis that participants in the intervention condition will have higher historical empathy compared to participants in the control condition, with direct contact again acting as a moderator in this relationship (H2). Findings revealed there was no significant main effect of condition β = .13, t = 0.67, p = .505 F(2,114) = .28, p = .754 on historical empathy and there was no significant main effect of direct contact β = -.01, t = -0.11, p = .505, on historical empathy. There was also no significant interaction between condition and direct contact on historical empathy.

Regression and mediation analyses were conducted to test the hypothesis that participants in the intervention condition will have higher historical knowledge and higher contemporary knowledge (H3) compared to the control condition, with historical knowledge acting as a mediator to contemporary knowledge. These regression analyses revealed that there was no significant main effect of condition, β = .29, t = 1.83, p = .070, R^2 = .05, $F(2,114) = 2.89$, p = .060, on pupils' contemporary knowledge nor of condition, β = .03, t = 0.18 p = .855, R^2 = .01, $F(2,114) = 0.52$, p =.598, on pupils' historical knowledge. The mediation analyses revealed the hypothesis was not supported and no mediation took place. Taking part in Bubbles did not significantly predict contemporary knowledge (the direct effects c') β = .19 (p = .128). Taking part in Bubbles did not significantly predict historical knowledge scores (a path) β = -.02, p = .891. Historical knowledge did significantly predict contemporary knowledge controlling for Condition (b path) β = .49, p <.001. The total effect (c path) of the intervention on contemporary knowledge, including both direct and indirect effects was not significant (β = .18, p = .239). The indirect (ab path) of the intervention on contemporary knowledge through historical knowledge was not significant (β = -.01, 95% CI (-0.17, 0.19)). The lower and upper bounds did not exclude zero.

Next a moderated mediation analysis was conducted to test the hypothesis that the mediation relationship between the intervention and contemporary knowledge through historical knowledge will be moderated by direct contact (H4). Condition (control vs intervention) was entered as a predictor, historical knowledge entered as a mediator, contemporary knowledge the outcome and direct contact the moderator. The moderator was placed in-between the predictor and the mediator. This moderated mediation utilised process model 7.

The mediation model produced an Average Causal Mediation Effect (ACME) = 0.019, 95% CI [-0.18, 0.26], p = .933. The ACME was a test of the joint mediation path. The moderated mediation was also not significant with the difference between the ACME at 1 S.D below the moderator and 1 S.D above the moderator = 0.153, 95% CI [-0.21, 0.61], p = .404. There was also no significant direct effect in the moderated mediation model, the difference between the average direct effects (ADE) was 0.198, 95% CI [-0.72, 0.30], p = .444. These results revealed no moderated mediation took place.

Discussion

In this quantitative study, an evaluation analysing the impact of an intervention was conducted with interest in historical knowledge, contemporary knowledge, historical empathy and social attitudes among school pupils. This evaluation aimed to establish the impact of the intervention on historical knowledge, contemporary knowledge, historical empathy and social attitudes by comparing scores from the control and intervention group for those variables. Further than that, the study aimed to add to research suggesting that indirect contact interventions are most effective among participants with low levels of direct contact by considering the potential moderating effect direct contact had on any increases in historical knowledge, contemporary knowledge, historical empathy and social attitudes. Finally, mediation and then moderated mediation analyses were conducted with the aim of exploring whether potential increases in contemporary knowledge were mediated by increases in historical knowledge, and whether this was moderated by direct contact.

Analyses of the data revealed that there were no significant differences in mean scores between the control group and intervention for the variables social attitudes, historical empathy, contemporary knowledge and historical knowledge.

Results of the regression analyses that explored whether pupils in the intervention group displayed more positive social attitudes, and whether this effect would be greater among pupils with lower levels of high-quality direct contact with an outgroup, found that the intervention did not result in pupils in the intervention displaying significantly higher social attitudes. The regression model also showed how there was not a significant effect of the levels of high-quality direct contact pupils had at the time of the intervention on their social attitudes. An interaction analysis revealed there was no significant interaction between taking part in the intervention and the level of high-quality direct contact participants reported on their social attitudes. These findings were not consistent with the hypothesis, which had predicted the intervention group would display more positive social attitudes, with there being a greater effect among participants with low-levels of high-quality direct contact.

Although the intervention did not result in an improvement in social attitudes towards different religious groups, research has suggested that if prejudice is perceived as malleable rather than fixed during this critical developmental window young people are more likely to build positive interracial relations as they grow up (Apfelbaum, Dweck & Eberhardt, 2022). This suggests that methodological limitations may have been a reason for the lack of significant results in terms of the impact of the intervention on social attitudes.

Analyses of the data comparing the intervention group to the control group also showed that taking part in the intervention did not have a significant impact on historical

empathy, and again there was no significant effect of the levels of high-quality direct contact reported by participants on their levels of historical empathy. These findings were not in line with the previous research nor the hypothesis that had predicted the intervention group to display higher levels of historical empathy than the control group.

One explanation for the intervention having a lack of a positive impact on historical empathy is that pupils were not successfully moved through Levesque's (2008) three-stage model of historical empathy: imagining, contextualising and judging. Although the time exploring Bubbles gave pupils ample time to imagine, picture and consider a lively representation of the historical setting they were placed in, it could be argued more could have been done to encourage pupils to raise questions about this setting, which is an important part of the imagining stage of developing historical empathy. As the Bubbles platform was also very visual it could be argued that pupils were instantly presented with the historical setting they were told to explore and learn about, whether this inhibited participants' opportunity to imagine the historical situation and draw on prior knowledge before loading up the platform should be considered in similar interventions in the future.

Indeed, in prior research the imagining stage of Levesque's model for inducing historical empathy has involved encouraging participants to ask themselves 'What do I know about this period?' and 'What comes to my mind when imagining this period' (Wilschut & Schiphorst, 2019). It is quite possible that Bubbles did encourage these questions among participants and it would be useful for future research to establish whether or not this is the case in similar interventions. The main shortcoming of Bubbles in fulfilling the stages of increasing historical empathy through the lens of Levesque's model would likely be a lack of 'judging' among participants. Participants in the intervention group were taken on a journey

through Jewish life in Berlin before and after Kristallnacht, however when encouraged to discuss what they had learnt with one another or the educator few participants engaged. This meant that only a small number of participants would have actively voiced their opinions on what their perceptions of the historical topic were, what differences there are between life then and now, and what their judgement of the conduct of people from that historical time would have been, all of which were considered questions that operationalized this stage of Levesque's process in previous research (Wilschut & Schiphorst, 2019). It is possible that the lack of 'judging' among participants underlies the non-significant findings when it comes to the impact of the intervention on pupils' historical empathy.

Regression analyses conducted on the data revealed that taking part in the intervention did not have a significant impact on pupils' historical knowledge when comparing participants from the intervention to the control group, the same can be said for the level of high-quality direct contact as that also did not have any significant effect on historical knowledge. These results were contrary to the hypothesis, it was expected that the intervention group would show increased historical knowledge compared to the control group. In line with the debate around how best to increase historical understanding it could be suggested that pupils compared their own experiences to the historical experiences of Jewish people in 1930s Berlin that they were learning about, thus creating a 'mind-numbing presentism that reads the present onto the past' (Wineburg, 1999: p 493). However, opposing research on interventions aiming to increase historical knowledge and understanding has suggested that participants comparing their own lived experiences to the historical ones they are learning about can positively impact historical knowledge (Endacott, 2014).

Analyses of the data showed that taking part in the intervention had no significant impact on pupils' contemporary knowledge, however having more high-quality direct contact with the outgroup was significantly related to pupils displaying higher levels of contemporary knowledge. Again, these findings were not in line with the hypothesis nor previous research, which had predicted that pupils in the intervention group would display higher levels of contemporary knowledge when compared to the control group.

Results from the mediation analysis exploring whether the intervention impacted contemporary knowledge through historical knowledge acting as a mediator showed only that an increase in historical knowledge was significantly associated with an increase in contemporary knowledge, and contrary to the hypothesis no mediation took place. The moderated mediation explored any potential moderating effect direct contact had on the impact of the intervention on pupils' contemporary knowledge through historical knowledge, it can be concluded, contrary to the hypothesis, that no significant moderated mediation took place within this data.

This quantitative study did not establish that the intervention had any significant impact on the variables explored. This could have been because Holocaust education often has complex outcomes that can differ between participants partly depending on the levels of Holocaust education participants had experienced prior to the intervention. In terms of theoretical implications, the findings of this study should by no means take away from the wealth of research that has outlined the positive impact of indirect contact interventions, nor should it discourage future research from considering direct contact a potential moderator or aiming to establish potential mediators of indirect contact interventions.

This study could have done more to increase confidence in any potential findings by addressing methodological limitations. More items to measure constructs could have been included. Crucially, the impact on attitudes towards exclusively Jewish people could have been explored rather than grouping together Christians, Muslims and Jews in the contact star as this is what the intervention focussed on. Importantly, Christian and Muslim participants were not removed from the analysis which may have partially subtracted the intergroup element of that part of analyses. Including a pre-post-test survey would have also been useful. Time constraints meant these limitations were unfortunately present in the current research, but future research should strive to include these improvements.

A limitation of this study was some variability in demographics between the control and intervention group for example level of direct contact reported. There were significantly higher levels of direct contact reported among the intervention group compared to the control group. This could be an example of the social desirability effect and solutions could have involved a pre-test survey or utilising Simpson's measure of diversity rather than the self-report measure utilised. A social network measure could also have been more effective in measuring direct contact here as participants would have listed out their friends and taken more time over this measure. The practicalities of completing the research in collaboration with a charity and in schools meant unfortunately this could not be addressed. If we had had more time and had recruited more schools then analyses could have controlled for demographics to explore whether the impact of the intervention differed depending on the demographics of the participants.

The rollout of the intervention was slightly different across every school, largely due to technical difficulties, and the difficulties that come with completing applied research in

real-world settings. This could well have impacted results in a way not predicted or accounted for in analyses. In an attempt to address these concerns, it was decided that the next rollout of the study should be conducted in university labs with university student participants to allow for a more controlled and consistent roll out of the intervention. A further weakness is that the control group did not have a task to do prior to completing their survey, ideally there would have been a similar interactive platform, just without the intergroup and historical education aspect, for them to explore. A power analysis could have been useful as it is possible this study was underpowered. Finally, historical knowledge could have been considered a manipulation check, the results of which could have helped point to why there was a lack of significant results or alternatively could have increased confidence in any significant results.

A focus on Levesque's model for increasing historical empathy (2008) should be included in future studies aiming to evaluate interventions in terms of their impact on historical empathy.

Although the analyses in this study did not yield any significant findings, similar analyses should indeed be explored in future research as there is potential to find mechanisms and desired outcomes from interventions that play pivotal roles in the intervention's success. For example, research that conducted a mediation analysis on a similar extended contact intervention found that intergroup empathy was crucial to improving outgroup attitudes and stereotypes (Vezzali et al., 2017). Indeed, that research called for future research to "examine more closely whether other affective processes act as mediators of extended contact" (p. 27).

Further research exploring the extent to which participants map their lived experiences onto the historical lived experiences they are learning about, and whether participants who do this more or less display greater increases in historical knowledge would be useful.

This study emphasizes the importance of challenging prejudice through interventions targeted at young people in the hope younger people perceive prejudice as malleable rather than fixed. Indeed, the present intervention may have had an impact on participants perceptions of the malleability of prejudice and this would be an interesting inquiry for future research.

Study 1B: Exploring the Impact of the Intervention on Young Adults' Social Attitudes, Historical Empathy, Contemporary Empathy, Historical Knowledge and Contemporary Knowledge.

Abstract

This study evaluated a historical education-based e-contact intervention utilising indirect contact in terms of its impact on reducing prejudice among young adults (N = 145). Specifically, this study investigated the impact of the intervention on social attitudes, knowledge and empathy. Analysis tested whether direct contact acted as a moderator on the impact of the intervention. Additional analysis involved testing historical knowledge as a mediator on the impact of the intervention on contemporary knowledge, and then direct contact as a moderator in this relationship. Similarly, analysis tested historical empathy as a mediator on the impact of the intervention on contemporary empathy, and then direct contact as a moderator in this relationship. Results showed that the intervention only improved social attitudes for participants who reported low levels of direct contact. The mediation and moderated mediation analyses did not have any significant results. The theoretical and practical implications of findings are discussed.

Introduction

This study was carried out in the months that followed study 1a, in light of the findings, and considering the research linking the impact of interventions on increases in empathy to improved social attitudes, contemporary empathy was added in as a measure. This study was also conducted in university labs, allowing for a more consistent roll out of the intervention. Otherwise this study was informed by the same theory and followed the same practical steps as study 1a.

Aims of This Study

This study aims to add to the limited research exploring the impact of immersive historical educational e-contact interventions. This study builds on study 1a by rolling out the intervention in a more controlled manner, this was possible due to the nature of conducting research in university labs as opposed to in schools across the UK. This study will explore the impact of Bubbles among young adults (N = 121) to help add to research that compares prejudice reduction interventions effectiveness across different age groups. This study will explore the impact of Bubbles on social attitudes, historical knowledge, contemporary knowledge, historical empathy and, in an improvement compared to study 1a, contemporary empathy. Scores from the control and intervention groups will be compared through t-tests, regression, mediation and moderated meditation analyses in an attempt to understand any underlying mechanisms and driving forces behind the impact of Bubbles

Hypotheses

1) Participants in the intervention condition will have more positive intergroup attitudes compared to participants in the control condition. The effect of the intervention will be stronger among those with lower direct contact.

2) Participants in the intervention condition will have higher historical empathy and higher contemporary empathy compared to participants in the control group. The positive relationship between intervention and contemporary empathy will be mediated by heightened historical empathy.

3) The effect of the intervention will be stronger among participants reporting low levels of direct contact. The mediation of the relationship between the intervention and contemporary empathy by historical empathy will be moderated by direct contact so that the positive relationship between intervention and historical empathy will be stronger among those reporting low direct contact.

4) Participants in the intervention condition will have higher historical knowledge and higher contemporary knowledge compared to participants in the control group. The positive relationship between intervention and contemporary knowledge will be mediated by heightened historical knowledge.

5) The effect of the intervention will be stronger among participants reporting low levels of direct contact. The mediation of the relationship between the intervention and contemporary knowledge by historical knowledge will be moderated by direct contact so

that the positive relationship between intervention and historical knowledge will be stronger among those reporting low direct contact.

Method

Participants

This study was conducted at the University of Kent in the Psychology college. Once ethical approval for the study was obtained, an advert for the study was posted on the Research Participation Scheme (RPS) website. First and second psychology year students are required to obtain a certain number of RPS credits each term. Non-psychology students were offered £5 compensation for taking part in the study.

161 of the participants were students. Some students were significantly older than others. We therefore removed 16 older students and only included 'emerging adults' (18-25-year olds) in the analyses, meaning a total of 145 students were included. Older participants were not included in the analysis of this study as the focus was on the impact of the intervention on social attitudes, and research has suggested social attitudes are more changeable among young people (Apfelbaum, Dweck & Eberhardt, 2022). There were also no Jewish students included in the analysis to ensure this was an intergroup contact intervention. Of the 145 students included in analyses, 67 students were part of the experimental (intervention) group and 78 were part of the control group. Block randomisation was used when assigning participants to a condition. Table 4, shown below, shows a breakdown of demographics between the control and intervention groups.

Table 4

Demographics of Participants in Study 1B

Demographic	Overall	Control	Experimental
		Gender	
Male	33 (23%)	13 (17%)	20 (30%)
Female	104 (72%)	61 (78%)	43 (64%)
Non-binary/ Gender fluid/ Agender	5 (3%)	2 (3%)	3 (4%)
Prefer not to say	2 (3%)	2 (3%)	1 (1%)
Age	M = 20.00 SD = 1.58	M = 20.23 SD = 1.58	M = 19.73 SD = 1.34
		Ethnicity	
White	86 (59%)	48 (62%)	38 (57%)
Mixed or multiple ethnic backgrounds	12 (8%)	9 (12%)	3 (4%)
Asian or Asian British	23 (16%)	13 (17%)	10 (15%)
Black, Black British, Caribbean or African	22 (15%)	8 (10%)	14 (21%)
Any other ethnic group	2 (1%)	-	2 (3%)
		Religion	

Muslim	6 (4%)	2 (3%)	4 (6%)
Hindu	3 (2%)	3 (4%)	-
Sikh	1 (1%)	-	1 (1%)
Buddhist	4 (3%)	3 (4%)	1 (1%)
Christian	47 (32%)	27 (35%)	20 (30%)
No religion	71 (49%)	38 (49%)	33 (49%)
Any other religion	2 (1%)	-	2 (3%)
Prefer not to say	11 (8%)	5 (6%)	6 (9%)

Ethics

Informed consent was received from all participants before they started taking part in the study. Participants were informed that they could stop taking part in this study at any time. Confidentiality was important to this research throughout and this was communicated to the participants prior to them taking part in the study. Ethical approval from the University of Kent was secured before this study was conducted.

Design

Due to time constraints a pre-test was not administered in this study. Instead, this quantitative study consisted of controlled experiment with a post-test design. The survey responses of participants in the control group and the experimental group were compared to assess the impact of the intervention on the latter. The experimental group took part in the

intervention and explored Bubbles before completing the survey while the control received no intervention. Students were assigned to either the experimental or control group, by the researcher. Both groups answered the same questions in the survey.

Procedure

The experimental group took part in the intervention. The study was run so there were groups of students completing the intervention and survey and groups of students completing only the control survey. All the questions included in the survey given to participants in the control group were also given to participants in the experimental group. Participants in the control group did not complete any focus groups or interviews.

Whether in the experimental group or control group, participants were given the basic information for using the PC before being directed to their own individual booths in the Psychology labs, from which they could communicate with one another through either their microphone or the chat function. As mentioned the intervention group received information about how to access, operate and explore Bubbles.

The Intervention

The intervention was the same as for study 1a with participants exploring the Jewish family home set in 1933 for 10-15 minutes, having the freedom to interact with objects they were interested in, to access an information panel about them and watch survivor testimonies prior to the Kristallnacht function being triggered. Participants then had 5 minutes to explore the house again and see how the persecution of Jews by the Nazis impacted the family home

participants had become familiar with. Participants completed a survey immediately after completing the intervention.

Measures

All the measures were the same as Study 1a, with the addition of contemporary empathy. The reliability scores were calculated using either Pearson's correlation coefficient or Cronbach's alpha depending on whether there two or three items included respectively. The items included measuring historical empathy had strong correlation (r = 0.68, $p < .05$), the items included measuring contemporary knowledge had a moderate correlation (r = 0.36, $p < .05$) and the items included measuring social attitudes had a Cronbach's alpha reliability score of a = 0.89, N = 145.

Contemporary Empathy

Contemporary empathy was measured by asking participants to what extent they agreed or disagreed with three items (the response scale was 1-5 with 1 = strongly disagree and 5 = strongly agree). One item was adapted from the Toronto Empathy Questionnaire; "It upsets me to see people experience prejudice and discrimination" (Spring et al., 2009). An additional item was adapted from another study: "When I see a victim of prejudice, I try to put myself in their shoes to consider how it feels" (Kisida, Goodwin & Bowen, 2020). An additional item was formulated by the research team: "When someone is excluded from a group because others think they don't belong it upsets me". The mean of these items was calculated to create a composite score for each participant's contemporary empathy. Cronbach's alpha was calculated as a reliability score for these items: a = 0.66, N = 145.

Analysis Strategy

This study employed a similar analysis strategy to study 1a: t-tests were utilised to assess whether means of the outcome variables varied significantly between the control group and the intervention group. Correlations were explored in an attempt to provide a full picture of the data. Mediation analyses and moderated mediation analyses were conducted in an attempt to explore the ways in which the intervention was effective.

Results

Initial Exploration of the Data

Correlation analyses were conducted to provide an overview of the variables. The table below (Table 5) shows a correlation matrix for variables included in this study, along with mean scores for variables to help begin painting a picture of the data prior to analysis directly relating to the stated hypotheses.

Table 5

Zero order correlations among variables (students)

Variable	M	SD	1.	2.	3.	4.	5.	6.	7.
1. Condition (control – intervention)	1.46	0.5	-						

2. Direct contact	2.95	0.96	-.03	-					
3. Social attitudes	3.53	0.77	.16	-.09	-				
4. Contemporary empathy	4.46	0.46	-.14	.16	.20*	-			
5. Historical empathy	2.9	1.11	.05	.10	.12	.34***	-		
6. Contemporary knowledge	4.27	0.65	.05	.08	.19*	.40***	.32***	-	
7. Historical knowledge	3.74	0.94	-.07	.07	.08	.29***	.35***	.44***	-

Note. The scale of all variables was 1-5, apart from Condition for which 1= control and 2 = experimental. * $p < .05$; ** $p < .01$; *** $p < .001$. M stands for mean and SD stands for standard deviation.

The above table (Table 5) shows that mean scores for contemporary empathy, historical knowledge and contemporary knowledge were high and potentially pointed to a ceiling effect issue with these items.

T-tests were conducted to tests the hypotheses that participants in the control group will have more positive social attitudes (H1), higher historical empathy (H2), higher

contemporary empathy (H2), higher historical knowledge (H4) and higher contemporary knowledge (H4) compared to the control condition.

Table 6

Mean scores for control and experimental group for students (standard deviations are reported in parentheses)

Variable	Control	Experimental	t-test	df
Social attitude	3.42 (0.65)	3.66 (0.88)	-1.86	119.99
Contemporary empathy	4.52 (0.45)	4.39 (0.47)	1.73	137.45
Historical empathy	2.85 (1.12)	2.96 (1.1)	-0.60	140.35
Contemporary knowledge	4.24 (0.68)	4.3 (0.6)	-0.57	142.87
Historical knowledge	3.81 (0.93)	3.67 (0.96)	0.86	138.12
Direct contact	2.97 (0.95)	2.92 (0.97)	0.30	138.75

Note. The scale ranges from 1 to 5 for all measures.

*p <.05; **p <.01; ***p <.001.

These t-tests revealed (see Table 6) that were no significant differences in the means of the outcome variables between the control and intervention groups. The scores among both the control and intervention groups for contemporary empathy and contemporary knowledge are close to the maximum possible scores, implications of these findings are discussed.

Regression analyses were conducted to test the hypothesis that participants in the intervention condition will have more positive social attitudes compared with the control group, with the effect being stronger among those who had reported lower levels of direct contact (H1). Level of direct contact and social attitudes were entered as continuous and ordinal variables, these variables were also centred within the regression in line with Aiken and West (1991). Interaction analyses were conducted and interactions were examined further using simple slopes analysis. Findings revealed that there was not a significant main effect of condition, $\beta = .24$, $t = 1.88$, $p = .063$, $R^2 = .03$, $F(2,142) = 2.31$, $p = .103$, nor direct contact, $\beta = -.07$, $t = -1.00$, $p = .317$, on student's social attitudes. There was no significant interaction between condition and direct contact, $\beta = -.17$, $t = -1.25$, $p = .212$.

As the hypothesis was directional (H1) in a prediction for interaction, simple slopes were run even though the main interaction analysis was not significant. Simple slopes were calculated to indicate the relationship between condition and direct contact at 1 standard deviation above and below the mean level of direct contact for the sample (Aiken & West, 1991). Simple slope analysis showed that the positive slope between condition and social attitudes was significant for students with lower levels of direct contact ($t = 2.22$, $p < .05$), but not for students with a medium level of direct contact ($t = 1.88$, $p = .063$) and a high level of direct contact ($t = .44$, $p = .662$) (see Appendix, Figure 1). These findings show that the indirect contact intervention was only effective in promoting more positive social attitudes when students had low rather than medium or high levels of direct contact.

Regression and mediation analyses were utilised to test the hypothesis that participants in the intervention condition will have higher contemporary and historical empathy compared to participants in the control condition, with historical empathy being

expected to act as a mediator in this relationship (H2). Findings revealed no significant main effect of condition, β = -.13, t = -1.70, p = .091, R^2 = .04, F(2,142) = 3.32, p <.05, on students' contemporary empathy, nor of condition, β = .12, t = 0.63, p = .532, R^2 = .01, F(2,142) = 0.91, p = .403, on students' historical empathy. Contrary to the hypothesis, students who were in the experimental condition did not show significantly higher contemporary empathy nor historical empathy. The mediation analysis revealed that the effect of the intervention on students' contemporary empathy was not mediated by historical empathy. Taking part in Bubbles did seem to significantly predict contemporary empathy (the direct effects c') β = -.15 (p < .05). However, taking part in Bubbles did not significantly predict historical empathy scores (a path) β = .11, p = .553. Historical empathy did significantly predict contemporary empathy controlling for Condition (b path) β = .15, p <.001. The total effect (c path) of the intervention on contemporary empathy, including both direct and indirect effects was only marginally significant (β = -.13, p = .085). The indirect (ab path) of the intervention on contemporary empathy through historical empathy was not significant (β = .02, 95% CI [-0.04, 0.08]). The lower and upper bounds did not exclude zero. The results show that the hypothesis was not supported and no mediation took place.

Next a moderated mediation analysis was conducted to test the hypothesis that the mediation relationship between the intervention and contemporary empathy through historical empathy will be moderated by direct contact (H3). Moderated mediation analysis was conducted with condition a predictor, contemporary empathy the outcome variable, historical empathy the mediator and direct contact the moderator. This moderated mediation utilised process model 7.

The mediation model produced an Average Causal Mediation Effect (ACME) = 0.015, 95% CI [-0.04,0.07], p = .548. The ACME was a test of the joint mediation path. The moderated mediation was also not significant with difference between the ACME at 1 S.D above the moderator and 1 S.D below the moderator = 0.017, 95% CI [-0.08, 0.12], p = .72. There was also no significant direct effect in the moderated mediation model, the difference between the average direct effects (ADE) was = 0.015, 95% CI [-0.26, 0.24], p = .86. These results revealed no moderated mediation took place.

Further regression analyses were conducted to test the hypothesis that participants in the intervention condition will have higher historical knowledge and contemporary knowledge compared to those in the control condition, with historical knowledge acting as a mediator in this relationship (H4). Findings revealed no significant main effect of condition, β = -.13, t = -0.84, p = .400, R^2 = .01, F(2,142) = .72, p = .490, on students' historical knowledge, nor condition, β = .06, t = 0.59, p =.555, R^2 = .01, F(2,142) = .60, p =.551, on students' contemporary knowledge. Contrary to the hypothesis students who explored Bubbles did not have significantly higher historical or contemporary knowledge than students in the control group.

The mediation analysis testing H4 found that the impact of the intervention on contemporary knowledge was not mediated by historical knowledge. Taking part in Bubbles did not significantly predict contemporary knowledge (the direct effects c') β = .10 (p = .292). Taking part in Bubbles did not significantly predict historical knowledge scores (a path) β = -.14, p = .387. Historical knowledge did significantly predict contemporary knowledge controlling for condition (b path) β = .30, p <.001. The total effect (c path) of the intervention on contemporary knowledge, including both direct and indirect effects was not

significant (β = .06, *p* = .570). The indirect (ab path) of the intervention on contemporary knowledge through historical knowledge was not significant (β = -.04, 95% CI (-0.14, 0.06)). The lower and upper bounds did not exclude zero. The results show that the hypothesis was not supported and no mediation took place.

Another moderated mediation analysis was conducted to test the hypothesis that the mediation model, specifically condition (intervention vs control) impacting contemporary knowledge through historical knowledge, will be moderated by direct contact (H5). The hypothesized moderated mediation model was tested in a single model using a bootstrapping approach to assess the indirect effects at differing levels of the moderator. Condition was the predictor variable, historical knowledge the mediator, the outcome variable was contemporary knowledge and direct contact was the proposed moderator. The moderator was placed between condition and the mediator. This moderated mediation utilised process model 7.

The mediation model produced an Average Causal Mediation Effect (ACME) = -0.42, 95% CI [-0.13,0.24], *p* = .86. The ACME was a test of the joint mediation path. The moderated mediation was also not significant with difference between the ACME at 1 S.D below the moderator and 1 S.D above the moderator = -0.077, 95% CI [-0.28, 0.10], *p* = .56. There was also no significant direct effect in the moderated mediation model, the difference between the average direct effects (ADE) was = 0.123, 95% CI [-0.22, 0.50], *p* = .44. These results revealed no moderated mediation took place.

Discussion

In this quantitative study, the impact of an online historical learning intervention involving indirect contact was explored with the aims of testing if and how the intervention impacted knowledge (historical and contemporary), empathy (historical and contemporary) and social attitudes among young adults. This study also explored whether young adults' reported levels of high-quality direct contact acted as a moderator on the impact of the intervention on the stated variables. The results suggested that the intervention only had a significant impact on participants' social attitudes when they reported low levels of direct contact, this finding is consistent with previous research. Results suggested that this intervention did not significantly impact knowledge or empathy. Theoretical implications and methodological limitations are discussed below.

Analysis of the data revealed that there were no significant differences in mean scores between the control group and intervention for the variables social attitudes, historical empathy, contemporary knowledge and historical knowledge. Results of the regression analyses that explored whether students in the intervention group displayed more positive social attitudes compared to students in the control group, and whether this effect would be greater among students with lower levels of high-quality direct contact with an out-group, found that the intervention did not result in students in the intervention displaying significantly higher social attitudes. This was not in line with the hypothesis which had predicted the intervention group would display more positive social attitudes compared to the control group. These findings, although not expected, do fit in with the trend of research that has found varied outcomes in Holocaust education. Previous research has found that similar media related interventions utilising intergroup contact theory have led to increased stereotypes among some participants, whilst also finding the intervention effective in promoting cultural understanding among others (Cole et al., 2003).

As expected, direct contact moderated the intervention effect, so that the positive impact on social attitudes was only significant among those with low prior direct intergroup contact in the last year. This is consistent with previous studies showing the beneficial effects of indirect contact on social attitudes among participants with low levels of direct contact, but not for those with moderate or higher levels of cross-group friendships (Vezzali et al., 2017). These findings are also in line with research suggesting interventions should target young people as potential prejudicial attitudes present may not yet be deeply entrenched (Rutland & Killen, 2015).

Analyses of the data comparing the intervention group to the control group also showed that taking part in the intervention did not have a significant impact on either historical empathy or contemporary empathy, and again there was no significant effect of the levels of high-quality direct contact reported by participants on their levels of historical empathy or contemporary empathy. These findings were not in line with the hypothesis that had predicted the intervention group to display higher levels of historical empathy and contemporary empathy than the control group. For similar reasons to those stated in study 1a one explanation for the intervention having lack of a positive impact on historical empathy is that pupils were not successfully moved through Levesque's (2008) three-stage model of historical empathy: imagining, contextualising and judging. This study also reported that historical empathy did not have a mediating effect on the relationship between condition and contemporary empathy. One explanation could be that taking part in the intervention did not result in increased contemporary empathy, this could be due to the reasons noted above such as a failure to take students through the three stages of increasing historical empathy (Levesque, 2008).

Previous research has found direct contact to be a moderator on the impact of indirect contact interventions (Vezzali et al., 2016), this would suggest that similar models to the one tested here should indeed be explored further even though the results here were not significant.

Contrary to previous research finding positive effects of educational interventions on contemporary and historical knowledge (e.g. Cowan & Maitles, 2007), the current study did not see an improvement in historical and contemporary knowledge among participants in the intervention group compared to those in the control group. This could be partly a result of the confusion that can be associated with immersive, animated virtual worlds that has been suggested to be a distraction from learning activities (Fernandes et al., 2016),

Considering previous research has found that older students who had had the opportunity to study the Holocaust at primary school displayed more tolerance towards different social groups and displayed increased understanding of the role of the individual in combating racism, varying levels of Holocaust knowledge going into this intervention among participants could have affected the findings.

The current research has theoretical implications as the findings suggest that indirect contact interventions are effective among young adults only when they have limited experience of direct intergroup contact. Although, in the case of the effect of the intervention on students' social attitudes, direct contact moderated the effects of indirect contact such that the intervention was more effective among those reporting low levels of direct contact, the two strategies (direct contact and indirect contact) should not be seen as non-complimentary,

in fact the opposite is true as there is evidence that indirect and direct contact have mutually reinforcing effects on out-group attitudes (Turner et al., 2008).

One potential limitation of this study was the limited number of items used to gather a score for each measure. Only using one or two items to measure historical empathy, contemporary knowledge and historical knowledge respectively meant that reliability scores either could not be calculated or had to be calculated using correlations which is far from ideal. This was partly due to the time constraints of the data collection and a conscious effort to keep the survey reasonably brief considering the intervention and focus groups also had to be completed within the allotted time slot. Contemporary empathy and contemporary knowledge scores were also close to the maximum score of five for both the control and intervention groups, meaning it is possible there was a ceiling effect and a wider range of response options was needed.

The contact star was utilised to measure any potential changes in social attitudes. This measure has indeed been used to measure the impact of similar interventions previously (Goodbun, 2022). However, it would have been useful to have a measure that specifically explored the impact of the intervention on participants' attitudes towards Jewish people. This was potentially a major weakness in this aspect of the current study, which grouped together attitudes towards Muslims, Christians and Jews, as this study did not remove Christian and Muslim participants from the analysis. Again, including more items as a measure here would have also been useful to further understand the effect of the intervention on behavioural intentions, implicit and explicit attitudes and levels of prejudice.

This study failed to establish whether or not the intervention had an impact on participants knowledge of historical discrimination. Although there was an attempt to establish participants' prior knowledge with the historical knowledge item being included, participants' responses may well have been subjective. Due to time constraints this study compared the historical and contemporary knowledge scores between participants in the control and intervention group. This is a methodological weakness which could have been improved with the addition of a pre-intervention survey which could have been more comprehensive in assessing all participants' base levels of the historical discrimination being studied. This would also have allowed historical knowledge to have been included as a manipulation check which would have allowed the researcher to have more confidence in any potential findings.

Although working with young adults allowed for a more consistent and controlled roll out of the intervention, conducting research exclusively with university students is another weakness of this study as they are not a good sample of the population. This is not ideal and future research should attempt to recruit a sample that is more representative of the general population. Recruiting university students as participants was cost effective due to the research participation scheme credits and also allowed for the collection of more qualitative data. This was a crucial aspect of this research as a whole and really added to the richness of the data. This was particularly the case with regards to the student focus groups in study 2 as although focus groups with pupils were productive there were too few, and although interviews with teachers were interesting, teachers were not the intended audience of the intervention.

Further research would be useful to determine whether the intervention had a positive impact on some of the participants' social attitudes, and if so how and why this was the case. Future research should also explore the effects of direct contact over time and consider the effects of direct intergroup contact on how participants respond to interventions if the direct intergroup contact took place some time ago.

Given the positive findings of research exploring interactive interventions that have combined arts and history (Kisida, Goodwin & Bowen, 2020; Graham & Brouillette, 2016; Hardiman et al., 2014), it would be useful to explore whether platforms like Bubbles have a greater impact on historical and contemporary empathy if the participant plays an even more active role throughout their learning experience rather than simply exploring and observing the space, in a similar manner to said interactive interventions.

Although this study found no significant effects in this moderated mediation, this model could and should be explored further as the literature review found there is a lack of this type of evaluation among similar interventions. It is crucial that the underlying mechanisms of interventions are explored more thoroughly to make future interventions more streamlined and more effective. This point is particularly important as there is currently a lack in terms of the amount of experimental testing of interventions in general (Paluck, 2016). It would also be important for future research to establish participants' knowledge prior to the intervention. This is important as it is highly likely that participants would have studied the Holocaust for varied amounts of time. Future research should also consider exploring the impact of similar interventions on older participants. Although there is general consensus that prejudice is more malleable in younger participants, if interventions do indeed

have positive outcomes among older participants then they would have many potential positive benefits worth investing in.

Conclusion

This study added useful and novel research to the growing and important catalogue of intervention evaluations. Given that direct contact interventions are often costly and impractical it is crucial that there is an increase in understanding of whether and how varied approaches to indirect contact interventions are effective, as they are typically cheaper, more flexible and have potential for a more widespread impact. Although, for the main part, this research did not find this specific intervention to have a significant impact on social attitudes, knowledge or empathy, this research was in line with the type of research that is necessary in this field; more evaluations of these interventions must take place and those evaluations must explore potential moderating and mediating effects to establish what mechanisms makes interventions effective or not.

It would be useful for future research to also consider which aspects of interventions are most effective, and what makes certain aspects of interventions more effective among different groups of participants. Although this study did not find that the intervention seemed to effect school pupils and young adults differently, previous research has shown the importance of finding the optimum age to target with prejudice reduction interventions.

Study 2: Exploring the Impact of the Intervention on Young Adults, School Pupils and Teachers Through a Thematic Analysis of Interviews and Focus Groups

Abstract

The second study, through the thematic analysis of data collected from focus groups and interviews with pupils, young adults and teachers (N = 79), aims to explore the most and least useful aspects of an online learning platform utilizing extended contact in terms of its effect on empathy, knowledge and behavioural intentions. This study built on findings from studies 1a and 1b, and also identified the main themes and sub-themes from the transcribed and coded focus groups and interviews. The main themes from the data included the impact on the ease of learning about the topic, whether the platform provided an insight into Jewish culture, whether the platform provided opportunity for intergroup contact as well as the emotional response the intervention triggered among participants.

Introduction

There has been a considerable amount of research on virtual reality and education over the years, with a distinction often being made between immersive virtual reality, where the virtual environment surrounds you as can be achieved with a headset, and non-immersive virtual reality, where the user explores a virtual environment through a desktop (Ott & Freina, 2015). In contrast research on gaming tends to define immersion as the involvement in gaming that results in a lack of awareness about time in addition to a sense of 'being' in the task environment (Jennett et al., 2008). A series of recent studies on historical education exploring either immersive virtual reality, non-immersive virtual reality or immersive gaming have found that when this form of media is combined with primary source documents, such as survivor testimonies and audio and visual evidence from the time, as well as direct instruction it will likely inspire historical empathy amongst users (Law, 2020; Patterson, Han & Esposito, 2022).

Personal connection

This study will consider the impact the evaluation had on personal connection. Personal connection, as mentioned earlier, can take place when an individual feels personally involved with a task because the objective or subject matter appeals to the student or because the task seems like a real-world situation (Immordino-Yang & Damasio, 2007). Personal connection itself can often be a unique experience when triggered by museum visits; a study which involved interviews of 12 participants all of whom had visited museums found that their experiences of the visit were personal for different reasons with some embracing detailed descriptions of every object they had encountered, some offering intermittent

musings and others providing audible emotional responses that were without words in response to their museum visit (Roberts, 2013).

Many instructional methods for historical interventions involve making personal connections to the subject matter. Although more recent research has suggested focussing on historical factual information rather than drawing connections between the past and the present, there is still an emphasis on students understanding both the identity of the individuals they are studying as well as how what they have learnt has implications for their own life, which could and should still be considered a form of personal connection with the people and situation they are studying (Domitrovich et al., 2022). The literature review and introduction to study 1 also informs this study.

This study will explore whether Bubbles was successful in developing personal connection between participants and the topic and groups they were learning about, and if so how Bubbles achieved this and in turn whether this seemed important to participants' experiences of the intervention.

Aims of This Study

This qualitative study aims to build on Study 1 by deeply exploring interviews and focus groups that were conducted with either pupils and students who had taken part in the intervention or with teachers present in schools in which the intervention was conducted. By closely analysing the coded responses of participants this study will complement the first study by developing a deeper understanding regarding the impact of the intervention on social attitudes, (historical and contemporary) knowledge and empathy.

Another aim of this study is to identify patterns in the data, describe those patterns and provide a theoretically informed interpretation of them in the process of evaluating the Bubbles intervention. The study aims to: explore the impact of the intervention on knowledge, empathy and social attitudes; explore the positive personal connection induced mainly through the exploration of the first part of the Bubbles platform prior to the Kristallnacht function and finally explore the emotional response to and impact of the platform as a whole with a focus on the second part of the exploration of the platform following the Kristallnacht change.

Method

Participants

The total number of participants in either focus groups or interviews was 79. There were three focus groups across three schools with 10 pupils taking part. They were with Year 7 pupils (male and female), Year 9 pupils (male and female) and Year 12 and 13 pupils (all male). We also conducted 13 student (young adult) focus groups and 4 student society/ community focus groups (total Number of young adult participants = 55). Participants in the student/community focus groups had a mean age of 19.4 and included 13 (23.6%) males and 38 (69.1%) females.

14 teachers trialled the programme on their own or with their class and they were all interviewed individually. Teachers were aged between 22 and 60 years old, there were 6 males and 8 females.

Ethics

Participants were informed that the focus groups and interviews would be recorded and transcribed and informed consent was given prior to the recordings beginning. As psychology researchers, the team and I were aware that when conducting interviews, we needed to try and keep a neutral tone and do our best not to allow our own views, beliefs or reactions to influence participants' responses. I also considered past research in schools whilst creating the survey and interview protocol. This thought process influenced the wording and nature of the questions in attempts to best keep to time constraints and utilise language that aimed not to lead answers one way or the other whilst also being straightforward to understand.

Data Collection

Semi-structured focus groups exploring the pupils' and students' experiences, thoughts on and take away points from the intervention were recorded. An interview protocol was used (see appendix, Figure 4 and Figure 5). Focus groups lasted between 7 and 75 minutes. Pupils and students took part in the focus groups immediately after taking part in the intervention. Teachers were interviewed individually with interviews lasting 30-60 minutes, all teaching staff interviewed in the days or weeks following the intervention. The variability in the length of the focus groups was due to the nature of qualitative research, where interviews are led by participants, ethical requirements to allow participants to stop the interview at any time, and logistics: the majority of the focus groups took place in the university labs in a series of back to back bookings which meant a time limit.

Participants selected to take part in focus groups would all sit around the table immediately after completing the survey. Once all participants were present a semi-structured focus group recorded and led by a researcher would take place. Ideally the gender, age, ethnicity and faith would have been reported alongside quotes included in the analysis, however had we noted this information down during the focus groups it would have significantly disrupted the flow of the interviews with young adults. This was also not ethically possible to note down in the school focus groups.

Analysis

The reflexive thematic analysis approach adopted for this study, emphasizes the inescapable subjectivity of data interpretation by the researcher (Braun & Clarke, 2021), this research follows the six-recursive-phases of Braun and Clarke's approach: familiarisation; coding; generating initial themes; reviewing and developing themes; and writing up. In line with the experiential qualitative research tradition that thematic analysis is often associated with, this study focusses on the exploration of pupils' students' and teachers' subjective experiences and sense making (Braun & Clarke, 2013).

Familiarisation with the data began during data collection, as I conducted the vast majority of the focus groups myself. The transcripts were transcribed by the team, I then checked the transcripts against the initial recordings and read over the transcripts several times. Familiarisation along with discussions with fellow researchers who were involved in transcribing, conducting focus groups or were to be involved in the coding process informed initial notes on potential codes.

This study utilised reflexive thematic analysis. This approach allowed theoretical flexibility whilst focussing on the development of codes and then 'themes' from the data. As stated by Braun and Clarke these themes cannot exist without the researcher, instead they are created by the researcher. Each transcript was read over carefully and a team of researchers decided whether certain statements should be coded, and if so the raw data was organised into meaningful groups. The entire data set was systematically coded, partly with a 'theory-driven' approach with the specific aim to code around empathy and knowledge and partly with a 'data-driven' approach which allowed the data to influence the themes. Coding was performed manually by myself and the research team with the common aims of creating as many potential themes as possible, coding extracts of data inclusively to not lose the context and to code individual extracts into as many codes as they fitted into or not to code sections if they were not relevant to the study.

A mixture of inductive (data-driven) and deductive (theory driven) orientation to coding was adopted, inductive for the aspects of this study not explored in study 1 and deductive for the aspects already explored in study 1. With regards to the inductive orientation, as per guidelines to an inductive orientation of thematic analysis, there was minimal engagement in literature during the early stages of this aspect of the analysis (Braun & Clarke, 2006). There was a focus on semantic meanings in the data. This unstructured and organic coding method allowed for the development of codes as our familiarity and understanding of the data increased. Themes were developed across cases from codes, following the coding of the entire data set. Reflexive thematic analysis suited the size of the dataset for this qualitative study (N = 69).

Once all the data was coded and collated, codes were sorted into potential themes. The potential themes were then examined and cross referenced with the data to ensure they were an accurate representation of the data. After combining and separating some themes the process ended with there being 4 main themes and 10 sub-themes.

Results

Making a Difficult Topic Easier to Learn and Teach

Making it Easier for Learners to Experience the Perspective of Jews in 1930s Berlin

There was consensus among young adults, pupils and teachers that the Bubbles platform provided new insights and perspectives on the persecution faced by Jews in Nazi Germany during the early 1930s. This new perspective for users included the content of Bubbles (new information) focusing on the persecution of Jews, the novel and creative mode of learning, and the immersive nature of the materials.

> Yeah, it, like, really allowed me to see it from that perspective, and it really gave me a good insight on, like, the lives that Jewish people lived. Because I have, like, if I have difficulties, like trying to put myself in other people's shoes. But with that platform it allowed me to like immerse myself in the world that they were living in. (a school pupil)

One way Bubbles achieved this was by depicting, in the historical context, Jewish life and the persecution they faced in an immersive and more creative manner than many of the

learners would have been accustomed to. The learning platform was often compared to more traditional teaching methods in the focus groups and interviews, with Bubbles being described by users as more personal and more accessible particularly for those who may not find reading textbooks productive. As a teacher stated "as a history teacher, I think that it would be quite a useful tool". The navigation being under the control of the user was popular among students and pupils and seemed to add to the immersive nature of the platform as it transitioned learning from a passive to a hands-on experience.

The immersive and visual nature of the platform was extremely popular amongst learners. A number of pupils stated how learning about the Holocaust can often be daunting and sad but they found exploring Bubbles to be a more exciting way of learning and one that could be more accessible to younger learners as the animation and lack of real-life pictures makes it more likely to be considered age appropriate. The fact that learners could explore at their own pace and interact specifically with objects they were interested in was highlighted as a strength of the platform, this is further evidence that the new style of learning on Bubbles could engage learners who generally don't enjoy history education and appeal to students and pupils from a range of academic abilities. Bubbles should be considered a more accessible version of what could be a visit to a museum or historical setting, and in line with interventions that took students on such visits (e.g. Cowan & Maitles, 2011), Bubbles did seem to aid learners understanding of both historical and contemporary anti-Jewish behaviours and attitudes.

There was also a consistent notion among many students and pupils that the persecution of the Jews happened solely because they were Jewish. Users described the house in the platform as 'normal' and went on to tell how the experience put the persecution into

perspective more than other education on the topic had. This seemed to be a result of participants discovering similarities between their own experiences and those of the Jewish family whose house they were exploring. This was evident as participants described the destruction of the toys making them sad and making the topic more relatable which in turn helped them understand the magnitude of the persecution: “It makes it more relatable in a way to just to understand” (a university student). As one student said when describing Kristallnacht, “it was as real as you could make it”. There was evidence of the intervention inducing emotional empathy here as participants reported feeling the same emotions as the victims: “I feel like you can actually see what it’s like for them” (a school pupil). These responses to the intervention are in line with research exploring the impact of Holocaust education; research found that Holocaust education is particularly powerful in giving learners a wider perspective of human rights and a deepening in understanding of the causes and consequences of stereotyping (Carrington & Short, 1997).

Many young adults and pupils conveyed how they felt empathizing with and putting themselves in the shoes of Jewish people in 1930s Berlin and that this was made easier because of the more immersive nature of the learning platform compared to more traditional history education methods. Learners spoke of gaining an insight into the lives Jewish families lived, something they had had difficulties doing in history lessons previously. From the perspective of the students and pupils the platform provided a learning opportunity which induced empathy in a more powerful manner compared to standard history lessons, providing participants with ample opportunity to step into the shoes of a Jewish family and gain an insight in to life and culture both before and after the turning point in Nazi persecution that was Kristallnacht. As one student said when describing Bubbles, “It gave us a real good insight into the Jews, a German Jewish family, how they lived and what they did back then”.

Teachers agreed that Bubbles allowed their students to consider knowledge that they had been learning about from new angles. There was a feeling that exploring the platform provided a powerful learning method to learn about the everyday lives of Jewish families through the familiarity of the objects present This strength of the platform was emphasized when comparing the platform to learning from the textbook. Where the Bubbles intervention allowed participants to explore the house and information in it as a historical source for a long duration of time students and pupils were able to generate a web of knowledge relating to Jewish families of the time and paint a vivid picture of how they were living. In contrast, as teachers stated, sources in textbooks have often been chopped down to a sentence or two making it difficult for learners to gain anything about the reality of the subject of the source's life. This point was echoed by another teacher who felt Bubbles expanded their pupils' knowledge, not just of Jewish culture but also the persecution they faced, as they could learn what Germany was actually like at the time through the usefulness of understanding the build-up to the Holocaust learning about persecution in settings beyond the concentration camps and gas chambers.

> What they can then do is to transplant their minds into this whole program and and it's no longer an abstract thing. It's something that they can connect to in a totally different way. (a teacher)

The survivor testimonies (videos which users could watch within the house) were consistently highlighted as a strength of the Bubbles platform as a tool for encouraging perspective taking. The videos seemed to aid the experience of being immersed within the platform extending the variety of things users could do and

explore: “you’re immersed into it with the items and then the videos that helps” (a university student).

The impact of the testimonies of Holocaust survivors was clear: these evidently had a significant impact beyond just exploring the home itself, and were viewed as a crucial and stand out part of the experience which aided the participants’ potential for increasing perceived similarity between themselves and people who were alive within the historical context they were learning about. The testimonies seemed to bring the platform to life and helped participants gather further understanding of how some of the people who lived in a real world similar to the virtual world they had been exploring would have felt.

> You can look at the home where you can't really look nowadays, but then you hear the people who actually experienced it ... but they were speaking about their experiences in the past and I like the reality aspect. (a university student)

> I feel like you can actually see what it's like for them and just watch people talking who are survivors talk about their own experience. (a school pupil)

Teachers, particularly history teachers, strongly expressed their view that when teaching history, the aim “should always be about the survivors. So we should always be hearing about the individual” (a teacher). This was viewed to be important ethically, and from an educational perspective, as hearing from survivors was engaging emotionally, and brings history to life. The survivor testimonies were overwhelmingly viewed as a strength of Bubbles, “I thought the fact that we had a survivor speaking to us excellent, 100%” (a teacher).

Provokes Curiosity

> "Yeah, I definitely wanted to learn more about the rabbit painting and what made it a German aesthetic" (a university student)

Pupils and students who explored the platform seemed to leave with an appetite to learn more about Jewish lives, the persecution they faced in the 1930s and how they can apply what they had learned to the modern day. The platform seemed to provoke curiosity on a number of levels, whether that be about a particular painting or object in the house or in other cases bigger questions regarding the persecution of Jews and how lessons can link to contemporary issues of discrimination. The diversity seen in increases of curiosity regarding different aspects of the platform shows how the different strands of knowledge and information that participants could gain built a web of knowledge and thought-provoking insights that came together in a culmination of a strong feeling that pupils and students were keen to learn more after exploring the platform.

> "I think it was something that I actually kind of want to research and actually find out about" (a university student).

The high levels of curiosity in the pupils' and students' focus groups outlined how the learners had engaged with the platform, had consumed and retained much of the information on it and had also felt the gravitas of the topic being taught to the extent that many had suggestions on how the platform could help them dive deeper into the topic. Although the interactive nature of the platform was a success in helping users gather new perspectives on

Jewish life and the persecution they faced, many users were keen to discover more about these topics through the platform. The curiosity Bubbles provoked was evident in the number of learners who were keen to learn more about German-Jewish culture. Time and time again users referred to the paintings in Bubbles as being captivating and a useful insight into culture at the time, especially as they were linked to text documents that gave more context on the paintings; for example, the text relating to a painting depicting mountains explained that the setting was where many German and German Jewish families holidayed in the summer. There was a feeling that music accompanying the experience would have been a strong benefit and would have provided more to learn about the culture, as well as making the experience more immersive and potentially inducing more focus amongst users as they would have heard less of the excitement and commotion in the computer suite that was generated around the 'exciting' new learning experience learners were partaking in, although this excitement in itself was a sign Bubbles provided an engaging experience.

The freedom of the user to explore the platform however they wished, and interact with objects they were interested in, encouraged users to find aspects of the platform that particularly interested them, this generated more curiosity among users and encouraged further exploration and engagement with the platform. The creation of a willingness to learn among students and pupils of different levels, and with different interests, highlights the appeal and curiosity provoking strengths of Bubbles. In a way the positives of the user having control over their learning experience is in line with research promoting student led education and the encouraging outcomes that this can have in terms of students actively leading the way in their own education; indeed, future research should explore the outcomes of similar learner-led interventions on a range of age groups as the majority of research in this field has focused on higher education students (Kotecha, 2011).

Exploring the kitchen proved to be an area that many pupils and students found thought provoking. The daily rituals of preparing and sharing food with family and loved ones is a relatable topic to many; the exploration of the kitchen allowed students and pupils to tap into this familiar food related set up as a means of thinking deeply about the situation the Jewish family found themselves in. The data told how students considered and indeed wanted to know more about whether their food habits changed, what the tradition about wine pouring was about (one particular object in the kitchen highlighted this in a little detail) and how the food was prepared. These highly relatable aspects of the platform not only helped users increase their knowledge of day-to-day life at the time but also helped users empathise with and understand the family which in turn made the shocking persecution that was evident after the Kristallnacht change even more powerful. This highlights how interventions based on platforms similar to Bubbles may not be able to fully explain the historical events, as textbooks aim to do, rather they may bring about a keenness to learn more among users as they can create a relatable environment which, through active exploration, provokes curiosity among learners which can be capitalised upon in follow up lessons on the topic. In this sense Bubbles is again shown to be similar to research exploring the impact of museum or historical site visits in the way in which the platform seems to increase participants' knowledge and also increase the appetite for learning about the topic (Cowan & Maitles, 2012).

Participants Created a Personal Connection With the Jewish Family Through the Platform

> "I think, it would be more useful. I feel like what I learned about World War Two and history, it's so easy to talk about just figures like you know, D-Day was this many deaths, Dunkirk was that many deaths.
>
> …You kind of have something to kind of visualise these be more than just numbers on a page." (a student)

The exploration of Bubbles allowed users to explore the platform at their own pace and in whichever order they preferred, it is therefore likely that no two users experience of Bubbles was identical. The active decision making of the user from the outset of their Bubbles experience provided an engaging experience for the vast majority of users. Compared to a classroom discussion where one pupil or student can speak at a time and the rest, although expected to remain engaged, could potentially switch off without detection, from the movement of the avatars and computer screens it was reasonably clear that the vast majority of the users of the Bubbles platform were involved, in their own unique way, in the exploration and learning experience. This created a personal pupil/student-led learning environment which, in line with research on the area, has the potential to have positive outcomes on future learning beyond just the topics explored in this platform.

Despite the serious nature of much of the learning platform many participants described the experience as fun or exciting. It was clear from the focus groups that this should be considered a strength of the platform as a means of fostering positive indirect intergroup contact with the user and the Jewish family whose house they were exploring. The 'game' like nature of the controls and exploration was often mentioned by pupils and students, with some finding the avatars cute or funny. There was consensus that once users got to grip with controls it was fun, especially for younger users, to move around in a virtual

space. For that virtual space to be a Jewish family house providing insightful information on cultural objects as well as relatable objects, again with information, an environment in which users could boost their knowledge of Jewish culture whilst having fun was created. The importance of positive intergroup contact cannot be understated, the most convincing evidence of its effects being a large meta-analysis that included over 515 studies and found a highly significant negative relationship between contact and prejudice (Pettigrew and Tropp, 2006).

The generation who explored Bubbles in this study are used to playing video games and Bubbles created an environment in which students and pupils wanted to actively learn, an aspect that holds clear benefits over more traditional history teaching methods which, as one student stated, leave many learners thinking “What am I supposed to do with that?”. The first person and immersive nature of Bubbles instead encourages users to be in the setting, to feel and understand the differences in culture, to expend less energy on trying to figure out what a teacher wants them to take from information and instead focus on exploring aspects of the historical context that they are interested in. This allows many students and pupils who may not have been the biggest fans of history lessons to learn valuable knowledge of other cultures and the persecution they faced, all while being welcomed into their house and exploring because they are keen to learn and establish a personal connection with the house that they have been welcomed into to explore.

The progression in popularity and sophistication of media, and particularly video games, has drastically increased the levels of stimulation children and young adults are used to in day-to-day life. This has created a situation in which teachers feel that if they are to properly gain their students’ and pupils’ attention for long enough to impart knowledge,

understanding and empathy then they need something that ‘really grips’ and ‘engages’ students in the classroom. There was a feeling among teachers that the videos involving the survivor testimonies were an aspect of Bubbles that contributed to the platform being engaging enough to allow the possibility of increasing learners knowledge, understanding and empathy through creating an immersive environment.

Indeed, the data from the focus groups and interviews supported the notion that the platform satisfied the conditions that give rise to an increase in personal connection with a topic being studied. Participants explored survivor testimonies, cultural objects and serious issues surrounding stereotyping and discrimination whilst also being able to connect with relatable everyday objects. This led to what appeared to be participants seeing themselves in the topic whilst also experiencing others’ experiences to some extent which seemed to provoke a deep consideration of memory; all of which have been considered aspects of personal connection induced by museum visits in previous research (Roberts, 2013). This development of personal connection, coupled with historical imagination, is important as it has been suggested personal connection is one of the main building blocks to providing a foundation for a potential increase in historical empathy (Bartelds, Savenije & Boxtel, 2020).

> “I think that it's it's they enjoyed it because it was something different. It's something different. They don't very often, particularly in history, they don't often get to go on the computers. It's just it's always explaining what was happening and there's only so far those explanations can go.” (a teacher)

This theme explored personal connection, the immersive nature of Bubbles and the impact of the platform in terms of helping participants understand new perspectives. The

interviews and focus groups highlighted how Bubbles made a topic that is often difficult to teach easier by making it easier for users to experience and understand the perspective of those they were learning about, provoking curiosity about the topic and reaching participants who may not respond as well to more traditional teaching techniques by inducing a greater personal connection between the learner and those they are learning about. The topic can be challenging to teach due to the persecution that occurred often being difficult to grasp, partly due to the magnitude of the persecution and partly due to the time that has passed since the 1930s. The immersive aspect of Bubbles was central to confronting these barriers to learning and helped the platform make the topic easier to teach for teachers and learn from for pupils and students. The platform was particularly useful for those who have difficulty imagining things from other peoples' perspectives and it could also be argued that the platform had a positive impact on participants' perceived importance of perspective taking itself.

An Insight Into Jewish Culture

Boosts and Reinforces Knowledge About Jewish Culture and the Persecution They Face

The interactive and active learning that Bubbles induced among learners also had an aspect of repetition that helped reinforce new knowledge about Jewish culture and everyday life. Although many participants wished there were more rooms to go into or more objects to interact with, again pointing to the power of the platform in provoking curiosity, the fact that they would therefore often see the same object more than once reinforced their learning, especially if the object in question was new to them.

Students' understanding of Jewish culture and customs seemed to be the area of the most increased knowledge, particularly from the first part of the platform in which they were exploring the house prior to the Kristallnacht change. This was a strength in the platform in terms of utilising indirect contact to explore and understand the similarities and differences between the user and the Jewish community. The word 'normal' was again used to convey this by students as they described how Jewish people of the time were "the fact they were very, I guess, normal people with very normal lives" (a university student). This could be considered a form of humanization; a well-researched concept in psychology in which research has found that expressions of empathy between groups can lead to reciprocal empathy and a greater willingness to accept the humanity of all members of the other group (Gubler, Halperin & Hirschberger, 2015). The survivor testimonies appeared to be an aspect of the platform that was particularly strong when it came to encouraging the humanization of those belonging to social groups different from oneself; "those videos the individuals expressing what they were interested in, like their hobbies, their music, which are humanising things" (a university student).

It could also be argued that there was an increase in perceived similarity as a result of the increased understanding that many Jews in Germany would have been leading similar lives to non-Jewish Germans prior to the persecution inflicted by the Nazis. This increase in the understanding of community and culture through the similarities between cultural groups at this point in history was again largely contributed to by the survivor testimonies in which a Holocaust survivor recounted how they were raised in school believing they were of the same culture as the non-Jewish German kids and how they remember that changing as they were told it was actually us versus you. Objects in the house such as the toys, musical instruments

and works of art also helped learners understand similarities between German Jews and non-Jewish Germans of the time.

> "I clicked on the piano and it was nice to see that, like it wasn't just Jewish people. If you had a piano, it was just like it was German citizens as well. And it's just nice to see that they weren't that different apart from their religion and what they believed in." (a school pupil)

Developed Empathy Towards Jews in 1930s Germany

There was a feeling among teachers that although the platform had potential to develop contemporary empathy, in order for pupils to leave the intervention with a strong feeling and understanding of how the programme impacts them and how they can apply learnings to their lives certain aspects the programme had to offer more scaffolding in terms of linking to contemporary issues. However, there was a general consensus that the platform provided potential for users to increase their historical empathy.

Teachers thought pupils had the strongest interest in everyday objects, and that these were the most powerful objects as they provided a 'way in' to explore Jewish family life. Teachers argued that to further build users' empathy and perspective taking, Bubbles could build on this feature by including more everyday objects that would be used to provide information on the families lives in the home and outside of the home, for instance their jobs. Teachers particularly thought that the objects belonging to the child, such as toys, could be expanded, as young people are more likely to connect with those objects and relate them to their own lives, building empathy: "I thought it was good the way there were, like the toys on

there and just sort of showing that this is a normal family like" and "I think because they relate to children more and I think they can empathize with children more than they can adults." (a teacher)

The impact of Bubbles on providing participants with an insight into Jewish culture was strong as responses from focus groups showed how participants boosted and reinforced their knowledge of Jewish culture and everyday life as well as displaying increases in understanding of the persecution they faced in the 1930s. This insight into the lives of Jewish families in 1930s Berlin also seemed to result in an increase in empathy, to a certain extent, as to how it would have felt to be a part of a Jewish family in the lead up to Kristallnacht.

There was evidence that the platform helped boost participants' historical empathy, determining whether this translated to an increase in contemporary empathy was however less clear. Research on historical empathy that has suggested that it is a skill learnt more easily when: students have access to an eyewitness testimony, in this case the survivor testimonies, the opportunity to visit a historic site, in this case it was a virtual historic site, and classroom discussions, in this case this was through the chat feature. Barring mixed responses to the chat feature, which will be explored further in the analysis, there was general agreement that the platform satisfied the other building blocks of historical empathy; "you can look at the home where you can't really look nowadays, but then you hear the people who actually experienced it ... , but they were speaking about their experiences in the past and I like the reality aspect." (a university student). There was also evidence that these building blocks of historical empathy lead to an increase in historical empathy among participants, a good example being one university student saying "I guess empathetic of what they would have gone through to have that all taken away from them".

The survivor testimonies were seen as a real strength of the platform: “you could get one of the survivors like accounts, and that was brilliant” (a teacher). In line with research that has suggested allowing students contact with eyewitnesses is a crucial step to inducing historical empathy (Bartelds, Savenije & Boxtel, 2020), many students and pupils pointed to the videos as a key aspect of the platform in terms of helping them empathise with Jewish people who were living in the 1930s. One student when describing their experience watching one of the survivor testimonies said “just hearing it from her, made it easier for me to put myself in their shoes and understand what was going on for them”. The fact these were videos and not just quotations from survivors also seemed to be important in helping the platform be more effective. Research has highlighted how it is important for educational interventions aiming to increase historical empathy to include both visual and textual information that provide first-hand accounts of hardships faced in the past (e.g. Endacott & Brooks, 2013). This seems even more important now that young people are used to being stimulated by many forms of technology at once, for example scrolling through social media in front of a television programme whilst listening to music. Bubbles allowed participants to take in information in many different formats, the survivor testimony videos seemed to add richness to this experience and helped generate historical empathy among participants.

> “In general, one of my overall feedbacks was as you well know, games are so well developed now … (what is) presented to them in the classroom has to be something. You know something that really grips them or something that will engage them into it. So videos is good.” (a teacher)

This theme highlighted the positive impact of the platform in the way in which it provided an insight into Jewish culture through boosting knowledge of both cultural items, ways of life and the persecution Jewish people faced in the 1930s. This insight seemed to be supported and bolstered by the platform having a positive impact on historical empathy towards the Jewish family whose home they had been exploring. Although it seemed clear from the data that there was an increase in historical empathy, whether or not this resulted in an increase in contemporary empathy was unclear and will be explored further in a later section of the analysis.

The Platform as a Means of Creating Contact both Between Participants and also Between Participants and the Educator

The educational platform Bubbles aimed to incorporate multiple forms of intergroup contact. One aspect of this intergroup contact was the indirect contact through the exploration of a Jewish family house and the increased understanding and empathy that this aimed to induce which it was hoped would improve social attitudes. Another aspect of the potential for intergroup contact in Bubbles was the interaction users could have with one another and the educator whilst exploring the platform. This section explores the impact of this interaction between users and between the user and the educator by examining the mixed response to these features that was apparent from focus groups and interviews. The last decade or so has seen a wealth of research on indirect intergroup contact through e-contact, which has been positively related to many beneficial social outcomes including reduced intergroup anxiety and improved contact expectancies when interventions are effectively implemented (e.g. White et al., 2018). This section will consider whether the platform allowed for effective

indirect intergroup contact through the interactions available, and if so whether these interactions seemed to foster positive social outcomes.

A Distraction

The use of avatars did not work for everyone, students often told how they did not add anything to their user experience or how they were a distraction from learning. They were seen as a distraction as they could obstruct the users' vision of the objects they were trying to look at. They could also be described as a positive distraction as some students told how they were encouraged to re-visit certain objects that had a lot of avatars looking at them and so reinforce knowledge they were learning.

The proximity chat function was utilised by very few student or pupil users. This was largely the case for students as they felt they needed more conversation starters to be provided for them if they were to have a conversation with a stranger. The need for facilitators of intergroup contact between users was a consistent argument raised in focus groups. In situations where students did use the proximity chat and speak to each other through their microphones they told how the conversation with other users was ultimately not as valuable as the information they could gather by exploring the platform so they put little effort into retaining the information from their discussion with the other user. Students also suggested that getting to know the people they would go onto explore the platform with prior to being placed in the platform would have likely resulted in more interaction taking place within the platform. A guided conversation or the provision of objectives would have been useful facilitators of intergroup contact between participants and would have increased the

potential for collaborative learning between participants whilst also giving participants the opportunity to engage with people from other social and cultural groups to themselves.

The chat feature was a tool to aid interaction between the users exploring the platform at the same time, however it was clear that when utilised by the pupils who were all in the same classroom the chat feature became a potential obstacle to learning and was considered a distraction. Young adults told how they could imagine their younger selves taking full advantage of the chat room to have a conversation with friends rather than exploring the platform, this proved to be the case while trialling the Bubbles platform with younger school pupils.

These findings have important wider implications for future educators and researchers looking to effectively implement interventions involving intergroup e-contact. Bringing together participants in a structured way before they start tasks or begin the main section of an intervention seems likely to improve the interaction between participants when completing tasks. Thinking carefully about how to structure and create effective interactions is essential.

Taking Away from the Seriousness of the Topic

It was suggested by students that the avatars were funny or cute and in situations where the users are familiar with each other the avatars would add a degree of fun to exploring the platform. It is unclear whether this makes a more relaxed learning environment in which users can increase knowledge, empathy and understanding or whether this aspect of the multi-user experience takes away from the seriousness of the topic.

The lack of discourse related to the topic in the chat feature among younger participants could have been an obstacle to learning and a hinderance to the improvement of social attitudes. Although for many the freedom to explore the platform as one wished, and say whatever one wanted in the chat feature, was seen as a strength, the lack of seriousness in the chat led for some school pupils to suggest it could be censored.

Although feedback on the chat function was mixed, much of the focus from teachers was on the negative aspects of the chat feature; " putting silly things in the chat and I had to give a warning to one child because I can't remember what they said, but it was completely irrelevant" (a teacher). The mixed response to this feature is in line with the mixed research into similar more immersive educational platforms, some of which have found that using virtual reality and giving students or pupils freedom to explore and interact can result in them willingly spending more time on the platform (Alhalabi, 2016), however other research has suggested that learning through immersive platforms can be confusing, especially when there are many functions and this can distract from the learning process (Fernandes et al., 2016).

Providing a Space for Positive Collaboration

Students saw the usefulness of discussion around the topics covered in Bubbles, however this was mainly a result of discussion that occurred during the focus group. Many students suggested that for this conversation to occur within the platform there would need to be more pointers or prompts with the intention of stimulating discussion as it is unlikely users would spark up a conversation with strangers whilst in the platform. This was evident as students reported that even if they tried to start a conversation with fellow students, who they hadn't met before the intervention, they did not get a response.

In the case of the school pupils, the chat function did bring about the potential for positive collaboration as it was popular, however it appeared many pupils were using it for the wrong reasons and were not staying on topic within the chat feature. There were reports that school pupils gave out their social media information or discussed football scores among other distractions in the chat feature rather than collaborating over their exploration of the platform. This was potentially a result of the pupils being in a chat function with many of their friends and classmates and therefore taking it as an opportunity to have some fun rather than staying on topic. This was not exclusively the case and there were examples where school pupils did indeed utilise the chat function in a collaborative manner; “The person I was sat next to put in the chat how to get those videos. People were asking so she put it in.” (a school pupil).

The gathering of new knowledge by exploring the platform was potentially increased thanks to the ability to see where fellow users were exploring and which objects they were spending more time in close proximity to. Students told how they could find new objects to interact with that they may have missed as the avatars of fellow users drew their attention to them. In some cases, students reported that they found another room in the platform as a result of following another avatar, this points to collaborative learning and a positive interaction in the learning process. This collaborative learning thanks to the interaction between users was reiterated as there were cases where users asked fellow users for advice on how to access certain aspects of the platform, for example the survivor testimonies, and they received the help they needed. This displays a level of empathy and understanding between users, adding to the empathy and understanding the platform is intending to foster towards Jews and other minorities that are being or have been persecuted.

Teachers suggested that the chat feature had several potential positive uses for helping learning and the retention of new knowledge. They saw their students share points and concepts that they had gained by exploring Bubbles; teachers felt it was valuable for pupils to be able to see their contributions being shared with the class in writing.

Although, in the majority of the Bubbles platform being carried out in schools, there was opportunity to collaborate with the educator, and indeed an opportunity for positive intergroup contact with them, it was difficult for school pupils to capitalise on the opportunity due to the general excitement in the room; "I couldn't hear what she was saying because everyone was talking and I couldn't hear her" (a school pupil). The presence of the educator could have been a real benefit and potentially influenced the impact of the platform greatly as previous research has found that a teacher being present and active was vital for an intervention that involved a school trip to Auschwitz to have a positive impact (Cowan & Maitles, 2011). Although there were teachers present in the rooms in which the intervention took place, the platform was designed for the educator to be in contact with the participants throughout their experience. However, the educator's ability to lead the exploration of the platform was hindered due to technical difficulties, and in some cases, this meant they could not be present within the platform alongside participants. The need for an educator leading the platform was emphasised by one teacher saying "I think with sensitive information, I think as a teacher you want a bit just a bit more control". In classrooms where the educator was able to lead the session the presence of the educator seemed to be a real benefit to students and pupils, with teachers describing how the educator enriched the experience. The university students did not have an educator present but the researcher delivered a script provided by the NHCM, this seemed to aid learning with one student saying "You explain

some stuff that the actual Bubbles didn't really a lot". In situations where the educator from the NHCM was present they seemed to add a lot to the experience for participants as well as generating a point of positive intergroup contact which involved collaborative learning and then discussion about new concepts participants had learnt.

This theme highlighted how the platform had great potential for collaboration and intergroup contact, both between participants and between participants and the educator. In situations where this worked well this was a real strength of the platform, however in many cases participants needed more guidance and scaffolding to allow these points of potential intergroup contact to have as positive an impact as possible.

Emotional Response

This theme explores the impact of Bubbles in terms of the emotional response among participants. Through interviews, participants described how they experienced a range of emotional responses including shock, distress, emotional empathy, connectedness between generations, horror, hope and fear. Here the different aspects of Bubbles that most stimulated these responses are examined and how these responses were perceived to have impacted knowledge, empathy and social attitudes is explored.

Kristallnacht Provoked Emotions Beyond Learning in Books

> "I know that I'd taught some of them about Kristallnacht before, I didn't get the reaction of "gasp". So I think to actually see that happen, it gives them an extra

dimension to what was going on at the time… and what impact that would have had on the people who were there." (a teacher)

It was clear that the Kristallnacht function was thought provoking among students and pupils and triggered a rather different emotional state to the first part of the Bubbles experience prior to Kristallnacht. Prior to the Kristallnacht function participants had enjoyed exploring the house and learning about objects and toys that were either informative about Jewish culture or similar and relatable to household items the participants may have enjoyed themselves: "It was enjoyable. I liked being able to walk around the house and be able to see like what would be in a Jewish household and what everything meant and how they were used." (a school pupil). After the change was triggered participants conveyed feelings of shock, horror and distress as they learnt about the devastating and swift nature of the persecution faced by Jewish families in 1930s Berlin; as one pupil said "It was really interesting to see what they actually did. It was horrifying". Participants questioned what was happening to the house, they had had the opportunity to get familiar with the objects and set up of the rooms before the sudden change.

The sudden change the Kristallnacht function brought about seemed to make the feelings of empathy towards Jews being persecuted during the lead up to the second world war more widespread among students and pupils, with many claiming they could put themselves in the family's perspective more and understand how the family would have felt in response to the persecution of the Nazis. The increase in empathy following the Kristallnacht change was a common occurrence throughout the interviews and focus groups, as one university student said "I guess [it made them more] empathetic of what they would have gone through to have all that taken away from them". The change also increased the

knowledge among pupils and students of how the Nazis persecuted Jews as they could get a feel for how swiftly orders of persecution were carried out against their victims, this was emphasized by the unexpectedness of the Kristallnacht change among participants. There was also increased knowledge of the severity of the persecution suffered by Jews at the hand of the Nazis, students picked up on the fact that no room in the house was sparred in the destruction, children's toys were broken and the wrecking of the house was absolute with the lasting impact of graffiti on the walls and an array of broken objects.

The unexpected nature of the Kristallnacht function was powerful in provoking curiosity and emotion among students from the teachers' viewpoint. Teachers felt that the Kristallnacht change resulted in their pupils being taken aback and thinking deeply about the persecution they had witnessed on the platform. As much as teachers felt that their pupils were enjoying the intervention, largely due to it being a different type of lesson, they felt there was a seriousness brought about by the Kristallnacht function that connected with the students in a different way to lessons they had previously had on the subject. The Kristallnacht function created empathy as participants felt shock, horror, fear and loss in the short amount of time that the change came about. These feelings were heightened by the immersion and sense of connection they had developed with the family through their exploration of the platform.

Interestingly some students felt like the change was too quick and did not give them time to properly empathize with how the Jewish family would have felt as a result of Kristallnacht. Specifically, it appeared students and pupils would have liked more time to explore that platform after the Kristallnacht change had been triggered, they would also have liked to have been able to interact and learn about objects after the change had occurred.

Although learners had time to explore the house before and after Kristallnacht, there was not a video or recreation of the event itself happening, some students felt this would have been a powerful addition to the intervention and make the experience more representative of the trauma that the family went through.

The Kristallnacht change was a major strength of the platform in providing a new perspective and improved knowledge on the persecution of Jews by the Nazis. The abruptness of the change helped learners gain understanding on a practical and emotional level of the devastating manner in which one group could increase the levels of persecution they are inflicting on another. Student participants, young adults who would have studied this topic at length previously at school, described how the Kristallnacht change within Bubbles was the moment when their understanding of the persecution 'clicked' as they felt a different kind of empathy, which felt more real to participants, from actually seeing the persecution in comparison to reading or hearing about it. As one student said "you could see yourself in the situation somehow".

Teachers believed that the Kristallnacht function was one of the strongest aspects of the platform in terms of being a memorable learning experience that generated emotion among their students in a manner they were unable to achieve through more traditional teaching methods. There was consensus that the Kristallnacht change was memorable and grabbed participants' attention; "It's supposed to demonstrate Kristallnacht and they all were quite taken aback by that and interested in what was happening" (a teacher).

A Connection to Modern Day Events

> "Yeah, it's like. I don't want to compare, but kind of a similar thing going on in the modern day." (a university student)

Participants were divided on whether Bubbles can be applied to modern day discrimination and conflicts. There was a slight feeling of uncomfortableness among some participants when considering whether the lessons of persecution taught in the intervention were ongoing today. When asked whether the platform made them think about anything happening in the modern day they said "Is it like the Muslims in China being put in concentration camps?" (a university student). This response represented a middle ground in a theme that seemed to divide many students and pupils in the focus groups. Although it was unanimous that the learning of the build-up to the Holocaust was very much a valuable and relevant lesson that should 'definitely' be taught, it was clear that there was conflict in opinions about whether the lessons were considered purely historical or historical with application to the modern day. The responses from teachers, students and pupils did suggest that more scaffolding and support throughout the platform would have been useful in helping participants make the link between historical and contemporary discrimination and persecution, and therefore increasing the power of the platform in terms of participants connecting their learning to the modern day. As a teacher said, in response to how the platform impacted their pupils' awareness of modern-day discrimination; "I think yeah, that would mean to be drawn out maybe with perhaps I don't know, guided worksheet come along with it".

The power of Bubbles to transport users into the past reduces the need for them to construct an abstract world and makes it easier for learners to connect to the past in the present. Teachers told how this would change their pupils' thinking processes and make it

easier for them to put themselves in the persona of the Jewish family from the 1930s. This highlights how the immersive nature of the platform could induce both historical and contemporary empathy as it makes times gone by more accessible and easily imaginable to students whilst not detaching them from the present day; “what they can then do is to transplant their minds into this whole program and and it's no longer an abstract thing. It's something that they can connect to in a totally different way” (a teacher). This could have made it easier to feel that they are learning lessons that they can apply to the modern day as the topic they are learning about was often described as more ‘real’ and it became easier to ‘step into the shoes’ of those they were learning about.

This theme showed how the intervention induced an emotional response among many participants, and partly through this emotional response helped participants connect their learning to the modern day. The Kristallnacht feature of the platform was consistently described as one of the most powerful aspects of the platform in terms of the emotion it provoked and the empathy that this induced. The swiftness of the change from before to after Kristallnacht created a sense of shock and horror among participants that was particularly powerful. Participants also connected their learning to similar events that they had learnt about more recently, and connections to the modern day were potentially easier to make than traditional learning thanks to the ease with which users could learn about the past in the sense that the platform was less abstract and required less imagination than traditional learning. However, the data suggested participants would require more guidance to connect their learning to modern day events and enable the platform to have more of an impact on participants’ behaviour intentions.

Conclusion

This qualitative study outlined the mixed responses from teachers, school pupils and young adults following their experiences with the Bubbles platform. The data from focus groups and interviews suggested the platform was successful in aiding perspective taking, stimulating an emotional response and boosting knowledge of Jewish culture. The data regarding the opportunities for collaborative intergroup contact between participants or between a participant and the educator suggested there was potential here, and with more guidance this aspect of the platform could well induce positive social outcomes. This qualitative study added richness to the evaluation of the intervention and the following parts of this thesis will consider the results from both Study 1 and Study 2.

Limitations

The technical difficulties that the interventions faced in schools meant that the roll out was often slightly different from school to school (See Figure 2 in appendix). This could have hindered the efficacy of the intervention. These technical difficulties could also have resulted in school pupils and students not taking the intervention as seriously as required, which could well have influenced their responses to both the quantitative and qualitative side of this study. It would be a shame to continue to waste the valuable time of secondary school pupils with platforms that need updates in-between each visit to a school and often only work at a fraction of their potential, instead similar interventions must ensure platforms have been adequately tested before the intervention begins if the evaluation is to be considered reliable.

The time constraints in schools and with young adult participants also meant that the survey was shorter than ideal and it would have been useful to include more items for each

measure in the quantitative surveys for Study 1. An improvement of the evaluation in this regard would be useful to understand whether the lack of items was a factor in the lack of significant findings in this study. As well as this, in a bid to increase reliability, it would have been useful to have further tests of historical and contemporary knowledge that did not exclusively rely on self-reports but rather involved a short test.

As with reflexive thematic analysis it is important to consider how I as a researcher may have been influenced in my approach by my own identities and perspectives and experiences, and this could have contributed to the methodological limitations of this study. As an atheist British white male, I approached the analysis of the interviews through this lens. Likewise, it is possible that participants responded to me as a British white male, and revealed information accordingly. In order to mitigate this I attempted to be as impartial as I could, not ask leading questions, not disclosing my faith and allowing the discussion to be led by the participants though using the interview protocol. The interview protocol itself was also developed and devised with the help of researchers and the National Holocaust Centre and Museum in an attempt to make it thorough but also to mitigate influences and biases that I may hold as an atheist British white male. The research team did work collaboratively in the coding of data and sorting into themes in an attempt to ensure the themes reflected the data rather than a reflection of a sole researcher's biases.

Future recommendations

Much research into the effects of education concerning the Holocaust has focussed on the short-term impact of interventions, with the long-term impact not being clear cut when examined (Cowan & Maitles, 2007). Tracking the long-term impact of education

interventions involving the lead up to the Holocaust would provide useful insight into how best to encourage lasting pro-social behaviours through similar interventions.

Reimer et al., (2021) highlighted that very few contact interventions have had more than a few hundred participants, and even when they have it is questionable whether they met the criteria for an adequate contact intervention. Therefore, more large-scale interventions with delayed-outcome measures are required (Paluck et al., 2019). There is a great need for longitudinal evaluations of interventions that tell us more about the lasting effects of interventions, especially considering research has shown interventions can have a positive effect in the moment but no positive effect when the same participants are analysed just two weeks later (Bailard et al., 2023).

Future evaluations should also consider which aspects of the intervention bring about the most positive impact and to which groups. It is possible that certain aspects of the intervention were impactful within this study, but this might have not come up as a significant finding because there is also potential that not every participant engaged with the aspects that were impactful, as every participants' experience of the intervention was unique. It would have been useful for there to have been data on which aspects of the platform each individual participant had interacted with.

Concluding remarks

This thesis is, to my knowledge, the first mixed methods study evaluating a historical education indirect e-contact intervention targeted at school pupils and young people. Overall the study supports the notion that indirect contact-based interventions can hold a positive

impact among young people in terms of improving perspective taking, empathy, knowledge of different cultures and knowledge of the harm discrimination can cause. This research adds to the important field of intergroup contact research by attempting to make sense of underlying mechanisms through, as recommended by previous studies (Vezzali., 2017), the exploration of moderated mediation analyses. This research also bolsters the notion that those who have experienced higher levels of direct contact with an outgroup may be less effected by indirect intergroup contact interventions, but it should be stressed here that by no means does this research imply direct and indirect contact interventions should not be used in unison.

The Bubbles platform could be useful as a prejudice reduction strategy that aims to also teach about historical topics in the hope of improving both historical and contemporary empathy and knowledge as well as social attitudes. Although the quantitative study found few significant findings, the themes and sub-themes that emerged throughout the data in the qualitative study showed how the platform could impact outcomes such as perspective taking, cultural knowledge and empathy. However, consistent with the present results, this study suggests the intervention would need some minor adjustments to ensure the platform has as positive an impact as possible; for example more support to encourage intergroup contact between participants and some questions to encourage participants to judge the information they are learning in a bid to help increase historical empathy and encourage participants to consider the importance of new information they may have learnt.

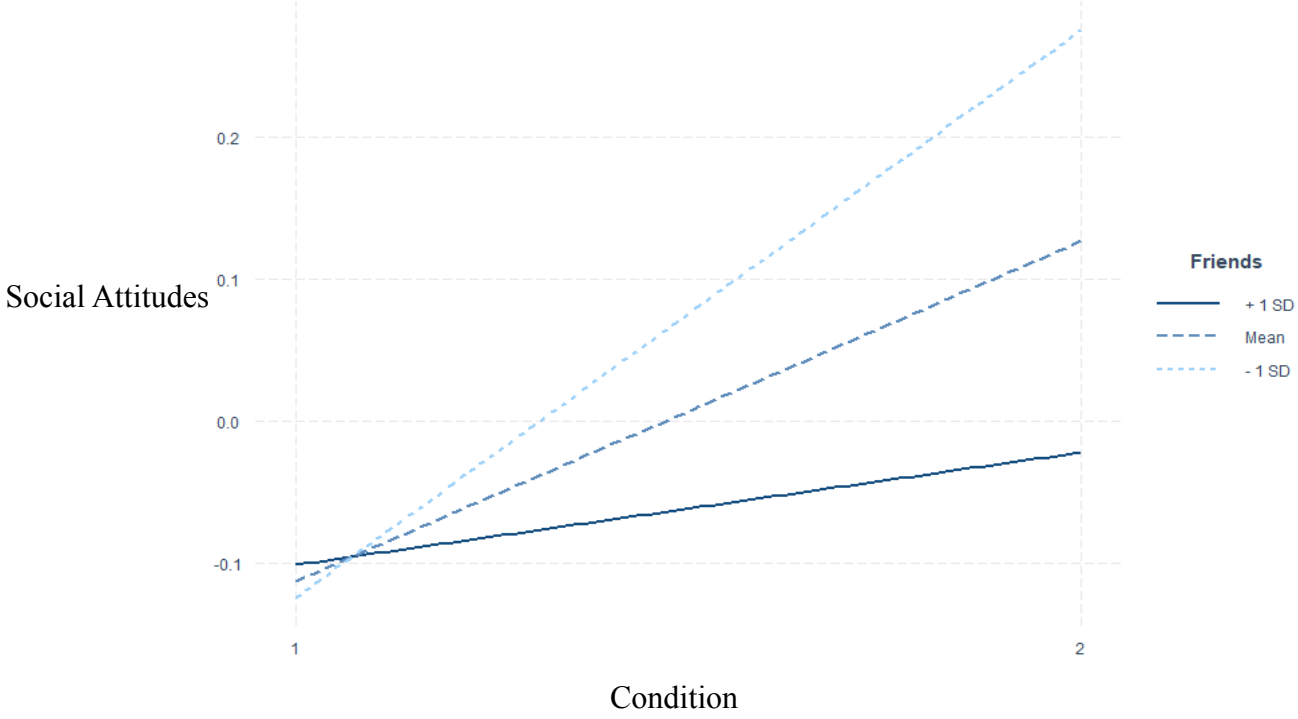
It would be very useful for future prejudice reduction interventions to explore online platforms of a similar immersive nature and to evaluate them more thoroughly. There is a great opportunity for such platforms to allow for a combination of historical and

contemporary learning, with collaborative intergroup contact also a great possibility. Given the nature of the qualitative work that will be required to deeply understand such similar platforms, and the great possibility of researchers bringing their own approaches that could be flawed in many ways, it is vital a strong body of work is put together by a range of researchers to assess such platforms. Future research should consider which groups these online platforms would have the most impact on and how platforms could be fine-tuned to be more effective amongst different demographics. As seen in this study, discussions with various stakeholders, in this case teachers, young adults and pupils, is crucial if there is to be richness and weight attached to such qualitative research.

The quantitative aspect of this study, although littered with methodological limitations, helped to add to a movement within intergroup contact research that is deeply considering the mechanisms that make an intervention successful. The moderated mediation model utilised in this study should be explored further to help streamline prejudice reduction interventions. This is incredibly important in a time of increased discrimination and increased reports of hate crimes. Indeed, with schools and educational institutions under increased financial pressures, it is crucial that interventions make best possible use of the valuable time and resources that they will be taking up in their implementation.

Appendix

Figure 1. *Simple slopes analysis*



Note. This is a graph for the simple slopes analysis mentioned in study 1b (p. 73)

Figure 2. Table showing the differences in delivery of the intervention between schools.

School	Educator present	Individual PCs	Worked in small groups	Worked as a class on the projector	Paired with another school	Avatars present	Headphones	Webcams	Microphone	Access to the shout function	Kristallnacht change
1	✗	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓
2	✗	✗	✗	✓	✗	✓	✗	✓	✗	✓	✓
3	✗	✓	✓	✗	✗	✓	✓	✗	✗	✗	✓
4	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓	✓
5	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓

Note. The school that was not included in the analysis was not included in the table.

Figure 3. The contact star that was adapted from the Anne Frank Trust report (Goodbun, 2021) and utilised in study 1a and study 1b.

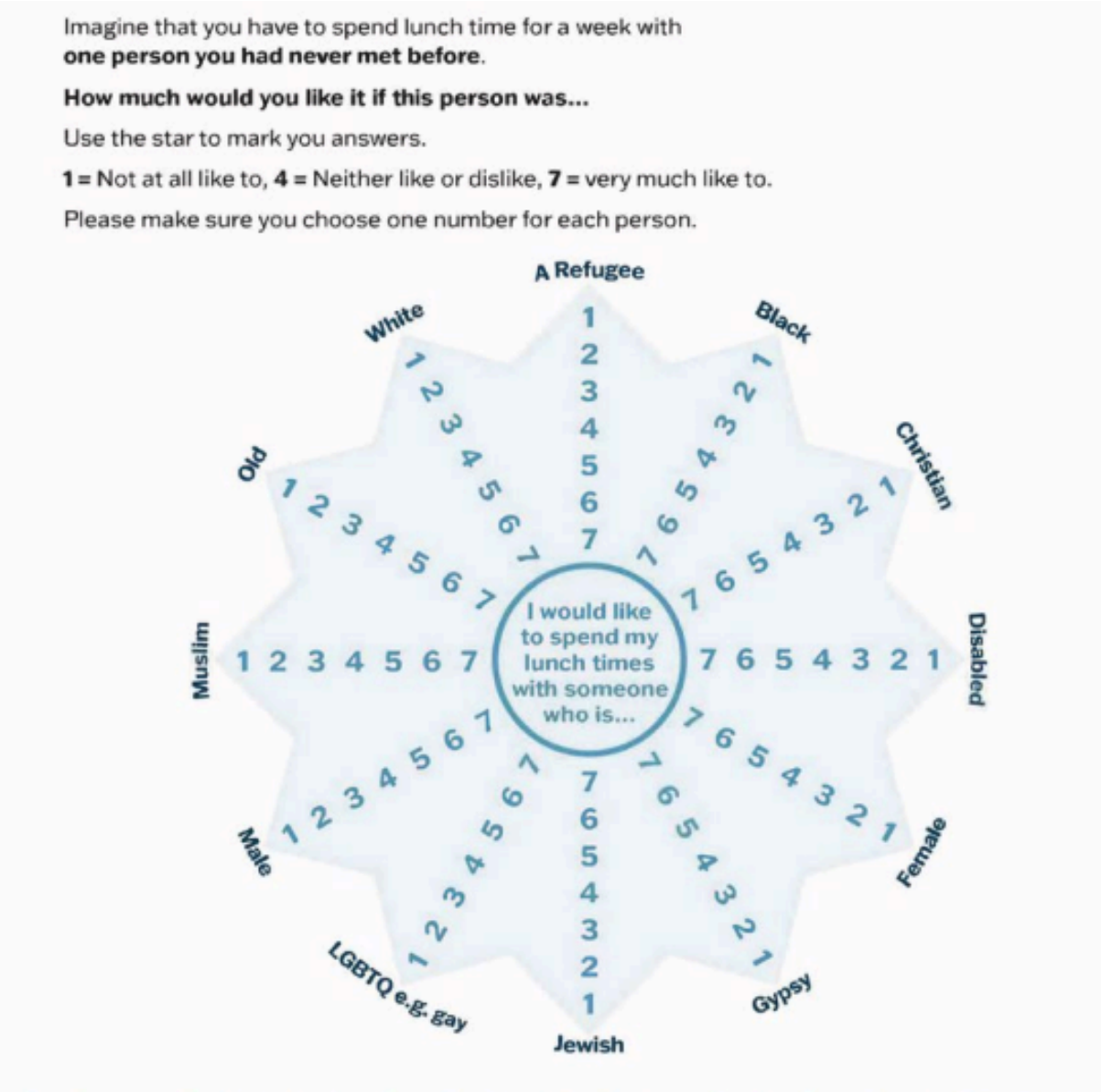


Figure 4. The young adult and school pupil interview protocol used in semi-structured interviews and focus groups for study 2.

Proposed Topic Guide: Focus group interviews

Below is a proposed topic guide that further explores the research questions found in the survey. The interview process will be iterative and may therefore change over the course of the interviews, however the core topics will remain the same. Participants will be school students. Participants will provide informed consent using the same information sheets as in the survey, but regarding interviews/focus groups. They will be given an opportunity to opt out at any time.

Length of interview/focus group: approx. 30 mins.

Introduction

Aim: To introduce the ideas behind the research and give context for the focus group

- Introduce self as the interviewer – who you are, aims of research (as described in information sheets and permission letters)
- Lay out the room to encourage conversation if poss
- Ice breaker with students: ‘So do any of you know each other? Would you like to introduce yourselves, say your name,
- If possible get everyone talking
- Introduce study: who/what it is for, what is it about.
- Key points:
- purpose of interview/focus group (elicit more detail about experiences at Bubbles)
- length of interview/focus group (roughly 30 minutes but perhaps up to an hour depending on how the discussion goes)
- voluntary nature and right to withdraw at any point without explanation

- avoid using jargon and offer to further explain anything students don't understand
- reasons for audio recording the interview (for transcription and accuracy, so interviewer can focus on you)
- audio recording stored securely, deleted as soon as focus group is transcribed
- Notetaking is to stop me from forgetting ideas and follow up questions, nothing else.
- Not everyone has to agree and not everything said has to be positive, we are here to get honest opinions and try to understand what students are thinking.
- All responses are valid, there are no right or wrong answers.
- Confidentiality, and how findings will be reported: only general findings will be reported, we may report quotes from individuals but these will be anonymous and all identifying information removed from the quote
- Really important that we all agree some ground rules for the focus groups: we all get a turn to talk, we all listen when others are talking, we are really interested in all of your ideas. We are respectful of each of each other.

- Any questions?

Turn audio Recording On

Print out/photos of the rooms to aid conversations

Part 1: Background

Aim: to engage and relax the participant

- How old are you?
- What lesson are you meant to be in just now?
- Did you do anything nice in the half term break?
- What year are you in?
- What is your ID code? (if only 2-3 present in focus group)

Part 2: Bubbles evaluation

Introduction:

SO tell me what you did when you used Bubbles (each participant individually talks through the session)

Ok, so here is a question for the whole group…

-so how did it all start?

-then what happened?

Interesting! Thank you for sharing, I'm curious…. if you were to explore the platform again what would you do differently?

-and in your bubble were you paired up with another student? If so were they from another school? (NOTE ANSWER FOR FUTURE QUESTIONS)

-if yes: could you speak to each other? Could you see eachother?

-what was that like?

-were the instructions on how to use the platform clear?

If they seem talkative on this topic can expand on this, or can go in to it later at the end of each subsection below

-what rooms did you go in?

-what objects did you pick up? (NOTE ANSWERS FOR NEXT QUESTIONS)

-so how did you feel in room _____ /when using object _____

Did any aspects of the platform have special meaning to you?

Knowledge, empathy and feelings:

Aim: To elicit perceptions of Bubbles programme, how engaged with it, feelings and knowledge it instigated.

Impact on knowledge

Did you learn anything new in Bubbles? Anything you didn't know before?

What kind of knowledge on the topic did you have before taking part in the bubbles programme? Did you learn anything new?

-tell me more about that

-anything else?

-did you learn anything new about the everyday lives of Jewish people living in Germany in 1938?

-did you learn anything new about the holocaust?

-Did you see anything in the room make the history feel more real?

-did you learn anything about how the state started to exclude Jewish people in Germany? The processes they used to do it?

Was there anything surprising to you?

Was there anything the platform made you think more about?

- What did you find most interesting and why?

Impact on perspective taking

-do you think it helped you to get into the shoes of Jewish people living in Germany at that time, provide an insight into what their lives were like?

Did it give you an idea of how it felt for Jews living in Germany in 1938?

How do you think they felt?

- what do you think it would feel like to be a German Jew before Kristallnacht?

-what do you think It would feel like to be a German Jew after Kristallnacht?

Sharing knowledge

-did you feel a need to speak about your experience and share your experience with other people, maybe friends or family?

-what would you tell them?

Did you share anything you learned?

-is there anyone in the world you'd like to explore the platform with? If so why?

-is there anything that could have been included on the platform that wasn't?

-anything you'd like to know more about?

Application to present day

-so we talked so far about how Bubbles might change how you think and feel about the holocaust, but do you think anything you learned is useful for modern times?

-Did it change anything about how you see the world today?

-does the program teach you anything about life and people?

-what would you do if you saw an anti-Jewish post on social media?

-What, if any, kinds of behaviors that contributed to the Holocaust do you see still around today?

-does it make you think differently about equality now?

-some people think we shouldn't learn about the holocaust as it happened in the past, what do you think about that?

-do you think the holocaust is something from the past that we don't really have to learn about, or is it useful?

User engagement

-did you find it easy to use the system?

-did the teacher aid your journey through the platform?/did the teacher talk to you whilst you were exploring the platform?

-DO you think this is better than other types of learning you have done about the holocaust?

If they worked in a pair (camera + mic)

-do you think that being paired up with someone changed how you used bubbles?

-did you talk to each other when you were moving around the room? (what did you talk about and when)

-did you notice other people in your group were there, or did you do it individually?

- were the interactions you experienced competitive or cooperative?

-do you think it would have been different to explore the platform by yourself?

-did you follow each other around or did you go where you wanted?

-did you enjoy working with people from the other school?

-did the other people (own or other school) help you get more out of Bubbles?

-did you feel like you were working as a team or individually?

-did you expect to talk more or less to the person you were paired with? What helped/stopped you from talking to one another?

-did you notice any reactions on the web cam from the person you were paired with to rooms/objects on the platform?

-is there anything you would do differently?

-or maybe anything you would change about the platform? Particularly about the pairing aspect?

If they worked in a pair (just mic)

-do you think that being paired up with someone changed how you used bubbles?

-did you talk to each other when you were moving around the room? (what did you talk about and when)

-did you notice other people in your group were there, or did you do it individually?

- were the interactions you experienced competitive or cooperative?

-did you follow each other around or did you go where you wanted?

-did you enjoy working with people from the other school?

-did the other people (own or other school) help you get more out of Bubbles?

-did you feel like you were working as a team or individually?

-did you expect to talk more or less to the person you were paired with? What helped/stopped you from talking to one another?

-is there anything you would do differently?

-or maybe anything you would change about the platform? Particularly about the pairing aspect?

If they worked solo

-do you think it would have been different to do this with others?

-is there anything you would do differently?

Benefits/drawbacks of pairing with someone from THE SAME school

-had you worked with the student you were paired up with before?, would you like to work with them again in the future?

-would you have preferred to have been paired up with a student from a different school, maybe one far away?

Benefits/drawbacks of pairing with someone from A DIFFERENT school

-would you have preferred to have been paired up with a student from the same school as you?

-would you like to work with the student you were paired up with again in the future?

Part 8: Thanks and Debrief.

Aim: Wrap Up

- Thank you so much for answering my questions, do you have any further things you would like to add or ask me?
- I just want to remind you that all of your answers will only be seen by members of our team until they have had any identifying information removed. Even then, they will only be shared in small parts.
- *Turn audio Recorders off*

Thanks and Debrief, make sure that they are feeling confident about the project aims, what we'll do with data and confidentiality.

Distress Protocols: triggered on the participant looking or sounding upset before, during or after the interview.

- If an individual appears to get upset acknowledge the difficulty of the topic and thank them for their contribution
- Remind them that they don't have to share it they don't want to
- If they continue to be upset offer to take a minute
- If they are still upset offer to turn the recorder off for a minute
    - Ask if they would like to continue
- Provide them with helpline and websites for support

Figure 5. *Interview protocol used in Study 2 for teacher interviews*

Proposed Topic Guide: Focus group interviews- Teachers who oversaw a class of students taking part in the intervention

Below is a proposed topic guide that further explores the research questions found in the survey. The interview process will be iterative and may therefore change over the course of the interviews, however the core topics will remain the same. Participants will be school teachers. Participants will provide informed consent using the same

information sheets as in the survey, but regarding interviews/focus groups. They will be given an opportunity to opt out at any time.

Length of interview/focus group: approx. 30 mins.

Focus group size: N=1, plus 1 x RA

Introduction

Aim: To introduce the ideas behind the research and give context for the focus group

- Introduce self as the interviewer – who you are, aims of research (as described in information sheets and permission letters)
- Introduce study: who/what it is for, what is it about.
- Key points:
- purpose of interview/focus group (elicit more detail about experiences at Bubbles)
- length of interview/focus group (roughly 30 minutes but perhaps up to an hour depending on how the discussion goes)
- voluntary nature and right to withdraw at any point without explanation
- reasons for audio recording the interview (for transcription and accuracy, so interviewer can focus on you)
- audio recording stored securely, deleted as soon as focus group is transcribed
- Notetaking is to stop me from forgetting ideas and follow up questions, nothing else.

- Confidentiality, and how findings will be reported: only general findings will be reported, we may report quotes from individuals but these will be anonymous and all identifying information removed from the quote

- Any questions?

Turn audio Recording On

Print out/photos of the rooms/objects to aid conversations

Part 1: Background

Aim: to engage and relax the participant

- How long have you been teaching?
- What subjects?
- Did you do anything nice in the half term break?
- What year group are you teaching?
- What is your ID number?

Part 2: Bubbles evaluation

Introduction/general questions:

SO tell me how do you think the session went when your class used Bubbles?

-how did it all start?

-then what happened?

-roughly how many groups were there in your class?

-were some people working alone?

-were your class paired with another school

-were the instructions on how to use the platform clear?

-were there any technical difficulties?

-what did you think of Bubbles?

-what did the students think of it, how did they get on with it?

-were you in contact with another school/teacher to coordinate the experience for those paired with a student from a different school?

-what was that like?

(If they seem talkative on this topic can expand on this, weaving in the main themes below, or can go in to it later at the end of each subsection below)

Knowledge, empathy and feelings:

Aim: To elicit perceptions of Bubbles programme, how engaged with it, feelings and knowledge it instigated.

Impact on knowledge

-do you think the class were aware of what happened specifically in Germany in the Nazi era prior to taking part in this programme? (I.e. what was the young people's starting point?)

-Do you think your students gained new knowledge through the Bubbles platform?

-tell me more about that, why do you think that, can you think of any examples?

-anything else?

-do you think pupils learned anything about how the state started to exclude Jewish people in Germany?

-Do you think some students grasped the processes the state used to do it?

-what made you think that?

-was there anything surprising, with regards to new knowledge, about the student's reaction during their learning experience?

-did you get an impression of an aspect of the programme that students found most interesting? Why do you think that was?

-did any students ask questions, or say they wanted to learn more?

-Or were any students keen to learn more about particular objects?

-Did you see anything in the room make the history feel more real for the students?

-Did students seem shocked or alarmed by anything on the platform

Impact of Bubbles compared to other programmes

-did you notice any students paying particular attention to certain rooms/objects?

-have you previously taught the class anything related to the persecution of Jews in Germany/ the events that led up to the holocaust?

-if so, do you think the pupils reacted differently to the interactive session than they would have a more standard taught lesson?

-do you think this method of learning about the lead up to the holocaust is better/worse than other methods?

-how so?

-did you learn anything new from overseeing the interactive experience?

-how do you think different age groups would respond to this platform?

Impact on perspective taking

-do you think they gained a better insight into the lives of Jewish people in Germany in the Nazi era?

-why do you think that?

-any examples?

-did any students ask you questions about life from another person's perspective as a result of the programme? Maybe about being a Jewish child in Germany in 1938? -why do you think they asked?

Sharing knowledge

-were any students keen to share new knowledge they had learnt as a result of taking part in the bubbles prorgamme with you?

-were students sat next to each other/ in the same group seeming keen to discuss new knowledge?

-did students taking part in the programme individually stop to talk to each other about their experiences?

-did you hear students talking to each other about it? What did they say?

-did students share anything about the impact the programme had on their feelings?

-did you feel a need to speak about your experience and share your experience with other people, maybe friends/ family/ other teachers?

-what would you tell them?

Curiosity and want more information:

-did any students suggest they were going to continue further research on this topic in their own time?

-Did any student say that they would be keen to learn more on this topic in school time?

-Was there any talk of wanting a trip to Germany/the National Holocaust museum to learn more?

-How do you think the students felt whilst going through the platform? Why?

Application to present day

-and do you think they would apply their new understanding of historical context to modern day situations?

-do you think the program was useful in terms of teaching students anything about life and people today?

-did students seem to consider the events they learned about as something from the past so not important or rather something valuable to learn about moving forward?

-Did you notice any changes in behavior from students towards others from different ethnic/faith backgrounds?

-do you think taking part in this programme could change behavior towards people from different ethnic/faith backgrounds to themselves?

User engagement

Ease of use

-did you find it straightforward to set up the programme?

-do you think students understood whether they were working with someone else or individually

-how focused did students seem?

-was it distracting for some students to be talking to others over zoom with multiple conversations going on in the room?

-did any groups/students require leadership/guidance once they had started exploring the platform?

-did you enjoy working with people from the other school?

-in comparison to other teaching methods, how does this platform compare in inducing conversation about equality?

-again in comparison with other teaching methods, did students seem to take on more new knowledge or do you think an alternative task would have been more productive?

Benefits/drawbacks of pairing with someone from THE SAME school

-do you think pairing students with students from another school added anything to this learning experience?

-did it make a difference pairing some students up, or would it have been the same if they had taken part on their own?

- were the interactions you witnessed competitive or cooperative? Or did they interact with eachother at all?

-to what extent were interactions between students who were paired together positive or negative?

-did you expect more or less collaboration between students paired together with a web cam and mic on?

-did students seem more focused on exploring the platform, communicating with fellow students, or a blend of the two?

-were there some students who were more engaged than others? Any reason why?

-is there anything you would change about the aspect of the programme that meant students were potentially paired up/not paired up with someone else?

-did you expect more or less collaboration between students paired together with just a mic on?

-did the web cam being on or off seem to change the level of interaction between students paired together?

-would you have preferred students to have been paired with students from a different school, maybe one far away? Why?

Benefits/drawbacks of pairing with someone from A DIFFERENT school

-do you think pairing students with students added anything to this learning experience?

-did it make a difference pairing some students up, or would it have been the same if they had taken part on their own?

- were the interactions you witnessed competitive or cooperative? Or did they interact with eachother at all?

-to what extent were interactions between students who were paired together positive or negative?

-did you expect more or less collaboration between students paired together with a web cam and mic on?

-did students seem more focused on exploring the platform, communicating with fellow students, or a blend of the two?

-were there some students who were more engaged than others? Any reason why?

-is there anything you would change about the aspect of the programme that meant students were potentially paired up/not paired up with someone else?

-did you expect more or less collaboration between students paired together with just a mic on?

-did the web cam being on or off seem to change the level of interaction between students paired together?

-would you have preferred students to have been paired with students from this school instead? Why?

If not paired

-some of the other schools that took part paired students with students from another school and they explored the platform together, what do you imagine the benefits/drawbacks of this would be?

Impact on teacher:

-did you learn anything new about the holocaust?

-has taking part in this platform made you likely to change/adapt teaching methods in the future?

Part 8: Thanks and Debrief.

Aim: Wrap Up

- Thank you so much for answering my questions, do you have any further things you would like to add or ask me?

- I just want to remind you that all of your answers will only be seen by members of our team until they have had any identifying information removed. Even then, they will only be shared in small parts.
- *Turn audio Recorders off*

Thanks and Debrief, make sure that they are feeling confident about the project aims, what we'll do with data and confidentiality.

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- Provide them with helpline and websites for support

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Footnotes

[1] Anti-Jewish behaviours and attitudes is the terminology that will frequently be used throughout this paper as opposed to anti-Jewish racism or anti-Semitism. Anti-Jewish racism is racism against Jewish people, hence the definition is similar to that of racism and involves 'the belief that humans may be divided into separate exclusive biological entities called 'races'; that there is a causal link between inherited physical traits of personality, intellect, morality and other cultural and behavioural features; and that some races are innately superior to others' (Smedley, 2024). Anti-Semitism can be defined as a form of hate, bias, and prejudice against a person from the Jewish community, leading to physical and psychological harm (Walker et al., 2024). Anti-Jewish behaviours and attitudes will be utilised more frequently in this paper to be clear what we are referring to. In cases where previous research is being citied, anti-Jewish racism or anti-Semitism may be used.