Exhibiting Forensic Archaeologically-Derived Holocaust Data Through Virtual Heritage Technologies: An Ethical Perspective

by

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Abstract

Forensic archaeology has demonstrated its ability to identify, record and analyse evidence from Holocaust landscapes. With an increased number of investigations over the last two decades, vast quantities of evidence are generated, providing unique spatial and temporal understandings of the Holocaust; which can enhance commemoration and education perspectives. This research explores the ethical complexities when using virtual heritage visualisations to represent forensic archaeologically-derived Holocaust data. Desk-Based Analysis (DBA) and non-invasive archaeological fieldwork data acquired by the author in 2013 and 2015, from investigating Sylt camp (1942-1945) (Alderney; Channel Islands) provides a case study for research. This data was presented through an online platform ('Explore Lager Sylt') which resourced a photorealistic virtual tour, series of abstract evidence-based 3D reconstructions and various multimedia. Guidance for developing this platform was provided by the London (2009) and Seville (2011) Charter, with research assessing their suitability for Holocaust representations. To acquire comparative data, the 'Explore Lager Sylt' and 'Anne Frank Secret Annex' platform created by the Anne Frank Fonds, was disseminated to 104 participants through focus study groups, interviews and questionnaire surveys. Employees and visitors of the United States Holocaust Memorial Museum (USHMM) and (UK) secondary school students formed the participants to research. Using grounded theory and thematic data analysis, four key themes were identified (accountability, communication, education and presentation), underpinning dissemination considerations. This research highlights that many benefits stem from learning about the Holocaust from a forensic archaeological perspective, emphasising the importance of incorporating historical and contemporary evidence within education. By demonstrating how ethical complexities can be addressed, this research establishes a framework for future archaeological representations of the Holocaust.

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1.0 Introduction

The systematic murder of millions of individuals by Nazi Germany between 1933-1945 is known as the Holocaust. Although this term generally refers to Jewish victims, other victims were targeted due to their ethnicity, political views, religious beliefs and sexual orientation. These victims included Western European populations (such as Germans, Belgians, Dutch, French, Greeks and Italians), Slavic populations (such as Russians, Poles, Serbs and Ukrainians) and those of African descent. Political groups (such as Capitalists, Communists, Leftists, Social Democrats, Socialists, Spanish Republicans and Trade Unionists) and religious groups (Freemasons, Jehovah Witness, Muslims, Orthodox Christians, Protestants and Roman Catholics) were also targeted. Additionally, Roma and Sinti, lesbians, gays, bisexuals and transgender people (LGBT), persons with disabilities, Soviet Prisoners of War (PoW) and any other individuals opposed to Nazi ideologies were incarcerated and killed (USHMM.org, 2018). The geographical scale of the Holocaust was evidenced through the construction of over 42,000 (concentration, extermination, transit, forced labour and PoW) camps, transportation links, fortifications and (forced labour) factories across Europe (Megargee & White, 2018; Sturdy Colls, 2015). Contrary to traditional perspectives and the ambiguity surrounding the term ‘Holocaust’ (USHMM.org, 2018; Lang, 2005; Richardson, 2005) (Chapter 2 Section 2.1.1), the author considers this word to incorporate any victims persecuted under Nazi policies alongside sites purposefully constructed to eradicate these individuals and/or groups.

The term 'Never Again' provides a commemorative response to the Holocaust, acting as an educational reminder of former inhumane actions (Holtschneider, 2011; The Watson Institute for International Studies, 2003). However, 'Never Again' requires accurate knowledge of historical events to ensure atrocities do not reoccur. Holocaust narratives are considered valuable in conveying lessons in morality, ethics and human rights and therefore, dissemination of Holocaust materials is considered of paramount importance (Maitles & Cowan, 2007; Short 2005; Blum, 2002). Traditionally, historians and historical materials provided the means which the Holocaust is taught and learnt. More recently Holocaust studies has begun to derive information from forensic archaeology, which applies unique methodologies to examine tangible evidence of atrocities in the form of material culture and investigative data (Schute, 2017; Sturdy Colls & Branthwaite, 2018; Sturdy Colls, 2015; Crossland, 2013; Haimi & Mazurek, 2013; Sturdy Colls & Colls, 2013; Darmamin & Mootz, 2006; Schofield & Johnson, 2006). The types of primary sources used by archaeologists to assist interpretations include: cartographic data, photographic data, aerial imagery, documentary evidence, witness testimonies, interviews, plans, Geographical Information Systems (GIS), geophysical data, remote sensing data, artefacts, buildings, vegetation changes and man-made landscape alterations.

Increasingly, Holocaust data generated from archaeological investigation is predominately digital (Sturdy Colls, 2015; Sturdy Colls & Colls, 2013). Therefore, innovated representation and dissemination methods are required, which can be attained from disciplines such as virtual heritage and digital humanities. Myer's (2008) eloquently conveys the challenges confronted by archaeological investigations of Holocaust sites, drawing awareness to: a 'series of tensions' between 'remembering and forgetting', 'live human actors and the material record', testimony and evidence conflictions, and the overwhelming quantity of sources; all compounded by the elapsed time since the event alongside political agendas, social, cultural and religious perspectives. However, by disseminating digital forensic archaeological data from Holocaust sites some of these issues can be partially addressed (Sturdy Colls, 2015; Sturdy Colls & Colls, 2013).

As Reading observed as early as 2001, 'the Holocaust has taken on a virtual dimension' (Reading, 2001: 323). This is demonstrated by the Future Memory Foundation who 'seek to conserve and present the history of Nazi crimes and the Holocaust in the service of education' since 'we are entering the post witness era we have to resort to advanced technologies such as virtual and Augmented Reality to make the sites themselves become the portal to the historical sources' (FutureMemoryFoundation.org, 2015). Although, technological advances offer both promise and risk, dependant on how representation and dissemination are maintained.

From the courtroom to online, Holocaust representation difficulties have included: global terminology inconsistencies, conveying empathy alongside how realism and authenticity can be maintained even when unknown. These issues become further complicated through cultural, political, religious and societal influences, all of which profoundly impact understandings of the Holocaust. This thesis outlines the moral dilemmas and solutions encountered by the author when displaying Holocaust narratives through different visualisations. It presents the ethical contemplations of Holocaust representation, specifically, interpreting how to disseminate forensic archaeological data through virtual heritage technologies given the recent emergence of these fields.

1.1 Study Context & Basis for Further Study

The foundation for Holocaust forensic investigations was the 1943 Katyn Forest massacre of 4,500 Polish elite and military (Smolensk, Russia) (Sterio, 2011; Ranta & Takamaa, 2007; Haglund *et al*, 2001). Post-World War Two, military investigations were conducted at Holocaust sites by War Crime Commissions acquiring evidence for criminal sentencing (Arad *et al*, 1999; Central Commission for Investigation of German Crimes in Poland, 1946) which, although they combined elements of archaeological and anthropological methods, did not include archaeologists. Given recent advances in forensic archaeological methodologies, these investigations are considered insufficient in quantity and quality, failing to accurately search and document sites, with limited

attempts to discover and record (mass) graves (Sturdy Colls, 2015; Bistrovic & Kemmelmeier, 2014; Gilead *et al*, 2010).

Since 1945, archaeological links with the Holocaust have been minimally maintained through investigation, heritage, commemoration and tourism. For example, archaeological methods have supported heritage centre and memorial renovations at the Operation Reinhard extermination camps[1] (Gilead, 2014; Haimi & Mazurek, 2013; Gilead *et al*, 2010; Kola, 2000). These investigations broadly unearthed: 33 mass graves, eight structures and personal artefacts at Bełżec (Kola, 2000); and five structures, seven mass graves (Kola, 2001), camp boundaries, over 1,000 artefacts (Gilead *et al*, 2010), and a prisoner tunnel (Gilead, 2014) at Sobibór. Schute (2017: 1) considers that archaeological findings, such as those from Sobibor, 'formed the culmination of an emerging Holocaust archaeology in the last decade, research which tends to have a strong emphasis on material culture and its emotional and symbolic value'.

Holocaust archaeological research focuses on infamous Holocaust sites, such as Treblinka (Sturdy Colls, 2012), and lesser-known sites, such as Lager Norderney (Sturdy Colls & Colls, 2013). This allows previously 'forgotten camp sites' to be brought into the public's consciousness, raising greater awareness, education and commemoration of the Holocaust (Schute, 2017: 3). The extensive research currently conducted within this field is demonstrated by the varied locations where investigations have occurred. For example: Netherlands (Schute, 2017; Schute, 2013), Norway (Jasinski, 2013), Germany (Sturdy Colls, 2015; Theune, 2014; Theune, 2010), Poland (Sturdy Colls, 2014; Sturdy Colls, 2012; Pawlicka- Nowak, 2004; Pawlicka-Nowak, 2004a) and Alderney (Kerti, 2013 unpublished; Sturdy Colls & Colls, 2013; Sturdy Colls, 2012) (Chapter 2 Table 2.2).

The evidence discovered through archaeological investigations of Holocaust sites highlights both the requirement for and significance of its methodologies. By conducting above and below-ground investigations, evidence such as the location of structures, material culture and mass graves have been identified. This evidence helps to understand how victims lived, survived and died, alongside perpetrator actions, such as extermination methods, dominance, control and the concealment of crimes. Additionally, investigative evidence further fulfils commemorative and educational functions through authentically confirming the existence of atrocities[2]. These evidence-based interpretations differ from traditional historically-derived Holocaust narratives, which are primarily created using historical and archival sources. Archaeology further enhances traditional historical narratives, by incorporating these sources within investigations, producing an amalgamation between contemporary evidence and the historical record. With increasing declassification of World War Two

[1] Operation Reinhard was the Nazis codename for the extermination of the Jews. Subsequently, this lead to the construction of three extermination camps named Bełżec, Sobibór and Treblinka, which used gas chambers to systematically eradicate Jewish populations (Arad, 1999).
[2] The term 'authentic' is further discussed in Chapter 7 (Section 7.2).

archive materials (for example, Guardian.com, 2017), archaeologists can further Holocaust understanding, providing a voice for both living and dead victims.

Many ethical complexities are associated with Holocaust investigations and commemoration. The investigations at the Operation Reinhard camps commenced due to insufficient memorialisation (for example, Bełżec) (Kola, 2000) and limited acknowledgement of Jewish victims (for example, Sobibór) (Kola, 2001). The conversion from a crime scene to a heritage site produces the impression that 'adequate commemoration' has been fulfilled (Sturdy Colls, 2015: 28). Similarly, Holocaust sites where memorial transformation has occurred with no investigation presents an identical paradox (Ibid). Therefore, archaeology can perform a fundamental role, ensuring effective investigation has occurred at sites transforming into places of commemoration and heritage.

Even at sites where construction works have completely modified the landscape, such as Bełżec, technological methods can still assist deciphering the site's former appearance. The archaeological techniques excavation and coring, conducted at Bełżec and Sobibór, were considered a 'monumental failure' by Jewish communities (Weiss, 2003). This is attributed to the disturbance of Jewish graves, contradicting Jewish Halacha Law[3] (Sturdy Colls, 2015; 2012; Rosensaft, 1979). Subsequently, Gilead *et al* (2010) considers 'that mass graves at the Nazi extermination centres will not be excavated in the foreseeable future. Information regarding their location…will be obtained by remote imagery and non-invasive geophysical methods' (Gilead *et al*, 2010: 13). Accounting for investigation sensitivities, non-invasive forensic archaeological approaches have been devised by some scholars, most notably Sturdy Colls (2015), allowing respectful and non-disruptive investigation of Holocaust sites to continue. Subsequently, greater quantities of digital data are produced from these approaches.

The ethical complexities associated with Holocaust representation are by no means only a contemporary issue. As early as 1945, the importance of visualising atrocities was recognised through criminal proceedings, with video providing eyewitness testimony (Douglas, 2005). Through continuous technological developments, societal exchanges have transformed. Advances in computing (such as Moore's[4] and Glider's law[5]) (Ch'ng *et al*, 2013), photogrammetry software algorithms (such as Scale-Invariant Feature Transform (SIFT)) (Historic England, 2017; Sun *et al*, 2014) and equipment (such as laser scanning) combined with attainable product costs, all influence cultural and virtual heritage representations. Subsequently, from the creator's perspective, visualisation often considers photorealistic representation the 'gold standard' of success (Tan &

[3] The Jewish Halacha Law is underpinned by the Torah's commandments outlining religious customs. A specific aspect of these customs states, 'not only is it forbidden to exhume the bodies but even to open the graves is strictly prohibited' (Rosensaft, 1979: 164).
[4] Moore's Law: Exponential growth of computer circuit transistors doubling approximately every 18 months (Schaller, 1997).
[5] Glider's Law*:* Digital communication bandwidth triples every 12 months (Mayer-Schönberger & Hurley, 2000).

Rahaman, 2009; Roussou & Drettakis, 2003; Roussou, 2002). Although technological advances can produce photorealistic representations of Holocaust landscapes, many sites lack sufficient evidence and sources that inform spatial and aesthetical details. Therefore, the boundaries of photorealistic representations require contemplation.

The dissemination of archaeological findings from Holocaust investigations has relevance within education (Sturdy Colls, 2012; 2015a; Kushner, 2002; Stone & MacKenzie, 1994). Research conducted by Sturdy Colls (2015 & 2015a) emphasises the utility of archaeological materials within educational contexts, referring to extensive datasets obtained by archaeologists which can form 'the basis of discussions with students concerning the nature and extent of genocide at the specific site being examined and the Holocaust more broadly' (Sturdy Colls, 2015a: 51). The educational potential for these data is also highlighted through Darmamin and Mootz's (2006) research, who describe associations between everyday historical objects and stories, which contemporary audiences can identify with.

Holocaust education is also rife with ethical complexities, contradictions and insufficient clarity. What is taught about the Holocaust differs significantly between countries, with a variation in language and terms used to describe the same event; for example, 'Holocaust', 'Shoah', 'Nazi persecution', 'extermination of Jews' and 'genocide against the Jews' (Carrier *et al*, 2015: 38). Even definitions surrounding the term 'Holocaust' and victim definitions are of significant academic debate (USHMM.org, 2018; Magilow & Silverman, 2015; Lang, 2005; Richardson, 2005). Holocaust research highlights requirements for empathy within education, to allow deeper associations to be developed between audiences and narratives (Gubkin, 2015; Dulberg, 2002; Short, 1999). Traditionally, empathic qualities derive from eyewitness testimony, which can now be technologically manipulated. Thus, one may question ethical boundaries between natural and manufactured empathy effectiveness, and degrees of 'manipulation'.

These complexities are evident within the United Kingdom (UK) through the (2016) University College London (UCL) report, 'What do students know and understand about the Holocaust? Evidence from English Secondary Schools' (Foster *et al*, 2016). The UCL conducted research with over 8,000 students, comprising the largest sole nation study within secondary school Holocaust education (Foster *et al*, 2016). Although this report highlighted that a basic understanding of the Holocaust exists within British secondary schools, many significant historical aspects are not understood (Ibid). These aspects are broad in scope but essentially encompass an understanding of 'who were the victims?', 'who were the perpetrators?', 'who was responsible?' and 'when and where did the Holocaust take place?' (Foster *et al*, 2016: 211). The report considers student Holocaust perspectives are congruent with political, sociocultural, myths and misconceptions, with external

factors such as media and entertainment further creating confusion (Foster *et al*, 2016; Holocaust Commission Report, 2015).

Therefore, Holocaust representation whether educational, commemorative, heritage or tourism, requires ethical consideration. Often, ethical issues can be categorised by religious, political, societal or cultural factors; Young (1993: 12) explains, 'motives for memory are never pure'. The author considers that qualities from forensic, archaeology, virtual heritage and digital humanities are all required to disseminate accountable, transparent, unbiased, evidence-based Holocaust narratives, through encompassing unique characteristics that can achieve ethically robust outcomes within Holocaust representation. Whilst technological processes, software and representation formats from this research will undoubtedly become obsolete, the archaeological data and ethical representation framework will continue to be of value within Holocaust studies.

The dissemination of Holocaust materials through virtual heritage technologies conforms to Beech's (2002: 199) ideology that Holocaust memorials fulfil both a 'remembering' and 'not forgetting function', naturally commemorating Holocaust events, sites and landscapes. However, representation style, type and formats can influence audience perception, thus recognition of details such as artistic and historical licence (Sturdy Colls, 2015), representation type (London Charter, 2009) and presentation of multimedia materials (Ibid), all have a profound impact on what the audience 'takes away' from interaction.

The book, 'Preserving Memory: The Struggle to Create America's Holocaust Museum', reveals the challenging ethical dilemmas confronted by those creating the United States Holocaust Memorial Museum (USHMM) (Washington, D.C) (Linenthal, 1995). The literature unravels Holocaust representation complexities ranging from the museum's location, construction design, competing narratives (victims, perpetrator, liberator and bystander), what and how narratives should inform, alongside the active selection of sources and artefacts (Ibid). In essence, this literature addresses the sensitivities surrounding ownership of Holocaust memory, grappling with societal levels of acceptance and understanding when displaying Holocaust narratives. This is described by Linenthal as 'judgement and good taste…in its presentation of murder' (Linenthal, 1995: 196).

Digital heritage technologies are being increasingly used in Holocaust representation. For example, augmented reality provides a suitable approach for on-site representations where limited or no physical Holocaust structures survive (Belsen-project.com, 2012) (Figure 1.1). Other digital and virtual forms of representation include 3D reconstructions and virtual tours. 3D reconstruction provides a visual method to display landscapes, structures and features. This is of relevance within Holocaust representations, given the Nazis' endeavours towards complete eradication, destruction and concealment of atrocities (Sturdy Colls, 2015; Arad, 1987). Virtual tours provide spatial,

thematic visualisations by geotagging historical sources and evidence within contemporary landscapes. Holographic technologies are also being created to disseminate survivor testimony. With the inevitable loss of Holocaust survivors and generational distancing from living memory, holographic visualisations permit audiences to digitally interact and engage in questions and answers with Holocaust survivors (SFI.USC.edu, 2018) (Figure 1.2). These digital approaches extend heritage, tourism, commemoration and memorialisation boundaries, providing important educational resources. These diverse forms of representation encompass interactive and engagement qualities, considered essential for learning (Kozhevnikov *et al,* 2014; Waring & Evans, 2014).

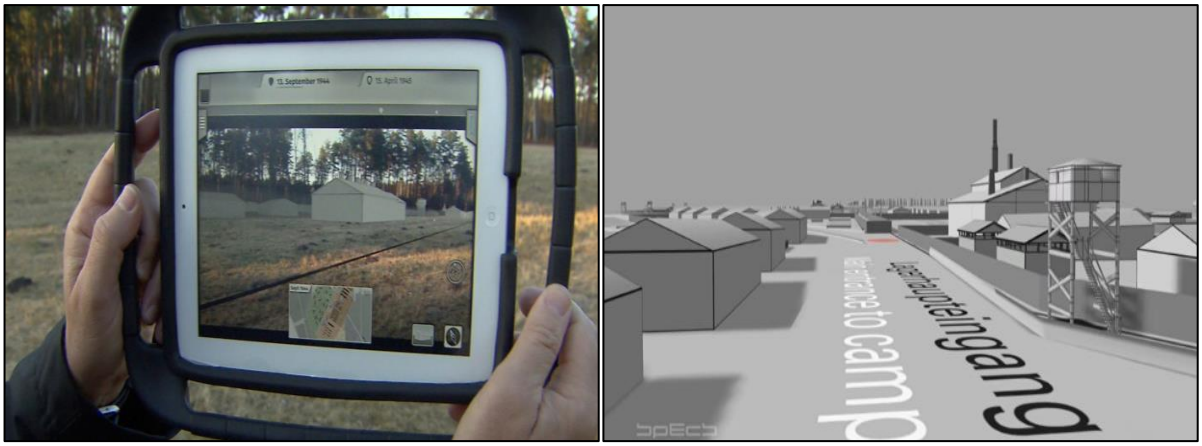


Figure 1.1*: (**Left**) Bergen-Belsen augmented reality app (Belsen-Project.com, 2012). (**Right**) Bergen-Belsen 3D reconstruction (Belsen-Project.com, 2012).*

Digital Holocaust representations disseminating archaeological findings are greeted with the same ethical challenges highlighted above. However, further complexities are apparent through 'limitless' digital visualisation possibilities, with reality and virtual reality boundaries becoming further obscured. By digitally reconstructing Holocaust sites, audiences are provided with an opportunity to visit historical pasts which may (for example, Auschwitz concentration camp) or may not (for example, Bergen-Belsen concentration camp) physically exist. Holocaust studies continue to produce Holocaust virtual environments. For example, an augmented 3D model of Bergen-Belsen concentration camp was developed because the camp was destroyed in 1945 (Belsen-Project.com, 2012). The virtually reconstructed camp structures are displayed to audiences through handheld digital devices when visiting the site, displaying spatial and temporal structural relationships (Ibid) (Figure 1.1). Similarly, a laser scanned 3D model of Auschwitz Birkenau has been developed for use within criminal proceedings, refuting the defence of former Nazi camp guard Reinhold Hanning that he was unable to see people being exterminated from his position in a watchtower (BBC.co.uk, 2016) (Figure 1.3).

Current digital Holocaust representations vastly differ in appearance. The Bergen-Belsen 3D reconstruction is represented with simplistic details (such as colour) and historical rigour (such as avatars) deliberately excluded (Belsen-Project.com, 2012) (Figure 1.1). Contrastingly, the laser scanned Auschwitz 3D model (Figure 1.3) portrays a realistic representation, using colour and displaying details such as barbed wire fences, whilst incorporating historical rigour (such as avatars and terrain vegetation) (BBC.co.uk, 2016). Although each model's intended purpose differs and consideration of surviving features alongside method/equipment selection vary, both examples demonstrate the current possibilities (and thus contemplations) within virtual Holocaust representations.

***Figure 1.2**: Holographic representation of Holocaust survivor Pinchas Gutter as part of the New Dimensions in Testimony project (SFI.USC.edu, 2018).*

No specific guidance for digitally representing Holocaust sites have been defined. More broadly, guidance for computer-based representations within cultural heritage exists through the London Charter (2009) and archaeology computer-based representations through the Seville Charter (2011). These documents outline details surrounding transparency, authenticity, reliability and accuracy for constructing and disseminating computer-based representations through 'scholarly rigour' (London Charter, 2009: 2). The emphasis within these documents is firmly rooted in the creators' perspective, not the audience, thus limiting user considerations. Building upon these foundations, public perceptions required evaluating to understand how Holocaust archaeological representations can be effectively developed and disseminated.

Much virtual heritage literature emphasizes the requirement for end-user perspectives (e.g. Champion, 2014; Ibrahim *et al*, 2011; Tan & Rahaman, 2009; Economou & Pujol, 2006), which are underdeveloped. The justification for end-user input stems from educational and communication interaction experiences, with decisions regarding 'how' and 'what' users experience being controlled by the expert, and thus the 'sense of perception is subjective' (Tan & Rahaman, 2009: 144; Ibrahim *et al*, 2011). Ibrahim and Ali (2018: 11) highlight that 'the viewer constructs the narrative', through the way content is selected and discarded. Therefore, a greater understanding of narrative structure within virtual environments is required. Although these approaches are useful for Holocaust archaeological representations, user interpretation is required to understand its effectiveness. Furthermore, Economou and Pujol (2006) describe that data from virtual heritage interactions with older participants are absent, with research primarily being conducted with younger participants.

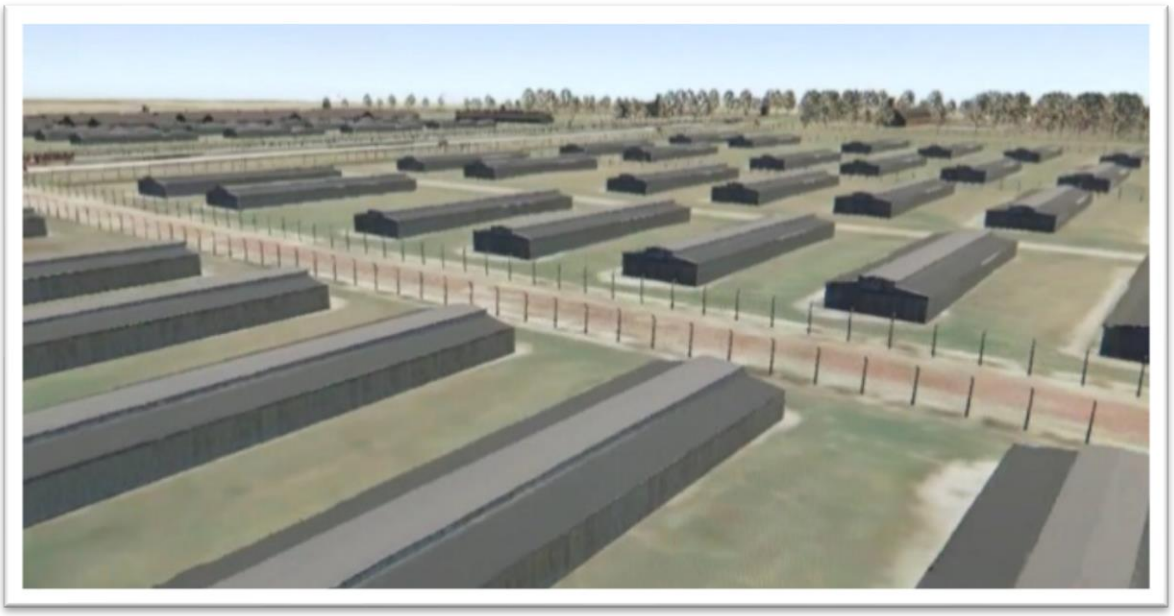


Figure 1.3*: Laser scanned 3D model of Auschwitz Birkenau, created for ascertaining 'lines of site' during criminal sentencing of former Nazi guard Reinhold Hanning (BBC.co.uk, 2016).*

1.2 Aims & Objectives

The primary aim of this thesis is to analyse the ethical sensitivities involved in exhibiting forensic archaeological data derived from Holocaust sites through virtual heritage technologies.

The aims are to:

1. Evaluate contemporary digital heritage resources and identify ethically-based practices to display forensic archaeologically-derived Holocaust data.

2. Determine the effectiveness of virtual heritage technologies embodying commemoration and educational values for raising public knowledge of lesser-known Holocaust sites.

The objectives are to:

1. Evaluate current digital and virtual heritage resources depicting Holocaust-related materials, contemplating their ethical content and representational format.
2. Develop a virtual heritage platform (based upon step one's findings), to display forensic archaeological data obtained from a case study site (Lager Sylt, Alderney).
3. Apply qualitative research methods (focus study groups, interview and questionnaire surveying), to identify and evaluate participant perspectives of the case study platform (step two) and an existing platform, the 'Anne Frank Secret Annex', to outline recommendations for future work.

To identify the ethical sensitivities associated with Holocaust representation through virtual heritage technologies, this research uses two different case studies. The initial case study derives from the online platform, the 'Anne Frank Secret Annex', created by the Anne Frank Fonds. This platform uses a virtual tour digital environment to display the secret annex and convey Anne Frank's narrative through traditional historical sources. The second and primary case study site considered in this research is Sylt concentration camp in Alderney in the British Channel Islands (Figure 1.4). This platform was constructed by the author specifically for this research, using the author's undergraduate research[6] (Kerti, 2013 unpublished) and archaeological fieldwork data acquired by author, staff and students from the Centre of Archaeology (Sturdy Colls & Colls, forthcoming; Sturdy Colls, 2012; Sturdy Colls, 2015). This platform resources a series of evidence-based 3D reconstructions and virtual tour, to convey Lager Sylt's narrative, created from forensic archaeological data. The platform can be accessed here: https://lager-sylt.website/index.html.

Sylt provides a unique research case study, being the only concentration camp constructed on occupied British territory during World War Two (Megargee & White, 2018; Pantcheff, 1981). The camp is located in the Channel Islands archipelago on the island of Alderney, in-between England and France (Figure 1.4). Between 1942-1945, the camp housed Russian and European prisoners, although, these claims are contested between two different British military investigations post-1945 (Pantcheff, 1981; WO311/13: Rpt No. PWIS (H)/KP/702). However, both investigations highlight that Sylt was primarily for non-Jewish inmates involved in slave labour (Ibid).

[6] The research is titled, 'The application of non-invasive archaeological techniques to record, map and decipher Sylt concentration camp' (Kerti, 2013 unpublished).

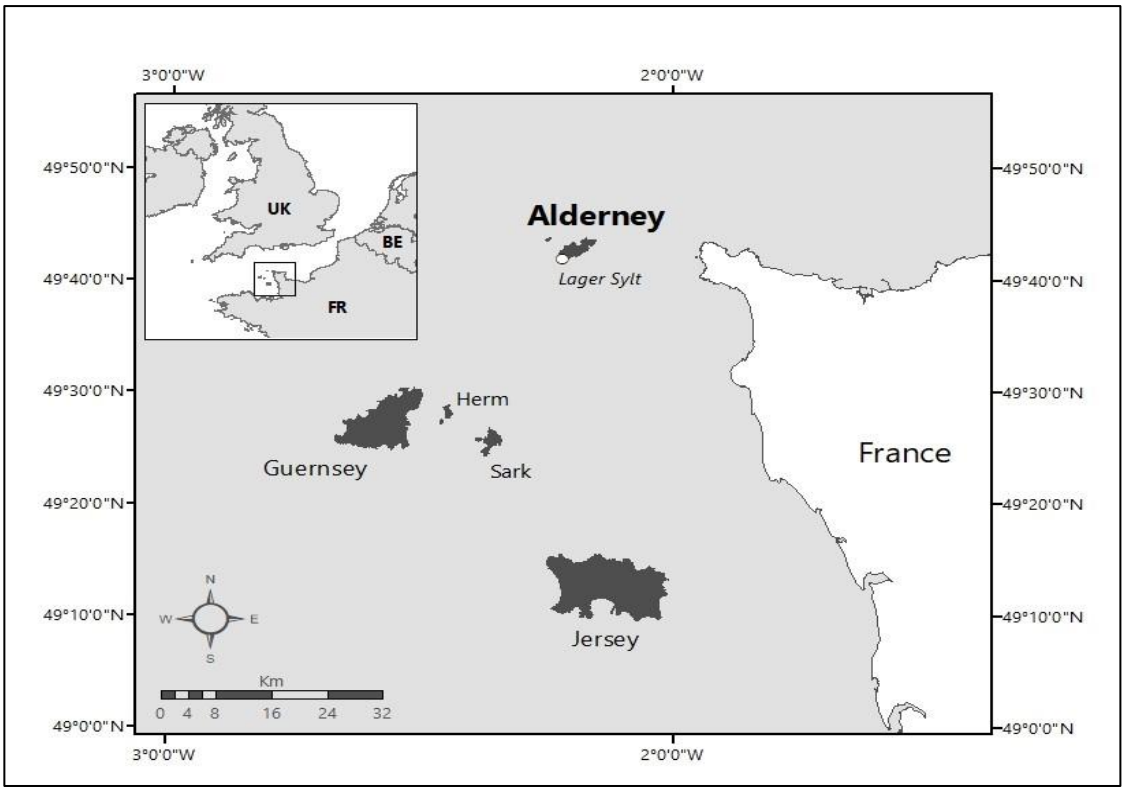


***Figure 1.4**: The Channel Islands archipelago is situated approximately 15 – 20km east of the northern coast of France. Alderney is the most northerly island of the group and the Sylt concentration camp location is approximated by the white marker in the south-east corner of the island (Swetnam, 2018).*

Many ethical complications were encountered when conducting archaeological site investigations (2010-2015), including: restricted site access, imposed method restrictions, government and public opposition (Sturdy Colls & Colls, forthcoming; Sturdy Colls, 2012; Kerti, 2013 unpublished; Sturdy Colls, 2015). Further ethical complexities are evident when conflicting literature accounts are considered, with the 'official' site narrative comprising of a 'watered-down' version of events by comparison to the historical record (Pantcheff, 1981; WO311/13: Rpt No. PWIS (H)/KP/702). Literature frequently describes Sylt as being 'destroyed' or 'dismantled' by the Nazis and states that (post-war) returning islanders used materials for construction elsewhere on Alderney (Forty, 2005; Saunders, 2005; Bonnard, 1991; Steckoll, 1982; Pantcheff, 1981; Packe & Dreyfus, 1971), contradicting the author's undergraduate research. These complexities originate from the conflicting post-liberation military investigations (1945), which focused more on satisfying British political and public impressions (Megargee & White, 2018), subsequently disregarding victim commemoration.

Lager Sylt's current overgrown appearance conceals evidence of the camp's existence (Figure 1.5). The author's 2013 undergraduate archaeological fieldwork and desk-based assessment (DBA), identified and documented 37 landscape features, providing camp, victim and perpetrator insights at Sylt (Kerti, 2013 unpublished) (Chapter 3 Section 3.2). In 2015, the author conducted fieldwork for this thesis at Sylt using photogrammetry methods to document the site, creating a virtual tour. An

important aspect of this research endeavours to understand if virtual heritage technologies can effectively provide a method to disseminate materials about Holocaust sites which bare limited resemblance to their former appearance, lack 'obvious' surviving landscape evidence and where on-site commemoration is not desired e.g. by the local population.

Figure 1.5*: The overgrown extent of Sylt concentration camp in Alderney (author's own image).*

1.3 Context & Methodology Overview

To achieve the aims and objectives, a mixed methodological approach was undertaken. This comprised five distinct aspects including: literature review and website evaluation, forensic archaeological fieldwork, the development of virtual heritage representations, qualitative research methods and data analysis. Forensic archaeological fieldwork data was initially acquired from the author's undergraduate research (2013) alongside fieldwork for this thesis (2015). Virtual heritage representations comprise a contemporary virtual tour, displaying Lager Sylt as it appeared in 2015 and a series of abstract 3D evidence-based reconstructions, mapping the construction of the camp. These representations are supported by multimedia materials presented throughout the platform. Qualitative research methods comprised focus study groups, interviews and questionnaire surveying, undertaken with three UK secondary schools, alongside USHMM employees and visitors. Participants were presented with the case study platform, 'Explore Lager Sylt' and an existing platform 'The Anne Frank Secret Annex', allowing rich, diverse and comparative ethical perspectives to be acquired between interactions. Data analysis comprised a grounded theory and thematic analysis approach, through theming, coding and interpreting participant responses, identifying differences and similarities within datasets.

1.4 Thesis Structure

This thesis comprises eight chapters, with chapter one outlining the justification and approach introducing why this research is required and its significance within Holocaust studies. The seven other chapters highlight ethical issues within Holocaust education, commemoration and representation; all underpinning the complexities, challenges and contemplations encountered when constructing and disseminating the Lager Sylt platform.

Chapter 2, the literature review, highlights the ethical issues associated with representation through Holocaust education, Holocaust archaeology, spatial representation, forensic archaeology, dissemination of Holocaust materials and virtual heritage. Chapter 3 presents the mixed methodological approach undertaken to construct, develop and acquire perspectives from disseminating the 'Explore Lager Sylt' and 'Anne Frank Secret Annex' platforms. Chapter 4 focuses on the 'Anne Frank Secret Annex' platform, which is evaluated using the London (2009) and Seville (2011) Charters as ethical guidance. This chapter also presents the results obtained from presenting the platform to secondary school focus study groups. Chapter 5 outlines Lager Sylt's history, ranging from its construction, exchanges in command, victim brutalities and subsequent post-liberation military investigations. The chapter discusses ethical complexities relating to this site, through literature inconsistencies, the adoption of an 'official' narrative, inadequate site commemoration and its current appearance. Additionally, questionnaire surveying results conducted amongst Alderney's inhabitants are presented. Chapter 6 outlines the author's created platform 'Explore Lager Sylt', addressing the ethical contemplations anticipated before and during construction. The qualitative results evaluating this platform from secondary school participants, USHMM employee interview participants and USHMM visitor questionnaire participants are presented. Chapter 7 provides the discussion, outlining participant perspectives regarding the ethics of representation against the current literature. Participant responses from both the 'Anne Frank Secret Annex' and 'Explore Lager Sylt' platform are evaluated, demonstrating how forensic archaeological practices can ethically represent data through virtual heritage technologies. Chapter 8 provides the conclusion, recommendations for future representations and further work required.

2.0 Literature, Project & Professional Practice Review

During a conversation at Majdanek concentration camp (Germany) between prisoners, Donat recalled that 'everything depends on who transmits our testament to future generations, on who writes the history of this period' (Donat, 1965: 210). Since 1945, Holocaust testimonies have been represented through all available media types, from literature to film, board games to video games. Frequently, literature describing the ethical issues and Holocaust representation commences by asking, 'who has the right to represent the Holocaust?' and 'how can the Holocaust be represented?' Given the indescribable atrocities that occurred, these questions are historically evident through events like the Nuremberg Trials (1945-1946) when the prosecution presented allied liberation concentration camp footage during the tribunal. Robert Jackson 'the chief counsel for the Allied prosecution' stated, 'the proof here will be so overwhelming that I venture to predict not one word I have spoken will be denied' (Douglas, 1995: 450; Farmer, 2010).

Young (1989) emphasises that the act of retelling is vital for (Holocaust) memory, however, 'expectations, responses, and ideological frameworks influence the way testimony is given and received' (Krondorfer, 2008: 247: Young, 1989). Thus, one may perceive that representation and interpretation of Holocaust information is subjective. Huyssen (1992) reminds us that monuments should not be perceived as enduring in materiality, memory or symbolism, as their memory can become distorted through social and political transitions; with original meanings lost throughout time and replaced by new generations who ascribe their own meanings and messages. Subsequently, varied Holocaust representations have influenced societal understanding, creating confusion between reality and myth, remembering and forgetting, simply the known and unknown (Foster *et al*, 2016; Ebbrecht, 2010; Levy & Sznaider, 2006; Lang, 2005; Young, 1993). However, the author argues that forensic and Holocaust archaeological investigations assist in rectifying these misunderstandings, by focusing on surviving landscape traces and evidence.

This literature review takes a broad approach to evaluate different Holocaust representation mediums. Initially, Holocaust education curriculums are reviewed alongside associated complexities encountered when teaching this epoch. This chapter continues to outline the establishment of Holocaust and forensic archaeology, highlighting how the investigative methods and findings contribute to criminal investigations and commemoration. Following this, an overview of digital Holocaust representations is presented through evaluating contemporary online platforms and the associated methods of representation. The diversity of Holocaust data and varied forms of dissemination is then outlined, highlighting the relevance for spatial and temporal evidence. Finally,

the chapter introduces and defines virtual heritage, emphasising the relevance of the field to disseminate forensic archaeologically-derived investigative data from Holocaust sites.

2.1 Holocaust Education

Holocaust institutions emphasise the historical interpretations and moral lessons as rationales for Holocaust education. Yad Vashem describes three main Holocaust educational objectives: learn history, remember victims, and implement teachings into modern day life (Raz, 2004). The USHMM promote similar rationales, but further emphasize moral lessons, to shape students into 'responsible citizens' (USHMM.org, 2017). The University College London (UCL) Holocaust Education Centre, emphasises empowering students through historical evidence and understanding, 'making Holocaust education ideal for stimulating independent enquiry across a whole range of…subjects' (HolocaustEducation.org, 2017). Therefore, Holocaust education incorporates a multitude of socio-historical and psychological factors, assisting personal human behaviour and development (Short & Reed, 2017). These values are considered essential within educational realms; therefore, a contemporary global perspective of Holocaust education will be outlined. However, emphasised throughout this literature review are British and American systems, highlighting ethical similarities and differences; thus, displaying a requirement for both British and American research participants (Chapter 3).

2.1.1 Holocaust Curriculum & Knowledge Bases

The necessity for Holocaust education is outlined within a country's curricula, which is defined as 'an objectified record of institutionally sanctioned analytical concepts and historical narratives' (Carrier *et al*, 2015: 19). However, no universally agreed Holocaust education curricula exist, with variations between countries involved and those who were not. Curricula also differ within countries, as evident in the disparity between the American states (Ibid; Table 2.1, direct and partial reference). Further nuances emerge through the different subjects in which the Holocaust is taught. In UK secondary schools, the Holocaust is taught within history, citizenship, English, Personal, Social, Health and Economic Education (PSHE) and religious studies (House of Commons, 2016). Therefore, the potential for student misunderstandings arises through the Holocaust being taught from a moral perspective, as opposed to a historical one (Salmons, 2003; Blum, 2002; Kinloch, 1998). As Kinloch (1998) explains 'where the prime goal of the educator is to teach the lessons, rather than the history, there is sometimes a disregard for the past that can be harmful, actually distorting the historical narrative' (Kinloch, 1998: 141; Salmons, 2003).

In 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and Georg Eckert Institute for International Textbook Research outlined the status of Holocaust curricula from 135 countries, through 272 curricula; representing all continents (Carrier *et al*, 2015). The report disclosed that 'the Holocaust is part of the curriculum in approximately half the countries investigated' although variations existed between different curricula contexts and terminology (Table 2.1) (Carrier *et al*, 2015: 38). The report presented a sliding scale, ranging from 'direct reference' to 'no reference', indicating the type of Holocaust education disseminated. The term 'direct reference', denotes countries whose curricula uses the terminology, 'Holocaust', 'Shoah', 'Nazi persecution', 'extermination of Jews' and 'genocide against the Jews'. Partial reference details countries who indirectly teach the Holocaust to illustrate topics (such as Human Rights). Context refers to curricula with no direct mention of the Holocaust but incorporates the topic through wider contexts (for example, World War Two). No reference denotes curricula's which do not mention the Holocaust; frequently, these countries do not specify historical education content.

Table 2.1: *Holocaust education references within curriculums from 203 countries (Carrier et al, 2015: 75).*

Status	Countries (and Territories)	Number
Direct Reference	Albania, Andorra, Armenia, Australia, Austria, Belarus, Belgium (Flanders, German-speaking Community, Wallonia), Bermuda (British Overseas Territory), Bosnia and Herzegovina (Republika Srpska), Brazil, Bulgaria, Canada (British Columbia, Newfoundland and Labrador, Ontario), Cayman Islands (British Overseas Territory), Chile, Croatia, Czech Republic, Denmark, England, Estonia, Ethiopia, Finland, France, Germany (Bavaria, Lower Saxony, North Rhine-Westphalia, Saxony), Greece, Guatemala, Hungary, Ireland, Israel, Italy, Latvia, Kazakhstan, Liechtenstein, Lithuania, Luxembourg, The former Yugoslav Republic of Macedonia, Malta, Republic of Moldova, Montenegro, Namibia, Netherlands, Northern Ireland, Panama, Philippines, Poland, Portugal, Romania, Russian Federation, Serbia, Singapore, Slovakia, South Africa, Spain, Swaziland, Sweden, Switzerland (Basel-Landschaft, Bern, Central Switzerland), Trinidad and Tobago, Turkey, United States of America (Arkansas, California, Texas), Wales	**57**
Partial Reference	Argentina, Belize, Canada (Alberta, Nova Scotia, Prince Edward Island), Colombia, Ecuador, Mexico, Slovenia, United States of America (Maryland)	**8**
Context Only	Algeria, Bhutan, Bosnia and Herzegovina, Botswana, Burkina Faso, China, Cook Islands, Costa Rica, Cote d'Ivoire, Cyprus, Democratic Republic of the Congo, Dominican Republic, El Salvador, Gambia, Georgia, Honduras, India, Indonesia, Japan, Kenya, Lesotho, Malaysia, Mauritius, Morocco, Mozambique, Nicaragua, Niger, Norway, Pakistan, Paraguay, Peru, Republic of Korea, Rwanda, Scotland, Senegal, Sri Lanka, Suriname, Switzerland (Jura, Lausanne), Tunisia, Uganda, Ukraine, United Arab Emirates, United Republic of Tanzania, Uruguay, Yemen, Zimbabwe	**46**
No Reference	Angola, Antigua & Barbuda, Azerbaijan, Bahamas, Bahrain, Benin, Bolivia, Brunei, Cameroon, Dominica, Egypt, Fiji, Ghana, Guyana, Iceland, Micronesia (Federated States of), Iraq, Jamaica, (Kosovo),	**28**

	Lebanon, Nepal, New Zealand, Palestine, Papua New Guinea, Samoa, Seychelles, Thailand, Zambia	
No Data	Afghanistan, Bangladesh, Barbados, Cambodia, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Cuba, Democratic People's Republic of Korea, Djibouti, Equatorial Guinea, Eritrea, Gabon, Grenada, Guinea, Guinea-Bissau, Haiti, Iran (Islamic Republic of), Jordan, Kiribati, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Liberia, Libya, Madagascar, Malawi, Maldives, Mali, Marshall Islands, Mauritania, Monaco, Mongolia, Myanmar, Nauru, Nigeria, Niue, Oman, Palau, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, San Marino, Sao Tome and Principe, Saudi Arabia, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Syria, Tajikistan, Timor-Leste, Togo, Tonga, Turkmenistan, Tuvalu, Uzbekistan, Vanuatu, Venezuela, Viet Nam	**64**

The 2015 UNESCO report further analysed 89 curricula Holocaust textbooks from 26 different countries, highlighting Holocaust terminology varies globally with terms 'Shoah', 'Holocaust', 'genocide', 'massacre', 'extermination' or 'final solution', all used to describe the same event (Carrier *et al*, 2015). The report continued to highlight variations between who Holocaust victims were. Frequently, countries defined victims as exclusively Jewish, with other victims including 'Sinti and Roma, people with disabilities, political opponents, homosexuals or other socially marginalized groups, featuring less' (Carrier *et al*, 2015: 38).

Prior to 2009, a small but relevant body of research had been conducted surrounding Holocaust education. These studies often incorporated qualitative research methods of questionnaire surveying and interviews, to determine content and associated barriers (Short & Reed, 2017; Maitles & Cowan, 2007; Clements, 2006; Russell, 2006; Short, 2005; Burtonwood, 2002; Hector, 2000; Supple 1992; Brown & Davis, 1998; Fox 1989). This research revealed prevalent issues including insufficient clarity of lesson aims (Brown & Davies, 1998; Russell, 2006; Clements, 2006), insufficient curriculum time (Brown & Davies, 1998; Hector, 2000), limited resources and materials (Supple, 1992), ineffective department collaboration (Brown & Davies, 1998) and limited approaches for responding to prejudice (Burtonwood, 2002). In 2009, the UCL published a report outlining the 'trends, perspective and practise' within English secondary school Holocaust education (Pettigrew *et al*, 2009). Through analysing 2,108 teacher responses from online surveys and interviews, the report highlighted teacher training challenges resulting from insufficient clarity surrounding aims, approaches and knowledge required for delivering effective Holocaust education (Pettigrew *et al*, 2009).

In 2016, UCL conducted the biggest sole nation study into (English) Holocaust education in secondary schools (Foster *et al*, 2016). Data obtained from over 9,500 participants through student surveys and focus study groups, highlighted contemporary perspectives regarding what is, and is not, currently understood within Holocaust education. The study revealed by the age of 14, more than

85% of students had learnt about the Holocaust, with 83% of students understanding its importance, 81% finding it interesting and 70% expressing further interest in learning (Ibid).

The report outlined that a lack of core knowledge exists regarding essential Holocaust information, including: who the victims and perpetrators were (with 56% of participants believing Adolf Hitler was solely responsible for the Holocaust); where the Holocaust occurred (most participants connected Auschwitz-Birkenau with the Holocaust, but failed to recognise other camps such as Bergen-Belsen[7]); and Britain's role within the Holocaust (17% of students believed Britain created rescue plans to save the Jews and 23% believed that Britain was unaware of the genocide) (Foster *et al*, 2016). However, these findings are not specific to Britain, with similar misunderstandings occurring within Germany (Meseth & Proske, 2010) and the Netherlands (Boersema & Schimmel, 2008).

The 2016 UCL report concluded that considerable knowledge gaps exist between what is taught within schools and academic research (Foster *et al*, 2016); highlighting a requirement for greater shared collaboration between scholars and secondary school teachers. Additionally, four barriers including: insufficient guidance, insufficient assessment framework; insufficient curriculum time and an increase in schools transforming to academy or free-schools[8], were highlighted as requiring improvement. These issues mirror the problems outlined by the UK's (2010) Country Report compiled by the International Holocaust Remembrance Alliance (IHRA)[9]. This report highlighted teacher concerns including: content prioritisation versus limited curriculum time; diversity and prejudice; relationships between teachers and students, specifically dealing with emotional responses; and limits to understanding (ITF, 2010). The report suggested that teachers required greater professional development, access to survivor speakers and justification for educational relevance by comparison of time and resourcing constraints (Ibid).

The 2016 UCL report emphasised contemporary sociocultural influences (especially media), to account for student Holocaust perceptions; which reflected cultural and political representations, and myths and misconceptions maintained within British society (Foster *et al*, 2016; Holmes, 2016; Short, 1995). The report used the example of the fictional book 'The Boy in the Striped Pyjamas', due to its historical inaccuracies, characterisations[10] and its 'take-home' messages[11] (Foster *et al*, 2016; Gray, 2014). Furthermore, this book was not considered primary school age appropriate, due to its focus on concentration camps (Foster *et al*, 2016; Gilbert, 2010). Consequently, the UCL report

[7] Due to its historical significance within British Holocaust history, Bergen-Belsen Concentration Camp was liberated by the British (1945) and, therefore, knowledge of its existence would be expected by British students.
[8] These schools are not required to conform to England's National Curriculum.
[9] Formerly known as 'Task Forces for International Cooperation on Holocaust Education Remembrance and Research'.
[10] The literature is considered dismissive of how the Nazis coerced children's beliefs.
[11] The literature only addresses Jewish Holocaust victims.

highlighted requirements for Continuing Professional Development (CPD) programmes, to provide teachers with skills to 'challenge' and 'critically evaluate' student misconceptions (Foster *et al*, 2016: 213).

2.1.2 Age Appropriateness

The English National Curriculum introduces the Holocaust to secondary school students aged 13-14 (Department for Education, 2013). However, Holocaust Institutions identify that students aged 11-12 demonstrate empathetic abilities, essential for interpreting and understanding Holocaust events (Short & Reed, 2017; USHMM.org, 2017; HET.org, 2017). Although, students this age, have difficulties 'placing [the materials] in a larger historical context' (USHMM.org, 2017). The Holocaust Education Trust (HET) provides teaching materials and guidelines for primary school students (aged 10 and above), thus representing both ability and demand for Holocaust education at a younger age. This material is considered age appropriate by avoiding horrific Holocaust accounts such as camp life, focusing more on Jewish life pre-war (HET.org, 2017).

In the Netherlands, teaching materials are provided by the Dutch National Committee for primary school students aged between 10-11 (Ross, 2008). Booklets provide content 'on the meaning of war and freedom in the lives of children' and also introduce Dutch World War Two commemoration traditions (Learning-from-history.De, 2018). Additionally, approximately two-thirds of Dutch primary schools yearly request the Anne Frank Journal, supporting deeper associations between World War Two and the Holocaust (Ibid; Ross, 2008). In 2016, Westerbork Transit camp (Netherlands), promoted an exhibition targeting children between the ages of 5-9. The exhibition incorporated the literature *Kinderen met een ster* (Children with a star), focusing on Jewish children Holocaust survivors, which should be read aloud (by an adult) or listened to through headsets (KampWesterbork.nl, 2016). However, age appropriateness should be carefully contemplated regarding the content and types of materials shown, and if required an age rating should be applied (for example, the Imperial War Museum's Holocaust exhibition (IWM.org, 2017)).

2.1.3 Empathy

Educators are confronted with the crucial and complex challenge of generating empathy through Holocaust materials. The importance for empathy has been historically debated within Holocaust education (Gubkin, 2015; Riley, 2001; Hector, 2000; Gregory, 2000; Short, 1999; Supple, 1998; Baum, 1996; Dawidowicz, 1990). Empathy is considered essential to interpret multiple past perspectives, forming a fundamental component for understanding Holocaust narratives (Dulberg, 2002). Studies display that the development of empathy is something which can be learnt and taught but is initially shaped by personal experiences (Yimaz, 2007; Dulberg, 2002). However, empathy

cannot be achieved simplistically. For example, displaying images of the deceased does not evoke empathy, but consequently restricts learning through 'shocking' students. Thus, a fine line exists between empathy and trauma (Sturdy Colls & Branthwaite, 2018; Gubkin, 2015; Linenthal, 1995) (Chapter 7 Section 7.7).

The UK's 2010 Country Report outlined that teachers expressed concerns surrounding emotional discomfort for themselves and their students. Teachers reported their own 'sadness, horror and even dread' whilst delivering Holocaust lessons (ITF, 2010: 22). Another teacher stated that 'the biggest challenge she faced was not crying in front of her students when delivering lessons' (Ibid: 22). Further concerns encompassed 'inappropriate' student responses, with several teachers believing students had become anaesthetised towards violence and consequently 'saw it as a challenge to 'shock' these students into feeling sufficiently moved' (Ibid: 22). Many Holocaust institutional websites respond to these complexities by providing age-appropriate teaching materials (HET.org, 2017; HolocaustEducation.org, 2017; USHMM.org; 2017).

2.1.4 Eyewitness Testimony

The importance of encountering first-hand survivor testimony in Holocaust education is acknowledged within research as capturing empathy to a greater extent than any other resources (Short & Reed, 2017; Foster *et al*, 2016; Suissa, 2016; Imber, 2013; Kushner, 2006; Baum, 1996). The 2016 House of Commons report, described first-hand testimony as being 'irreplaceable', highlighting a necessity to invite Holocaust survivors to speak at secondary schools (House of Commons, 2016: 10). The report outlined concerns about declining Holocaust survivors and demonstrated how contemporary practices can use survivor accounts after a survivor has died. For example, 'a film featuring a young lady reading the words of her grandmother drew attention to the efforts being made to preserve through recordings the direct words of survivors' (House of Commons, 2016: 10).

Requirements for survivor testimony is further apparent through specific survivor story materials available for online teaching; such as Anne Frank's diary (AnneFrank.org, 2017), Nesse Godin (USHMM.org, 2017a) and Helene Seligmann (HolocaustEducation.org, 2017). Research conducted by Imber (2013: 1) explains that students should 'see victims as an individual rather than as a statistic...doing so allows for empathy with the victim'. Survivor testimony also provides students with the opportunity to interpret inconceivable events into something tangible, by listening and asking questions (Suissa, 2016; Imber, 2013; Kushner, 2006). When Holocaust survivors deliver moral messages, the student becomes transformed into a transmitter of memory (Imber, 2013). However, the role of memory and Holocaust testimonies encompasses issues surrounding account

variations, whereby two individuals can share the same experience but recall different interpretations of the event (Levi, 1988). Further contemplations are apparent through Myers (2008: 235) description of an 'inherently flawed sample', whereby only survivors provide eyewitness accounts, as the deceased does not have a voice (Hilberg, 1985).

2.1.5 Other Forms of Holocaust Education

Holocaust organisations currently provide (online) teaching packages to tackle Holocaust education barriers and issues. Many alternative initiatives exist including: museum visits, outreach activities, memorials, commemoration and various online resources. Some of these initiatives incorporate a country's own atrocities within Holocaust education, as demonstrated through South Africa and Namibia's travelling Anne Frank exhibition (UNESCO, 2017). From the exhibition's success, Holocaust Centres were established in Cape Town (1999), Johannesburg (2008) and Durban (2009) (Ibid). Alternatively, charities such as the Holocaust Memorial Day Trust (HMDT) encourage yearly commemoration, supporting over 7,700 activities in 2017 (HMD.org.uk, 2017). The HMDT inspires individuals to reflect on the Holocaust and other genocides on the 27th January; coinciding with the liberation of Auschwitz-Birkenau. The HMDT provides guidance regarding how individuals may develop commemorative activities, ranging from researching individual survivor stories to cooking traditional cultural dishes (HMDT, 2017).

Many Holocaust organisations provide online teaching materials to support classroom education. Websites created by USHMM, UCL's Centre for Holocaust Education, HET, Yad Vashem and Anne Frank present a diverse range of teaching resources. These materials provide teachers with guidance and frameworks for delivering age-appropriate Holocaust education. The online resources create meaningful pedagogies by learning about the Holocaust through art (HET's Art and the Holocaust) (HET.org, 2017b), archive film footage (USHMM's Three Minutes in Poland) (USHMM.org, 2017b), primary Jewish sources, such as letters, diaries and photographs (USHMM.org, 2018a) and artefacts (UCL's Centre for Holocaust Education Footprints) (HolocaustEducation.org, 2017a).

Within the UK, funding was granted to the HET and the Centre for Holocaust Education to develop teacher training CPD courses, Beacon schools and bespoke workshops (House of Commons, 2016; Holocaust Commission Report, 2015). The HET provides opportunities for teachers and students to become Holocaust Ambassadors alongside participating within the 'Lessons from Auschwitz' programme. To become a Holocaust ambassador, individuals must engage with first-hand Holocaust survivor testimony and visit Auschwitz Birkenau concentration camp (HET.org, 2017a). Currently, 23,000 people have become ambassadors and are encouraged to share experiences from the lessons they learnt (Ibid).

In January 2015, the UK government announced plans to develop a new national Holocaust memorial and learning centre in London (Holocaust Commission Report, 2015). The memorial and learning centre will be co-located ensuring Holocaust memory is maintained across Britain. This memorial responds to dissatisfaction and inadequate Holocaust practices, such as the 'wholly inadequate' Hyde Park memorial, and ineffective 'Holocaust education failing to reach significant numbers of young people' (Ibid: 12). Additional UK Holocaust initiatives were outlined in the 2016 House of Commons report, acknowledging that many students are deprived of the opportunity to visit sites, such as the limited capacity of HET's 'Lessons from Auschwitz' programme, and thus promoted the use for 'augmented reality technology, such as 3D virtual tours of camps…that can be used to reach more people' (House of Commons, 2016: 11) (Section 2.3).

2.2 Holocaust & Forensic Archaeology

2.2.1 Early Investigations

The origins of forensic and Holocaust archaeological methods are linked to 1943 and the discovery of a mass grave in Katyn forest (Smolensk; Russia) (Sterio, 2011; Ranta & Takamaa 2007; Haglund *et al* 2001). The investigation commissioned 12 forensic specialists from 11 European countries, establishing the first international team to investigative atrocities[12] (Haglund & Sorg, 2002; Haglund *et al*, 2001). The investigation applied medico-legal expertise to exhume 4,500 Polish military and elite victims, identifying 2914 individuals through archaeological methods (Sterio, 2011; Ranta & Takamaa 2007). However, no archaeologists were involved in the investigation. Pathologists discovered execution gunshot markings on victim skulls alongside personal artefacts such as newspapers, diaries and winter clothing (Ledford, 2011; Sterio, 2011). Although investigations determined Soviet responsibility for the atrocities, the Soviets conducted their own investigation, the 1944 'Special Commission for Determination and Investigation of the Shooting of Polish Prisoners of War by German-Fascist Invaders in Katyn' (Tyers, 2009). Despite global perceptions that the Nazis conducted the Katyn massacre, in 1990, the Russian government admitted responsibility (Gerson, 2011; BBC.co.uk, 2013; BBC.co.uk, 2010; Guardian, 2010).

Many methods applied during the Katyn investigations (for example, taphonomy and personal artefact identification), form the basis of modern-day forensic archaeological processes. Enhancing these methods, forensic pathologist Keith Mant, conducted investigations with the Army Medical Corps, locating deceased UK military individuals in Germany (1945-1948) (Hanson, 2008; Mant, 1950). Mant developed forensic archaeological taphonomy practices alongside spatial coordination within exhumations (Mant, 1987; Mant, 1950). In 1987, Stuart King of the Forensic Science Service

[12] This action was not repeated again until the Rwandan genocide investigations in 1994 (Haglund *et al*, 2001).

(FSS) recognised similarities between archaeology and criminal investigative techniques, such as timeline interpretation, evidence identification and deterioration (Blau, 2016). These advances evolved into the field 'forensic archaeology' (Mant, 1987; Skinner, 1987; Sigler-Eisenberg, 1985). However, the evidence obtained from post-World War Two investigations (such as human remains, artefacts, surviving physical evidence, eyewitness testimony, maps, plans, photographs and other forms of documentation (Sturdy Colls, 2015; Arad *et al*, 1999; Central Commission for the Investigation of German Crimes in Poland, 1946)), has been rarely used within Holocaust education.

2.2.2 Development of Forensic Archaeology

Forensic archaeology is a relatively new field, recognised for its efficiency to search, survey, locate, confirm and record, scenes of death and disaster (Steele, 2008). Within British and American frameworks, forensic archaeology can be defined as a 'discipline that uses archaeological theories, methods and techniques in a legal context' (Groen *et al*, 2015: 3; Hunter & Cox, 2005). However, a lack of global definition exists due to varying application between countries (Groen *et al*, 2015). Through amalgamating multiple fields (forensics and archaeology), conflicting expectations of its implementation and evidential value often ensues (Crossland, 2013; Connor & Scott, 2001). This has created insufficient global recognition of the field's potential within legal frameworks and has resulted in variations between regulations (Steele, 2008). Regardless of disparity, forensic archaeological methods have demonstrated search and recovery abilities, establishing evidence relating to death, burial and violence (Groen *et al*, 2015; González-Ruibal & Moshenska 2014; Hunter *et al*, 2013).

Both America and the UK incorporate forensic archaeological practices within their legal frameworks, applying investigative techniques to: domestic homicide (Schultz, 2007; Hunter & Cox, 2005); missing persons (ICMP.int, 2017; Bartelink *et al*, 2016; Morewitz & Colls, 2016; Hunter & Cox, 2005) (including missing war dead) (Emanovsky & Belcher, 2012; Hanson, 2008); fire scenes (Gould, 2007); serious crime (Hunter *et al*, 2013); human rights and mass disasters (ICMP.int, 2017; Sturdy Colls, 2015; Gould, 2007). However, in Central and Eastern Europe, forensic archaeology is primarily concerned with recovering human remains from World War One (Pollard & Banks, 2007; Dewilde *et al*, 2004; Saunders, 2002); World War Two (Šlaus & Petaros, 2015; Sturdy Colls, 2015; Gilead *et al*, 2010; Gojanović & Sutlović, 2007; Jankauskas *et al*, 2005); and the Communist epoch (Jankauskas, 2015; Mark, 2010). In Latin America, forensic archaeological methods are only applied to human rights violations (Bernardi & Fondebrider, 2007; Steadman & Haglund, 2005; Crossland, 2000), contrasting with countries such as India, who resource forensic pathologists' expertise (Aggrawal, 2015).

As no universal framework exists for the search and recovery of human remains, different agencies have often undertaken these practices (CIfA, 2014; Steele, 2008). Although intentions of seizing evidence often informs criminal prosecution by identifying the deceased, contributing to the historical record and reconstructing scenes, the tangible evidence is also presented within fields of: dark tourism (Podoshen & Hunt, 2011; Domenico & Domenico, 2009; Miles, 2002; Lennon & Foley, 2000); commemoration and memorialisation (Kucia, 2016; Marcuse, 2010; Ashworth, 2008; Brett *et al*, 2008; Myers, 2008; Barsalou & Baxter, 2007; Levy & Sznaider, 2005; Young, 1993); museum heritage (Sturdy Colls, 2015a, 2012; Holtschneider, 2011; Williams, 2007; Young, 1993); digital and virtual heritage (Ch'ng *et al*, 2013; Sturdy Colls & Colls, 2013); alongside educational and humanitarian awareness (Groen *et al*, 2015; Sturdy Colls, 2015, 2012; Ferllini, 2007).

The application of archaeology is informed by several global guidelines and organisations, including: the World Archaeological Congress (WAC) (Worldarch.org, 2017), the European Association of Archaeologists (EAA) (EAA.org, 2018), the British Association for Biological Anthropology and Osteoarchaeology (BABAO) (Babao.org, 2017), the Archaeological Institute of America (AIA) (Archaeological.org, 2017), Society for American Archaeology (SAA) (SAA.org, 2017), Register of Professional Archaeologists (RPA) (Rpanet.org, 2017) and the Association of Social Anthropologists of the UK and the Commonwealth (ASA) (ASA.org, 2017). Within the UK, forensic archaeologists devised the Special Interest Group (SIG), who merged with the Chartered Institute for Archaeologists (CIfA). Formed in 2011, CIFA forensic archaeology SIG was established to identify suitable methodologies and ethical codes of practice, establishing 'appropriate standards and guidance for forensic archaeology [which are to be] adopted, maintained and enforced' (Archaeologists.net, 2017). These practices permit forensic archaeologists to operate within (UK) legal frameworks through rigorous attention towards locating, seizing, documenting and storing of evidence, for legal scrutiny and proceedings (CIfA, 2014).

The CIFA (2014) guidelines highlight that 'at present, there is no single central text, upon which to draw and the methods employed in forensic archaeology remain in continuous development' (CIfA, 2014: 3). Therefore, assembled guidelines are acquired from former CIfA archaeological literature works (2008 & 2009), technical papers from professional bodies (such as English Heritage), and academic literature (Hunter & Cox, 2005; Hunter, 1999). Due to the criminalist nature of investigation, the text has been approved by the Forensic Science Regulator and has incorporated similar international guidelines from the United Nations and American Academy of Forensic Science (CIfA, 2014).

2.2.3 Contemporary Holocaust Investigations

Holocaust archaeology can be defined as investigations that use archaeological methods and techniques to locate evidence of the atrocities perpetrated during the Holocaust (Schute, 2017; Sturdy Colls, 2015; Haimi & Mazurek, 2013; Jasinski, 2013; Sturdy Colls & Colls, 2013; Theune, 2010). This emerging field differs from forensic archaeology, as Holocaust investigations are not always in pursuit of prosecution. Although some archaeological investigations at Holocaust sites have been presented in a legal context, other investigative aims include commemoration, research and memorialisation (Sturdy Colls, 2015; 2014).

Despite various post-liberation Holocaust investigations occurring (Section 2.2.1), the number of sites examined is considered limited against the vast scale of camps and ghettos established by the Nazis (Megargee & White, 2018). These investigations were conducted without archaeological assistance, as the field was still underdeveloped, and only sought to confirm the presence of camps and graves (Sturdy Colls, 2015; Arad *et al*, 1999). Holocaust landscapes also became modified through erecting memorials at various sites to commemorate events. Sturdy Colls (2015) categories these transformations as 'marked sites where in-field investigations took place after the war', 'marked sites where no in-field investigations took place' and 'unmarked sites' (Sturdy Colls, 2015: 28). These site transformations present the impression that 'adequate' commemoration and investigation has occurred (Sturdy Colls, 2015: 28). Consequently, the use of invasive methods to investigate and transform these sites into places of commemoration and heritage, have potentially removed the possibility for future investigations.

Since 1945, Holocaust site investigations became stagnated, with a limited number of legal and commemoration examinations occurring (Table 2.2). In 1986, excavations performed at Chełmno extermination camp (Poland) are considered the first-time archaeological research was conducted at a Holocaust site (Gilead *et al*, 2010). This research continued between 1986-1987, 1997-2002 and 2003-2004 and was also the first research to recognise 'the ways in which the physical evidence could enhance both historical narratives and the experience of visitors to the site' (Sturdy Colls, 2015: 35; Gilead *et al*, 2010; Pawlicka-Nowak, Ł, 2004; Pawlicka-Nowak, Ł, 2004a). By using invasive techniques, archaeologist unearthed mass graves, barrack foundations, personal artefacts and 'the basement rooms and the corridor through which the naked Jews were marched' (Gilead *et al*, 2010: 16). Also, during the 1980s, archaeological investigations were conducted at the *Schutzstaffel* (SS) and Gestapo Headquarters (Berlin, Germany) (Sturdy Colls, 2015; Bernbeck & Pollack, 2009). This research initiated through political motivations became transformed into the 'Topography of Terror Museum' (Berlin, Germany).

Following these archaeological projects, invasive investigations have emerged at other Holocaust sites throughout Europe (Table 2.2). During the 1990s, legal investigations were conducted at sites such as Serniki in Ukraine, owing to eyewitness testimony describing the presence of mass graves (Wright, 1995). Archaeological involvement stemmed from requirements to acquire evidence for prosecution (Sturdy Colls, 2015; Bevan, 1994). These projects all demonstrated the relevance for archaeological research to be undertaken at former Holocaust sites, by producing tangible evidence (such as mass graves and artefacts) and ascertaining details, such as camps boundaries. These findings have been used within criminal proceedings to provide direct evidence of atrocities and as heritage and commemoration spaces.

Table 2.2*: Examples of contemporary archaeological investigations at Holocaust sites.*

Investigation Type	Investigation Location
Archaeological Survey	**Austria**: Hartheim euthanasia centre (Klimesch, 2002). **Germany**: *Schutzstaffel* (SS) and Gestapo Headquarters (Berlin) (Bernbeck & Pollack, 2009). **Jersey**: Lager Wick (Carr, 2016). **Normandy**: La Glacerie (Early, 2013). **Norway**: Romsdalshalvøya (Romsdal Peninsula) (Jasinski, 2013).
Geophysical Survey	**Alderney**: Lager Sylt (Sturdy Colls, 2015; Kerti, 2013 (unpublished)) & Lager Norderney (Sturdy Colls & Colls, 2014). **Germany**: Dachau (Linck & Dagnault, 2012), Stutthof (Paris, 2011) & Bergen-Belsen (Sturdy Colls, 2015). **Norway**: Ybenheer camp (Bosma, 2016). **Poland**: Sobibór (Haimi & Mazurek, 2013), Treblinka (Sturdy Colls, 2013). **Serbia**: Semlin (Sturdy Colls, 2013a).
Legal	**Poland**: Auschwitz-Birkenau (Państwowe Muzeum Auschwitz-Birkenau w Oświęcimiu, 2013) & Jedwabne (Gross, 2004). **Romania**: Vulturi Forest (Time, 2010). **Ukraine**: Serniki, 1990 (Wright, 1995) & Ustinovka, 1991 (Wright *et al*, 2005).
Memorialisation	**Germany**: Buchenwald (Hirte, 2000), Rathenow (Antkowiak & Völker, 2000), Ravensbrück (Antkowiak, 2000), Dachau (David, 2001), Flossenbürg (Ibel, 2002), Bergen-Belsen (Assendorp, 2003), Groß Schönebeck (Grothe 2006), Sachsenhausen (Theune, 2010) & Mauthausen, (Ibid). **Netherlands**: Kamp Westerbork (Schute, 2013) & Amersfoort (Wijnen & Schute, 2012). **Norway**: Falstad (Anderson Stamnes, 2013). Westerbork (Schute & Wijnen, 2013; Schute, 2013). **Poland**: Chełmno (Pawlicka-Nowak, 2004; Golden, 2003); Bełżec (Kola, 2000; O'Neil, 1998) & Sobibór (Bauman *et al*, 2010).

The types of physical data produced from archaeological investigations of Holocaust sites are often exhibited at heritage centres or museums, authenticating accounts and events. Although perceived authenticity is maintained through the site of atrocity itself, the evidence performs an authentic marker role (Weizman, 2010; Moore, 2009; Schofield *et al*, 2006). These markers can comprise personal victim items, for example, victims' shoes, hair and glasses (as exhibited at Auschwitz-Birkenau concentration camp). Archaeological investigations at Chełmno discovered thousands of different artefacts including: 'glass artefacts such as bottles, syringes, metallic tableware such as

cups, plates, bowls, silver, as well as combs, toothbrushes, dentures, spectacles shoes, textiles, etc' (Gilead, *et al* 2010: 19). Whilst many hundreds of these items are displayed throughout museums in Poland and the UK, the sheer vastness of findings means the entirety of the collection cannot be shown. This highlights that investigative findings require supplementing by technology, producing a digital catalogue of evidence. Arguably, although these markers act as narrative guides, producing empathy and awareness regarding aspects such as scale, they do not essentially represent authenticity (Moore, 2009; Brett *et al*, 2008).

Holocaust memorialisation has momentous responsibility serving as 'justice and reconciliation, forgiveness and retribution, and remembrance and forgetting' (Moore, 2009: 48). However, representations (including a lack of) can create either risk and promise, dependent upon the management and development of a memorial (Brett *et al*, 2008). Holocaust memorialisation comprises a diverse amalgamation including peacebuilding, learning, mourning and personal reflections, incorporating public and private functions (Barsalou & Baxter, 2007). Beech (2002) explains that Holocaust memorial sites fulfil a 'remembering function', thus providing for the needs of survivors and families of the deceased, and a 'not-forgetting function', which focuses more on general societal needs (Beech, 2002: 199). These public spaces of acknowledgement are commonly represented through museums, libraries, monuments, walls of victims' names and sites of conscience[13] (Ibid). Young (1993: 12) states that the 'aim of memorials is not to call attention to their own presence so much as to past events because they are no longer present'. Young (1993: 2) also states that within the context of memorialisation 'motives for such memory are never pure' and that the rationale for memorials varies significantly; for example, tourism, education, guilt/shame, self-aggrandisement, remembrance or governmental requirements of self-explanation (and even national myths).

2.2.4 Ethics of Investigation

The term 'archaeology' often evokes thoughts of historical artefacts and evidence. However, the Holocaust is still a recent event, residing within the memories of many living victims (Sturdy Colls, 2015; Young, 1993). Therefore, both the Holocaust and forensics require alternative definitions to other types of archaeology, distinguishing themselves from traditional understandings of what constitutes as being 'archaeological'. This definition can be explained as any sub-surface disturbances seeking epoch evidence as archaeological in nature (Groen *et al*, 2015). Some practitioners and academics are endeavouring to reconfigure contemporary opinions, highlighting that Holocaust archaeology is more than 'just excavation' (Sturdy Colls & Branthwaite, 2018).

[13] A memorial site designed specifically to engage public discussions of contemporary social issues.

Chapter 1 (Section 1.1) outlined that traditional archaeological methods (such as excavation) present only one possibility for investigating Holocaust sites. Whilst the previously mentioned investigations highlight the necessity for archaeological methods, through revealing evidence of the Holocaust, many ethical sensitivities became apparent from these investigations. For example, Vulturi Forest (Romania) (Voz Iz Neias, 2011), Bełżec and Sobibór extermination camps, (Poland) (Bauman *et al*, 2010; Kola, 2000; O'Neil, 1998), have all been scrutinised for their lack of ethical awareness. The application of destructive techniques (excavation and drilling), applied during fieldwork at Bełżec, caused significant anguish, humiliation and frustration to Jewish communities by disturbing the deceased (Kola, 2000). Paradoxically, investigative commemoration endeavours at the sites Bełżec and Sobibór resulted in disrespecting the Jewish communities (Gilead *et al*, 2009). These issues forced archaeology to devise non-invasive methodologies to account for the living memory, Jewish Law (Halacha)[14] and scientific analyses of human remains sensitivities (Sturdy Colls, 2015; 2014; Green & Green, 2006; Geller, 1996).

Living memory complexities contribute to the issues associated with investigating this period of history. After World War Two, many memories of the Holocaust became naturally suppressed allowing victims to rebuild their lives. Adjacent to this suppression derives trauma, from which suppression can also act as a coping mechanism. A wealth of research exists addressing the nuances of trauma and memory recall of Holocaust survivors (LaCapra, 2014; 1996; Bernard-Donals, 2007; Levy & Sznaider, 2005; Des Pres, 1980). Conversely, some victims describing their experiences of the Holocaust were met with disbelief. This is demonstrated through former concentration camp prisoner Georgi Kondakov's response when describing being imprisoned on British soil, 'do you think I dreamt spending fourteen months in a German camp?' (Bonnard, 1991: 2). Kondakov further explained that other victims, 'were not eager to give any information on the subject; they were suspicious and distrustful. Even the former prisoners themselves often did not want to recall the past, some of them even denied the fact that they had been in Alderney' (Bonnard, 1991. 14).

These examples highlight that Holocaust landscapes conceal the memories of atrocities, which victims have 'dealt' with through different approaches. Therefore, within certain cases, archaeological intervention may be seen as unwelcome (Harrison & Schofield, 2010). Archaeological findings may also present ethical challenges, through contradicting survivor testimony. The 1997-1999 archaeological investigation of Bełżec extermination camp revealed a wooden structure which was considered the remnants of a gas chamber due to other evidence located within the vicinity (Kola 2000). These claims contradicted survivor eyewitness accounts by Reder

[14] The Jewish Law (Halacha) stipulates that humiliation and confusion is brought onto those who are exhumed (Geller, 1996).

(1999) and Pfannensstiel (Arad, 1993) who described the gas chambers being constructed from concrete; Kola dismissed their claims (Ibid). This highlights archaeology's ability to challenge existing understandings of the Holocaust and also reveal new insights.

Another challenge encountered by Holocaust archaeologists is 'embedded' or 'popular' narratives, which present Holocaust perspectives which may, or may not, adhere to the historical record (Magilow & Silverman, 2015; Sturdy Colls, 2015). Subsequently, archaeological findings which oppose established narratives can be greeted with 'hostility and objection' (Sturdy Colls, 2015: 339). A frequent method in which these types of narratives are initiated is through political motives. For example, the initial opening of Auschwitz I museum was presented from Soviet perspectives, emphasising Polish and International victims, despite the majority of victims being Jewish (Lennon & Foley, 2000; Young, 1993). The USHMM has been described as 'Americanising' the Holocaust, distorting the reality of a European Holocaust (Saidel, 1996; Young, 1993). The Channel Islands (specifically Jersey, Guernsey and Alderney) present selective memories to support their version of events whilst living under Nazi occupation, consequently detaching from victim memory (Lennon & Foley, 2000).

Holocaust narratives can also become obscured through repetition of well-known images/scenes of the Holocaust. Ebbrecht (2010) and Baron (2006) describe the persuasiveness of the Holocaust, whereby filmmakers only need to 'draw on a rich source of previous movie plotlines and images' to enforce repetition, thus becoming engrained within society's collective and personal memories (Ebbrecht, 2010; Baron, 2006: 240). Repetition of the Holocaust through popular media is considered to reduce understanding of events to simplistic tolerance 'lessons to learn', emphasising political values and subjective experiences (Levy & Sznaider, 2006: 26). This approach creates an alternative Holocaust perspective, outside of victim or perpetrator perspectives, as an observer (Ebbrecht, 2010; Baron, 2006; Levy & Sznaider, 2006).

The privileged position of the observer and storyteller can be considered central to the politics of remembrance and memory (Levy & Sznaider, 2006). Due to event and perspective complexities, the Holocaust is not essentially a linear narrative which can be presented in a logical manner without omitting history. Due to the enormity of victim, perpetrator and bystander accounts alongside a wealth of archival evidence, an active selection of materials occurs within Holocaust representation. A group or an individual decides what materials will most suitably illustrate a point. Within this instance, the potential for memory manipulation occurs through prioritising one evidence type for another (Suleiman, 2006; 2006a). For example, the Diary of Anne Frank has become an iconic Holocaust symbol but generally omits broader details surrounding the gradual development of Nazi persecution.

The ethical challenges outlined above highlight requirements for Holocaust archaeologists to contemplate the ethics surrounding disseminating fieldwork findings. Increasingly, Holocaust investigations resource non-invasive methods to account for on-site ethics. For example, the 'Accessing Campscapes: Inclusive Strategies for Using European Conflicted Heritage' (iC-ACCESS), uses 'archaeology, forensic investigation, geography and digital humanities to locate, record and digitally preserve landscapes of mass violence' (Campscapes.org, 2016). These types of projects produce greater quantities of digital data, requiring innovated forms of presentation for public interpretation. Also acknowledged above, archaeologists need to find appropriate forms of dissemination for findings which contradict eyewitness testimony but does not dismiss the account. The field is further required to find suitable forms of dissemination which can present findings that challenge 'embedded' or 'popular' narratives by providing sufficient evidence to support conclusions and convey multiple perspectives simultaneously.

Sturdy Colls (2015: 5), acknowledges that 'the results of archaeological surveys at Holocaust sites are rarely integrated into historical narratives; rather…presented as an 'add-on' to the 'known' history of a place, or they are overlooked or ignored'. However, a potential future concern of disseminating Holocaust investigative findings may derive from virtual representation replacing a physical site visit. This is highlighted through a conversation during fieldwork conducted at Treblinka, between an archaeologist and member of the public, who asked, 'is it work visiting [Treblinka] labour camp?' (Sturdy Colls, 2015a: 41). As the Nazis attempted to eradicate all evidence of atrocities by destroying structural remains, many Holocaust landscapes bare limited resemblance to their former appearance (Sturdy Colls, 2015; Gilead *et al*, 2010; Arad, 1987). As limited heritage survives, visitors are often drawn more towards Holocaust sites with physical structures, as opposed to those without. Therefore, virtual representations of these sites may provide greater insights than physical spaces, which may replace requirements to visit certain sites.

2.3 The Holocaust in the Digital Age

Many archaeological educational and research initiatives have commenced through the discovery of Holocaust evidence. The Holocaust Education and Archive Research Team (HEART), developed a website, detailing archaeological methods and findings discovered during an investigation of sites such as Bełżec (HolocaustResearchProject.org, 2018). The website combines materials from DBA (such as historic photographs and eyewitness testimony), with archaeological evidence to support the site's narrative. Similarly, Yad Yashem displays photographs from the Sobibór archaeological investigations upon its website, providing users with an understanding of the Holocaust through evidence (YadVashem.org, 2018). Schute (2014: 7), describes creating a database for 'education work with students and pupils' displaying archaeological findings from investigations at Buchenwald (Germany) (Hirte 2000). The author of this thesis assisted in the development and construction of a

platform exhibiting archaeological research acquired from Treblinka in collaboration with the Centre of Archaeology and the Google Cultural Institute (Sturdy Colls, 2015a). The platform exhibited DBA and fieldwork data through multimedia formats, alongside a virtual tour of the site. The platform endeavoured to provide a 'sustainable educational resource, which can be used by members of the public, teachers, students and researchers' (Sturdy Colls, 2015a: 6).

2.3.1 Online Representations

In 2001, Anne Reading observed that the Holocaust has become virtual, describing nonlinear formats in which Holocaust materials are digitally represented. Since, new Holocaust dissemination techniques and methods have emerged online, far succeeding the CD-ROMS and cyberspace multimedia defined by Reading (2001). However, the internet can be described as both a superb and contemptible resource for those endeavouring to learn about the Holocaust. Although certain online ethical guidelines exist (for example, copyright and plagiarism), the internet can be considered a difficult environment to maintain the authenticity, accuracy and accountability of information displayed. Therefore, the internet displays both reliable and unreliable Holocaust information simultaneously, creating a confusing environment to understand what is, and is not, reliable.

Online Holocaust representations can be broadly categorised through three different website types, including:

- **Table 2.3 - Digital Archives**: Collect, store and exhibit a variety of Holocaust sources which can be accessed through advanced search functions. These websites are usually associated with museums and archives.

- **Table 2.4 - Digital Multimedia:** Exhibit a wide variety of Holocaust sources through varied multimedia formats (image, text, audio and video), as the main communication method.

- **Table 2.5 - Virtual Construction:** Resources virtual heritage representations (Section 2.6), for multisensory interaction. Site representations, structures or artefacts are digitally presented through virtual tours and 3D models.

Table 2.3: *Examples of digital archive Holocaust websites.*

Website Name	Academic Literature	Artefacts	Audio	Legal Reports	Map/s	Personal Document	Photographs	Testimony	Video	Other
The USC Shoah Foundation Visual History Archive	✓							✓	✓	E-learning teaching packages
Ghetto Fighters House Museum		✓		✓		✓	✓	✓		E-learning teaching packages
Yad Vashem	✓			✓		✓	✓	✓	✓	Victim database
Forced Labor 1939-1945: Memory & History					✓				✓	
Yale University library: Holocaust testimonies									✓	
The United States Holocaust Memorial Museum	✓	✓	✓	✓	✓	✓	✓	✓	✓	-Victim database -E-learning teaching packages
Simon Wiesenthal Centre: Museum of Tolerance	✓		✓		✓	✓	✓		✓	
Vancouver Holocaust Education Centre	✓	✓	✓	✓	✓	✓	✓	✓	✓	E-learning teaching packages
Leo Baeck Institute	✓	✓	✓	✓	✓	✓	✓	✓	✓	Podcasts
Voices of the Holocaust (voices.edu)	✓		✓		✓	✓		✓		Interview Archive
The Holocaust Collection		✓	✓		✓	✓	✓	✓		

Table 2.4: *Examples of digital multimedia Holocaust website.*

Website	Academic Literature	Artefact	Audio	Legal Report	Map/s	Personal Document	Photograph	Testimonies	Video	Other
Shtetl.lt					✓		✓	✓		
Auschwitz.org		✓		✓	✓	✓	✓	✓		-E-learning teaching packages -Victim database -Images of digitally constructed barracks
Speak in Spite of Everything					✓			✓	✓	
Forensic-Architecture: Living death camps	✓		✓	✓	✓	✓	✓	✓	✓	Combines GPR & laser scanning data
Holocaust History		✓	✓		✓	✓	✓	✓	✓	
Joods Monument	✓	✓	✓	✓	✓	✓	✓	✓		Interactive memorial tiles
British Library: Voices of the Holocaust		✓	✓		✓	✓	✓	✓		E-learning teaching packages
Holocaust Explained	✓	✓	✓		✓	✓	✓	✓	✓	(UK) secondary school focused
Nizkor.org				✓		✓	✓	✓		
Holocaust.umd			✓			✓	✓	✓	✓	
Dachau Concentration Camp		✓	✓		✓	✓	✓		✓	
Virtual Museum: Heritage of		✓				✓	✓	✓		

the Jews of Lodz										
Death Camps	✓	✓		✓	✓	✓	✓	✓		Images of virtually reconstructed structures
Camps.bbk.ac.uk	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Yahadinunum	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Telling Stories			✓			✓	✓	✓	✓	

***Table 2.5**: Examples of virtual construction Holocaust websites.*

Website	Academic Literature	Artefacts	Audio	Legal Reports	Map/s	Personal Document	Photographs	Testimonies	Video	Virtual Type
Anne Frank Museum: Secret Annex		✓	✓		✓	✓	✓	✓	✓	Virtual Tour: photorealistic/ evidence-based reconstruction
Ten Boom Museum			✓		✓		✓	✓		Virtual Tour: 360° panoramic photos
Hungarian Holocaust Museum		✓	✓		✓		✓			Virtual reconstruction Auschwitz-Birkenau crematorium: Photorealistic
Martyrdom of Polish Village: Village of Kielce.			✓		✓	✓	✓	✓	✓	Virtual reconstruction: Abstract interactive 'house' and maps.
Florida Centre Instructional Technology: A teachers guide to the Holocaust	✓	✓	✓	✓	✓	✓	✓	✓	✓	-Single scene virtual tour: 360° panoramic photos -Music
Remember	✓	✓	✓	✓	✓	✓	✓	✓	✓	Single scene virtual tour: 360° panoramic photos

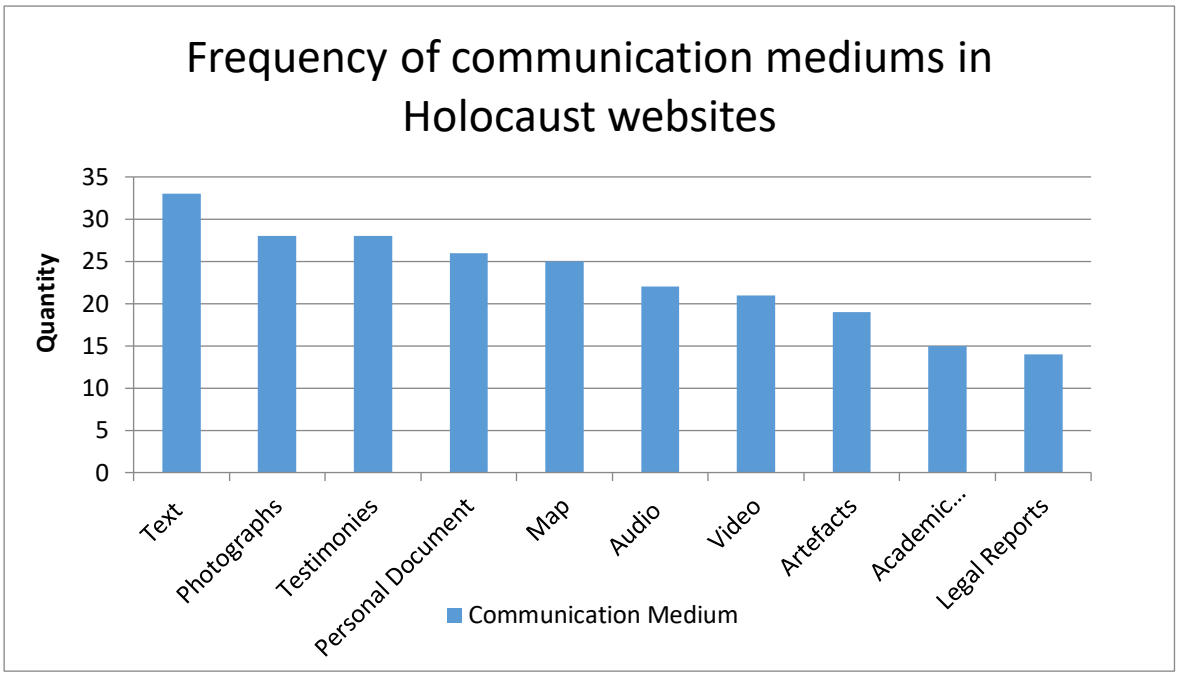


***Figure 2.1**: The number of times a specific communication medium occurs within the analysed websites.*

From analysing the 33 websites (which by no means is an exhaustive list), the most frequently occurring form of communication is text which is present throughout all websites (Figure 2.1). Joint second is eyewitness testimony (28/33 websites). This coincides with Holocaust education requirements stating testimony is essential in communicating empathy (Short & Reed, 2017; Foster *et al*, 2016; Suissa, 2016; Imber, 2013). Legal and war reports were the least applied media to convey Holocaust information. Table 2.5 highlights that virtual tours were resourced greater than 3D reconstructions throughout the six websites. From 35 websites, only six (18%) resourced virtual heritage visualisations to communicate Holocaust information, highlighting a demand for wider implementation.

2.3.2 Spatial Representation

Many shared characteristics between Holocaust archaeology and geography exist, for example, both endeavour to interpret landscapes alongside how individuals interact with their environment. Remnants of over 42,000 camps, ghettos, transportation links, factories, fortifications, ghettos and killing sites, from the Holocaust, are still evident within landscapes today (Megargee & White, 2018; Sturdy Colls, 2015). Through extensive involuntary deportation, diffusion and displacement of millions of individuals across Europe, the significance of the Holocaust as a spatial and temporal event can be evaluated through geographical techniques and perspectives (Giaccaria & Minca, 2016, 2011; Sturdy Colls, 2015; Knowles *et al*, 2014; Sturdy Colls & Colls, 2013).

Spatial and temporal research conducted by geographers into the Holocaust is reflected through spatial narratives (Cole, 2015; Bodenhamer *et al*, 2013; Madden & Ross, 2009; Azaryahu & Foote, 2008); spatial transformation of Nazi camps (Giaccaria & Minca, 2016; Knowles *et al*, 2014; Carter-White, 2013; Sofsky, 2013; Sturdy Colls & Colls, 2013; Giaccaria & Minca, 2011; Beorn *et al*, 2009; Charlesworth, 2004); ghettos and spatial transformation (Cole, 2013, 2009; Giordano & Cole, 2011; Cole & Smith, 1995); commemoration (Azaryahu & Foote, 2007); and education (Fitchett & Good, 2012; Hartmann, 2002). Therefore, 'Holocaust geographies' uniquely interprets Holocaust sites, prisoner and perpetrator movements alongside personal narratives from a macro to micro scale. This information can inform audiences about the Holocaust through perspectives such as education and commemoration.

A geographer's role is to question and interpret where and why things are located within certain spaces, alongside how individuals/communities interact with their environment (Ruffell & McKinley, 2008). Although, limited understanding regarding: how prisoners lived, survived and died; spatial attributes (such as camps and transportation systems); and how Holocaust sites have been transformed, remain largely unexplored (USHMM.org, 2017c; Sturdy Colls, 2015; Sofsky, 2013). This analysis and interpretation can be used in conjunction with recently declassified archival documentation to highlight original Holocaust perspectives (for example, Guardian.com, 2017). Therefore, data collection and analysis have the potential to reveal insights including: the topography and layout of Holocaust sites, transportation systems, movement of victim and perpetrators; displaying the significance of geographical methods within Holocaust research (Sturdy Colls, 2015; Knowles *et al*, 2014; Myers, 2008; Charlesworth, 2004).

In 2007, the USHMM hosted the 'Geographies of the Holocaust' workshop, which demonstrated the potential for spatial analysis and temporal and cartographic visualisation methods. Research was displayed through six different projects comprising, 'Auschwitz a Case Study', 'Landscapes of Experience: Representing the Evacuations from the Auschwitz Camp System, January 1945', 'the Budapest Ghetto', 'A Geography of Complicity: Spaces and Mentalities in Wehrmacht participation in Einsatzgruppen Killings in the Soviet Union', 'The Holocaust in Italy' and 'Mapping the SS Concentration Camp System over Space and Time' (USHMM.org, 2017c, 2017d; Knowles *et al*, 2014). These projects incorporated historical archive materials consisting of aerial and ground photographs, eyewitness accounts, architectural camp plans, maps, alongside Geographical Information Systems (GIS) data, to map, record and display spatial and temporal movements of individuals alongside the construction of Holocaust structures (Ibid).

The 'Auschwitz Case Study' project used geographic-visualisation tools to produce a digital rendering of Auschwitz concentration camp through architectural plans, archival documentation,

eyewitness testimony, historical maps, aerial and ground photographs (Knowles *et al*, 2014) (Figure 2.2). These materials were presented through layered functions, permitting users to view chronological information from different periods and areas of the camp's development. Spatially representing the camp, an aerial image containing geotagged points informs users about specific spaces within the camp. Clicking on a geotagged point presents alternative information (for example, quotations and photographs), allowing users to develop associations between space and historical materials (Ibid).

The 'Mapping of the SS Concentration Camp System over Space and Time' project used GIS techniques to interpret spatial and temporal features of different camp types, locations and construction dates. Through using GIS, greater accuracy of data capture, management, analysis and representation is maintained (Bonham-Carter, 2014). The GIS data visually displays patterns and relationships between datasets (Ibid). The project incorporated data from the USHMM's 'Encyclopaedia of Camps and Ghettos', which represents over 1,100 Holocaust camps on maps (Knowles *et al*, 2014). This information simplistically and effectively visualises Nazi camps throughout Europe, as well as their proximity to Germany. Through GIS analysis, systems can display historical spatial data informing details such as, where the Nazis conducted and executed atrocities (Ibid). By using layered functions, users can display niche information such as individual experiences, spaces and construction periods, all accessible within one platform.

These projects demonstrate the benefits of multi-disciplinary research between geography and Holocaust studies. Through drawing upon modern mapping methods and visualisation techniques, themes, patterns and trends are simultaneously revealed about Holocaust landscapes through easily interpretable formats. Research conducted by Sturdy Colls and Colls (2013) used GIS and total station methods to record landscape features at Lager Norderney camp (Alderney; Channel Islands). This project combined historical and contemporary aerial images to develop a digital terrain model (DTM) of the site, transforming 2D materials into 3D representations (Ibid). By providing users with greater spatial understanding through visualisation, the project used geotagged points to access materials about specific areas within the site (Sturdy Colls & Colls, 2013). These projects display the ability to convey vast and complex Holocaust narratives, through simplistic visualisation outputs; suitable for educational and commemorative purposes.

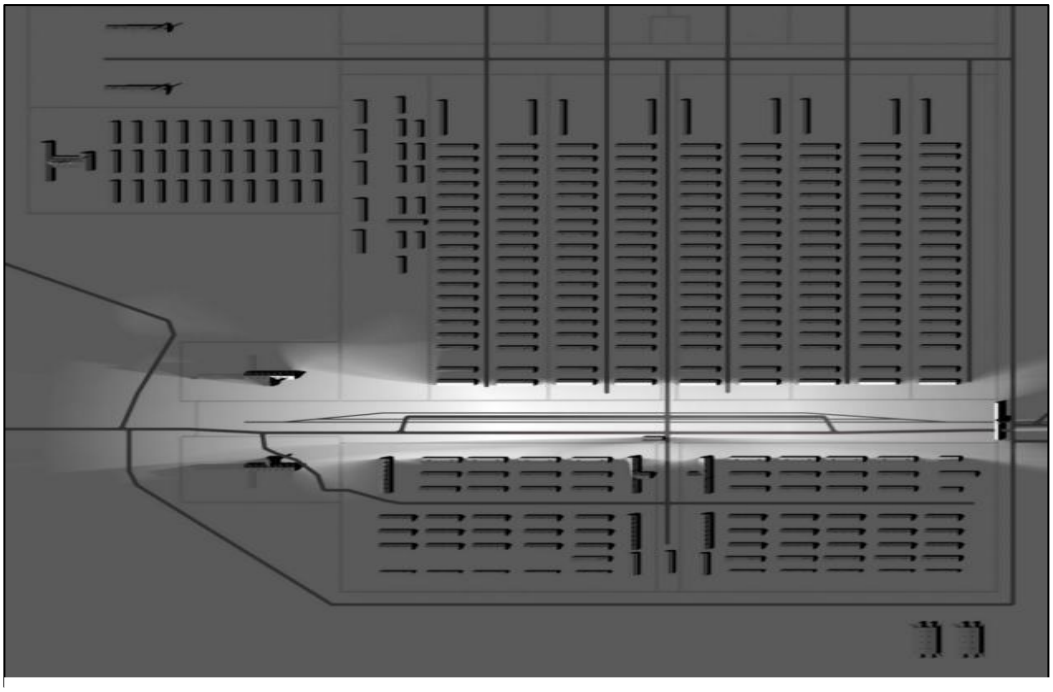


Figure 2.2*: A light displaying a line of site from the 'Auschwitz case study' representation (Knowles et al, 2014).*

2.3.3 Forensic Architecture

In Weizman's (2010) paper 'Forensic Architecture only the Criminal Can Solve the Crime', forensic analysis of built structures is defined as 'forensic architecture'. Forensic architecture provides a method to translate structural event perspectives, of a feature or object (Ibid). Bearing witness to events, Weizman (2010: 16) defines structures as, 'not just passive elements' but 'receptive sensors on which events are registered'. Weizman (2010: 11) continues to explain that evidence of destruction caused by conflict, is still evident on buildings or within the rumble of a collapsed building (Ibid). Therefore, the role of forensic architecture is to 'translate' or 'interpret' these structures.

In 2017, the Royal Ontario Museum (Toronto, Canada) displayed an exhibition titled, 'the Evidence Room'. The exhibition displayed replicas of key objects from forensic architectural analysis of Auschwitz's gas chambers, including: a full-scale gas column 7reconstruction, airtight doors and hatches, alongside over 60 plaster casts of evidence (such as blueprints and photographs) (ROM.on.ca, 2017). The exhibition stemmed from Professor Robert Jan van Pelt designs, which was presented during the Irving vs Penguin Books trial (Van Pelt, 2016). The 2000 trial derived from the publication 'Denying the Holocaust: The Growing Assault on Truth and Memory', which stated that Irving was a Holocaust denier and a falsifier of history (Lipstadt, 2012). Supporting Lipstadt's defence, the Evidence Room provided forensic architectural evidence of the Nazis' intent to commit genocide through purposefully designed gas chambers (Van Pelt, 2016). This evidence significantly

contributed to the trial's success, highlighting the importance of forensic architecture to provide evidence of the Holocaust.

Within conflict archaeology studies, Schofield and Johnson (2006) discuss the value of buildings as a form of communication, through concealing details including who constructed them, how they were used and have become adapted to further suit surroundings. From a Holocaust perspective, surviving buildings are a testament to those who constructed them (Sturdy Colls, 2015). As Holocaust victims were forced to construct buildings, they serve as a reminder of prisoner suppression often resulting in death through forced labour (Sturdy Colls, 2015; Carr, 2014). Despite the number of camps constructed throughout Europe (42,000) (Megargee & White, 2018), limited 'obvious' traces remain within these spaces, due to Nazi endeavours to destroy the evidence (Sturdy Colls, 2015; Gilead *et al*, 2010; Arad, 1987). However, these landscapes still require 'translating' or 'interpreting' using forensic architecture methods.

Weizman (2010) discloses through the United Nations Fact Finding Mission Report on the Gaza Conflict (2009), that evidence was required to clarify claims that the Israeli military was deliberately targeting homes. As a form of intelligence gathering, materials comprising geospatial data, aerial imagery combined with on-site evidence, was acquired to interpret events (Ibid). Similarly, the Holocaust boasts a wealth of archive materials, which discloses information about constructions that occurred throughout the Holocaust. This information can greatly assist interpretations of Holocaust spaces, which do and do not display 'obvious' surviving traces. Jaskot (2017) describes these types of materials, as containing visually temporal and spatial details due to capturing specific epochs.

The combination of forensic architecture and the Holocaust is further demonstrated through the 'Living Death Camps' project between the research agency Forensic Architecture (Goldsmiths University; London) and forensic archaeologist Dr Caroline Sturdy Colls (ForensicArchitecture.org, 2014). The 'Living Death Camp' project explores political commemoration complexities at the former Nazi concentration camp *Staro Sajmište* (Belgrade) (ForensicArchitecture.org, 2014). The structures which occupied this space were used by the Nazis to house and kill victims (Sturdy Colls, 2013a). Recently, these structures accommodated residents and were also used as business spaces (ForensicArchitecture.org, 2014). However, local governments evicted residents to transform the site into a form of commemoration (Sturdy Colls, 2013a). Since the eviction, no commemoration has commenced in Belgrade, being the only European capital city not commemorating World War Two concentration camps (Byford, 2012); which is a European Union entry requirement (Stockholm International Forum, 2000). This project demonstrates potential approaches for forensic architects and archaeologists when investigating and interpreting Holocaust sites. The project's results

combined Ground Penetrating Radar (GPR) and laser scanning data, to display multi-layers of the site's history (Ibid) (Figure 2.3).

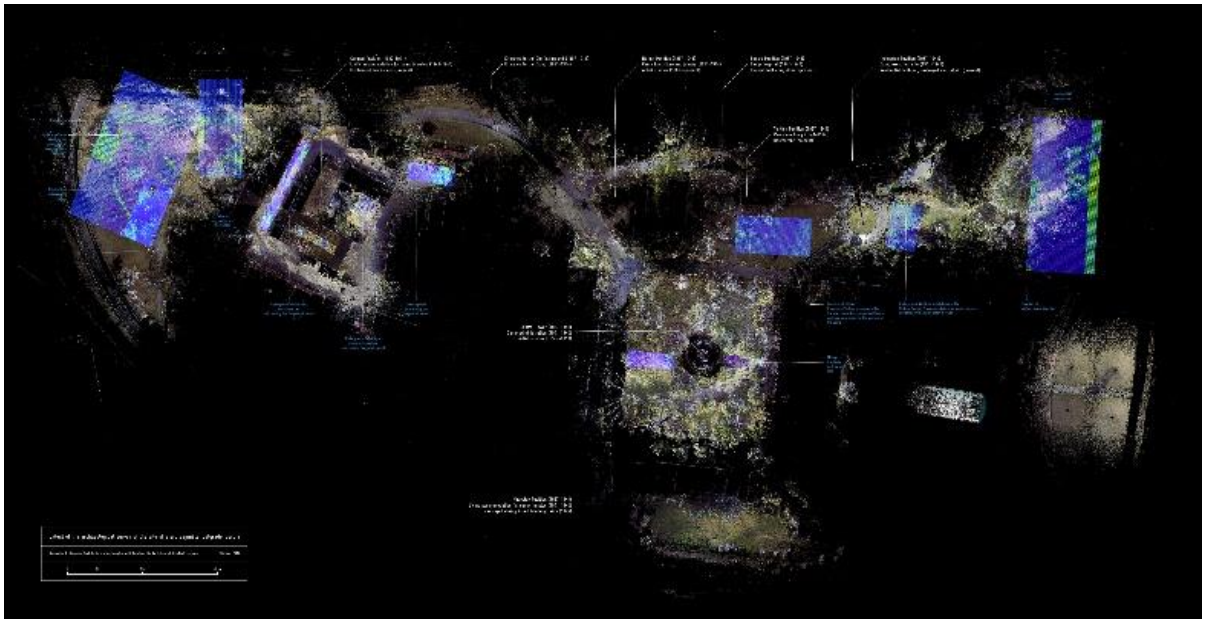


Figure 2.3*: Laser scanning and Ground Penetrating Radar (GPR) data combined from the 'Living Death Camps' project.*

2.3.4 Electronic Presentation of Evidence (EPE)

In 1956, Sir Mortimer Wheeler highlighted that archaeology has a fundamental role to inform the public about its findings, 'it is the duty of the archaeologist, as of the scientist, to reach and impress the public, and to mould his words in the common clay of its forthright understanding', (Wheeler, 1956: 234). The objective of forensics and archaeology can be considered one of the same, the reconstruction of event narratives (Crossland, 2013; Connor & Scott, 2001). Centrally guiding reconstructions are evidence discovered from investigations. However, different reconstruction intentions appear between the two disciplines, with archaeology's primary target the historical record and forensics the pursuit of prosecution (Ibid). This nuanced confliction has, on the one hand, the power to assist human rights convictions and on the other, the potential to diminish victim memory; even ignite conflict (González-Ruibal & Moshenska, 2014). Therefore, reflection regarding the act of dissemination within forensic archaeology should be contemplated and its tangible impact assessed.

A fundamental role of a forensic archaeologist is to disclose investigative findings and explain their meaning within courtrooms, through the role of an expert witness (CIfA, 2014; Hunter & Cox, 2005). The CIfA (2014) provides information concerning written and electronic evidence, outlined in the Disclosure Manual for Expert Witnesses (CPS, 2010). The handbook describes three expert witness key obligations: retain, record and reveal. The handbook further outlines that investigative findings can be disseminated within courtrooms through multiple formats.

Commonly, courtroom dissemination of forensic archaeological evidence entails verbal communication, supported by a written report and visual presentation (CPS, 2010). This provides the expert witness with an opportunity to communicate the investigative rationale, methodological approach and explain the findings and incorporate other findings from alternative agencies (IfA, 2011). The (2014) CIfA report states that any information disclosed by forensic archaeologists should be communicated in a manner accessible to a layperson and suitable for courtroom dissemination. Additionally, investigative findings should be disseminated (after legal proceedings) allowing other forensic archaeologists to understand the relevance of results for future investigations (Ibid).

The dissemination role of forensic archaeologists also exists within the academic community. Findings should be communicated through journals and conferences, providing audiences with the opportunity to learn and critique techniques, methods and findings (CIfA, 2014). This essentially differs from criminal prosecution perspectives, which demand greater emphasis surrounding the evidence chain of custody, which may be held to scrutiny within a courtroom. Within academia, journals are subjected to a peer-review process, with experts contemplating if a journal paper is suitable for publication. This process is not maintained within criminal prosecutions, as the forensic archaeologist is solely accountable for their presentation of evidence. Alternatively, forensic archaeology has disseminated information through mainstream formats including: television programmes, film-documentaries, news articles and online publications.

Within genocide and human rights conflicts, the term ‘evidence’ is often used to describe investigative findings. The word 'evidence' encompasses a broad definition within the Oxford Dictionary being described as ‘the available body of facts or information indicating whether a belief or proposition is true or valid’, or through legal contexts, ‘information drawn from personal testimony, a document, or a material object, used to establish facts in a legal investigation or admissible as testimony in a law court’ (Oxforddictionaries.com, 2017). Under the broad term ‘evidence’, findings such as human remains are also incorporated. Although this term is suitable within courtroom proceedings, within the public domain, this term groups a wide range of findings, detracting what this evidence type actually is, a human being; which can create upset amongst relatives of the deceased (Thompson, 1998). For example, the continuous political ignorance and lies regarding Argentina’s ‘disappeared’ (1984), resulted in mass grave exhumations. Covering these stories, the media used the term 'bodies of evidence', as proof to confront political statements denying atrocities, upsetting many victim relatives (Crossland, 2000).

Evidence presentations in courtrooms are currently undergoing a global transformation, from a paper-based to a digital form of presentation[15] (Schofield, 2012). This method of courtroom dissemination is called Electronic Presentation of Evidence (EPE). Its application has many advantages within criminal proceedings through displaying multiple forms of multimedia evidence (for example, text, audio, image and video) within the same facility (Gov.UK, 2016; Schofield, 2012). This has improved time and costs in relation to document handling[16]. In 2005, a protocol issued by the Lord Chief Justice of England and Wales outlined the advantages of EPE courtroom application, stating 'greater use of other modern forms of graphical presentations should be made wherever possible' (Justice.Gov, 2005: 16).

EPE methods have been reported to focus the juror's attention, with the average juror's attention span lasting approximately seven minutes, whilst also generating greater attention of representations, with evidence being 'more relevant' and thus, easier to interpret (Devine *et al*, 2001; Schroder 1997). This naturally adopts the philosophy of 'less is more' (Lounsberry, 2014), meaning that more time is allocated to interpreting significant trial evidence (Schofield, 2007). Furthermore, technology has become heavily integrated within western societies, with many individuals accustomed to visual media (television, computers and mobile devices) (Schofield, 2011; 2007). Therefore, both an expectation and potential necessity derives courtroom visual presentations reflecting societal preferences of engaging with information.

The implementation of EPE methods also provides a resource for expert witnesses to relay complex information through alternative communication means than written or verbal. Research conducted by the American Bar Association (ABA) displays that jurors become quickly disengaged and feel overwhelmed when confronted by written and verbal technical and scientific explanations (Schofield, 2009; Kuehn, 1999). Through visualisation advances, complex spatial and temporal data can be conveyed through CGI and 3D formats, thus presenting technical materials in an accessible and recognisable format (Schofield, 2011). CGI application provides courtrooms with a demonstration of 'what if' scenarios, answering competing hypotheses and exposing evidence inconsistencies (Schofield, 2011). Therefore, the communication advantages for EPE and CGI within courtroom presentations is irrefutable.

Visualisation approaches encompass a persuasive nature, due to the 'seeing is believing' inclination and thus demands attention regarding its implementation and interpretation (Schofield & Fowle,

[15] Also see media articles such as: Guardian.com, (2018) and Supchina.com, (2018).

[16] This is evident through cases such as the death of British scientist David Kelly, whose hearing comprised approximately 10,000 pages which were scanned and displayed through digital formats. Case reports claimed that the hearing time was reduced by at least a quarter (Jackson, 2009).

2013; Schofield & Mason, 2012; Schofield, 2011; Speisel & Feigenson, 2009). Although the potential for reconstruction of events (or scenes) through photorealistic outputs exists, research currently highlights that representations often display a lack of realism (Bailenson *et al*, 2006). However, this visualisation format effectively displays chronological event sequences which are not bound by physical restrictions such as viewpoint. This provides jurors with multiple event perspectives which can be sped up or slowed down, accentuating specific details. However, (limited) research has acknowledged the concerns surrounding courtroom biases, although no definitive solutions have been identified (Schofield & Mason, 2012). Though, studies do demonstrate that visual aids are more likely to persuade jurors' beliefs (Lederer & Solomon, 1997; Krieger, 1992; Seltzer, 1990).

Alongside visually enhanced courtrooms representations, research into courtroom Immersive Virtual Environments (IVE) and Virtual Reality (VR) has ensued (Schofield, 2014, 2011; Bailenson *et al*, 2006). Research projects such as Digital Forensic Archaeology (Digitalforensicarchaeology.com, 2016) endeavours to record and present virtual crime scenes through 3D, 4D and 5D processes, also the Juries and Visual Evidence Project (JIVE) (2008) researched the effects of visual interaction within courtroom trials. However, JIVE research suggests that interactive visual evidence has 'modest influence' upon jurors but does display an effect on individuals more likely to reach a conviction (Schofield & Mason, 2012: 224). Although, IVE and VR interactions provide judges and jurors with the opportunity to virtually revisit a crime scene, research indicates manipulation potential by constructing emotional biases, deliberately implemented to influence jurors (Bailenson *et al*, 2006; Rizzo, Wiederhold, & Buckwalter, 1998). Despite these technological advances, greater research is required regarding juror influences and EPE visualisations.

Holocaust representations can benefit from advances within the field of EPE. From a courtroom perspective, it can be understood that complex scientific explanations require presenting in a format suitable for audiences with different levels of understanding. The investigative method rationale should also be clearly explained, allowing audiences to understand what and why specific methods were used alongside the relevance of the investigative results. Significantly, as the Holocaust still resides within living memory (Section 2.2.4), attention towards the terminology used to describe findings should be contemplated. By using EPE methods the audience's attention can be focused by adopting the 'less is more' approach (Lounsberry, 2014). This research further displays that western cultures expect information to be disseminated digitally, whilst relaying multiple perspectives of event/scenes. However, contemplation of the 'seeing is believing' concept should be considered prior to disseminating representations to the public.

2.3.5 Holocaust Representations

As previously mentioned (Chapter 1 Section 1.1), Holocaust studies frequently resource virtual environments to represent Holocaust landscapes and sites. Chapter 1 described an augmented application which displayed 3D models of the barracks at Bergen-Belsen concentration camp (Germany) (Belsen-project.com, 2012) and a 3D laser scanned model of Auschwitz Birkenau (Poland) (BBC.co.uk, 2016). Similarly, representations of these camps have also been created by Studio 101% and Leeds University. Studio 101% developed a virtual reality application of Auschwitz Birkenau titled 'Witness: Auschwitz', providing audiences with an immersive experience to explore the camp (Alphr.com, 2017) (Figure 2.4). Leeds University (United Kingdom) are currently developing virtual projects of Bergen-Belsen and Neuengamme concentration camps (Leeds.ac.uk, 2018).

Figure 2.4*: A photorealistic virtual reality model of Auschwitz Birkenau concentration camp, created by Studio 101% (Alphr.com, 2017).*

These projects demonstrate that the Holocaust can be represented through computer-based visualisations. Through observation, each virtual Holocaust environment vastly differs in terms of representation. For example, the design of the Bergen-Belsen 3D models can be considered abstract, with details such as colour and avatars deliberately excluded. Contrastingly, the laser scanned Auschwitz 3D model visually portrays a realistic colour representation, and displays details such as a barbed wire fence, avatars and terrain vegetation. Studio 101%, virtual reality simulation of Auschwitz contrasts both these forms of representation and is closely aligned to a video-game style output. Effects within this representation are extensively resourced; for example, sirens and weather conditions.

Two (Bergen-Belsen and Studio 101% Auschwitz models) out of three virtual environments, combine multimedia materials within the representations. These multimedia materials assist narratives by providing multiple evidence types that describe specific areas within the camps. The inclusion of these materials aid audience associations between contemporary virtual environments and the past (Ibrahim *et al*, 2011). They support the 'real goal' of virtual heritage, to understand past cultures and experiences (Ibid), alongside enhance user experiences through 'interactive digital storytelling' (Rizvic, 2014: 7).

The variations between these Holocaust virtual representations highlight the extent of possibilities that can be applied to depict Holocaust scenes and environments. Out of the three representations, only the immersive virtual reality model of Auschwitz (Studio 101%) endeavours to portray how the camp would have operated during the Holocaust; contrasting the laser-scanned Auschwitz model displaying how the camp appears today; and the Bergen-Belsen model showing spatial attributes of the camp. The variations between these representations are dictated by the project's aims and objectives regarding the function and purpose of the final output (for example, courtroom presentation or education) alongside the method/equipment selection.

In contrast, institutions such as the University of Southern California (USC) Foundation and National Holocaust Centre and Museum apply holographic representations to communicate survivor testimony (SFI.USC.edu, 2018; Ma *et al*, 2017). With concerns of declining numbers of Holocaust survivors, 'the Forever Project' and 'New Dimensions in Testimony' project have recorded Holocaust survivor testimonies through holographic processes (Ibid). Selected survivors were recorded responding to 'likely' questions audiences may ask. Similarly, to the Holocaust camp virtual representations, these holographic representations capture a sense of time and place. The application of virtual reality within Holocaust representations have potential within education, commemoration, awareness, historical preservation alongside new narratives continuation and development.

2.6 Virtual Heritage

Virtual heritage is a combination of VR and cultural heritage (Economou & Tost, 2011) and can be defined as, 'the use of computer-based interactive technologies to record, preserve, or recreate artefacts, sites, and actors of historic, artistic, religious, and cultural significance and to deliver the results openly to a global audience in such a way as to provide formative educational experience through electronic manipulations of time and space' (Stone & Ojika, 2000: 73). Literature often debates a 'suitable' definition of virtual heritage, due to its interdisciplinary nature and continuous technological developments (Champion, 2014; Reffat & Nofal, 2013; Ibrahim et al, 2011; Tost & Champion, 2007). Virtual heritage terminology frequently used throughout the thesis include: 3D

reconstruction, 360° panoramic photos, photorealism, photorealistic and virtual heritage representations (see Glossary for definitions).

2.6.1 Stages of Development

Expanding on Addison's (2000) three stages of virtual heritage development (3D documentation, 3D representation and 3D dissemination), Tost and Champion (2007) propose five virtual heritage domains: capture, presentation, distribution, learning environment and evaluation (Tost & Champion, 2007; Addison, 2000). Initially, the capture process involves acquiring accurate data about specific heritage. Associated archaeological and virtual heritage methods and techniques are used, which comprise (but are not limited to) physical measurements and sketches, photogrammetry and GIS. Presentation processes seek to virtually exhibit accurate data through engaging, authentic and reliable processes, most frequently virtual tours and 3D models. Dependant on a project's aims and objectives, data distribution should be coordinated through sufficient channels (such as online or museum exhibitions). This process should emphasize effective learning environments, appropriate for the target audience. Once presented, a project should be evaluated for its suitability and effectiveness.

2.6.2 Guidelines

Besides research by Addison (2000), Tost and Champion (2007), numerous directives and articles exist recommending how archaeologists should document, represent, disseminate and archive digital/virtual heritage data. UNESCO provides a charter titled the 'Preservation of Digital Heritage' (2003), the Archaeology Data Service (ADS) provides 'Guides for Good Practice relating to CAD' (2002) and 'Virtual Reality' (2002a). However, directives outlined by the London Charter (2009) and Seville Charter (2011) (Lopez-Menchero & Grande, 2011) which 'establish principles for the use of computer-based visualisation methods and outcomes in the research and communication of cultural heritage' (London Charter, 2009: 2) are considered the benchmark for virtual heritage protocols. These documents provide a broad outline, focusing on 'intellectual integrity' providing a 'robust foundation' to communicate computer-based cultural heritage (London Charter, 2009: 3).

The above sources dictate suitable directions for data representation, ensuring scholarly and historical vigour. Accountability is often emphasized throughout the literature, using the terminology 'transparency', 'authenticity', 'reliability' and 'accuracy' (Bentkowska-Kafel *et al*, 2012; London Charter, 2009; Roussou & Drettakis, 2003; ADS, 2002). However, through the perspectives of the Holocaust, these guidelines become complicated through fragmented, incomplete or contradicting historical sources and materials. Most often, equipment selection and visualisation output are

directed through surviving heritage, which within Holocaust contexts has frequently been destroyed, concealing evidence. If limited (or no) heritage survives, virtual heritage still permits visualisation opportunities through evidence-based or hypothetical reconstructions. This may ensue through virtually reconstructing the heritage (whether an individual structure, entire site or artefact) providing a representation of what may have formerly appeared. If considerable surviving heritage does survive, techniques (for example, photogrammetry) may be utilised to produce an existing state replication.

Output variations between these techniques include: photo, photorealistic, animation and 3D modelling, all of which are dictated by the visualisation method selected (Ch'ng *et al*, 2013). The London Charter (2009) outlines that method selection and visualisation type should be relayed to audiences. Research by Economou and Pujol (2008) describes the audience's lack of awareness between 'real and virtual' worlds, thus clarity regarding what is and is not authentic is required (Economou & Pujol, 2008). Further complexities may be encountered through the construction stage of virtual heritage, with Holocaust structures often experiencing varying levels of adaption for alternative usage, thus reflection of these changes provides further challenges for visualisations (Tan & Rahaman, 2009; Schofield *et al*, 2006).

2.6.3 Communication

Virtual heritage provides a communication tool for the public and scientific community through abstract and non/linear data which is gathered, stored and visually interpreted (Economou & Pujol, 2008; Osberg, 1997). Virtual heritage not only visually communicates information but also performs a role in preservation, education and commemoration of historical data. Ibrahim *et al*, (2011) states, 'while the main reason for a virtual heritage project is to preserve the past by reconstructing or reproducing heritage objects, the real goal in virtual heritage study should actually be to understand past culture' (Ibrahim *et al*, 2011: 276). A 'hollow' virtual environment does not contain sufficient context to convey cultural understanding, although the significance of a virtual environment does provide a vessel for 'being there' (Tan & Rahaman, 2009). Further complexities arise when 'being there' is not a true representation of what physically exists, and cultural awareness may not be represented (or able to be accounted for) (Tost & Champion, 2007).

Roussou and Drettakis (2003), address the evolution of visualisation, identifying a transformation pattern from realism to artistic, observed through painting, photography, film and computer graphics. Once the 'artist' has accomplished realism, 'the representation of reality became 'distorted' to communicate an inner vision' (Roussou & Drettakis, 2003: 2). This is reflected within the field of non-photorealistic rendering (NPR), through virtual heritage models which portray realistic

visualisations that do not physically exist. Whilst one may see benefits to such an impressive feat, within Holocaust representation these issues remain nuanced, which consequently may confuse audiences and be considered inauthentic. By representing structures and landscapes which no longer exist, audiences can be misled. Although photorealistic representations of Holocaust sites can be created, often, insufficient or conflicting historical sources describing characteristics such as appearance exist, allowing 'accurate' or 'authentic' representations.

Literature often debates the measurable success of virtual heritage visualisations through photorealistic representations (Tan & Rahaman, 2009; Roussou & Drettakis, 2003; Roussou, 2002). Renfrew (1994), importantly addresses that the desire to deliver realism within representations may influence the user's interpretation of content. Realism can be achieved using qualities such as natural sounds, weather conditions and avatars, which may influence perception (for example, rain simulation may evoke negative interpretations) (Addison, 2000). Roussou and Drettakis (2003: 1) state that users prefer a 'believable and convincing environment' rather than realistic representation. Elements such as immersion and seamless exploratory interaction can also influence virtual realism (Tost & Champion, 2007). Audience interaction provides sensory awareness of being present within a virtual environment, contrasting alternative forms of visual presentation (such as film) (Rizvic, 2014). Conversely, studies have shown that simplistic or abstract representations may be more valuable to audiences through learning characteristics (Economou & Pujol, 2008; Lee *et al*, 2005; Osberg, 1997).

The importance of cultural significance within heritage portrayal is outlined within the London Charter (2009), the Ename ICOMOS Charter (2007), and the ICOMOS Burra Charter (1999). However, cultural understanding through virtual visualisations is considered problematic with individuals unique experiences resulting in varied interpretations of culture (Tan & Rahaman, 2009). Bonini (2008) suggests that exhibition and explanation does not by itself, convey cultural awareness. Research conducted by Wedgewood (2009) argues that cultural value is learnt through individuals' ability to retain information, therefore, virtual heritage environments require promotion of reflection through interaction. If audiences are prompted to reflect and can make meaningful connections between representations independently, then an appreciation of heritage (thus, culture) may be achieved (Ibrahim *et al*, 2015). However, the term 'cultural' incorporates a vast number of sub-disciplines, which does not essentially focus on Holocaust representation.

Research conducted by Rizvic (2014: 7) revealed that users' experiences of virtual museums were enhanced through 'interactive digital storytelling'. This form of narrative and interaction suggests that audiences become motivated and inclined to further explore virtual environments. Additionally, Rizvic (2014) describes that audio storytelling is a substitute for non-movement within the virtual

museum. Audiences require contextual knowledge of a virtual space to add meaning to visual emotional response (Champion 2014; Roussou & Drettakis 2003; Shackley 2001). Whilst archaeologists and architects may be attentive to minute details of structural reconstructions, audiences often overlook these factors, with preferences towards humanistic elements such as who occupied the building (Ibrahim *et al*, 2015). Research displays that audiences require mixed multimedia communication, rather than just textual descriptions, as video, image and illustrations can provide greater clarity towards explanation (Ibid). Audiences are often discouraged by lengthy textual descriptions, with preferences for 'identifiable categories, meaningful headings, or highlighted important facts' (Ibrahim *et al*, 2015: 15).

2.6.4 Education

For virtual heritage platforms to fulfil an educational function, an understanding of cognitive processes behind interactions are required. Bonini (2008) argues that making meaning towards narratives and the overall virtual environment is required for learning. Research conducted by Kelly (2007) which analysed the interaction of museum visitors and virtual environments, claimed that 80% of responses achieved learning through making meaning. Pujol and Champion, (2012) describe cognitive 'overloading' whereby simplicity (i.e. limited interactivity) is key. Additionally, this research outlined that self-exploration preferences, as opposed to guided, is desired by audiences (Ibid). Research conducted by Ibrahim *et al*, (2011) outlined virtual heritage's inadequacies for cultural learning, as audiences struggle to create associations between the virtual environment and the past. However, this study also stated that audiences may be able to form these associations through realistic, engaging and multisensory platforms (Ibid). Research conducted on virtual heritage education promotes five essential elements comprising navigation, interpretation (of both the virtual environment and content), evaluation, cultural presence and meaningful content (Ibid). An advantage for virtual heritage learning derives from the removal of failure, as audiences can engage in their own time and revisit information to acquire greater clarity of context (Osberg, 1997). Much research is still required to understand the full learning potential of virtual heritage visualisations, as Economou and Pujol (2008: 9) state 'we are still missing data from older adults, and again, particularly how they interact in cultural settings'.

2.7 Summary

Chapter 2 presented an overview of the Holocaust from educational, archaeological investigation and representation perspectives. This chapter identified that many educational benefits derive from Holocaust education, with testimony performing an essential requirement through communicating empathy. From a teacher perspective, there are currently several key barriers encountered when

teaching the Holocaust, including: insufficient guidance, assessment frameworks and curriculum time; thus, emphasising the necessity for greater collaboration between academics and (secondary school) teachers (Foster *et al*, 2016; ITF, 2010). Subsequently, many external classroom initiatives have been developed addressing these barriers. For example, online initiatives provide e-learning teaching packages and lesson plans, comprising historical sources (such as photographs and testimony). Increasingly, virtual heritage visualisations are becoming interwoven with these initiatives, providing a unique form of Holocaust education, not previously available within traditional Holocaust education approaches.

The literature highlighted that many ethical complexities are apparent within Holocaust education and representation, for example, variations within terminology and subject content globally differ (Carrier *et al*, 2015). Since 1945, the Holocaust has continually encountered ethical representation controversies, ranging from courtroom trials to television programmes. Primarily, these representation controversies are enhanced through authenticity, accuracy and transparency claims against the historical record. Even when representations are considered, or attempt to address these qualities, alternative controversy has ensued through political or religious complaints. Consequently, inconsistent or continuous Holocaust narrative representations have resulted in myths and misconceptions within Holocaust understandings; detracting from learning (Foster *et al*, 2016). The (2016) UCL report highlighted that essential Holocaust understanding such as the different types of victims and perpetrators, where the Holocaust occurred and Britain's involvement, have become distorted (Foster *et al*, 2016; Holmes, 2016), blurring the boundaries between Holocaust fiction and non-fiction.

Given the increase in archaeological Holocaust site investigations and transition from invasive to non-invasive methodologies, a greater quantity of digital data is produced from investigation. By recognising ethical sensitivities from Holocaust representations and archaeological fieldwork, the representation and dissemination of contemporary archaeological Holocaust materials require thorough contemplation. This literature review produced the following research questions:

- What ethical visualisation methods and presentational qualities should be contemplated when constructing virtual heritage Holocaust environments?
- What is the perceived value of disseminating forensic archaeologically-derived Holocaust data, through virtual heritage technologies?
- Can virtual heritage environments effectively, coherently and accountably disseminate forensic archaeologically-derived Holocaust data?
- How do users learn about the Holocaust from interacting with virtual heritage environments and what is the perceived value of dissemination?

3.0 Methodology

Since the first archaeological methods were applied to investigate the Holocaust site, Chełmno extermination camp (Poland) in 1986, the relationship between archaeology and the Holocaust has become firmly established. Recognition of this relationship has become more apparent since 2000, through increased Holocaust archaeological investigations (Chapter 2 Table 2.2). As the majority of Holocaust landscapes were not examined post-1945, these investigations are considered unique with many significant findings acquired globally from sites (Chapter 2 Section 2.2.3). Despite the ethical sensitivities deriving from invasive investigations, archaeology responded by developing non-invasive methodologies using technological advances (Chapter 2 Section 2.2.4). Both invasive and non-invasive investigations produce vast quantities of evidence, through material culture, structural remnants and other forms of data. These evidence types provide a unique method to view and interpret the Holocaust, producing greater insights into how victims lived, survived and died, alongside how perpetrators used the landscapes to enforce dominance and control. Currently, the field lacks appropriate guidance and frameworks regarding how to ethically disseminate these findings, thus obstructing potential educational and commemorative opportunities for audiences worldwide.

This research is concerned with the ethical nature of disseminating forensic archaeologically-derived Holocaust data obtained from investigations. Through outlining the mixed methodological research approach, this chapter highlights the data collection, representation and analysis applied throughout this study. This chapter provides the justification for different methodological approaches undertaken and further outlines how the data generated addresses the study's aims, objectives and research questions.

3.1 Research Design

This research employs case study approaches, underpinned by qualitative and quantitative research methods. Case study research has been largely applied to social sciences and is considered valuable within practise-oriented fields (Starman, 2013), for example, education. Case studies are 'considered most appropriate as tools in the critical, early phases…when key variables and their relationships are being explored' (Gibbert *et al*, 2008: 2). The implementation of case studies is commonly applied to 'close interaction with practitioners' and thus are pivotal to real-life situations through generating applicable knowledge about a phenomenon (Gibbert *et al*, 2008: 3; Starman, 2013; Baxter & Jack, 2008; Riege, 2003; Meyer, 2001).

This research evaluated two case study platforms, which both utilised virtual heritage representations to convey Holocaust narratives. The literature and website review highlighted that limited studies exist which evaluated Holocaust representations through virtual heritage visualisations (Chapter 2).

The review continued to highlight that limited websites currently resource virtual heritage technologies to communicate Holocaust narratives. Therefore, a requirement existed to produce comparable data for the 'Explore Lager Sylt' platform.

The 'Anne Frank Secret Annex' platform developed by the Anne Frank Fonds, was identified through the website evaluation as a suitable case study comparison. Many variations between the Anne Frank and Lager Sylt platform are apparent, with the former communicating a well-known and 'typical' Holocaust narrative using traditional sources (for example, eyewitness testimony); and latter conveying a less-known narrative using archaeological evidence. Additionally, the Anne Frank platform uses a single character narrative (as opposed to Lager Sylt's multiple characters), and visualises an intact Holocaust space, as opposed to Sylt's destroyed space.

By conducting qualitative research using the 'Anne Frank Secret Annex', a comparative dataset for the 'Explore Lager Sylt' platform was produced; addressing the research aims one and two, alongside objective one (Chapter 1 Section 1.2). Qualitative data about the Anne Frank platform was generated through (UK) secondary school focus study group participants (Section 3.4.2). The 'Explore Lager Sylt' developed by the author to communicate Sylt's narrative. Qualitative data about this platform was generated through focus groups with (UK) secondary schools (Section 3.4.2), alongside interview (Section 3.4.3) and questionnaire surveying (Section 3.4.4) with employees and visitors of the USHMM.

Given the infancy within this field, a lack of knowledge exists regarding how the public perceives archaeological Holocaust data. Chapter 2 (Section 2.3.4) highlighted that within a courtroom, archaeological data can clarify event narratives by presenting evidence of atrocities. Section 2.3.3 (Chapter 2) further strengthen this perspective through outlining the Irving vs Penguin Books criminal trial (2000), which highlighted that forensic analysis of Holocaust spaces and structures was used to combat Holocaust denial claims (Van Pelt, 2016). However, this research does not intend to focus on how archaeological data can combat Holocaust denial. The deliberate exclusion of Holocaust denial materials, for example, the website review (Chapter 2 Section 2.3.1), derives from initial requirements to understand how the public perceives archaeological Holocaust data, outside of a courtroom environment. Additionally, this research was partially conducted using secondary school participants, and displaying Holocaust denial information to young audiences would have encountered further ethical approval barriers (Section 3.4.1).

The overall research design has five stages: literature review/website evaluation, forensic archaeology (fieldwork), virtual heritage (representation), qualitative research (data collection) and data analysis (Figure 3.1). Stages two (fieldwork) and three (representation) resourced quantitative methodologies. Stage one used photogrammetry surveying methods creating a virtual tour of Sylt as it appeared in 2015 (Section 3.3). Stage two (representation), used fieldwork surveying data obtained

from a 2013 investigation of Sylt to produce a series of evidence-based 3D reconstructions, displaying Sylt's yearly spatial attributes between 1942-1945 (Section 3.3). This data was further manipulated to exhibit Sylt's spatial characteristics in 2015, highlighting camp traces still surviving within the landscape. Additionally, sources derived from DBA and archaeological data were presented through various multimedia formats (video, audio, image and text), providing a narrative of Sylt.

Qualitative methods provide vigorous, reliable and accountable approaches to acquiring participant beliefs, feelings and values (Braun & Clarke, 2014; Charmaz, 2014; Baxter & Jack, 2008; Strauss & Corbin, 1990). Qualitative research incorporates epistemological approaches through relating theory with participant beliefs and opinions (Ritchie *et al*, 2013; Denzin & Lincoln, 2000; Marshall & Rossman, 1999). Qualitative research methods were applied to stage three of the methodology, comprising focus study groups, interview and questionnaire surveying (Section 3.4) to survey opinions about the disseminated case study platforms. Focus study groups were conducted at three (UK) secondary schools. Interview and questionnaire surveying was conducted at the USHMM with employees and visitors of the museum. The data was analysed through grounded theory and thematic-analysis approaches, allowing participants insights to be arranged, coded and interpreted (Charmaz, 2014; Strauss & Corbin, 1990).

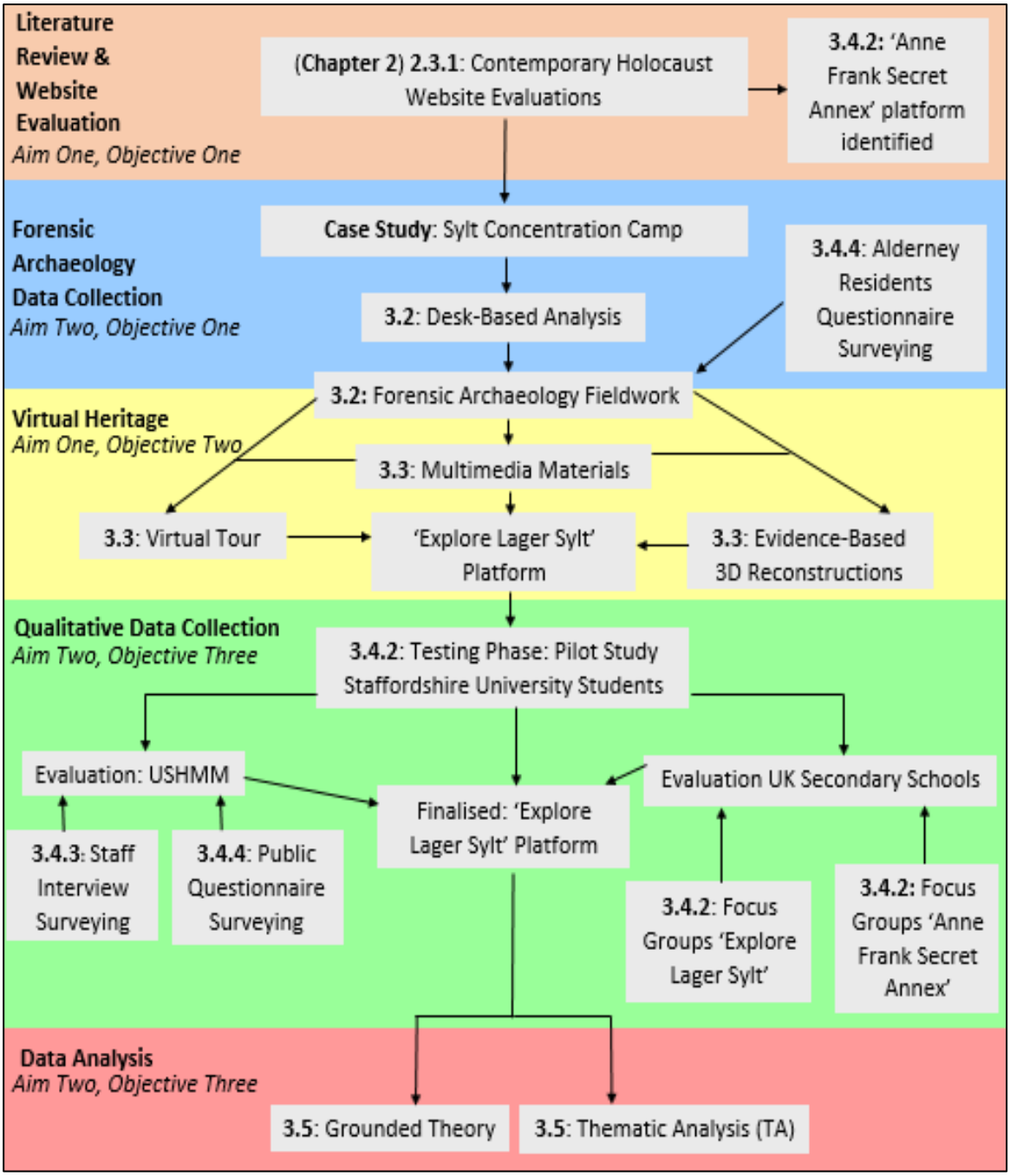


***Figure 3.1**: The overall research design, displaying the associated chapter sections, aims and objectives.*

3.2 Forensic Archaeological Data Collection

This thesis disseminated forensic archaeologically-derived Holocaust data obtained from investigating the case study site, Sylt concentration camp. The Centre of Archaeology has been regularly undertaking archaeological investigations at Sylt between 2010-2015. The author initially conducted investigations at Sylt as part of the Centre's undergraduate field school project in 2013 and as part of this thesis research in 2015. The data obtained from these investigations have been presented through a virtual heritage case study platform (Section 3.3). The types of archaeological

data acquired from both investigations are outlined here. The case study platform can be found here: https://lager-sylt.website/index.html.

Research deriving from the author's (2013) undergraduate dissertation titled, 'The application of non-invasive archaeological techniques to record, map and decipher Sylt concentration camp', comprised DBA and archaeological fieldwork datasets. Although, this thesis is not concerned with how the data was obtained, as this has been outlined elsewhere (Kerti, 2013. Unpublished), the datasets have been used within this thesis' case study platform. The different data types acquired from the 2013 investigation are presented here as primary and secondary data.

The 2013 undergraduate fieldwork revealed a considerable number of surviving landscape features at Sylt (Figure 3.2). These features comprised man-made structures (such as bunkers, steps, boundary walls and a tunnel), alongside man-made depressions and vegetation changes. To accurately document each feature's dimensions and location, Geographical Information Systems (GIS), Electronic Distance Measurer (EDM) and hand measurement equipment were used (Sturdy Colls & Colls, 2013). These features were recorded through sketches and extensive site photography, acquiring over 100 photographs (Kerti, 2013. Unpublished). The documented features are presented in Figure 3.2.

Legend:

Prisoner Camp Boundary:
Outer Camp Boundary:
Road:
Vegetation Change:
Sentry Pill
Feature:
Drain

1. Stable
2. Gateposts
3. Guard Bunker
4. Bunker
5. SS Garage/Workshop
6. SS Orderly Room
7. Stores
8. Prisoner Hut
9. Access Point
10. Prisoner Hut
11. Step Wall
12. Step Wall
13. Prisoner Hut
14. Prisoner Hut
15. Ablutions
16. Boundary Wall
17. Ablutions
18. Steps
19. Drain Hole
20. Kitchen
21. Kitchen Stores
22. Drain Hole
23. Construction Stores
24. Drain Hole
25. Steps
26. Flag/Gatepost
27. Septic Tank
28. Steps
29. Platform Entrance
30. Prisoner Hut
31. Prisoner Hut
32. Sick Bay
33. Tunnel Entrance/Exit
34. Commandant Platform
35. Depressed Area
36. Depressed Area
37. SS Quarters

***Figure 3.2**: A contemporary annotated aerial image displaying the position and describing the landscape features recorded at Sylt during the 2013 archaeological fieldwork (Kerti, 2013).*

Prior to conducting the 2013 archaeological fieldwork, DBA commenced to obtain and consolidate site information stored in archives, libraries, museums and online (CIfA, 2014). This information assisted the physical investigation of Sylt and the interpretation of the fieldwork data, creating a baseline for further study. Information was acquired from the Alderney Museum Archives (AMA), National Collection of Aerial Photography (NCAP), and Royal Air Force (RAF) archives (Table 3.1). Although copyright permissions were granted by NCAP and RAF archives to exhibit their archive materials within the Sylt case study platform, despite countless letters, emails and telephone calls, no response was received by the AMA.

***Table 3.1**: Archive materials acquired in 2013.*

Archive	Material Type	Title	Reference
AMA	Photograph	SS Canteen	AMA & Trevor Davenport
AMA	Photograph	Commandant's House	93/129
AMA	Photograph	Commandant's platform	Hans Hord Collection 02/007
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1943	ACIU/E/0182/4110
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1944	ACIU/RB/0463/3919
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1945	ACIU/106G/5368/3149
RAF	Photograph	Remains Lager Sylt Alderney, 1945	PC98/173/6057/6

The 2013 quantitative fieldwork data provided sufficient information to construct a series of evidence-based 3D models to visualise Sylt structures that existed during the 1940s. Through recording the location of surviving structural remnants, man-made depressions and vegetation changes, each 3D model could be accurately positioned onto various historic and contemporary aerial images (Chapter 6 Table 6.2-principle five). These datasets were presented alongside DBA sources to provide a historical evidence-based overview of the construction of Sylt camp between 1942-1945.

To build upon the existing archive data obtained from the 2013 DBA, a greater number of archives were resourced throughout this thesis research, to acquire diverse historical materials, outlining Sylt's history. The following archives provided historical materials used within the Sylt platform (Section 3.3): Bundesarchiv, RAF Archives, NCAP Archives, Kew National Archives, Jersey Heritage Trust, Island Archives (Guernsey) and AMA (Table 3.2).

The evidence-based representations only presented a specific epoch of Sylt, dramatically contrasting the current site conditions (over-grown vegetation and partially surviving structures). Therefore, adhering to strict non-invasive permissions, photogrammetry methods were conducted, capturing photographs of Sylt as the site resided in 2015. This dataset of 432 photographs provided the opportunity to create a 360° panoramic photo virtual tour of Sylt (Section 3.3). DBA sources were spatially presented within the virtual tour through geotagged points, providing a narrative of Sylt. However, not all areas within Sylt were documented using photogrammetry, due to the extensive vegetation growth masking specific surviving features.

To perform photogrammetry, a tripod, Single Lens Reflex (SLR) camera with a wide lens was used (Luhmann *et al*, 2006). The camera was placed centrally within a scene and the tripod's height was appropriately adjusted to avoid capturing only vegetation (this was adjusted accordingly for each scene). Using a wide camera lens to create 360° views of a scene, 48 photographs were captured (per scene). The camera settings - the shutter speed, aperture and ISO - were changed according to the lighting and weather conditions. However, these settings were not altered once shooting a scene for visual continuity (Ibid).

Table 3.2: *Archive materials acquired from 2015.*

Archive	Material Type	Title	Reference
AMA	Photograph	Germans marching through Alderney	Hans Hord Collection 02/007
AMA	Photograph	Prisoners Walking	Hans Hord Collection 02/007
AMA	Photograph	A note pinned to the courthouse	Hans Hord Collection 02/007
AMA	Photograph	Prisoners moving artillery	Hans Hord Collection 02/007
AMA	Photograph	Prisoners working on a farm	07/726
AMA	Photograph	Prisoners working at the harbour	07/726
AMA	Photograph	Lager Helgoland prisoner – Anton Yezhel	Hans Hord Collection 02/007
AMA	Photograph	Commandant House 1950	Hans Hord Collection 02/007
Bundesarchiv	Photograph	German Planes in flight	141-0678/o.Ang./CC-BY-SA 3.0
Bundesarchiv	Photograph	OT supervising prisoner	101II-MW-235510/ o.Ang./ CC-BY-SA 3.0
Bundesarchiv	Photograph	Maximillian List	R. 9361 III / 120344
Bundesarchiv	Photograph	Nazi officials on Alderney	101II-MW-5152-14A / Hans Järisch / CC-BY-SA 3.0
Island Archives (Guernsey)	Photograph	Prisoner death certificate	FK31-11
Jersey Heritage Trust	Audio Account	Gordon Prigent	L/D/25/L/52
Jersey Heritage Trust	Audio Account	Francisco Font	L/D/25/L/65
Kew Archives	Map	British Military Map of Alderney 1943	WO208/5013
Kew Archives	Plan	The Herold Case: Reported by Major T.X H Pantcheff – Sylt Plan (1945)	WO208/5013
Kew Archives	Documentation	Reports on Atrocities committed in Alderney 1942-1945	WO311/13
Kew Archives	Documentation	Reports on Atrocities committed in Alderney 1942-1945	WO208/3629
Kew Archives	Documentation	Alderney, Channel Islands: Ill-Treatment of Russian Forced Labourers	WO311/106
Kew Archives	Documentation	Jersey, Channel Islands: Ill-Treatment of Russian forced Labourers	WO311/107
Kew Archives	Documentation	Alderney, Channel Islands: Ill-Treatment of Allied Nationals	WO309/145
Kew Archives	Documentation	German occupation of Channel Islands: Death and Ill-Treatment of Slave Labour	WO311/11
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1945	ACIUMC106G. 4187.1 F/36"//541/3124
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1945	ACIUM 106G/5368. F/36"/3149
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1944	ACIUM/106G/K/0124/4029

NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1944	ACIUM 7GP/2530/F6". 13SQ.
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1943	ACIUM D/969. 542 DQDN.F/20"/4041
NCAP	Aerial Photograph	Aerial Reconnaissance: Lager Sylt 1942	ACIU/RB/0463/3919
RAF	Photograph	War Correspondents examine a re-useable coffin, Alderney Map 1945	PC98/173/6057/7
RAF	Photograph	Longy Common cemetery, May 1945	PC98/173/6057/8

3.3 Virtual Heritage Data Representation

Virtual tour technology has the ability to communicate both spatial and temporal data. Spatial data is visually communicated through 360° panoramas and each scene can be embedded with geotagged (or hotspot) information points, providing temporally related content. The virtual tour authenticated Sylt's narrative by presenting archaeological data in-situ (Mollah *et al*, 2016; Knowles *et al*, 2014). Furthermore, many educational benefits derived from this representation style through being user-driven, with the ability to present varied multimedia materials (Affleck & Thomas, 2005).

To construct the virtual tour, two different software packages were required comprising: Kolour Autopano Giga© and Panotour Pro©. Initially, Autopano Giga© stitched together all 48 scene photographs, through software algorithms identifying similarities between geometric patterns present between photographs (using Scale-Invariant Feature Transform (SIFT) algorithms) (Sun *et al*, 2014). This process was repeated until all images were stitched together to create panoramic images of each scene.

Each panoramic was imported into the Panotour Pro© software, which converted the image into 'cube-faces'. Each cube-face was automatically restructured through the software comparing features between two photographs, creating a 'line of sight' (Yastikli, 2007). This produced a 3D coordinate alignment between images presenting a 360° effect. This process was repeated nine times for each scene. The scenes were linked allowing users to navigate between each scene, creating the impression of 'movement'. The software further provided functions, such as floor plans, control bars, navigation modes, creating a bespoke user-friendly interface. A 'splash screen' outlining interaction instructions with the virtual tours control bar, floor plan, hotspots and scene titles was also created (Ibrahim *et al*, 2015) (Figure 3.3).

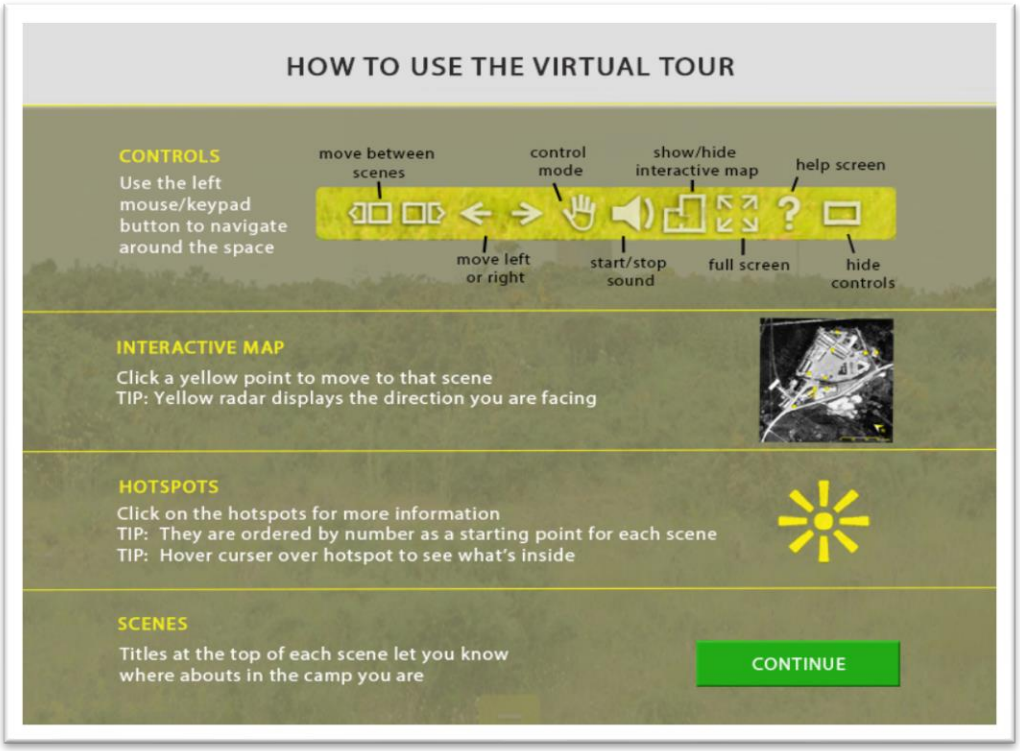


***Figure 3.3**: The virtual tour's 'splash' screen (author's own image).*

Despite the virtual tour providing contemporary views of Sylt, the majority of the camp's structures were destroyed in 1945. Therefore, essential spatial information (such as prisoners' barracks), are absent from the representation. The importance of displaying how the site formerly appeared is highlighted through the camp modifications deriving from a change in command from the OT and SS in 1943 (Chapter 5). The SS increased camp boundary security levels through additional barbed wire fences and positioning specific structures within the landscape, enforcing greater dominance and control over the prisoners (Chapter 5 Section 5.1.2) (Kolchnaev, 1991; Pantcheff, 1981). Thus, a series of evidence-based 3D models were developed to visualise this information, which is supported by historical sources presented through varied multimedia formats.

Using the open source software 'Google SketchUp', 3D models of Sylt structures from 1942, 1943, 1944 and 1945 were constructed, as well as, a 2017 reconstruction (Figure 3.4). The quantity and location of each structure at Sylt were traced through monthly and yearly aerial reconnaissance photographs and maps and further underpinned through the archaeological fieldwork data. This analysis highlighted that in 1942 the camp contained five structures, in 1943 16 structures and in 1944 26 structures. Corroborating each structure's dimensions, measurements acquired from (2013) archaeological investigation of Sylt (Section 3.2) were utilised alongside accurately scaled aerial images, which provided the terrain (or floor plan) for reconstructions (Figure 3.4). Once each series of 3D reconstructions were created, Environmental Systems Research Institute (ESRI) open source

application ‘Story Maps’, was used to present the datasets through chronological order. Story Maps supports the application of multimedia materials, to ‘harness the power of maps and geography to tell your story’ (ESRI.com, 2017). This format provided the opportunity to present DBA and fieldwork materials adjacent to the 3D reconstructions.

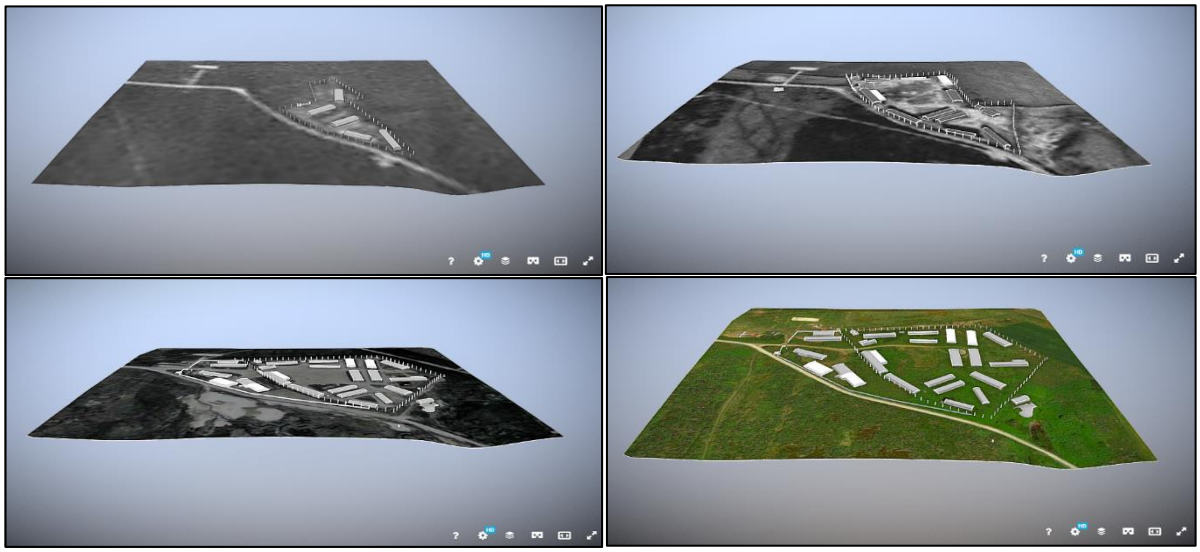


Figure 3.4*: Evidence-based 3D reconstructions of Sylt from: (**Top left**) 1942, (**Top right**) 1943, (**Bottom left**) 1944. (**Bottom right**) Image displays how the site would have appeared in a 2015 landscape (author’s own images).*

In isolation, the virtual heritage environments visually convey Sylt’s historical and contemporary spatial characteristics. However, these representations lack narrative and context, both of which are considered essential for learning and ‘meaning making’ of virtual environments (Champion, 2016; Pujol *et al*, 2012; Bonini, 2008; Roussou, 2007). Principle four of the London Charter (2009: 8) describes a requirement to resource alternative ‘graphical, textual, video, audio, numerical’ formats, to enhance the understanding of a computer-based visualisation. Investigative DBA and fieldwork materials were represented either spatially (virtual tour) or chronologically (3D reconstructions), creating evidence-based narratives and context.

A diverse range of multimedia materials was used to convey Sylt’s narrative (Figure 3.5). These formats were dictated either by investigative evidence type (for example, archive documentations), educational value (for example, video), authenticity (for example, photographs) or empathy (for example, testimony). All multimedia materials were formatted and edited through Adobe Photoshop© software and videos created through Adobe Premiere Pro© software (Adobe, 2013). To represent transparency, all multimedia materials are referenced, providing audiences with each source's original location (London Charter, 2009). Copyright permissions were granted by the relevant organisation (as outlined in section 4.2 of the London Charter (2009)).

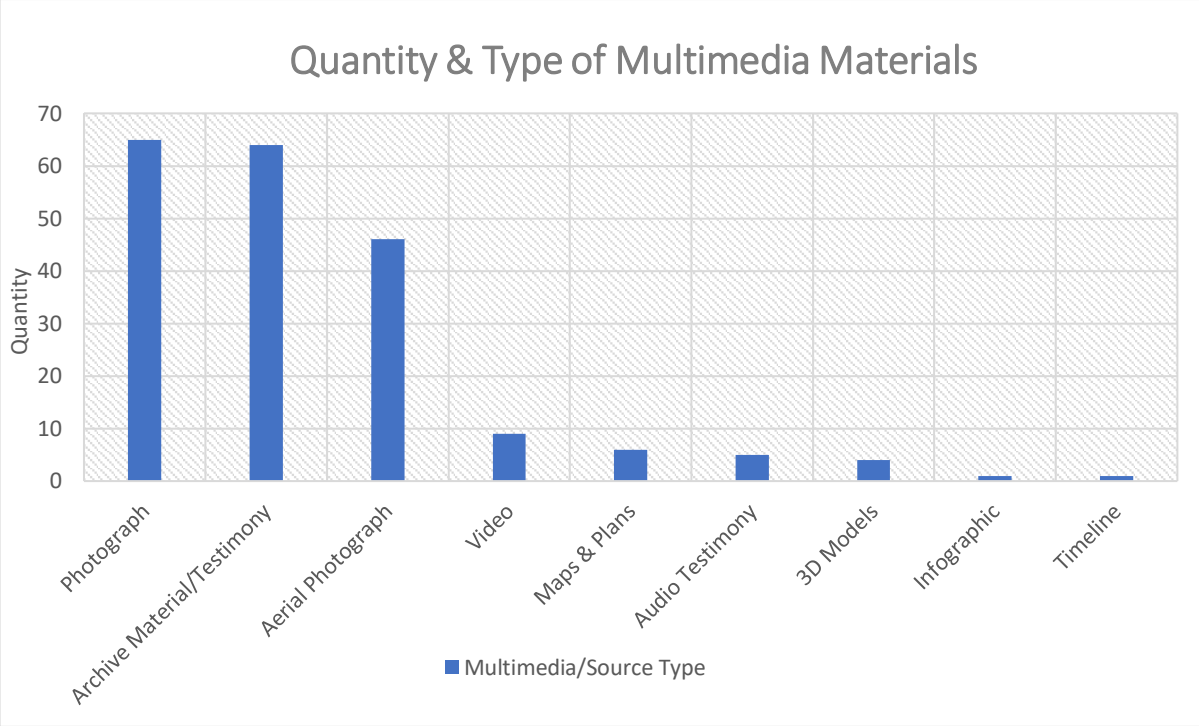


Figure 3.5: *The type and quantity of multimedia materials displayed within the Sylt platform.*

3.4 Qualitative Research

Qualitative research methods explore and interpret questions regarding what, how and why, about a specific phenomenon, to either generate new, or test existing theories (Ritchie *et al*, 2013; Liamputtong, 2009; Patton, 2002). Qualitative research is particularly relevant when interpreting subjects/topics that are ill-defined, allowing awareness of complex, sensitive, delicate or intangible knowledge to be made apparent through participant perspectives (Ritchie *et al*, 2013; Liamputtong, 2009). Therefore, requirements for qualitative research are directed through the research aims, objectives and questions.

Three different types of qualitative data collections methods were used in this study: (1) Focus groups were conducted at three different UK secondary schools. These schools were selected due to their religious ethos comprising Christian (Bishop Stopford School), Judaism (Hasmonean High School) and secular (Cannock Chase High School). (2) Interviews were conducted with different employees at USHMM, targeting diverse participant specialisms (from education to exhibition). (3) Questionnaire surveying was conducted on two occasions. Surveying was first conducted with Alderney inhabitants, to ascertain local sensitivities regarding Sylt. Secondly, surveying was conducted with visitors of the USHMM, allowing the members of the public with an interest in Holocaust history to provide individual insights into the case study platform.

3.4.1 Ethical Approval

The requirement for consent within research stems from the Nuremberg Code (1947), which enforces research ethics due to the human experimentation that occurred during World War Two (Annas & Grodin, 2008). Regulated ethical consideration and approval have become a fundamental expectation and cornerstone ensuring common standards are maintained throughout research (Sanjari *et al*, 2014; Stevens, 2013; Miller *et al*, 2012; Liamputtong, 2009). The process of ethical approval safeguards participants from physical and emotional distress, whilst providing a level of respect (Sanjari *et al*, 2014; Stevens, 2013; Miller *et al*, 2012; De Laine, 2000). As this research addresses ethics and ethical representation, research ethics were considered particularly important. In addition, the topic and age of participants required careful sensitivity and thus application for full ethical approval was essential.

The ethics committee at Staffordshire University expressed prolonged contemplation before granting permission to conduct this research. Initially, the committee approved the research ethics but then refused permission, to ensure greater safeguarding of the younger participants within the study. The University finally granted ethical research approval based on specific stipulations. Both parents and teachers of the school children interviewed were provided with the opportunity to view the Sylt and Anne Frank platforms prior to the focus groups commencing. Parental and teacher consent was also required for each secondary school student to participate in research. The ethics committee also expressed requirements for participants to receive debriefing forms after data collection. Additionally, the author created codes of conduct for these participants, to reduce any potential adverse effects (Appendix 1). Due to the nature and sensitivities of Holocaust research, consent was required for any participants under the age of 18, which was signed by a parent/guardian (Appendix 2).

The code of conduct was developed from the pilot study by observing participant responses and served as a gentle reminder as to how the students should engage in discussion. The code outlines considerations such as, turn off electronic devices and reminded participants that a voice recorder would document conversations; thus, non-verbal communication (such as body language) could not be detected. However, specific points outlined within the code of conduct (such as ‘express your views respectfully’), prompted contemplation of ‘controlling’ or ‘limiting’ participant responses.

To minimise any risks or adverse effects during qualitative data collection, participants were informed of a safe zone they could enter if they encountered emotional distress. A safe zone was designated outside of the research area, which if entered, they would be immediately attended to by a member of staff. By providing participants with an information sheet outlining the project, all participants were forewarned about the nature of the study (but also informed that no visually distressing materials are exhibited).

All participants were provided with a debriefing form, after participation. A debriefing form addresses an important aspect of the ethical process, reaffirming to participants the content and purpose of the research they have just undertaken; whilst also ensuring participants were not physically or mentally harmed (De Laine, 2000; Tesch, 1977). The form thanked participants for involvement and provided the researcher's and project supervisors' contact details if any questions arose after the study. Additionally, the form provided contact details for the charities Samaritans and Mind, who specialise in emotional support and distress (Appendix 3).

Outlined during the consent acquisition stage, participants were informed that confidentiality of any information disclosed would be treated with respect (Punch, 2013; Guillemin & Gillam, 2004; Corti *et al*, 2000; Sales & Folkman, 2000). Any participant research information was securely and privately stored (Ibid). For digital materials, the information was password protected (Corti *et al*, 2000) and non-digital materials were stored within a locked container (Guillemin & Gillam, 2004; Corti *et al*, 2000; Sales & Folkman, 2000). Participants were provided with details outlining who would view this information (for example, PhD supervisors) and that the data acquired would be used within this thesis research. To conceal participants' identities, identifier codes were assigned to datasets, ensuring any references or quotes from the transcripts, were presented through numerical and letter sequences (Guillemin & Gillam, 2004; Denzin & Lincoln, 2000). Interviewee identifier codes are written as 'US' with a number (e.g. US1). Similarly, questionnaire participations codes are labelled as USQ (followed by a number). Focus group codes are labelled with the school name, participant gender and the platform viewed; alongside a number. For example, C.C.A.F.F.1 refers to Cannock Chase, Anne Frank, Female, One.

3.4.2 Focus Study Groups

Focus groups provide researchers with the opportunity to capture different perspectives through recording conversations and interactions amongst participants (Krueger & Casey, 2014; Fern, 2001; Morgan, 1997). This approach allows participants to freely share their feelings and for ideas to be built upon via discussing other participant perspectives (Ibid). This method of data collection has formerly been applied to other studies which assessed participant interactions with websites (for example, Reading, 2003; Sweet, 2001), thus providing a suitable method for interpreting the ethical complexities when digitally representing the Holocaust.

Prior to conducting focus study groups with the public, a pilot study was undertaken with students from Staffordshire University, engaged in Humanities studies. Many advantages to conducting a pilot study exist, for example, ensuring the aims and objectives are feasible and valid in relation to the project (Van Teijlingen & Hundley, 2002; De Vaus, 1993). Also, the methodological approach itself was analysed ensuring the most appropriate approach to data collection alongside confirming the suitability and understanding of the focus group/interview questions (Ibid). Therefore, using

participants that study Humanities, produced responses formed through appropriate knowledge, allowing the 'Explore Lager Sylt' platform to be validated by participants focusing on the content presented. Through undertaking a pilot study, the 'code of conduct' was devised, providing the researcher with insight into potential sensitivities which may ensue within secondary school research. The pilot study participant demographics and results are presented in Chapter 6 (Section 6.5).

To guide the pilot study discussion, six open-ended questions were created comprising a mixture of engagement, exploration and exit questions (Appendix 4). The purpose of engagement questions are to introduce participants to the research topic and to encourage discussion (Powell & Single, 1996; Edmunds, 2000; Fern, 2001). Exploration questions seek to tackle the fundamental elements of research (Ibid). Lastly, exit questions are designed to ensure that no information is missed during the discussion (Edmunds, 2000; Fern, 2001). Each question was supported by prompts, ensuring the facilitator acquired specific insights (Appendix 4). The following six questions were asked to the pilot study participants:

Engagement Question:

1. What are your thoughts and feelings regarding the overall experience?

Exploration Questions:

2. Did you get a sense of digitally 'being there'? If so did this help learning?

3. Do you think an archaeological perspective is an effective way to learn about a Holocaust site?

4. Did you find any multimedia materials useful to learn from? Why?

5. Do you believe any of the website to be credible and/or reliable? Why?

Exit Question:

6. What one aspect of the website did you remember the most?

To ensure each question was suitable for wider participant age ranges and acquired perspectives relevant to the research aims and objectives, questions one, four and five were reworded.

- Question one amended to ⇨ Do you believe that the website was appropriate?
- Question four amended to ⇨ Which digital materials were useful to learn from? Why?
- Question five amended to ⇨ Do you believe the information on this website? Why?

Initially, participant responses from question one were too broad, with replies incorporating answers to other questions. To commence early engagement within discussions, this question was altered to focus specifically on the platform's appropriateness. Question four, replaced the word 'multimedia' to 'digital', as this did not appear a widely known term. Question five was met with some confusion amongst participants and required clarification. The word 'believe' was considered more understandable than 'credible' or 'reliable'. The code of conduct did not require amending, as no previously unconsidered issues arose throughout the pilot study.

Using secondary school students as participants, data was acquired from individuals who already engage with Holocaust education[17], allowing comparisons to be drawn between aspects such as traditional vs. archaeological Holocaust narratives and methods of education (for example, textbooks vs. digital platforms) (Foster *et al*, 2016; Traum *et al*, 2015; Pettigrew *et al*, 2009; Reading, 2003). Through addressing issues surrounding homogeneity, focus study groups provided an ideal method to increase greater discussion amongst participants (Fern, 2001; Morgan, 1997). Focus groups were conducted at three English secondary schools, with participants viewing either the Anne Frank Secret Annex (Chapter 4) or the 'Explore Lager Sylt' case study platform (Chapter 6). The following processes were undertaken for focus study groups:

- Participants were provided with a project overview and were required to complete a code of conduct form and personal questionnaire.
- Participants were divided into two groups: one group viewing the 'Anne Frank Secret Annex' platform and the other group viewing the Sylt platform. Group sizes range between 6-12 participants (per group).
- Each group was provided 30-40 minutes to interact with the platform. Due to different school's computer availability, participants completed this task either individually or in pairs.
- Participants were provided with headphones to listen to the platform audio, allowing participants to sit adjacent to one another without disturbance.
- Participants were invited to enter a focus group with data collection methods explained prior to asking questions. Participants were assured that there were no incorrect answers and were reminded that a voice recorder was used to document discussions.
- Participants were asked six questions by the facilitator.
- Once all questions were answered, participants were provided with a debriefing sheet and further opportunity to discuss any questions relating to the research.

[17] Through being a compulsory requirement within UK state secondary schools (Chapter 2 Section 2.1.2) (Department for Education, 2013).

3.4.3 Interviews

Interviews are the most common form of qualitative research and share many similarities with conversations (Baker *et al*, 2012; Liamputtong, 2009; Denzin & Lincoln, 2000; De Vaus, 1993). Interviews are frequently categorised as semi-structured, lightly structured or in-depth (Baker *et al*, 2012; Denzin, 2012). A semi-structured interview consists of pre-constructed but open-ended questions (Denzin, 2012), providing greater control than an unstructured interview, but limiting responses in comparison to structured interviews which uses closed-ended questions (Baker *et al*, 2012; Liamputtong, 2009). This study used semi-structured interviews, allowing the author to explore relevant participant responses to a greater extent (Baker *et al*, 2012; Liamputtong, 2009; Denzin & Lincoln, 2000). Interviews were conducted with different USHMM employees (Chapter 6). These employees held different roles at the museum covering research, teaching and the exhibition (both physical and digital) of Holocaust and other genocide materials. Thus, participant responses are considered to provide an invaluable contribution to research.

Participants were invited to view the Sylt case study platform for up to 40 minutes and then invited to a one-on-one interview. No time limit was arranged for each interview length. Each interview was guided by seven semi-structured and open-ended questions (Appendix 5). In total, 16 participants were interviewed in the USHMM offices in familiar surroundings (Table 3.5).

3.4.4 Questionnaire Surveying

A questionnaire is a method of data collection which consists of a series of pre-written questions, most frequently disseminated online or through a paper-based format (Patten, 2016; Liamputtong, 2009; Boynton & Greenhalgh, 2004; Denzin & Lincoln, 2000; Marshall & Rossman, 1999). Questionnaires can often consist of different questions types, including: closed and open-ended; rating and Likert scales; multiple choice and rank order (Patten, 2016; Boynton & Greenhalgh, 2004). Questionnaire surveying provides a practical form of data collection through having the ability to acquire large amounts of information, within a relatively short period of time (Patten, 2016; Ritchie *et al*, 2013; Boynton & Greenhalgh, 2004). This cost-effective approach also allows individuals, other than the author, to obtain data without affecting the study results (Patten, 2016; Boynton & Greenhalgh, 2004).

Questionnaire surveying was conducted on two separate occasions. Initially, during the 2015 forensic archaeological fieldwork, questionnaire surveying was conducted amongst islanders on Alderney (Chapter 5 Section 5.6). This endeavoured to ascertain local perceptions of Sylt and potential issues associated with disseminating Sylt's narrative (Chapter 5 Section 5.3 and 5.5). The questionnaire survey included four closed, three open-ended questions and an additional comment section.

To ascertain public perceptions of the virtual heritage case study platform, questionnaire surveying was undertaken with visitors at the USHMM; thus, targeting individuals who have at least some interest in the Holocaust. Surveying occurred over a three-day period, due to time constraints. The author was supported by two USHMM staff members, who approached museum visitors to participate in research. The museum provided five desktop computers and the same number of headphones for museum visitors to view the case study platform. A time limit of 40 minutes was set for participants viewing the platform and a minimum age of 18 was enforced (unless parents/guardians provided consent). Participants could share computers to interact with the Sylt platform, however, they were asked to fill in questionnaires separately. After viewing the platform, participants were asked to complete a 13-point, questionnaire (Appendix 6), which comprised a series of tick box, open-ended and Likert scale questions.

3.4.5 Participants & Sampling

Initially, questionnaire surveying was conducted amongst residents of Alderney. The participant criteria included being an Alderney resident and over the age of 18 (for consent purposes). An opportunistic sampling strategy was adopted, asking residents available at the time of surveying, through targeting different populated locations around the island (including the high street, beaches and shops). The number of participants surveyed is outlined in Table 3.3.

Table 3.3*: Total number of Alderney questionnaire surveying participants.*

Qualitative Method	Number of Participants
Questionnaire Surveying	12

The following text outlines qualitative research conducted at (UK) secondary schools and the USHMM. Study participants comprised an amalgamation of different age, gender, cultures and religions from different continents (Chapter 4 Table 4.1 and Chapter 6 Table 6.3; 6.5; 6.6; 6.7). This diversity was essential to understand different perspectives regarding Holocaust representation and qualities such as the educational effectiveness of using virtual heritage technologies to disseminate Holocaust archaeological data. All study participants were required to complete a personal information questionnaire, documenting details such as age, gender and religion (Appendix 7).

Different age ranges were essential to research as, although the platform was primarily designed for education (and commemoration), the information could also inform the broader public's understanding of the Holocaust; if made accessible online. Religious perspectives were explored through targeting Christian, Jewish and secular schools. These religious groups were purposefully selected due to participants religious beliefs. (Brin.ac.uk, 2018; Megargee & White, 2018). Although other religious schools were contemplated as part of this study (such as Muslim), however, due to

the lack of existing data within this discipline and time restraints, these three religions were considered most appropriate. By undertaking research in both England and America, the potential to interpret different cultural attitudes of Holocaust representation was incorporated within the method design.

In comparison to quantitative research, qualitative sample sizes are often smaller in number due to a phenomenon only needing to occur once to be of value (Ritchie *et al*, 2013; Baker *et al*, 2012). Scale and statistical significance are not applicable as large qualitative datasets are considered unmanageable and the results are not intended to represent every different societal opinion but provide a general overview (Baker *et al*, 2012; Denzin, 2012). Therefore, requirements for a strong sampling strategy are of fundamental importance when using a small-scale approach (Denzin, 2012; Mason, 2010). The greater heterogeneity within a population can require a greater sample size (Baker *et al*, 2012), however, if the population is considered relatively homogeneous then a smaller sample size is appropriate to address the projects research questions (Baker *et al*, 2012; Mason, 2010). Patton (1990) identifies that through using purposeful sampling, datasets have the potential to encompass rich information, specific to research.

A purposeful and maximum variation sampling strategy was adopted, by targeting participants either engaged in Holocaust education, employed within the Holocaust domain or had an interest in the Holocaust (Mason, 2010; Patton, 1990). Therefore, the criteria for selecting participants included those who may engage with a case study platform and those experienced in Holocaust representations. By targeting participants who held minimal to extensive Holocaust knowledge, a balanced perspective was generated regarding how to appropriately display forensic archaeological Holocaust materials.

The inclusion criteria for research outlined the fundamental skills required for interacting with the platform. Participants required basic computer knowledge to operate the online platform. Due to the nature of research and associated Holocaust representation sensitivities, a minimum age restriction of 13 years old was applied; in-line with (UK) National Curriculum (Department for Education, 2013) (Chapter 2 Section 2.1.4).

The exclusion criteria for participants were those who cannot read and/or understand the English language. These participants would be at a major disadvantage within the study, due to only one language type presented within the platform. Additionally, both the Sylt and Anne Frank platforms utilise a range of multimedia materials, therefore, participants who are blind and/or deaf would not be able to fully engage with the materials presented.

Within qualitative research, defining the 'ideal' number of participants is often difficult. Qualitative researchers generally use fewer participants but explore the research topic to greater depths than quantitative research (Ritchie *et al*, 2013; Baker *et al*, 2012). The following sections outline the

number of study participants, however, Chapters 4 and 6 provide further personal information including: age, gender, ethnicity, education and religion.

In total, two focus study groups were conducted at Bishop Stopford School and Cannock Chase High School, as each school was required to view either the Sylt or Anne Frank platform (Table 3.4). Due to a gender separation at Hasmonean High School, four focus study groups were conducted. Edmunds (2000), describes that a suitable number of participants for a focus study group is between 6-12. However, Edmunds (2000) continues to state that mini focus study groups can be composed of 4-5 participants.

Table 3.4: *School name and number of focus study group participants.*

Location	Total Number of Participants	'Explore Lager Sylt' Participants	'Anne Frank Secret Annex' Participants
Staffordshire University (Pilot Study)	3	3	N/A
Bishop Stopford School	19	10	9
Cannock Chase High School	13	6	7
Hasmonean High School	25	13	12

Table 3.5 outlines the number of USHMM interview and questionnaire participants; with Chapters 4 and 6 providing greater participant details, such as age and gender.

Table 3.5: *Total number of USHMM interview and questionnaire surveying participants.*

Qualitative Method	Number of Participants
Interview Surveying	16
Questionnaire Surveying	28

3.5 Data Analysis

Strauss and Corbin define grounded theory as 'a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon' (Strauss & Corbin, 1998: 24). Developed by Strauss and Corbin (1967), grounded theory was designed to allow researchers to generate new theories which would be intrinsically formed (or 'grounded') from systematic data collection, thus, providing the opportunity to devise new contextualised theories (Charmaz, 2014; Strauss & Corbin, 1997; 1990). The process of data collection and analysis are

merged and performed successively, endeavouring to achieve theoretical saturation (Charmaz, 2014).

Grounded theory analysis is primarily performed by analysing text obtained from qualitative research (for example, an interview transcript). Described by Strauss and Corbin as 'open coding', each line of text is explored, identifying specific information which can then be coded (or labelled) (Strauss & Corbin, 1997; 1990). Once all qualitative text is analysed, each code can be grouped by similarity. Broader groups deriving from these concepts can then be categorised, grouping textual data together. This process allows theory to be informed (Charmaz, 2014; Strauss & Corbin, 1997; 1990).

Similarly, thematic analysis (TA) has been widely applied across diverse fields including social, education, health and sciences (Charmaz, 2014). Its varied application is attributed to one of its major advantages of being theoretically flexible and thus can be applied to various frameworks (Braun & Clarke, 2006). TA has been used within Holocaust studies in relation to survivor narratives (Suedfeld, 1996) and Holocaust concentration camp site visitor responses (Nawijn & Fricke, 2015). TA is frequently used to analyse people's experiences, perspectives, thoughts and beliefs regarding a specific topic (Charmaz, 2014; Braun & Clarke, 2006). This is achieved by identifying and pinpointing principle themes, concepts and patterns within dataset/s, that address the research questions (Ibid). Marshall and Rossman (1999: 150) describe the TA process as 'bringing order structure and interpretation to the mass of collected data', thus theme analysis can reduce large datasets to key terms. Research outlines a six-stage process required to establish and create meaningful patterns from the data:

1) **Organise Data**: Continuous reading and re-reading of datasets to achieve immersion and content familiarity.
2) **Coding**: Generating codes for features present within datasets that assist in answering the research questions.
3) **Themes**: Utilising the codes created (stage two), broader patterns and themes can be identified.
4) **Reviewing Themes**: Refining of themes developed from stage three. This is achieved by comparing the themes against the datasets from which they transpired, checking that they address the research questions and the codes developed. Themes maybe refined, combined or discarded during this stage.
5) **Defining & Naming Themes**: Developing a greater detailed analysis and scope of the themes created throughout the previous stages. Additionally, a concise and informative title for each theme is developed.
6) **Write-Up**: The final stage comprises amalgamating all the narrative and themes text and contextualising these aspects with the existing literature (Braun & Clarke, 2006).

The software Nvivo© is often used to assist coding and theme identification of datasets. This software has been purposefully designed for qualitative researchers who wish to explore text or multimedia-based materials to a deep and rich level of interpretation (Bazeley & Jackson, 2013). The software provides a format in which large volumes of data can be easily managed, interpreted, analysed and exported in a systematic manner (Ibid). Through transcribing focus group and interview transcripts alongside questionnaire responses, the data can be analysed through an inductive (or bottom-up) approach (Braun & Clarke, 2014).

This research incorporated both grounded theory and thematic analysis approaches throughout data analysis. Although many similarities between these two methods exist, the justification for both methods was essential. Initially, grounded theory assisted in identifying emerging patterns from each transcript, through repetition and/or emphasised participant responses (Charmaz, 2006). Therefore, without trying to associate participant responses with pre-defined themes, biases were removed as the themes were developed from the data (Strauss & Corbin, 1997). Once the themes and patterns had been broadly identified, all transcripts were re-examined using Braun and Clarke's (2006) TA six-stage process, ensuring all data was thoroughly exhausted. This process was performed using Nvivo© software, which does not interpret or analyse the data, thus providing the author with control and transparency throughout the data analysis (Hoover & Koerber, 2011).

3.6 Summary

This chapter presented an overview of the mixed methods approach, undertaken throughout this research. The method's diversity allowed the data to effectively address the research aims, objectives and questions. The methodology was presented through four separate stages, including: forensic archaeological fieldwork, virtual heritage representations, qualitative data collection and data analysis (Figure 3.1). Forensic archaeological fieldwork was conducted at Sylt on two separate occasions, in 2013 and 2015. Both DBA and fieldwork data acquired from these investigations was represented through the case study platform, 'Explore Lager Sylt', developed by the author. This platform resourced virtual heritage visualisations, comprising a virtual tour and series of evidence-based 3D reconstructions, to communicate Sylt's past and present. The context for these visualisations was provided by presenting various archive sources, eyewitness testimonies and fieldwork data through different multimedia formats.

To understand the ethical implications of presenting forensic archaeologically-derived Holocaust materials through virtual heritage technologies, two different case study platforms were presented through various qualitative methodologies. Both the 'Anne Frank Secret Annex' and 'Explore Lager Sylt' platforms were presented to (UK) secondary school students through focus study groups. The 'Explore Lager Sylt' platform was also presented through USHMM employees through interviews and to USHMM visitors through questionnaire surveying. The diversity of these methods addresses

issues surrounding homogeneity, thus endeavouring to effectively acquire qualitative data. Subsequently, this data was transcribed and analysed using a combination of grounded theory and TA, to provide research with diverse, rich, unique and relevant responses to ascertain ethical complexities within Holocaust representation.

4.0 Anne Frank Secret Annex

Anne (Annelies Marie) Frank, born in Germany (1929) to a Jewish family, moved to the Netherlands in 1933 because of the Nazis rise to power (AnneFrank.org, 2017a). Following Germany's invasion of the Netherlands (1940), many restrictions on Jews were enforced through Nazi policies (Croes, 2006). Between 1942-1944, Anne and her family went into hiding in a secret annex in Amsterdam at 263 Prinsengracht, escaping Nazi persecution (AnneFrank.org, 2017a; Frank, 1947). During this time, Anne kept a diary describing her experiences as a young teenage girl living in the secret annex. In 1947, '*Het Achterhuis. Dagboekbrieven 14 Juni 1942 – 1 Augustus 1944*' (The Annex: Diary Notes 14 June 1942 – 1 August 1944), was published, becoming one of the most well-known Holocaust narratives (Frank, 1947). Since its release, the 'Anne Frank diary' has been translated into 70 languages, selling over 30 million copies worldwide and has been adapted and represented through stage performances, television series and over nine films and documentaries (AnneFrank.org, 2017a; Magilow & Silverman, 2015).

Through analysing existing Holocaust-related websites (Chapter 2 Section 2.3.1), the virtual heritage resource – the 'Anne Frank Secret Annex' platform - effectively exhibits this Holocaust narrative. Launched in 2011, the Anne Frank platform is a digital extension of the Anne Frank House museum (Amsterdam; Netherlands), which was developed to visualise the space in which the Frank and Van Pels' families hid during World War Two (AnneFrank.org, 2017b). The Anne Frank platform provides an ideal comparison for the Sylt platform created for this thesis (Chapter 6), as both platforms resource similar virtual heritage technologies to represent Holocaust narratives. Some variations do exist between each platform, for example, traditional (historical) vs. archaeological narratives; single vs. multiple 'character' narratives; globally known vs. unknown narratives, and visualisation of a surviving Holocaust space vs. a destroyed Holocaust space. Therefore, being one of a limited number of contemporary resources to compellingly disseminate a Holocaust narrative through virtual heritage technologies, this platform provides a unique comparison for the Sylt platform. By initially assessing the 'Anne Frank Secret Annex' platform against the London Charter (2009), this chapter explores the qualities of the platform through conducting focus study groups with students from three (UK) secondary schools. The results deriving from focus group data analysis, provide a comparative dataset allowing deeper understandings of ethical contemplations when disseminating Holocaust narratives through virtual heritage technologies.

4.1 Platform Description

The platform consists of a photorealistic, 3D virtual tour of 263 Prinsengracht (Rizvic, 2014). Within the virtual tour, audiences encounter video stories, 'based on both the popular and authoritative editions of the diary and on reports by witnesses from the Anne Frank House

archives', primarily accessed through hotspots (AnneFrank.org, 2017b) (Figure 4.1). These stories are supported by audio accounts which automatically begin playing upon entering a virtual tour scene. Video and audio media are narrated by British actress Ellie Kendrick, who portrayed Anne during the BBC series 'The Diary of Anne Frank' (AnneFrank.org, 2017b; BBC.co.uk, 2014). Unlike its physical counterpart (which Anne's father Otto Frank requested remain unfurnished), the virtual tour depicts a furnished annex based on photographs taken during a 1999 educational project; illustrating how space would have appeared during hiding (AnneFrank.org, 2017c). The secret annex forms part of the Virtual Museum[18] collection, which displays varied digital representations of the Anne Frank story.

The platform allows audiences to view the secret annex remotely if they are physically unable to visit the museum. As the physical space is small and the museum often exceeds capacity, the number of visitors is restricted (AnneFrank.org, 2017b). Therefore, this communication method allows wider audiences to view and interact with the historical Holocaust space (AnneFrank.org, 2017b; Rizvic, 2014). Uniquely, the online representation also visualises spaces not accessible by the public, for example, Otto Frank's private office and the attic (AnneFrank.org, 2017b). Thus, the platform provides a unique insight into daily life within the annex, distinguishing itself from the content provided through a physical visit. Additionally, the platform provides an educational resource for students and teachers, with lesson plans outlining how the platform can be integrated within Holocaust education (AnneFrank.org, 2017d).

Alongside a virtual tour, the secret annex platform contains supporting narrative materials outlining 'Who is Who' alongside the 'Outcome' of all the individuals who occupied the annex (Figure 4.1). This information is presented through different multimedia including: image, text, audio and video. The platform's success is demonstrated by the site receiving over two million visits alongside numerous awards and prizes (AnneFrank.org, 2017a). In 2010, the platform won 'Site of the Day' on the Favourite Website Awards and the (Dutch) History Online Prize. In 2011, the platform won the 'Red Dot' Award for communication design, two 'Lovie' Awards within the categories of Charitable Organisations and Education; and in 2012 the site received the 'International Design and Communication' award (Ibid). Additionally, the platform has been awarded the 'Webby', 'Zilveren Spin' and 'Adobe Max', thus providing a benchmark for cultural Holocaust representation and communication (Ibid).

As of December 2018, the 'Anne Frank Secret Annex' altered the platform's design, introducing a virtual reality dimension, for those physically visiting the space. Subsequently, 'the 3D materials

[18] The Virtual Museum collection is 'the central point for knowledge sharing, news and events and educational activities related to Anne Frank…[including]…a Collection Browser and a Timeline' (AnneFrank.org, 2017c). The Collection Browser allows users to access and search historical sources relating to Anne Frank, whilst the Timeline provides an historical overview of Anne Frank.

from [the virtual reality tour] will replace the current 3D presentation of the whole building and its rooms' (Gerrit Netten[19], per comms, April 30, 2018; Haaretz.com, 2018). However, this research focuses on the platform's design pre-December 2018.

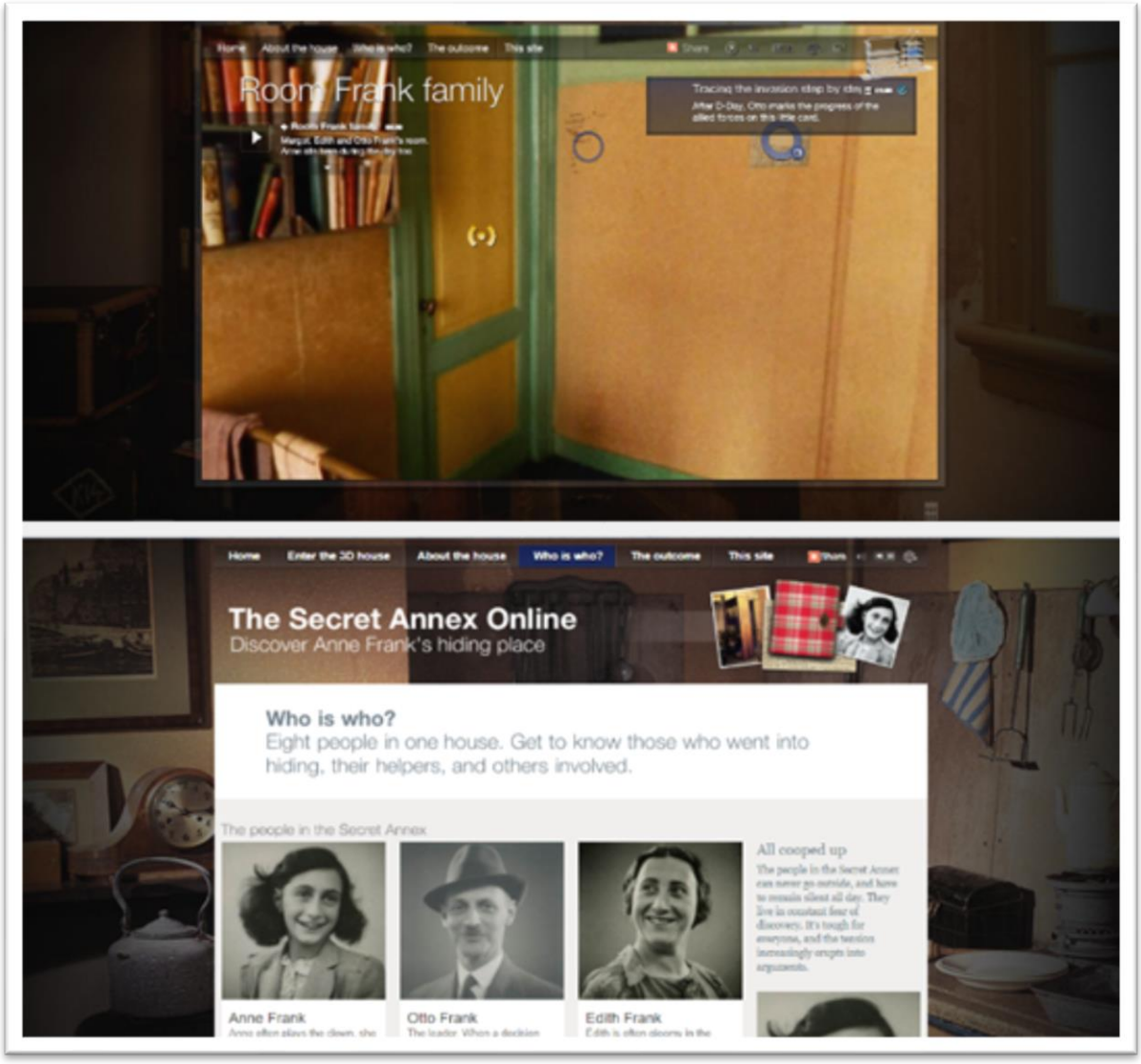


***Figure 4.1**: (**Top**): An example of the virtual tour's 'hotspot' function (AnneFrank.org, 2017a). (**Bottom**): Additional multimedia materials exhibited within the platform (AnneFrank.org, 2017a).*

4.2 Platform Critique

The author used the London Charter (2009) to evaluate existing Holocaust platforms (Chapter 2 Section 2.3.1) and underpin the construction of the 'Explore Lager Sylt' case study platform. When designing the secret annex platform, the Anne Frank House did not incorporate the Charter's principle's but instead focused on alternative 'learning styles' produced from digital interactions

[19] Digital projects manager at the Anne Frank Museum.

(Gerrit Netten per comms, April 30, 2018). The museum conducted user testing throughout development, understanding that 'the visitor has a different frame of reference than [the developer] has, which influences their interpretation of your information in ways you don't always foresee' (Ibid). This resulted in alterations to the platform, such as presenting hotspots through both spatial and list format.

The following text outlines the London Charter's (2009) six guiding principles for cultural heritage computer-based visualisations, used to evaluate the Anne Frank platform.

Principle One: Implementation

The London Charter's (2009: 5) principle one outlines intended use, stating that the Charter is 'valid wherever computer-based visualisation is applied to the research of dissemination of cultural heritage'. The following definitions are provided:

Cultural Heritage: 'The Charter adopts a wide definition of this term, encompassing all domains of human activity which are concerned with the understanding of communication of the material and intellectual culture. Such domains include, but are not limited to, museums, art galleries, heritage sites, interpretative centres, cultural heritage research institutes, arts and humanities subjects within higher education institutions, the broader educational sector, and tourism' (London Charter, 2009: 12).

Computer-Based Visualisation: 'The process of representing information visually with the aid of computer technologies' (London Charter, 2009: 12).

Computer-Based Visualisation Outcome: 'An outcome of computer-based visualisation, including but not limited to digital models, still images, animations and physical models' (London Charter, 2009: 12).

The Anne Frank platform conforms to the above definitions through digitally communicating how the annex appeared between 1942-1944, through a virtual tour. Therefore, the Charter's principles 'best practice' can be applied when developing and disseminating the platform, by incorporating the domains: museum, heritage site, education and tourism. The six principles provide a 'robust foundation' to evaluate the platform from a developer's perspective (London Charter, 2009: 4).

Principle Two: Aims & Methods

The Anne Frank platform combines a photorealistic, evidence-based virtual tour of a furnished annex, with photographs superimposed over a computer-based 3D reconstruction of the entire property (AnneFrank.org, 2017c) (Figure 4.2). This was repeated for every room in the house communicating a sense of time and place. The rationale for developing the virtual tour allows

audiences unable to physically visit the museum a digital opportunity to visit the space, fulfilling sections 2.1 and 2.3. of the London Charter (2009).

Section 2.1 of the London Charter (2009) outlines that computer-based visualisation is not always suitable for communicating cultural heritage. Section 2.3 refers to applying the most appropriate visualisation type, for example, hypothetical reconstruction or evidence-based representation (Ibid).

Principle Three: Research Sources

Principle three outlines the application of research sources, which are defined as 'all information, digital and non-digital', used throughout development and dissemination of a computer-based visualisation (London Charter, 2009: 7). The secret annex platform heavily incorporates a multitude of historical sources, including: contemporary and historical photographs, maps, diary entries, newspaper articles, archive documentation and audio accounts. These materials are presented within the platform and throughout the virtual tour, providing context and narrative. It is considered that the majority of sources are originally non-digital in nature and have been converted to digital.

The sources are primarily documented within embedded videos. There are 32 videos available throughout the platform, exceeding most other forms of multimedia materials presented. This addresses section 3.2 of the London Charter (2009: 7) regarding 'current understandings and best practice within communities', disseminating information through a familiar western cultural multimedia format. Resourcing video media allows vast quantities of information to be disseminated through multisensory engagement. The most common media dissemination method comprises audio, which automatically plays upon entering a virtual tour scene and is present within all videos.

Section 3.3 states that 'attention should be given to the way in which visual sources may be affected by ideological, historical, social, religious and aesthetic and other such factors' (London Charter, 2009: 7). Although digitally converted, it appears that the integrity of historical sources is maintained by limited editing. However, the use of 'ambient sound and music' alongside the narrator's voice can be considered to influence the content (AnneFrank.org, 2017b). Ellie Kendrick's audio narrative voiceover, sound effects and music, all produce emotional and empathetic qualities, influencing the audience's interpretation of information (Miu & Balteş, 2012; Wöllner, 2012; Sloboda, 1992). Humanistic sounds such as birds singing and church bells ringing, also enhance emotional qualities (Weninger *et al,* 2013). Differently, presenting original radio

broadcasts within the virtual tour[20] enhances the virtual environment's authenticity, by creating a sense of time and place.

Principle Four: Documentation

Enhancing Practice

Principle 4.1-4.3 emphasizes 'enhancing practice' from computer-based visualisations 'in relation to the context and purposes for which they are deployed' (London Charter, 2009: 8). The Anne Frank platform clearly outlines its aims and objectives, thus fulfilling principle one and four of the Charter. Audiences are given explanations regarding why and how the platform was constructed, alongside the rationale for dissemination. Principle four of the Charter continues to promote the rigorous application of documentation strategies, which underpin the inclusion of historical sources presented throughout the visualisation (London Charter, 2009).

It can be considered that the 3D reconstructed virtual tour 'frame' is, in essence, a hollow vessel, only communicating spatial characteristics (Tan & Rahaman, 2009) (Figure 4.2). By superimposing photographs over the 3D reconstructed frame, cultural context is communicated, visualising how the annex would have appeared between 1942-1944 (Figure 4.2). By embedding historical materials within the virtual tour's hotspots, audience experiences are further enhanced by linking historical materials to specific spaces. The application of personal accounts strengthens audiences' associations with those who occupied the annex (Short & Reed, 2017; Foster *et al*, 2016; Dulberg, 2002). By describing everyday events such as sharing a bathroom, audiences can relate to personal experiences, thus developing emotional and relatable connections.

The Anne Frank story provides a unique insight into maintaining a 'normal life' as a Jew during the Second World War. This story is considered unique for numerous reasons. Firstly, a thirteen-year-old girl's perspective of the Holocaust is presented, providing an opportunity for relatable language and (female) teenage development (Irwin-DeVitis & Benjamin, 1995). Additionally, Holocaust accounts have become dominated by male perspectives, often overlooking female (Jaskot, 2017; Hirsch & Spitzer, 2014), therefore, the Anne Frank narrative is considered unique (Copeland, 2003).

Property Rights & Privileged Information

The author considers the use of privileged information (for example, personal photographs and private diary accounts) as respectfully represented within the Anne Frank platform. The privileged information is used to support the narrative by authenticating claims whilst showing a humanistic side of the Holocaust; emphasising more 'everyday' events, as opposed to torture and barbarity

[20] Located in the 'Private Office' and 'Frank Family Room' scenes.

commonly associated with the Holocaust (Magilow & Silverman, 2015; Levy & Sznaider, 2006). This can be partially attributed to the environment within which the individuals lived (a property as opposed to a concentration camp) alongside the extensive collection of available materials. All individuals are referred to by name, with photographs showing them as both a victim and not a victim (i.e. pre-war) (Imber, 2013). Additionally, no graphic photographs of individuals are displayed.

An active selection of accounts from different editions of the 'Anne Frank Dairy' has been presented throughout the platform. The Anne Frank museum website outlines that three versions (A, B and C) of the 'Anne Frank Diary' exist, with version C compiled by Otto Frank (from version A and B), producing a multifaceted description of Anne Frank (AnneFrank.org, 2017e). The platform explains that the Anne Frank story is 'based on both the popular and authoritative editions of the diary and on reports by witnesses from the Anne Frank House archives' (AnneFrank.org, 2017b). Therefore, information disclosed on the platform can be perceived to be based on evidence. However, externally presented on the museum's webpage, the quoted sources presented throughout the platform derive from 'Anne Frank, The Diary of a Young Girl: The Definitive Edition' and 'The Diary of Anne Frank: The Revised Critical Edition', amalgamating different edited accounts (AnneFrank.org, 2017e). Thus, insufficient clarity exists regarding whether the text derives from the perspective of Anne Frank or edited by Otto Frank.

The property rights for the diary are nuanced regarding ownership of content. Copyright complexities were highlighted in January 2016, when Oliver Ertzscheid and Isabelle Attard separately published Dutch diary accounts (Guardian.com, 2016; Stilwell, 2016). From their perspective, it was considered that copyrights had expired, due to being 70 years after the diary's initial release (Guardian.com, 2016; Stilwell, 2016; Designs & Patents Act, 1988). The Anne Frank Fonds[21] who hold the diary's copyright, contested these actions, stating they have provided 'suitable' translations of Anne Frank's accounts (Guardian.com, 2016). Displayed upon the museum's website (AnneFrank.org), copyright permission for use of the secret annex materials are reserved by Anne Frank Stitching (AnneFrank.org, 2017f).

Primarily, sources are disseminated through the platform via video format. This method reduces third-party misuse, as the content is embedded within a video. Therefore, anyone wishing to access and use the materials is required to contact the Anne Frank Fonds (AnneFrank.org, 2017f).

Documentation of Knowledge Claims

As previously outlined, the Anne Frank platform adheres to sections 4.4, 4.6 and 4.10 of the London Charter (2009) by disclosing knowledge claims within the 'This Site' page. This section

[21] The Anne Frank Fonds is a charity founded by Otto Frank in 1963 (AnneFrank.ch, 2017).

outlines that the virtual tour displays reconstructed scenes of the annex from 1942-1944, although the museum's (external) webpage provides greater explanations regarding how the tour was created (AnneFrank.org, 2017a). This page explains that each room was re-furnished in 1999, photographed, and the images superimposed onto the 3D reconstruction (which is not disclosed on the platform and only evident between scene movements) (Figure 4.2). Although the virtual tour's 3D 'frame' is considered evidence-based, created from a physical building, the superimposed photographs simulate photorealism, depicting a specific epoch (1942-1944) as the annex currently remains unfurnished. This representation highlights varying levels of authenticity, demonstrating that photorealistic representation does not guarantee authenticity through scene restaging (Chhabra *et al*, 2003).

The virtual tour is considered an evidence-based reconstruction, as opposed to replication, from being constructed using historical sources and descriptions of each room provided by Otto Frank. However, the platform could provide greater transparency regarding this information, by disclosing this information within the platform. One may further question degrees of transparency within representation through the authenticity of the annex furniture (for example, furniture types, colours and fabrics), as the same items from 1942 may have not been available in 1999. Although, transparency is apparent within sections of the platform such as, 'Who is Who' and 'Outcome', which highlight any unknown historical information; for example, who informed the Nazis of the families hiding (AnneFrank.org, 2017g). Therefore, it is considered that transparency surrounding content is sufficiently maintained, but greater transparency may be required when describing the virtual heritage representation.

Documentation of Research Sources

Section 4.5 of the London Charter (2009: 8) states, 'a complete list of research sources used, and their provenance should be disseminated'. However, the 'Anne Frank Secret Annex' platform does not provide a reference list or bibliography upon its pages. Instead, this information is presented on an external website page (www.annefrank.org), which also outlines the version of Anne Frank's Diary from which quotations have been obtained, alongside the provenance of photographs, film, sound and music alongside materials acquired from archives (AnneFrank.org, 2017a; AnneFrank.org, 2017e).

Documentation of Methods

Due to 263 Prinsengracht having a dual function, serving as both a business and a hiding space for the Franks and Van Pels, a virtual tour is considered a suitable representation method to depict the inside of a building. As a virtual tour visualises space, indoor scenes are confined to a room, with walls acting as boundary indicators. The application of hotspots also allows multimedia materials to be represented according to their spatial reference, avoiding suggestive priority between sources

(Sturdy Colls, 2015). The rationale for presenting the secret annex through a photorealistic, 3D evidence-based reconstruction is outlined within the platform's pages.

Principle Five: Sustainability

Principle five emphasises sustainability strategies for preserving data used to create and develop computer-based visualisations (London Charter, 2009). The Anne Frank platform displays greater availability of context and access to spaces than the physical museum. Additionally, multimedia materials conveying the platform's narrative derive from physical sources, preserved by the Anne Frank Fonds (AnneFrank.org, 2017a; AnneFrank.ch, 2017). Therefore, the sustainability of the historical record is maintained by presenting source materials through innovative and novel visualisations, such as the virtual tour. However, limited mention regarding the storage of source materials that are disseminated within the platform exists.

Principle Six: Access

Principle six raises awareness regarding access to computer-based visualisations which should be 'planned in such a way as to ensure maximum possible benefits are achieved for the study, understanding, interpretation, preservation and management of cultural heritage' (London Charter, 2009: 11). The Anne Frank platform presents its content in three different languages, English, German and Dutch (AnneFrank.org, 2017a). Audiences are provided with instructions outlining navigation and interactivity processes through a 'splash screen' presented when entering the virtual tour. An interactive floor plan provides audiences with multi-navigational options to teleport around the virtual tour, creating interaction ease. Furthermore, through using the internet as a dissemination medium, the platform can be accessed globally.

Most importantly, the underpinnings of the platform provide audiences with the opportunity to visit a site which they may not be able to physically visit (AnneFrank.org, 2017a). Through a purposefully selected virtual tour method, audiences can view spaces occupied by the Frank and Van Pels' during the war, supplemented by superimposed furnished annex photographs and multimedia materials. Additionally, spaces that are physically out of bounds at the museum, are accessible within the platform, thus incorporating principle six of the London Charter (2009).

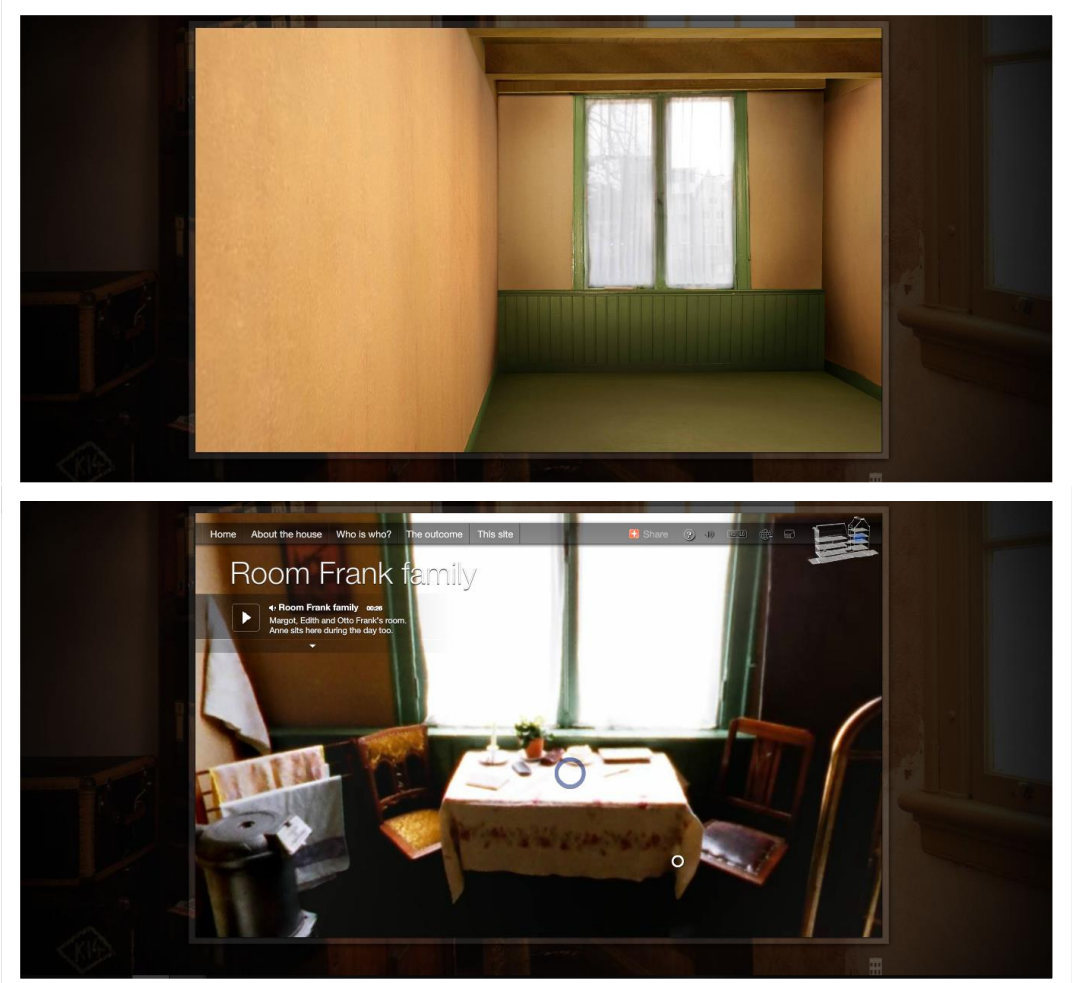


***Figure 4.2**: These images display the same room within the virtual tour, however, the top image displays the 3D reconstruction virtual tour 'frame', and the bottom image displays a superimposed photograph (AnneFrank.org, 2017a).*

4.3 Secondary School Focus Study Groups

To gather perspectives on the 'Anne Frank Secret Annex' platform, focus groups were conducted with students from three UK secondary schools. Focus groups provide an opportunity to acquire first-hand insights regarding participants perceptions surrounding a specific topic (Carey & Asbury, 2016; Krueger & Casey, 2014). Data deriving from implementation is considered rich and of value when addressing research questions (Ibid). Frequently, focus groups are used when limited knowledge is known, and can provide context towards existing theories, methods and literature (Krueger & Casey, 2014; Fern, 2001; Morgan, 1997). Focus groups are considered suitable for younger participants, due to their homogeneous qualities, which can subsequently encourage discussion (Fern, 2001; Morgan, 1997). Chapter 3 Section 3.4 provides greater justification regarding the implementation of this qualitative method as well as a general overview of the methodology employed herein.

A total of four focus study groups were conducted with secondary school students. Participants were recruited from three different secondary schools based upon the school's religious ethos. These comprised a recognised Christian school, a recognised secular school and a recognised Orthodox Jewish school. Due to separated gendered teaching at the Orthodox Jewish school, two focus study groups were conducted with different genders, as opposed to mixed gender groups conducted at the Christian and secular schools. This approach accounts for different religious values participants may hold, potentially influencing the interpretation of Holocaust materials presented upon the Anne Frank platform. The inclusion and exclusion criteria for this study has been previously outlined in Chapter 3 (Section 3.4.5), alongside ethical approval and consent processes (Section 3.4.1).

In total, 28 participants were recruited from the three different schools comprising 13 males and 15 females. Of these participants, eight considered themselves secular, six Christian, two Catholic and 12 Jewish. All participants identified themselves as White British, apart from three students who described themselves as White-Asian, White-English/Israeli and White-English/American. On average each focus study group had nine participants, conforming to the ideal number of focus group participants of 6-12 (Carey & Asbury, 2016; Edmunds, 2000). Table 4.1 provides a composition outline for each focus group.

Table 4.1*: Anne Frank focus group compositions.*

Religion	**Gender**		**Age**		**Ethnicity**			
	Male	Female	11-14	15-20	White-English	White-Asian	White-Israeli	White-American
Secular	2	6		8	8			
Christian	3	3		6	6			
Jewish	7	5	12		10		1	1
Catholic	1	1		2	1	1		

Chapter 3 (Section 3.4.2) provides the outline, approach and justification of conducting the focus study groups with (UK) secondary school students. Following this process, each focus group discussion was digitally recorded and transcribed verbatim, with transcripts checked twice for clarity. All transcripts were systematically coded using the software Nvivo©, identifying themes within the datasets relating to the research questions (Bazeley & Jackson, 2013) (Chapter 3 Section 3.5). Applying stages two-five of Braun and Clarke's (2006) six-stages of thematic analysis (Chapter 3 Section 3.5), identifying, coding and refining themes within the focus group transcript commenced. This was achieved by assigning a node (a word or words) to specific texts within each transcript (Saldaña, 2015; Braun & Clarke, 2006).

4.4 Results

In total, 73 nodes were created, comprising 22 parent nodes (general codes) and 51 child nodes (specific codes) (Table 4.2).

Table 4.2: *The overall number of nodes present in all Anne Frank qualitative datasets, categorised by key themes.*

Theme	Number of Parent Nodes	Number of Child Nodes
Accountability	6	5
Communication	6	8
Education	6	21
Presentation	4	17

As Table 4.2 highlights, all 73 nodes were condensed to four overall key themes which correlate to each research question. These themes are presented below (in bold) against the corresponding research questions[22].

Accountability: What is the perceived value of disseminating Holocaust data, through virtual heritage technologies?

Communication: Can virtual heritage environments effectively, coherently and accountably disseminate Holocaust data?

Education: How do users learn about the Holocaust from interacting with virtual heritage environments and what is the perceived dissemination value?

Presentation: What ethical visualisation methods and presentational qualities should be contemplated when constructing virtual heritage Holocaust environments?

Figure 4.3 displays the overall percentage relating to each of the four key themes outlined above. Table 4.3 outlines each theme's individual parent and child nodes hierarchies alongside the number of sources and references against each node.

[22] The Anne Frank platform does not present forensic archaeological data but presents traditional Holocaust narrative data through historical sources. The research questions presented below substituted the words, 'forensic archaeologically-derived Holocaust data', for the words, 'Holocaust data', to account for these differences.

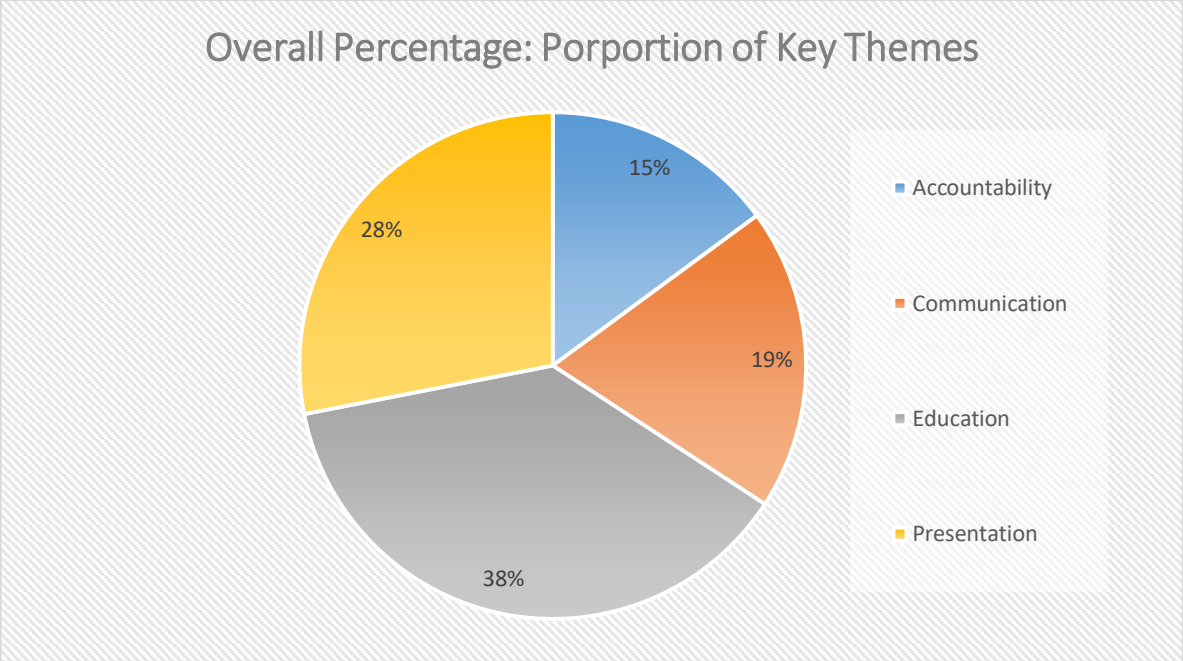


***Figure 4.3**: The overall proportion of each key theme coded from the Anne Frank focus study groups.*

***Table 4.3**: Themes, parent and child nodes coded from the Anne Frank focus study group transcripts.*

Theme	Parent Node	Child Node	Sources	References
Accountability	Believable		4	12
	Information Origin	Museum	2	3
		Narrative	3	6
	Presentation Style		3	3
	Representation		3	3
	Sources	Testimony	3	8
		Photographs	1	2
		Video	1	1
	Transparency		2	6
Communication	Digital Methods	Audio	3	7
		Photographs	4	10
		Testimony	3	9
		Video	4	31
		Virtual Tour	4	29
		Spatial	4	28
	Engagement		4	14
	Instructions		3	6
	Interactivity		4	18
	Language		3	8
Education	Age Appropriate		4	11
	Empathy		1	8
		Audio	2	4
		Testimony	2	9
		Photographs	2	4
		Video	3	7
		Virtual Tour	1	1
	Learnt Information		4	20

		Video	3	3
		Virtual Tour	4	6
	Most Remembered	Audio	1	1
		Fact Files	1	1
		Specific Information About Anne	3	15
		Video	3	11
		Virtual Tour	3	6
	Multimedia Materials		3	5
		Audio	3	5
		Specific Content	4	33
		Testimony	3	19
		Photographs	3	8
		Video	4	27
		Virtual Tour	4	34
Presentation	Appropriate	Content	1	1
		Language	2	2
		Narrative	1	1
		No	4	10
		Video	1	2
		Virtual Tour	3	9
	Navigation	Virtual Tour	4	24
		Platform	2	4
	Presentation & Layout		2	17
		Content	2	4
		Structure	2	2
		Virtual Tour	2	6
		Platform	1	2
	Replace Site Visit		1	1
		Atmosphere	2	4
		Distance	2	2
		Freedom (Virtual Tour)	2	6
		No	4	16
		Site Visit Preparation	2	3
	Sense of Being There		3	6
		No	3	9
		Yes	4	10
		Virtual Tour	4	10
	Technical Issues		1	1
		Video	1	2
		Virtual Tour	1	1

4.4.1 Accountability

Data analysis coded four different nodes relating to the platform's believability, including: information origin, presentation styles, sources and information transparency.

The origin of information comprised two different nodes, coded as museum and narrative (Table 4.3). Participants (*n*=3) considered the museum itself as a reliable origin (or source) to disseminate Holocaust information, as evidenced through participant H.H.A.F.M.6's comment; 'I think it

comes from a very reliable source. A museum in the actual house, it's not some fake place that you know was made up'. As the Anne Frank narrative was already known by focus group participants, the narrative itself automatically produced believability (*n*=6), 'there's no reason to not believe it. But then, I've read her diary, so I know that a lot of the stuff they are referencing is straight from the diary, they haven't altered it to convey a certain viewpoint' (participant B.S.A.F.F.1).

The presentation style and source types also impacted participant believability. Participants considered eyewitness testimony the most credible source type (*n*=6), as explained by participant H.H.A.F.F.2, 'I found they were all reliable because they were all from people who were there at the time. So, there was no way that it could have been wrong because these people weren't biased'. Additionally, the multimedia materials, photographs (*n*=3) and video (*n*=3), also enhanced the content believability.

The presentation style and quantity of sources presented throughout the platform assisted believability (*n*=3). Through presenting multiple source types (for example, testimony and photographs) supporting a specific point, participants considered the information reliable. Information transparency also provided belief, with participants understanding that not all information about the Holocaust is known. The data also demonstrated that information transparency can further incite learning, 'when they said they didn't know something, they always said it's not known... Added mystery to it then, because I wanted to know who'd been betraying them...It just made you wanna know more...So it's honest when they didn't know, but also added a bit of like intrigue' (participant C.C.A.F.M.1).

4.4.2 Communication & Education

Table 4.3 highlighted that many parent and child node similarities existed between the themes of communication and education, thus, both datasets are presented together. Coding displayed that eight key themes were identified including: age appropriateness, empathy, interactivity and engagement, learning resource, most remembered and multimedia materials.

4.4.2.1 Age Appropriate

Many participants (*n*=13) agreed that the content was suitable for their age groups and may also be suitable for younger audiences. Participants frequently referred to three platform aspects supporting these perspectives, including: language (*n*=7), multimedia representation type (*n*=4) (video (*n*=2), and virtual tour (*n*=2)).

Both written and verbal language was considered 'understandable' (*n*=4) and 'simple' (*n*=2), as highlighted by participant H.H.A.F.F.2, 'you could understand what they were saying but…it was in mature writing, but it was really easy to understand what they were saying. And like there was

videos for people and there was also information, so it kinda went to all the viewers because there was something there that everyone could understand'.

Participant H.H.A.F.F.2 highlighted that the use of different multimedia materials assisted different age group interpretations of information. Participant H.H.A.F.F.4 explained how the virtual tour assisted understanding, 'I liked the detail of all of the things that were in the rooms and how everything was laid out and how the person was speaking whilst I was looking around, so I knew everything'.

4.4.2.2 Empathy

Participants described empathy as being conveyed through different multimedia materials, including: audio (*n*=4), eyewitness testimony (*n*=9), photographs (*n*=4), video (*n*=6) and virtual tour (*n*=1). This displays the importance between narrative and testimony to convey empathy, as participants frequently saw Anne Frank as human. Participant B.S.A.F.F.1 explains, 'when you read facts and figures you don't really understand how many people were actually injured or killed during it. Whereas if you take a story like Anne Frank where it's a lot more personal you're understanding her real life and it's affected her. You take into consideration how it affected every single person that was involved, every single family and it makes you think about it a lot more and how disgusting it actually was'.

The multimedia video (which encompasses audio and visual multimedia qualities), was most effective in conveying empathy. Participant H.H.F.F.4 described, 'I find that it was good because on some videos when it comes to history is more like just a picture...I watched one about…what happened to them after they got caught, and I felt really moved by it. And usually when I hear that type of stuff I don't really feel anything, but I felt a bit more like closer to the situation from just seeing the video'. Interestingly, participant B.S.A.F.F.1 explained how the virtual tour itself encompassed empathic qualities, 'when there was some of the bedrooms and the fact that all of their possessions are in this one tiny room it's …quite claustrophobic what like just looking at it, and I think like it's quite emotive'.

Out of 24 coded empathy nodes, 18 nodes derived from female participants (audio (*n*=2), eyewitness testimony (*n*=7), photographs (*n*=4), video (*n*=4) and virtual tour (*n*=1)). The remaining six coded empathy nodes were from male participants (video (*n*=4) and audio (*n*=2)).

4.4.2.3 Interactivity & Engagement

A keyword deriving from the datasets was 'interactive', which primarily described the virtual tour's functionality. For example, 'people would much prefer to be doing something…interacting with something, moving about…metaphorically in a way, because you're on a computer…rather

than sitting there and reading' (participant H.H.A.F.M.6). This contrasts with engagement, which was often referred to in relation to both the virtual tour and videos. These two qualities are considered essential for learning, as participant C.C.A.F.F.1 explained, 'I feel like most people are like visual learners so to really like capture who you're talking about…it's important'.

4.4.2.4 Most Remembered

All participants were asked 'what one aspect of the website did you remember the most?' This was deliberately the last question asked and required responses from all participants. Participants provided a variety of answers, coded through audio (*n*=1), fact files (*n*=1), specific information about Anne (*n*=10) (Section 4.4.2.4), video (*n*=10) and virtual tour (*n*=6) (Figure 4.4). Of these responses, the nodes 'specific information about Anne' and 'video' were most often coded. The words 'informative', 'emotive' and 'structure' were often used describing the videos presented throughout the platform, as participant C.C.A.F.M.2 explained, 'the emotions…from the voice actors of like Anne Frank, then you had…very personal things like the heights and how over the year the heights increase and it made it a lot more relatable and emotional, so those were very good'.

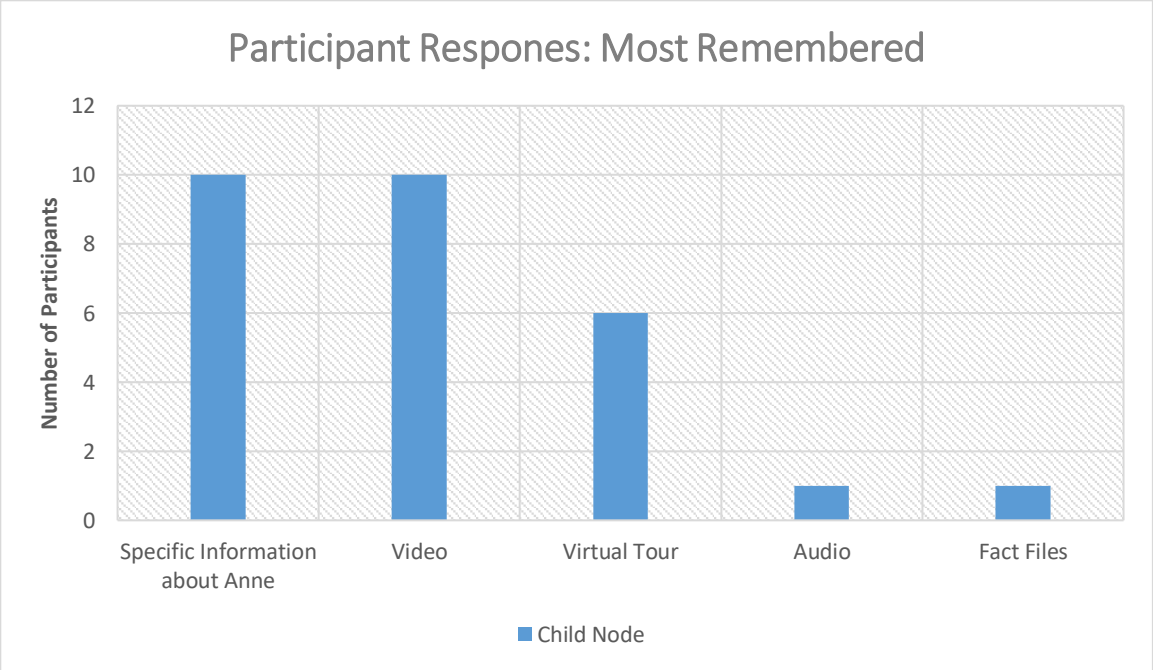


***Figure 4.4**: Anne Frank focus group responses to 'most remembered' platform encounter.*

4.4.2.5 Multimedia Materials & Educational Resource

Throughout discussions, participants often referred to the different multimedia types presented throughout the platform, comprising audio, photographs, video and the virtual tour.

Participants (*n*=5) referred to audio throughout the datasets as an effective communication method through the tone and pitch of Ellie Kendrick's voice (Section 4.2 principle three). 'I thought the videos were really good how they had like…voice actors in…you can relate to it a lot more...you're more involved in it so you feel a bit more you care about it' (participant C.C.A.F.M.4).

By capturing a specific moment in time, participants (*n*=7) considered photographs significant due to conveying emotions and reinforcing that the narrative was about human beings. As participant B.S.A.F.F.1 explained, 'when they were telling the stories of how Anne's relationships were affected, and they had the photos of each person where they had taken several and they were changing the way they looked, and you saw more into the person'.

Participants (*n*=15) considered video an effective educational multimedia communication. This is attributed to several different characteristics including: content relevance, informative, multisensory (audio and visual), structure and narrative. Participants considered video to be engaging by the choice of images and the voiceover characteristics. Participants frequently used words such as 'real', 'emotion' and 'relatable' to describe the videos, subsequently conveying empathic qualities, as explained by participant C.C.A.F.M.1, 'they were structured very informative, they had enough…visual aids but then the commentary was structured and informative as well. But it didn't feel like you were being lectured'.

The virtual tour was considered an effective spatial communication method (*n*=21), as described by participant C.C.A.F.M.1, 'I just thought they all lived in an attic. But then I didn't realise there was actually a whole...house...Because I wouldn't have known that, and it was just nice to visually understand'. This is partially attributed to communicating the annex as it would have appeared between 1942-1945, through superimposed photographs (Section 4.2 principle two and four). As participant B.S.A.F.F.2 explained, 'because when you look at an empty room…you like think about everything that, how they could have got around things. But…when you see the way it actually was, like when you looked at the kitchen it was, it barely had any room to move about...So I feel like doing that, putting how it would have been then, lets you understand just that little bit more how it was then'.

The virtual tour also provided participants with an understanding of the annex layout, with some participants believing the space was confined to a single room; as participant H.H.A.F.F.4 remarked 'I got a better perspective of what was going on…I've read the book and seen a few

movies and shows about it, but like seeing it in a virtual sort of way…I kinda got more of a bigger picture of what it really looked like. Because I honestly just thought it was just one floor, but I realise its much bigger than I imagined'.

Not all participants agreed that this method was an adequate form of communication, with one participant describing requirements for multiple representations to convey information, 'I think that both the videos and the actual 3D need each other...Cause you're not gonna, tell you about outside by the river...you're not gonna understand it by reading and listening to the recordings and it told us about like the two buildings that surrounded the house but I didn't know that where, or what it looked like or anything...So I only knew that because of the 3D' (participant H.H.A.F.M.2).

The virtual tour's presentation was addressed through discussion, with responses (*n*=11) considering the layout as appropriate. One participant (H.H.A.F.F.1) commented on a video checklist presented in the tour which provided an overview of all the videos, ensuring all content had been viewed. Although, participant H.H.A.F.F.2 expressed confusion regarding, 'the timeline…Because something's was from when they started there…and then the second part was like before they were leaving...I don't know if it was just me, but I was getting confused'. Additionally, participant C.C.A.F.M.1 explained a complexity regarding spatial narratives, 'I was just clicking on all these random rooms and it was telling me a bit. But I preferred just a video because it gave more of a structure to it, whereas I was just sort of running around to all these different rooms'.

Throughout discussions, participants demonstrated knowledge acquired from interacting with the platform, for example, 'Anne's favourite author was Dickens' (participant B.S.A.F.F.1) and 'Anne and Peter fell in love' (participant B.S.A.F.F.2). Participants (*n*=13) agreed that the museum portrayed the Anne Frank story effectively, however, limited content was presented regarding before and after the war, alongside a broader scope of the Holocaust. Participant C.C.A.F.F.1 explained, 'even though it's really good, I think it would be too vague in a sense that everything else you need to learn. Like, background before that, and after that, because it just gave you, obviously, the Frank's and Van Pels' point of view on the war'.

A small number of participants (*n*=3) also discussed the relevance of the materials in relation to educational syllabus requirements, 'I think it gave like a nice balance between textbook and then all the archive information as well because as much as a textbook gives you, there's always little bits that they just don't put in that are actually there…even if it's not for exam purposes' (participant C.C.A.F.F.2).

4.4.3 Presentation

Throughout coding, the presentation theme produced four nodes: appropriate; presentation, layout navigation and technical issues; a sense of being there and replace visiting a site (Table 4.3).

Participants were asked how appropriate they considered the 'Anne Frank Secret Annex' platform. The Anne Frank narrative differs from other Holocaust narratives, which often describe atrocities such as, camp experiences, as participant B.S.A.F.F.6 stated, 'because it wasn't really about…the horror of the Second World War, it was more like a personal story, trying to avoid the horror and like that kind of suppression rather than more broadly about Germans'. Therefore, one may perceive this narrative as appropriate within secondary school education. Some participants (*n*=6) considered that the narrative did not present all essential Holocaust qualities, as participant C.C.A.F.F.1 explained, 'even though it's really good, I think it would be too vague in a sense that everything else you need to learn. Like, background before that, and after that, because it just gave you, obviously, the Frank's and Van Pels' point of view on the war'.

No participants found anything offensive on the platform. Participants emphasised the appropriateness of the platform in relation to the multimedia material format which assisted 'humanising' Anne and the other attic occupants (Section 4.4.2.2).

4.4.3.1 Layout, Navigation & Technical Issues

Throughout discussions, participants referred to the layout and presentation of the platform and virtual tour. Although participants frequently considered the platform's presentation as 'structured' and 'organised', one conversation between participants highlighted the potential issue of presenting relevant information across multiple platforms:

'Maybe make a like a whole summary video of the timeline' (participant H.H.A.F.F.1),
'They have, they had like a link...' (participant H.H.A.F.F.4),
'Oh ok, I didn't see it.... (participant H.H.A.F.F.1),
'I didn't see it...' (participant H.H.A.F.F.2).

Participants were asked about navigation experiences from interacting with the platform and virtual tour. The responses are divided between effective and ineffective perceptions with the platform's navigation considered effective (*n*=4) through being structured and easy to locate information.

The virtual tour's navigation controls provided difficulties for some participants (*n*=8), as participant B.S.A.F.F.5 explained, 'the controls seem to fly about quite a lot... Spinning in circles rather than straight, I couldn't stop'. Participant C.C.A.F.F.1 highlighted that 'I think because it was

a whole like 360 degrees, spinning thing, like if it was just left or right...It would probably be easier'. Although the virtual tour contained a floorplan displaying a participant's location, this was only accessible by clicking a button. Participants (*n*=3) stated that 'in the house you kinda found yourself getting a bit lost' (participant B.S.A.F.F.6).

Two participants reported encountering some technical issues surrounding video access. Due to secondary school internet access restrictions, some computers had not been provided with the relevant online access, resulting in two participants having to swap computers.

4.4.3.2 A Sense of Being There & Replace Visiting a Site

Participants were asked if they had a 'sense of being there', producing the nodes yes (*n*=12), no (*n*=6) and virtual tour (*n*=9). Participants who considered to have experienced a sense of being there, frequently related this to the virtual tour, 'it was that realism that you don't always get to see in studying it, and you might not get the chance to see it in real life, so I thought it was nice' (participant C.C.A.F.F.2).

Participants answering no, explained that physical presence would create a greater sense of 'atmosphere'. As participant B.S.A.F.F.2 described, 'you can't really feel yourself in the space so it's like hard to comprehend the size of things and like the atmosphere and like how high the walls are and how closed off you are'. Although some participants believed that greater freedom of movement and access was provided by the virtual tour, in comparison to a visit, 'I think on the website you had a bit more freedom which way you wanted to go…which wouldn't be the same if you went to the site you have to follow all the patterns' (participant C.C.A.F.M.3).

All participants were asked if after viewing the virtual tour, this would replace a visit. The responses to this question produced the following nodes: atmosphere, distance, freedom (virtual tour), no and site visit preparation.

Several participants (*n*=5) considered qualities such as atmosphere, were absent through viewing the Holocaust site digitally, rather than physically, 'you can't exactly get like the atmosphere' (participant C.C.A.F.M.1), 'and the ambience in the sense there's like no way you'd get that just through a computer screen' (participant C.C.A.F.F.2). However, two participants considered this may replace a site visit, dependant on distance, and another two participants considered the platform useful to prepare for a site visit.

Six participants considered the virtual tour provided greater freedom of movement and access to areas that would not be available during a physical visit. Although the majority of these responses (*n*=12) considered that the platform could not replace a site visit. As participant H.H.A.F.F.4

highlighted, ‘I think like it's really good as in like it gives you a view, but nothing can replace actually physically seeing it with your own eyes’.

4.4 Summary

This study explored secondary school participant perceptions of the ‘Anne Frank Secret Annex’ through focus study groups, regarding how platform information was exhibited, disseminated, and interpreted. This chapter outlined the platform’s effectiveness of using virtual heritage and digital multimedia technologies to communication Holocaust materials. The Anne Frank platform is considered a Holocaust representation benchmark, indicated through the numerous awards received for education, communication and design qualities, alongside the number of visitors (Section 4.1). First-hand focus group data provided deep and rich insights, allowing the author to understand the specific qualities of the platform. This review assisted the development of the Sylt platform and provided qualitative datasets for comparison between platforms. Overall, this study suggested that virtual heritage visualisations provide a suitable dissemination method, by enhancing engagement and interaction, allowing students to acquire unique Holocaust insights about Anne Frank.

Given the valuable lessons Holocaust education embodies (Short & Reed, 2017; Maitles & Cowan, 2007; Short, 2005; Levi, 2003; Blum, 2002; Gregory, 2000), combined with diverse virtual representations possibilities, the importance of representation accountability is paramount. Consequences of unregulated Holocaust representations are evident through the UCL’s (2016) report, which highlighted student misconceptions of Holocaust events (Foster *et al*, 2016). Through obscuring, even fictionalising Holocaust histories, valuable lessons deriving from Holocaust representation can become distorted, subsequently diminishing commemoration and understanding. To avoid misrepresentation, the London Charter (2009), promotes guidance for cultural heritage computer-based representations. Therefore, the Charter is considered to provide ethical guidance for cultural virtual environment developers.

As Section 4.2 highlighted, the Anne Frank platform did not incorporate the London Charter’s principles throughout development. Through evaluation, it was apparent that the platform naturally addressed many of the principles. Given the findings from this research, this highlights a requirement for future virtual heritage Holocaust representations to incorporate the London Charter’s principles prior to, and throughout development. An objective of the Charter is to ‘ensure that computer-based visualisation processes and outcomes can be properly understood and evaluated by users’ (London Charter, 2009: 4). Section 4.4.1, described participant platform perceptions concerning accountability, essentially focusing on the historical materials exhibited, rather than the virtual environment itself. This can be attributed to participants considering the

Anne Frank museum as a reliable source, thus having confidence that the virtual environment is ethically represented

The presentation of source materials throughout the platform, frequently incorporated emotive qualities (such as music), influencing participant perceptions of the platform (Section 4.4.2.2). Whilst this approach may 'enhance practice' (London Charter (2009) Principle 4.1: 8), from a courtroom perspective, it would be considered to 'Disney-up' materials, enforcing biases towards content (Schofield & Fowle, 2013: 108). The author contemplates if Holocaust materials require emotional manufacturing, as these qualities naturally ensue from engagement with Holocaust sources (for example, eyewitness testimony). However, by applying these emotive qualities many empathic comments derived from the qualitative datasets, fulfilling requirements within Holocaust education (Gubkin, 2015; Riley, 2001; Hector, 2000; Gregory, 2000). Therefore, an ethical contemplation exists within Holocaust representation concerning the degree of manufactured empathy (Chapter 7 Section 7.7).

Although the data highlighted that video was most effective in conveying empathy, further research is required to understand if video (i.e. visual and audio) itself was effective, or if this can be accredited to the types of images presented, or the style (e.g. pitch and tone) of the audio; or both. The data highlighted that empathy mainly derived from female students, potentially relating to gender similarities of a female narrative, alongside gender differences highlighted within cognitive research (Baron-Cohen, 2003). Additional research is required into how empathy is developed among male students.

The data highlighted that thematic spatial representation can inform audiences greater than other means of Holocaust dissemination, such as film, television or literature (Section 4.4.2.1). Many participants considered this form of representation to provide greater freedom for exploration in comparison to site visits, displaying an important contribution from virtual heritage technologies. Participants considered that digital representations could not (or should not) replace visits, despite the platform providing greater access and information than a physical visit. Careful consideration regarding navigation and movement of virtual environments should be maintained, ensuring audience experiences are sufficiently effective. This data highlighted that spatial representations do provide a suitable Holocaust site representation approach, for physical structures. It should be noted that this data does not present an understanding regarding the effectiveness of spatial narratives representation where no physical structures remain since the Anne Frank Annex is intact.

Interestingly, the dataset highlighted a paradox of Holocaust narrative appropriateness. The Anne Frank narrative was considered age-appropriate, with the absence of 'horror' and graphic

representations (Section 4.4.2.1). However, atrocities are considered naturally bound to the Holocaust, given the brutality and murder of victims. By removing these atrocities, an altered version of events is presented. This highlights a requirement for a balance atrocity and familiarity, that audiences can both relate to, yet also learn of the brutalities that occurred.

The data highlighted that the Anne Frank narrative was recognised by the majority of participants, which assisted the believability of content. Subsequently, the information was generally accepted, with no participants questioning the different Anne Frank Diary sources. Importantly, information transparency enhanced interest, with some participants independently continuing to research unknown details (such as who informed the Nazis about those hiding in the annex), after the focus group were completed. The results from this study further highlighted many successes of using virtual heritage representations, to communicate a Holocaust narrative. Therefore, similar successes are endeavoured to be achieved through the 'Explore Lager Sylt' case study platform.

5.0 Case Study: Sylt Concentration Camp

Since 2010, the Centre of Archaeology (Staffordshire University) has regularly undertaken forensic archaeological investigations at the Sylt camp (Alderney; Channel Islands) as part of the 'Alderney Archaeology and Heritage Project'. The project's aims are to ‘preserve the sites by way of digital record and develop alternative forms of heritage presentation’ (Centre of Archaeology, 2018). Archaeological fieldwork conducted by the Centre has been central to this project, interpreting Sylt’s landscape by finding and mapping surviving structures, identifying man-made alterations and ascertaining camp boundaries. By locating, recording and comparing these features with sources derived from desk-based analysis (DBA), insights are provided about Sylt’s history, contributing to the historical record.

This thesis research continues the 'Alderney Archaeology and Heritage Project', by disseminating forensic archaeologically-derived fieldwork data acquired from Sylt (2010-2015) (Chapter 3 Section 3.2). This data has been represented by the author through the ‘Explore Lager Sylt’ platform (https://lager-sylt.website/index.html). Prior to describing how the platform was created and responses from interactions (Chapter 6), this chapter will provide the historical background to the events on Alderney and in Sylt. As will be shown, sensitivities encountered whilst undertaking archaeological fieldwork and when undertaking a questionnaire survey on the island, highlighted several ethical considerations which influenced the exhibition and dissemination of the data collected. This chapter provides context and understanding regarding as to why ethical complexities surrounding Sylt exist. This is addressed in part by outlining post-liberation British military investigations at Sylt, which presented conflicting results and which, it is argued, distorted and distilled Sylt’s narrative. These issues have become further complicated by inadequate site commemoration and heritage conservation, as the site currently remains overgrown with vegetation. Such issues are primarily attributed to political attitudes towards Sylt and the island’s occupation.

5.1 Historical Background

Alderney, measuring 4.8 kilometres long and 2.4 kilometres wide, is the most northerly of the Channel Islands, an archipelago of five islands located in between England and France (VisitAlderney.com, 2018). These islands comprise Guernsey, Jersey, Sark and Herm (Figure 1.4). Between May-June (1940), the ‘Battle of France’ prompted the British government to consider the strategic value in defending or evacuating the Channel Islands (Wood & Wood, 1980). On the 23rd June (1940) approximately 1,400 islanders were evacuated from Alderney, with 20 inhabitants remaining (Bonnard, 1993; Wood & Wood, 1980). On the 25th June (1940) a rescue team was assembled to remove cattle alongside the remaining islanders from Alderney (Bonnard, 1993; Packe & Dreyfus, 1971), with orders to remove residents ‘by force if necessary’ (Wood & Wood,

1980: 39). Despite these efforts, seven of Alderney's inhabitants remained (Bonnard, 1993; Packe & Dreyfus, 1971). On 2nd July 1940, two Fieseler Storch aeroplanes landed on Alderney signifying the start of a five-year occupation (Wood & Wood, 1980).

Despite encountering no resistance, Alderney's occupation was considered both a propaganda coup and of tactical value to the Nazis[23]. Some historians believe that it was the 'last stepping stone before the conquest of mainland Britain' (Bonnard, 1991: 21). Consequently, Adolf Hitler endeavoured to transform Alderney into an 'impregnable fortress' and to make it part of the Atlantic Wall[24] (Pantcheff, 1981: 2). Subsequently, Alderney became one of the most heavily fortified parts of Western Europe (Sturdy Colls, 2012; Pantcheff, 1981). By June 1941, Alderney's garrison comprised 450 military staff increasing to 2,500 by November 1941 (Bonnard, 1991; Pantcheff, 1981). In 1941 and 1943, Hitler passed orders for the 'Directive on the Fortifications and Defence of the Channel Islands', transporting foreign labourers (specifically Eastern Europeans[25], Spanish and French) to the island (Pantcheff, 1981: 3).

Initially, construction on Alderney involved the movement of materials throughout the Channel Islands (Bonnard, 1993; Pantcheff, 1981). *Organisation Todt* (OT), a Third Reich civil and military engineering group responsible for supplying labour[26], was tasked with this role (Christopher, 2014). By early 1942 most individuals on Alderney comprised paid and forced OT workers (Bonnard, 1993). To accommodate these workers, the OT constructed four main camps around the island: Lager Helgoland (Camp No. 1), Lager Norderney (Camp No. 2), Lager Borkum (Camp No. 3) and Lager Sylt (Camp No. 4) (Pantcheff, 1981) (Figure 5.1); alongside several smaller sites for specific working groups (Sturdy Colls & Colls forthcoming). Initially, Helgoland housed forced 'Russian' labourers with a capacity of 1,500; Norderney housed forced 'Russian', French, Czech, Dutch, Spanish and German volunteers with a capacity of 1,500; Borkum housed German volunteers with a capacity of 500 - 1000; and Sylt housed forced Eastern Europeans labourers with a capacity of 100-200 (Pantcheff, 1981). Although each camp was constructed to accommodate a specific number of victims, in reality, the sites exceeded capacity.

[23] Labelled 'Operation Sea Lion', Nazi plans were established to invade Britain (Saunders, 2005; Bonnard, 1993).

[24] A coastal defence system built by the Nazis (1942-1944) across Scandinavia and Europe (from Norway to Spain) (Saunders, 2001).

[25] Although Nazi documentation described prisoners on Alderney as 'Russian', these prisoners were primarily Eastern Europeans.

[26] The OT staff were (German) civilians subjected to military law. The organisation had para-military status alongside access to military facilities (Christopher, 2014).

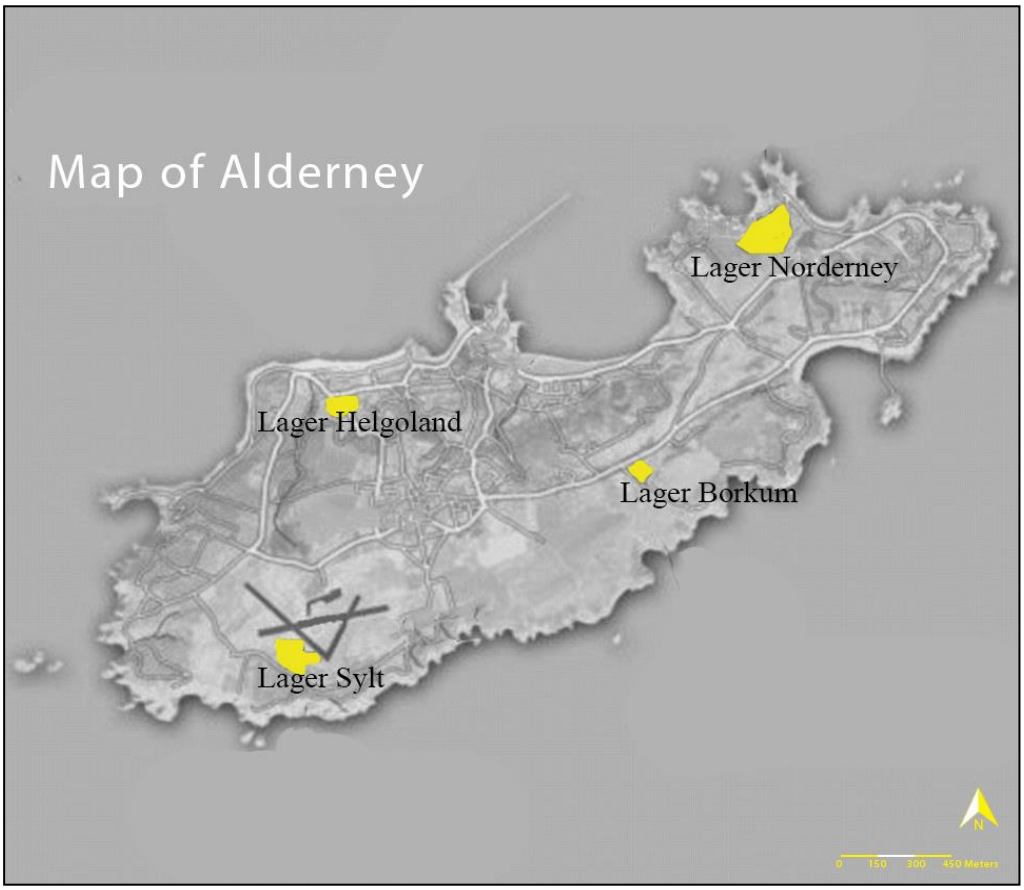


***Figure 5.1**: A map of Alderney showing the location of the four main camps.*

5.1.1 Sylt: Forced Labour Camp

In January 1942, the first barracks were constructed at Sylt by political prisoners and French 'volunteer' labourers (Bonnard, 1993). The camp was located south of Alderney's airfield, adjacent to a cliff road, providing ease of movement for German guards and prisoners around the island. Sylt's initial purpose was to house 100-200 political Eastern European prisoners, mostly Ukrainians (Bonnard, 1993; WO311/106). The camp exceeded capacity in 1943, forcing accommodation of up to 1,000 prisoners (Pantcheff, 1981; Freeman-Keel, 1995). Between January (1942) and March (1943), Sylt's operations were coordinated by the OT, who housed prisoners and forced labour workers in the camp (Bonnard, 1993; Bonnard, 1991; Pantcheff, 1981). These OT prisoners were responsible for fortifying Alderney's defences and continue development of the Atlantic Wall (Bonnard, 1993; Pantcheff, 1981).

By 1942, five barracks had been constructed at Sylt (NCAP: ACIU/RB/0463/3919), and the camp's security comprised guarded gateposts with 'its perimeter surrounded by coiled concertina barbed wire' (Steckoll, 1982: 72; Pantcheff 1981: 6). Eyewitness testimony by German private Gerhard

Nebel described island conditions in 1942 as 'worse than average' (Cruickshank, 1975: 174). Johann Burbach, a German officer, witnessed two naked corpses loaded into a National Socialist Motor Corps (NSKK) vehicle at Sylt in December 1942, describing the bodies as 'completely emaciated, consisting only of skin and bones' (WO311/13).

5.1.2 Sylt: SS Concentration Camp

In September (1942), the *Schutzstaffel* (SS) Baubrigade I was established with male prisoners from Sachsenhausen concentration camp (Germany) (Megargee, 2009), comprising 500 'Russians', 180 Germans, 130 Polish, 60 Dutch, 20-30 Czechs and 20 French (Pantcheff, 1981; WO311/13). Initially, Baubrigade I was tasked with deactivating unexploded bombs, and air raid debris removal (Ibid). In March 1943, Baubrigade I was transported to Alderney and housed at Sylt, with prisoners assisting the construction of Alderney's fortifications, working alongside the OT (Bonnard, 1991; WO311/106). An exchange in command of Sylt occurred between the OT and SS in late March (1943), transformed Sylt from a labour to a concentration camp, thus becoming a sub-camp of Neuengamme concentration camp (Germany).

In January 1943, prior to the arrival of the SS, construction at Sylt commenced (Sturdy Colls & Colls, forthcoming). By early March 1943, Baubrigade I prisoners were transported from St Malo in northern France to Alderney (Bonnard, 1991). Upon arrival at Sylt, only four barracks were erected, and the camp's security comprised a wire fence and gateposts displaying the words '*SS-Lager Sylt*' (Kukuła, 1999; Bonnard, 1993; WO311/11). To continue construction, in early 1943 Sylt's boundaries were extended to incorporate 10 additional structures (ACIU/E/0182/4110). Former prisoner Ivan Kolchanov explained, 'at the beginning, they only worked inside the camp. They levelled the ground, covered the wall with stones and repaired the square. After that, the striped[27] surrounded the camp with a new barbed wire fence and constructed watch towers at the corners' (Bonnard, 1991: 75).

Initially, prisoners constructed: the SS structures, extended the camp's boundaries, increased the security features and most importantly built the Commandants, Maximilian List, Tyrolean style accommodation (Kukuła, 1999; Pantcheff, 1981; WO311/11). Throughout construction, Sylt was split into two separate compounds: a prisoner section and an SS section. Increased security measures were further heightened through strict camp access, with a sign attached to the prisoner gateposts stating access was only granted by Sylt's Commandant and entry was only permitted in his presence (Bonnard, 1993; Bonnard, 1991; Steckoll, 1982; Pantcheff, 1981).

By August 1943, Sylt was at the height of expansion. Following the exchange in command in March 1943 and an influx of prisoners, the camp was extended with an additional 25 structures, to

[27] The 'striped' was a term used to describe the concentration camp prisoners, due to wearing striped 'uniforms' (Section 5.1.3).

house 880 prisoners (Bonnard, 1993; Pantcheff, 1981). These structures mainly consisted of wooden barracks, similar to other barracks erected throughout European concentration camps. However, several structures located within the SS section of Sylt were constructed from concrete, protecting the perpetrators from aerial attacks and the climate.

5.1.3 Prisoner Treatment & Atrocities

From March 1943, Sylt was under control by the *Totenkopfverbände* (Death's Head Unit), one of three constituent groups which formed the *Schutzstaffel* (SS). This specific Nazi paramilitary organisation was tasked with overseeing concentration and extermination camps operations (Mann, 2014). The *Totenkopfverbände* specialised in acts of dominance and brutality were distinguishable from other SS units through a skull badge displayed on their caps, and a Death's Head insignia upon the right collar of their uniforms (Ibid). Appendix 'H' of the military report, 'Reports on Atrocities committed in Alderney (1942-1945)' outlined the organisation of (SS) Baubrigade I, listing 29 different 'personalities' at Sylt (WO311/13). Names frequently mentioned throughout eyewitness testimonies included: Sylt's Commandant Maximilian List, who 'gave orders to guards as to brutal treatment of prisoners…and [was] therefore, ultimately responsible' (WO311/13); Sylt's replacement Commandant (1944) Georg Braun, who 'advised guards to shoot instantly if an inmate dared to break the ranks when marching' (Ibid); *Obersturmführer* (Senior Storm Leader) Kurt Klebeck leader of the SS guards; and *Scharführer* (Sergeant) Hegelhohe, commander of SS guards, who 'gave a bonus of 14 days' leave, extra food and drink to SS guards for every 5 dead prisoners' (WO311/13).

Lager Sylt prisoners were distinguishable from other island prisoners by wearing blue and white striped pyjama uniforms (Bonnard, 1993; Pantcheff, 1981) (Figure 5.2). Prisoners were identified by a number displayed on their uniforms and further categorised by offence, through wearing different coloured triangle symbols on their sleeves (Pancheff, 1981; WO311/106). These triangles denoted the offence committed, which could include: (green) habitual criminals, (red) political prisoners, (black) work-shy prisoners, (pink) homosexuals and (purple) conscientious objectors (WO311/106). Each morning prisoners woke at 5 am, cleaned the barracks, ate breakfast, attended roll-call and arrived back at the camp between 6-7pm each evening, following forced labour duties (Bonnard, 1993).

Forced labour lasted an average of 12 hours per day, seven days a week, however, eyewitness accounts also describe instances of prisoners working beyond 24 hours (Bonnard, 1993; Pantcheff, 1981). Commonly, forced labour comprised agricultural and construction works (Figure 5.2). Prisoners regularly encountered brutal acts by SS guards and the OT farm commander Hubert Rigner (Bonnard, 1991). Eyewitness accounts describe prisoners being beaten for planting produce to far apart alongside being tied to the farm gateposts and savaged by dogs (until unconscious) for

no apparent reason (JAS L/D/25/L/52; WO311/106). Accounts further describe SS guards shooting prisoners for wearing bags to protect their feet (JAS L/D/25/L/65). The prisoners were also reported to lack physical strength and stamina to perform intensive tasks, with individuals 'dropping from complete exhaustion' (WO311/106). As a consequent of 'unsatisfactory' work, including insufficient progress or moving from a designated space, prisoners encountered beatings (Bonnard, 1993; WO311/106).

The SS assigned certain prisoners the role of Kapo, which required undertaking supervision and discipline duties against other prisoners (Bonnard, 1991; Steckoll, 1982; Pantcheff, 1981). The Kapos ensured prisoner work was conducted accordingly, and if work was considered unsatisfactory then they would inflict punishment (Pantcheff, 1981). If such punishment was not conducted with sufficient brutality, the Kapo would be replaced. To encourage severe acts of brutality, Kapos were rewarded with 'a room to himself with a soft bed and white linen' (WO208/3629). By using prisoner Kapos, the SS created hierarchies and mistrust amongst the prisoners, and also required fewer SS guards to monitor prisoners. Eyewitness testimony often described German prisoners receiving preferential treatment similar to Kapos (WO311/13). These prisoners were not trusted by other prisoners, who warned 'not to make friends' [with them] (Bonnard, 1991: 68; Steckoll, 1982; Pantcheff, 1981). The prisoners slept in overcrowded barracks, with approximately 150 individuals per barrack (Bonnard, 1993). Prisoners received inadequate sleeping materials consisting of only a straw blanket, which was often infested with lice (Steckoll, 1982).

Camp brutality is frequently described throughout both prisoner and Nazi testimonies. The gateposts were a favoured punishment location with accounts detailing prisoners being strung to gateposts for days and whipped (Bonnard, 1993; Steckoll, 1982; Pantcheff, 1981; WO208/3629). Several Nazi testimonies describe the SS guards using bloodhounds to force prisoners through security fences, who were then shot through an attempt to 'escape' (Bonnard, 1993; WO311/106). The SS documented many prisoner deaths as 'suicide', but in reality, these were executions (Bonnard, 1993). The several accounts describing prisoners escaping, also explained that these prisoners often returned to Sylt, due to being on a remote island which lacked transportation and was denuded of food (Pantcheff, 1981; WO208/3629).

Sylt prisoner rations consisted of: bread 700g (daily), meat and sausage 800g (weekly), butter, lard and marmalade 35g (daily), sugar 30g (daily), cooking fats 15g (weekly), potatoes 1400g (weekly), fresh vegetables 1200g (weekly), four cigarettes (daily), skimmed milk 0.3 litres (daily), coffee 9g and tea 9g (daily) (WO311/13). These rations were not actually received by the prisoners, as testimonies explained that the SS used food as a form of control. Complaints of prisoner under-nourishment were often reported by OT staff to German headquarters, as prisoners lacked the

physical strength to perform the required labour duties (WO208/3629). A German officer's testimony explained how he was punished for providing concentration camp prisoners with bread which was forbidden (WO311/106; WO208/3629). Accounts describing prisoners collapsing from under-nourishment explained that these individuals were never seen again (WO311/13). Consequently, prisoners frequently fought amongst themselves for the food, with scenes described as 'terribly brutal' (Ibid). Prisoners caught scavenging were also punished, by being beaten or hung (Steckoll, 1982: 76; WO311/106; WO208/3629).

Prisoner rations were stolen by SS guards, who either ate, sold, traded or kept the supplies. This is apparent through testimonies that reported cheap meals could be acquired by other island soldiers at the SS canteen (Bonnard, 1993; Pantcheff, 1981; Cruickshank, 1975). Franz Docter (a port supervisor) instructed to establish a distillery at the SS canteen, explained that stolen food often received large profits (WO311/13). SS entertainment events held at Sylt often served food beyond the allocated rations, which was never questioned by attending German officer's (WO311/11). Sylt's Commandant, Maximillian List, was investigated by German military police, who found 'whole chests full of sugar, lard, dripping, bacon' (Bonnard, 1993: 175). However, insufficient food supply to prisoners was most evident through the 'emaciated' bodies of the deceased Sylt prisoners (WO208/3629). Any sick prisoners did not receive food rations (WO311/13).

Prisoners requiring medical attention were 'treated' within Sylt's sickbay, which was operated by the prisoners themselves, and therefore, was performed through insufficient medical equipment and knowledge (Pantcheff, 1981). An account by a German Air Force medical officer described offering the SS prisoners medical supplies, which was refused by the SS guards (Pantcheff, 1981; WO208/3629). The SS provided the Sylt doctor with pre-printed death certificates, labelling the cause of death as 'faulty circulation or heart failure' (WO311/13). In many instances, the island doctors were not permitted to view the deceased bodies but instead instructed by the SS to sign the death certificates (Pantcheff, 1981; WO311/13). During the SS's command of Sylt, a typhus epidemic occurred which killed between 30-200[28] prisoners (Steckoll, 1982; WO311/13). Due to the volume of deaths, infected prisoners were transported from the island (WO311/13; WO311/106). Any Eastern European prisoners that became sick were carried outside of the camp's boundary and shot (Steckoll, 1982).

Deception surrounding deceased prisoners at Sylt is highlighted through the pre-printed death certificates, a false bottom coffin and inconsistencies within the 'Russian' cemetery graves (Figure 5.2). Pantcheff explained that the SS 'were not accountable outside their own services', thus, documentation of the deceased was not held to account in a similar manner as the OT (Pantcheff, 1981: 68). A 'Russian' cemetery was established on Longy Common, as a burial site for all

[28] The variation between the number of deceased is attributed to the SS's burial and documentation inconsistencies.

prisoners on the island (Figure 5.2). During a British military investigation of Alderney in 1945 (Section 5.2.1), it was concluded that multiple burials had occurred within a single grave, owing to a discovered false bottom coffin; which was large enough to hold multiple bodies (Figure 5.2). Many discrepancies at the cemetery were discovered, including: 22 instances where the same name and date of birth was inscribed on headstones (wooden crosses); graves not arranged chronologically; exhumed graves containing one body, but two names on headstones; alongside names from documented deaths not appearing on wooden crosses (Pantcheff, 1981). Major Pantcheff stated, 'German records in Alderney were so confusing', contradicting 'traditionally renowned...meticulous and efficient administration' (Sturdy Colls & Colls, forthcoming; Sturdy Colls, 2012; Pantcheff, 1981: 70).

Numerous eyewitness accounts described Sylt prisoner burials. German Corporal Taubert described emaciated Sylt prisoners buried at the cemetery using a false bottom coffin on different occasions (WO311/13). German Officer Richter recalled orders to inscribe unmarked cemetery gravestones, long after burials had occurred (WO311/13). German Officer Hoffman explained that rows 5-7 within the cemetery were dead bodies from the concentration camp (WO208/3629). Franz Docter described being informed that between March and November (1943) 140 Sylt prisoners died (WO311/13).

Despite speculation regarding the deaths on Alderney and Sylt during Nazi occupation (Steckoll, 1982; DailyMail.co.uk, 2017; Sun.co.uk, 2017), many accounts refer to concentration camp prisoners being killed during forced labour and pushed off cliffs. Therefore, countless undocumented deaths may have occurred (Bonnard, 1993; Pantcheff, 1981). However, former Sylt prisoner Otto Spehr provided British military investigations with the master deaths record of Sylt prisoners, taken from Neuengamme concentration camp (Pantcheff, 1982). Although these documents were incomplete, they display that 103 prisoners died between March 1943 to February 1944. However, as 437 bodies were discovered in marked graves on Alderney, one may reasonably assume that it may never be known how many individuals died at Sylt concentration camp (Bonnard, 1993; Pantcheff, 1981). A document dated 10th May (1944) titled 'Not to Fall into Enemy Hands' states that in the threat of invasion 'in no circumstance will prisoners be allowed to fall into the hands of the enemy' (WO311/106).

***Figure 5.2**: (**Top left**) Sylt prisoners working at a farm (AMA 07/726). (**Top right**) A false bottom coffin discovered during a 1945 investigation (© Trustees of the Royal Air Force Museum PC98/173/6057/7). (**Bottom left**) The 'Russian' cemetery located on Longy Common (Alderney) (© Trustees of the Royal Air Force Museum PC98/173/6057/8).*

5.2 Post-Liberation Investigations & Contemporary Landscape

Since the disbandment of Sylt (1945), several investigations commenced endeavouring to decipher the former atrocities for prosecution purposes. DBA highlighted that the British military was aware of Sylt's construction as early as 1943, from a British military map displaying 15 camp structures (WO311/13) (Figure 5.3). This is further corroborated by several Royal Air Force (RAF) aerial reconnaissance images taken between 1942-1944, displaying the camp's gradual construction (NCAP: ACIU/RB/0463/3919; ACIUM D/969. 542 DQDN.F/20"/4041; ACIUM/106G/K/0124/4029) (Figure 5.3). The following text outlines two post-liberation British military investigations at Sylt in 1945, with the 'official' narrative formed from the findings of one investigation, whilst dismissing claims from the other. This section further addresses Sylt's use since 1945 and its condition.

5.2.1 Post-Liberation Investigations

Upon the liberation of Alderney on 16th May (1945), the atrocities committed against the forced labourers were investigated by Brigadier Snow, Major Haddock and Major Cotton (WO311/106). The two-day investigation headed by Major Cotton revealed that Sylt was initially constructed to inter Eastern European prisoners, and in 1943 was 'controlled by the S.S. for political, homosexual, conscientious objectors etc, prisoners of all nationalities' (Ibid). The document further described Sylt's dismantlement, with materials being used elsewhere on the island for 'defence works' (WO208/3629). The investigation deriving from eyewitness testimonies describes the atrocities occurring as Sylt, specifically beatings, dog attacks and shootings (WO311/11). The investigation

discovered the ‘Russian’ cemetery on Longy Common, false bottom coffin (Pantcheff, 1981; WO311/13), and details that Western and Eastern European prisoners were housed at Sylt (WO311/106).

In June 1945, at the request of the British War Office, Major TXH Pantcheff assumed control of Alderney’s investigations. Accompanied by Major Gruzdev from a Russian investigative team, interviews were conducted with approximately 3,000 individuals, from survivors, bystanders, and members of the German forces (Pantcheff, 1981). The investigation revealed accounts of brutality and murder, although, no prosecutions commenced (Pantcheff, 1981). Pantcheff's investigation dismissed the prisoner nationality claims disclosed within Major Cotton's investigation (Ibid), which subsequently, resulted in Longy Common cemetery being labelled as purely ‘Russian’ (Bunting, 1995).

In 1981, Pantcheff published 'Alderney Fortress Island' based upon his 1945 investigation, which became the ‘official’ historical narrative of Sylt. The literature explained that ‘Alderney has a human story to tell that has yet only been told incompletely, piecemeal and sometimes with distortion’, and this publication puts ‘flesh on the concrete skeleton...and breathes life into it’ (Pantcheff, 1981: 2). Pantcheff’s publication only dedicates 11 pages to Sylt’s history, ‘downplays’ the atrocities and extent of prisoner brutalities and dismisses significant findings from Major Cotton’s investigation, specifically, the diversity of Sylt’s prisoner nationalities (Carr & Sturdy Colls, 2016; Pantcheff, 1981; WO311/13). Sturdy Colls (2012), suggests this may be to justify the non-existent criminal prosecutions following the investigations.

Since 1945, several former Sylt prisoners have attempted to disseminate details about the camp. Former Sylt prisoner Kukuła explains, ‘the British Authorities didn't bother much about the crimes committed on Alderney, they would have preferred it if no-one knew of the camp…after the war, I tried to get a memorial erected on the site [Sylt]…but the authorities would not permit it. Criminal proceedings were started against Klebeck and Hegelhohe after the war…but when Germany took over the political power…they were all given amnesty’ (Bonnard, 1993: 176). After being evacuated from Alderney in 1944, former Sylt prisoner Otto Spehr worked for the BBC's German radio service. During broadcasting, Spehr spoke about Sylt and was consequently reprimanded, as ‘the British did not want to know that there had been a concentration camp on British soil’ (Barkham, 2017: 46). Although publicly accessible literature exists describing Sylt’s history, these texts downplay atrocities by sparingly describing prisoner nationalities brutalities and deaths (Carr & Sturdy Colls, 2016); for example, Forty, 2005; Saunders, 2005; Bonnard, 1991; Pantcheff, 1981; Wood & Wood, 1980; Cruickshank, 1975; Packe & Dreyfus, 1971. Other literature focuses on the Nazi military and architecture (for example, Partridge & Davenport, 1993), failing to acknowledge

the prisoners themselves, who built these fortifications using inadequate tools, clothing, and through the loss of lives.

***Figure 5.3**: (**Top left**) Aerial reconnaissance of Sylt July 1942 displaying five structures (NCAP ACIU/RB/0463/3919). (**Top right**) Aerial reconnaissance of Sylt January 1943 displaying 16 structures (NCAP ACIUM D/969. 542 DQDN.F/20"/4041). (**Bottom left**) Aerial reconnaissance of Sylt July 1944 26 (NCAP ACIUM/106G/K/0124/4029). (**Bottom right**) British home forces map 1943, displaying 16 structures Scale: 1:10.560 (WO311/13) (G.S.G.S).*

5.2.2 Contemporary Landscape

Sylt's current appearance is far removed from the atrocities described above. Concealed by overgrown vegetation, the only obvious physical reminders of the concentration camp are the gateposts leading to the prisoners' compound, several concrete bunkers and a tunnel from the prisoner's compound to the Commandant's villa. Although a small commemorative plaque is displayed on the gateposts, no information boards or preserved heritage exist. Carr (2014), highlights that 'drawing attention to dark histories is never a comfortable thing for any community…the established narrative of occupation in the Channel Islands fears accusations of collaboration above all else, and this has led to a lack of local questioning of, or research into, potentially sensitive subjects for the first 50 years after liberation' (Carr, 2014: 142). However,

research into Alderney's occupation highlights that these sensitivities have continued for several more decades (Sturdy Colls & Colls forthcoming; Alderney Press, 2017; BBC.co.uk, 2017a; Sturdy Colls, 2015).

Many Alderney islanders refer to Sylt as 'wasteland', which is rather in keeping with the site's appearance. During the 1960s, a building constructed within the prisoner's section of Sylt was positioned over the location of two former prisoner barracks. The building housed and provided airport direction finding equipment, which is located adjacent to the camp (Pinnegar, 2010). Currently, the dilapidated building stores agricultural equipment. In 2008, at the request of former prisoners, a memorial ceremony was held at Sylt commemorating those imprisoned between 1942-1945 (Carr, 2012). A small memorial plaque was attached to the middle gatepost of the prisoner's section of the camp by survivor Sylwester Kukuła (Ibid). The plaque reads, 'these gate posts mark the entrance to the former German Concentration Camp "S.S Lager Sylt" some 400 prisoners died here between March 1943 and June 1944. This plaque was placed here by ex-prisoners and their families 2008'.

Since 2015, the States of Alderney[29] has been reviewing Sylt's historical status requesting the site to be listed on the Register of Historic Buildings and Ancient Monuments record, to 'prevent development and further damage to the surviving remnants of the camp structures' (The States of Alderney, 2016: 3; BBC.co.uk, 2015). During committee discussions on Alderney, two politicians voted against classifying Sylt as a 'conservation area', with another member stating, 'economic independence for the island…lies in approving a £500m [million] electricity cable project linking France and Britain through the island, not in promoting its wartime occupation' (BBC, 2017). Other State members argue the potential for tourism, which may be increased if Sylt was transformed into a heritage site. Incorrectly, the Visit Alderney website labels Sylt as a 'labour camp…holding Jewish prisoners' (VisitAlderney.com, 2018a).

During a States of Alderney meeting in March (2015) a committee member stated, 'if there were buildings or something there worth conserving I might have a different opinion on it; but there is nothing, apart from a broken old wash trough, I presume it was, and a load of brambles' (Kelly, 2015: 41). Another States member responded, 'there is a little bit more there than just the trough. I think some of us who have actually seen the site realise that there is a substantial amount there that is a little more than just one single item; and in fact, although the site still is quite wild, there is certainly a lot more there than just the trough' (Kelly, 2015: 42). Although extensive evidence clarifying the surviving features at Sylt has been made apparent through the Centre of

[29] The States of Alderney comprises ten members and a President, who form the parliament and legislature on Alderney (Alderney.Gov, 2018).

Archaeology's archaeological fieldwork, certain members of the States of Alderney still dismiss these claims.

5.3 Embedded Narratives

After the Second World War, Sylt became public knowledge through media reports, resulting in rumours circulating about the existence of gas chambers on Alderney (Megargee & White, 2018). Quashing these claims, the findings from Pantcheff's 1945 investigation were publicised, presenting a less atrocious version of events (Ibid). Subsequently, Sylt's narrative became distorted and forgotten. Much literature surrounding Sylt's presence, describes the camp as 'destroyed', 'dismantled' or 'burnt' with gateposts and an underground tunnel only remaining (Forty, 2005; Saunders, 2005; Bonnard, 1991; Steckoll, 1982; Pantcheff, 1981; Packe & Dreyfus, 1971). An exhibition in Alderney's Museum, states, 'the gate pillars in the centre are all that now remains' (Figure 5.4). With a lack of clarity between the historical record and 'official' narrative, much sensationalist literature has emerged, such as Steckoll (1982), alongside contemporary press articles.

In 2017, several unsupported articles published by Kemp and Weigold claimed that 'up to 70,000 people could have been killed on the island' including Sylt prisoners; and that underground tunnels beneath Alderney were constructed to launch chemical weapons at the UK during World War Two (BBC.co.uk, 2017). The Daily Mail also published articles, with the headlines, 'Posing outside Lloyds Bank: The Nazi monsters who murdered thousands in BRITISH camps' (Dailymail.co.uk, 2017) and 'Hitler's British death island: Astonishing story of how the Nazis murdered 40,000 people in Channel Island concentration camps - and planned to blitz the South Coast with chemical weapons' (Dailymail.co.uk, 2017a). Endeavouring to combat these unsupported articles, islanders Trevor Davenport and Andrew Pantcheff (the son of TXH Pantcheff), requested that the British government release all archive materials relating to Alderney's occupation (BBC.co.uk, 2017a; ITV.com, 2017).

Examples of further inconsistencies derive from defining Sylt's camp type, as either a labour or concentration camp. The States of Alderney tourist map described the camp as 'Site of Lager Sylt'[30] (Figure 5.4). The Alderney Museum describes Sylt as a labour camp throughout exhibition boards (Figure 5.5), The United States Holocaust Memorial Museum Encyclopaedia of Camp and Ghettos (1933-1945 Vol. III), describes Sylt as a concentration camp, whereas Steckoll's 1982 literature is titled 'The Alderney Death Camp'. This contrasts an Alderney Museum exhibition board, which states, 'the suffering within Camp Sylt has been well documented, but it was not a death camp' (Figure 5.4); with a conflicting plaque dedicated only to Soviet citizens directly

[30] Although, mentions of Sylt have been removed from current versions of the States of Alderney map.

underneath stating, ‘it is almost impossible to calculate the exact number of labourers who died on Alderney during WW2. Almost 400 dead were listed in the cemeteries, 100 of whom were internees of Camp Sylt’ (Figure 5.5).

***Figure 5.4**: (**Top**) A States of Alderney map labelled as the ‘Site of Lager Sylt’ (Scale 1:10) (authors own photograph). (**Bottom**) A plaque dedicated to the Soviet citizen's deaths that occurred at Sylt (authors own photograph).*

The variations between Sylt’s camp category and wording throughout the museum (for example, victims referred to as ‘labourers’) the author considers these representations a method of distancing Alderney from past atrocities. These views are partially reflected within Alderney’s society, as

demonstrated during 2015 archaeological fieldwork when the author was asked by a local BBC employee, 'why are you bothering to investigate it [Sylt], it's hardly a death camp'. They are further reflected through the States of Alderney commemorative 'homecoming days' (VisitAlderney.com, 2018b) and Alderney Museum exhibitions, which emphasize the struggles encountered by returning post-war islanders alongside the destruction of Alderney, far greater, that victim atrocities. Sturdy Colls (2015: 78) highlights the complexities of undertaking archaeological investigations 'where such [narrative] contestation exists, particularly where it has developed over a long period of time…where sensationalist narratives have already been developed and where these have been contested by those who have maintained the official histories to date'.

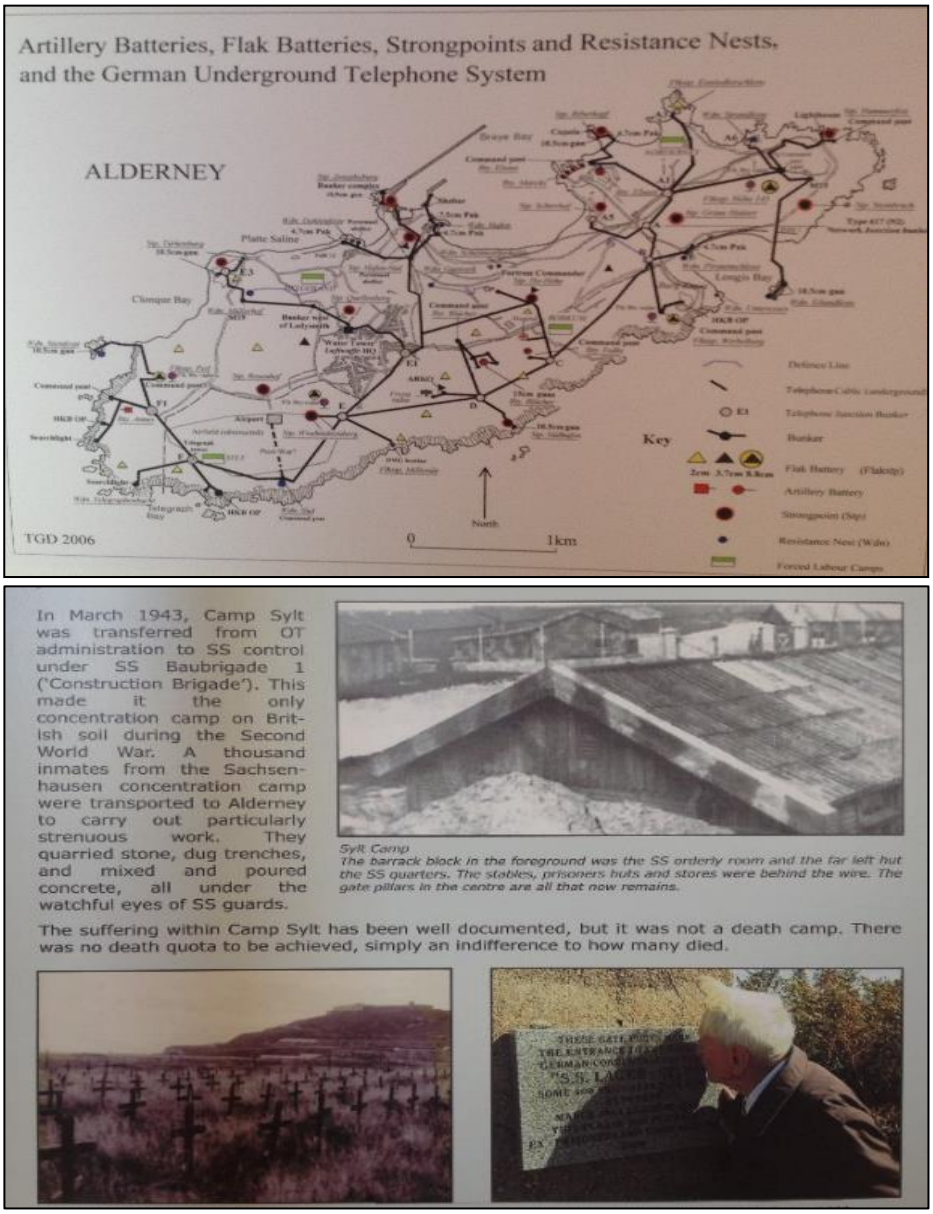


***Figure 5.5**: Alderney Museum exhibitions - (**Top**) The key from a map of Alderney describes Sylt as a forced labour camp (authors own photograph). (**Bottom**) Text underneath the image of Sylt barrack reads, 'the gate pillars in the centre are all that now remains' (authors own photograph).*

5.4 Forensic Archaeology Investigations

The author's undergraduate research aimed to clarify the existence of remaining structures and manmade features at Sylt. Prior to visiting the site, DBA commenced acquiring the source materials outlined in Chapter 3 (Section 3.2). To identify the survival of any landscape features, non-invasive methodologies were applied including: fieldwalking, topographic survey, geophysical survey and site documentation (Kerti, 2013 unpublished). Fieldwalking entails multiple benefits including: determining access restrictions, equipment limitations (such as interference) and can identify areas of interest (for example, vegetation irregularities). The extensive vegetation growth, covering three-quarters of the camp, required clearance allowing further interpretation of potential landscape features. Topographic and geophysical surveys were conducted using an Electronic Distance Measurer (EDM) and Global Positioning System (GPS), which allowed landscape surface features to be accurately recorded (Ibid). Alternative forms of site documentation derived from a photographic record (128 images), physical measurements of features, alongside archaeological plan drawings. Due to the extensive vegetation growth and time restrictions, only three-quarters of the camp was investigated.

In total, 37 landscape features were recorded during this survey, providing an understanding regarding how prisoners and perpetrators lived, died and survived (Sturdy Colls, 2015), alongside how the landscape and structures were used to enforce dominance and control. This data was overlaid onto historic and contemporary aerial images, assisting interpretation of the discovered features. The topographical and geophysical datasets were sustainably used to create accurate 2D and 3D site plans. By combining this data with DBA aerial reconnaissance photographs, an increase in security measures is observed from the exchange in command between the OT to the SS (1943). For example, Sylt became divided into two different compounds allowing greater prisoner confinement, sentry pill posts were positioned around the camp, within line-of-sight of one another, and all security measures surrounding the prisoners compound were heightened (Bonnard, 1993; Pantcheff, 1981).

5.4.1 Materials & Data Representation

The application of archaeological methodologies revealed landscape features either forgotten, unknown or previously considered destroyed, displaying the vital role that the Centre of Archaeology and the author's research performs in interpreting Sylt's past. Upon visiting the site, many concrete platforms, bunkers and structures are now apparent within the landscape, from vegetation clearance performed during investigations. The significance of the site remains separated from public understanding through being partially overgrown with no 'heritage management strategy in place to protect the sites connected to the occupation or to disseminate knowledge about them' (Sturdy Colls & Colls, 2013: 120). This, therefore, prompts alternative

dissemination approaches to be undertaken that provide commemoration and education of Sylt's past.

Chapter 3 (Section 3.2) outlined the extensive Sylt datasets acquired from DBA and fieldwork methodologies. Although, several issues arose prior to representation, including: how could the site be adequately represented, given its overgrown nature? How could conflicting historical testimonies can be displayed? Additionally, only three-quarters of the site had been investigated using non-invasive methodologies (thus lacking personal material culture). Throughout DBA, limited historical photographs were discovered displaying the site's former spatial and aesthetic appearance. Further representation complexities derived from knowingly raising awareness of sensitivities such as Sylt's unique location, being outside of *Lebensraum* territory (Eastern Europe) (Giaccaria & Minca, 2016), thus, highlighting Britain's knowledge of the Holocaust (pre-1945) (Section 5.2). Challenging of the 'official' site narrative was also considered potentially problematic to the author, with those familiar with Sylt maybe biased towards the existing narrative.

5.5 Forensic Archaeological Fieldwork & Public Responses

Prior to conducting 2015 thesis fieldwork, the author contacted different archives to acquire further historical sources, building upon the 2013 DBA collection (Chapter 3 Section 3.2). The Alderney Museum Archives (AMA), never responded to the author's email, telephone and post requests. Any contact with the museum was abruptly halted with verbal agreements ignored. Therefore, the author could only acquire materials from the museum through visiting Alderney and viewing exhibition stands.

During fieldwork, the author was approached by a male on a bike claiming to be undertaking daily exercise, although the author deemed this unlikely given the jeans, jumper and leather jacket worn. A conversation ensued, with the gentlemen enquiring as to the nature of fieldwork, presenting himself as a local with a historical interest in the camp. However, a closing comment from this local stated that the permission for investigation only permitted non-invasive work; suggesting greater knowledge about the fieldwork than he led the author to believe.

Similarly, in 2017, the Centre of Archaeology arrived on Alderney accompanied by a television film crew, to create a forensic archaeological documentary surrounding Alderney's occupation. One aspect of fieldwork focused on excavating Sylt's toilet block. Prior to arrival, permissions between the Centre and private landowners were granted. However, permissions became obstructed by the States of Alderney on the first day of arrival. Eventually, following discussions, the States of Alderney granted revised permissions for non-invasive photogrammetric surveys only. This comprised photographic capture of the gateposts and Commandant's tunnel, which any tourist

would be entitled to perform. During data collection, several people could be seen amongst the vegetation, and static radio receivers heard. It became apparent the site was being monitored and recorded.

Additional hostility encountered during fieldwork was presented in an article published by the Alderney Press[31]. This article, written by an islander stated, 'when I hauled the body parts...to the harbour for shipment, they were all dead quiet, so they are not going to make a noise now or care. Whatever their religion, they were dead, end of story, and now gone home, and the land belongs to Alderney, not them...I do not want vandals, supposedly in the name of the Alderney Museum, entering onto my land and property to collect WW2 items, taking it upon themselves to clear overgrown entrances, to gain access. I want them left overgrown, to deny access to everybody until they are completely hidden'. (Alderney Press, 2017: 15). Interestingly, this account highlights existing sensitivities of living memory and trauma experienced by a local.

5.6 Questionnaire Surveying: Alderney

To further understand the sensitivities between Sylt and Alderney's inhabitants, a questionnaire survey was conducted in 2015 amongst the local community. This questionnaire survey endeavoured to ascertain individual perspectives about Sylt and identify any potential future consequences for the community as a result of disseminating the 'Explore Lager Sylt' platform. The following text outlines the methodological approach and results from qualitative surveying.

The justification for the application of qualitative research methods has been outlined in Chapter 3 (Section 3.4), alongside the use of questionnaire surveying methodologies (Section 3.4.4). Questionnaire surveying within archaeology has been broadly conducted within fields such as community archaeology (Simpson & Williams, 2008; Ramos & Duganne, 2000), public archaeology (Matsuda, 2004; Pokotylo & Guppy, 1999) and forensic archaeology (Sturdy Colls & Branthwaite, 2018), to acquire first-hand perspectives through primary data.

5.6.1 Questionnaire Survey Design

The questionnaire survey conducted amongst Alderney's population comprised four closed and three open-ended questions, alongside an additional comments section (Appendix 8). The closed-ended questions sought information concerning participants age, residency period, if they have ever used digital heritage resources (generally), and whether these resources provide useful educational tools. The open-ended questions endeavoured to understand the impact of living within a former Third-Reich landscape, whether a digital heritage resource can replace a site visit and what potential effects may derive from disseminating the 'Explore Lager Sylt' platform.

[31] A local publication released fortnightly presenting local news.

The participants were provided with an outline of the research aims and a project sheet detailing further information (for example, contact details). Each participant was required to sign a consent form, outlining that the survey results may be included within the author's thesis. All participants were informed of anonymity through identifier codes (Chapter 3 Section 3.4.1) (for example, S1, S2, etc).

In total, 12 questionnaires were completed comprising six male and six female participants. Participant age ranges varied between 29-39 (*n*=2), 40-50 (*n*=3) and 51-69 (*n*=7). Five participants had lived on Alderney since birth, three for 20 years and four for ten years. Table 5.1 outlines the composition of participants. The data deriving from questionnaire surveying was analysed through grounded theory and thematic analysis methods (Chapter 3 Section 3.5). The use of Nvivo© software-assisted data coding, allowing themes to be identified, organised and categorised.

Table 5.1*: Questionnaire surveying on Alderney - participant composition.*

Gender		**Age**			**Residency Period**		
Male	Female	29-39	40-50	51-69	Since birth	20yrs	10yrs
6	6	2	3	7	5	3	4

5.6.2 Results

The qualitative hierarchy displaying the questionnaire's themes and nodes are presented in Table 5.2. Overall, the themes: Third Reich connotations, Educational Tool, Dissemination and Tourism were coded throughout questionnaire data analysis.

Table 5.2*: Themes, parent and child nodes coded from the Alderney questionnaire survey.*

Theme	**Parent Node**	**Child Nodes**	**Sources**	**References**
Third Reich Connotations	Ancestry		1	1
	Fortifications		1	1
	Indifferent		1	1
	No		3	3
	Positive		2	2
	Yes		5	5
	Community (Differences)		7	8
Educational Tool	Yes		12	12
Dissemination			4	7
	Museum		1	1
	Education		2	2
	Enhance Awareness		2	3
	Negative		3	3

	No		3	3
	Positive		5	5
	Yes		2	2
Tourism			6	6
	Replace Site Visit	Enhance Visit	4	4
		No	7	7
		Yes	2	2

Participants were asked if they believed there were any issues (or controversy) deriving from living in a former Third Reich landscape, with five participants agreeing and three disagreeing. One participant mentioned ‘a military landscape’ as fortifications appear all around the island but explained that this was not personally viewed negatively. Another participant explained that there is much interest regarding Alderney's occupation which should be ‘researched and presented to a new audience’ (participant S10).

Seven participants addressed community and individual island tensions attributed to Nazi occupation. One participant stated, ‘there are some locals that are descendants of some German soldiers that were here, so there are ties even with some of the Alderney people’ (participant S1). Although participant S8 explained, ‘local opinion is very split with some 'pro' promoting WWII camps and others wanting it ignored’.

Participants were asked if they believed any positive or negative effects may ensue from disseminating a Sylt digital heritage resource. Three negative responses were coded from this question, which participant S8 summarises, ‘locally - particularly due to mixed feelings - it could be seen as a negative addition’. Participant S7 further explained, ‘there are people with strong feelings within the community for and against greater publicity for this aspect of Alderney's history and it would be quite difficult to try to reconcile the two’. Participant S2 believed, ‘first [and] foremost Alderney must get Sylt running. Promoting a virtual tour before Alderney is ready, could destroy the whole initiative of this’.

Five responses addressed positive impacts disseminating a Sylt (digital) platform. These nodes mainly comprised the benefits of attracting greater tourism to Alderney. For example, ‘anything that puts Alderney on the map can't be anything but good for the island’ (participant S1). Participant S3 acknowledges, ‘no negative apart from stirring up old memories for some islanders directly affected by the wars. Positive yes if it adds to tourism’.

Participants were asked if they believed that digital platforms could or should replace a physical site visit, with one participant agreeing that it could and another stating, ‘for some people it could, but it might encourage others’ (participant S4). Although seven participants considered that a digital resource could not replace a site visit, participants identified that visits may be enhanced or encouraged through dissemination. Additionally, participant S5 considered that a digital resource

‘at the museum would be an added attraction’. One participant referred to benefits outside of the island's community stating, ‘not replace, but enhance the experience for those who wish to visit or have an interest without being able to visit’ (participant S10).

Many ethical sensitivities became apparent throughout questionnaire surveying. Although many participants greeted the author with enthusiasm, politeness alongside a keen sense to talk about Alderney's occupation, others did not share these sentiments. Whilst conducting surveying the author was approached by a community member, stating it was inappropriate to ask such questions (the questionnaire), and the author was directed from surveying into this individual’s office. After a lengthy discussion ascertaining who the author was and what was trying to be achieved from qualitative surveying, the author was further distracted through being introduced to other island officials. The following day (during archaeological fieldwork), a local commented to the author's supervisor that a student was disseminating ‘propaganda leaflets’ to members of the Alderney community.

The questionnaire responses and attitudes displayed a clear division amongst Islanders concerning Alderney's occupation. Although the majority of participants stated that the occupation formed a significant part of Alderney's history, approximately half of the respondents raised concerns about living memory, regarding individuals alive today, who lived during the occupation. As participant S1 previously described, ‘some locals…are descendants of some German soldiers’. However, participant S10 explained, ‘it is extremely important that this aspect of Alderney's history is handled well - with the appropriate level of respect. No one part of the community (e.g. a voluntary body) should be able to impose a veto on this process going forward. Alderney's history belongs to the community, not to a group of self-proclaimed experts in a local history society’. Interestingly, throughout questionnaire surveying, no participants mentioned the victims or commemoration of events.

5.7 Summary

This chapter outlined the ethical complexities of Sylt concentration camp against the existing literature, DBA and archaeological investigations. Primarily, these issues stem from ‘perception’ of Britain and Alderney’s inhabitants, who both endeavoured to maintain a certain ‘image’ post-1945. Subsequently, two conflicting post-World War Two investigations occurred, instantly distorting Sylt’s narrative (Pantcheff, 1981). Due to inconsistencies between information, Sylt’s narrative became further obscured through speculation (for example, Steckoll, 1982). Because of these issues, limited interpretation or emphasis regarding the camp’s layout and interactions between the landscape and prisoners have commenced. Therefore, although the results from the forensic archaeological examination of Sylt are considered unique, many complexities surrounding dissemination ensue.

Generally, the literature often describes Sylt as being 'destroyed' (Section 5.3) which is concealed by an overgrown landscape (Section 5.2.2). The results from the archaeological investigation (Section 5.4) demonstrated that the literature is incorrect (Kerti, 2013 unpublished). Therefore, potential issues derive from contemplating how the investigative findings can be adequately disseminated, disproving the current literature, despite vegetation concealing structural evidence of the camp. Similar dissemination contemplations exist through endeavouring to display how the Nazis manipulated the landscape, enforcing dominance and control over the victims, whilst the camp was continually adapted between 1942-1944.

Further representation complexities exist through fragmented, conflicting and inconsistent eyewitness accounts. Historical testimonies from perpetrators, victims and bystanders confirm the brutalities inflicted on Sylt prisoners (Section 5.1.3). However, contemporary narratives 'downplay' these atrocities, by focusing on the island's destruction, living under Nazi occupation and difficulties returning to the island (Carr & Sturdy Colls, 2016). Therefore, greater contemplation exists surrounding how to represent alternative and inconsistent accounts. Given the inadequate definitions surrounding Sylt's camp, issues are even apparent regarding describing the camp type (such as concentration or labour) (Section 5.3).

6.0 Case Study: 'Explore Lager Sylt' Platform

Chapter 5 presented an outline of the associated ethical sensitivities surrounding Sylt, ranging from residing between history and living memory to insufficient site commemoration and heritage management. These ethical sensitivities required careful contemplation prior to, and during, the construction of the 'Explore Lager Sylt' case study platform. Many initial concerns derived from the site's current appearance, specifically how the landscape remnants could be adequately conveyed despite extensive vegetation overgrowth. Additional issues regarding the educational value and paucity of information, with the fragmented, inconsistent and conflicting DBA materials.

Chapter 6 explores the ethical sensitivities outlined in Chapter 5 from a (digital) representation perspective, to understand the value of communicating Sylt's narrative through virtual heritage technologies. To guide the development of the case study platform, the London (2009) and Seville (2011) Charters both underpinned the construction of computer-based and multimedia representations; alongside addressing presentation, transparency and authenticity issues. This chapter also presents the qualitative data obtained from focus study groups, interviews and questionnaire surveying conducted with UK secondary schools, USHMM employees and visitors. This data outlines the perceived benefits and limitations of using virtual heritage technologies to present forensic archaeologically-derived Holocaust data. The results of this study are summarised through four key themes comprising accountability, education, communication and presentation.

6.1 Description of the Platform

The 'Explore Lager Sylt' platform, developed by the author, exhibits forensic archaeological data acquired from fieldwork investigations conducted at Sylt between 2010-2015 (Chapter 3 Section 3.2). The platform uses two distinct types of virtual heritage representations, comprising a 360° panoramic photo virtual tour (Figure 6.1) and a series of evidence-based 3D reconstructions. The nine-scene virtual tour displays areas within the SS and prisoner sections of Sylt, as they appeared in 2015. The series of four 3D reconstructions display the quantity and positioning of structures constructed at Sylt in 1942, 1943 and 1944. These structures have also been embedded onto a 2015 aerial image, highlighting the accuracy of the 3D reconstructions against the surviving landscape evidence (Chapter 3 Figure 3.4).

To provide context, both virtual heritage representations present varied multimedia materials, either exhibiting DBA research (for example, archival sources or eyewitness testimony) or archaeological fieldwork data (for example, photographs or sketches). The multimedia types and quantity have been outlined in Chapter 3 (Figure 3.5). The DBA sources form a narrative for Sylt, through alternative perspectives from: victims, observers/bystanders, perpetrators and (post-liberation) investigators. Outside of DBA sources, a narrative is also provided by the archaeological evidence, with video

voice-overs conducted by the author, explaining the significance of evidence discovered during archaeological investigations.

The presentation of the multimedia materials is dictated by the virtual heritage representation type. The virtual tour presents multimedia materials through geotagged points. This visually conveys the spatial relevance of information whilst also providing context into each area within the camp through a non-linear narrative. The 3D reconstructions are presented alongside different multimedia materials, providing explanations regarding the camps gradual construction and spatial layout. These materials are presented through a yearly chronological linear narrative. Supporting these materials, the global navigation bar provides further content. The 'About' tab outlines what and why the project was developed. The 'Infographic' tab outlines the investigative methods used by forensic archaeologists alongside the requirements for non-invasive techniques (Chapter 2 Section 2.2.4). The 'Timeline' tab chronologically displays the camp's gradual construction through text and aerial reconnaissance photographs. Lastly, an introduction video is also presented which outlines the island's Second World War history including evacuation and occupation in 1940.

The platform provides remote (virtual) access to explore Sylt camp, allowing audiences the opportunity to learn about Sylt's history if a physical site visit is unavailable. Currently, Sylt has no heritage management frameworks in place, and thus, the surviving landscape features are concealed by extensive vegetation growth, with no information boards explaining the relevance of each location (Chapter 5 Section 5.2.2). Consequently, the 'Explore Lager Sylt' platform provides greater context and understanding of Sylt's history by comparison to the physical site. The platform provides audiences a clearer view of key landscape features through videos and photographs, from fieldwork vegetation clearance. Additionally, a narrative of Sylt is presented through diverse multimedia formats, which provides an insight into prisoner and perpetrator daily life, by connecting historical sources and testimony to the landscape and surviving structural features. This performs both an educational and commemorative function, addressing issues surrounding the lack of heritage (Chapter 5 Section 5.2.2) and unsatisfactory site commemoration (Chapter 5 Section 5.3).

Figure 6.1*: Scene one of the 360° panoramic photo virtual tour from the 'Explore Lager Sylt' platform.*

6.2 The London Charter (2009) & Seville Charter (2011)

The design, development and construction of Sylt's platform were supported by the London (2009) and Seville Charter (2011). Both charters inform cultural and heritage computer-based representations, with the application of the London Charter (2009: 2) promoting 'intellectually and technically rigorous' visualisations, and Seville Charter focusing specifically on archaeological heritage computer-based visualisations (Lopez-Menchero & Grande, 2011). The London Charter's six principles are outlined in Table 6.1, alongside how they influenced the development of the case study platform. Although the London Charter (2009) has been previously outlined (Chapter 4 Section 4.2), this was in response to critiquing the 'Anne Frank Secret Annex' platform, and thus are readdressed here for clarity.

Table 6.1: *The London Charter's (2009) six guiding principles and construction of the Sylt platform.*

London Charter (2009) Principle	Informed Contribution
Principle One Implementation: '*The principles of the London Charter are valid wherever computer-based visualisation is applied to the research or dissemination of cultural heritage*' (London Charter, 2009: 5)	The London Charter's definition of cultural heritage has been previously outlined (Chapter 4 Section 4.2). The platform conforms to this definition through disseminating materials intended for educational and academic purposes, alongside being a 'heritage site' (London Charter, 2009: 3). Therefore, these computer-based visualisations should incorporate the Charter's principles.
Principle Two Aims & Methods: '*A computer-based visualisation method should normally be used only when it is the most appropriate available method for that purpose*' (London Charter, 2009: 6)	The platform resources two different computer-based visualisations, a 360° panoramic photo virtual tour and evidence-based 3D reconstruction. The virtual tour allows audiences to interpret archaeological evidence within its spatial context and communicate the site's current appearance. Due to overgrown vegetation concealing surviving camp features, a series of evidence-based 3D reconstructions were required. The 3D reconstructions

	display Sylt's spatial characteristics between 1942-1944 and 2015, visualising: the construction of the camp; how victims and perpetrators lived, survived and died (Sturdy Colls, 2015); and how the SS used the landscape and structures to enforce dominance and control over prisoners.
Principle Three Research Sources: '*In order to ensure the intellectual integrity of computer-based visualisation methods and outcomes, relevant research sources should be identified and evaluated in a structured and documented way*' (London Charter, 2009: 7)	All visual information within the platform derived from digital and non-digital sources and data. This information provided context for specific spaces within Sylt (for example, the purpose of a structure) and the appearance of the site between 1942-1945. Principle 3.3 of the Charter (2009: 7) states 'particular attention should be given to the way in which visual sources may be affected by ideological, historical, social, religious and aesthetic and other such factors'. Biases and conflicting perspectives exist between sources (for example, victim and perpetrator testimony). Therefore, contradictions and confirmations between sources are addressed by displaying sources simultaneously, allowing audiences to evaluate the evidence themselves.
Principle Four Documentation: '*Sufficient information should be documented and disseminated to allow computer-based visualisation methods and outcomes to be understood and evaluated in relation to the contexts and purposes for which they are deployed*' (London Charter, 2009: 8)	**Virtual Representations:** Using a virtual tour and 3D representations, audiences are encouraged to virtually explore Sylt camp through interactive and engaging visualisations (Ibrahim *et al*, 2011). This multisensory approach empowers users through self-learning (Pujol & Champion, 2012; Ibrahim *et al*, 2011; Bonini, 2008). **Property Rights:** All materials presented within the platform have received copyright permission, except those acquired from AMA (Chapter 3 Section 3.2). **Knowledge Claims:** The platform provides an outline describing what, why and how all representations have been produced. Any uncertainties are addressed, for example, the measurements of all the structures within the 3D representations (Table 6.2 – principle 5). **Research Sources:** The platform provides a reference list of all sources exhibited. When a source is displayed, its sourced location is also presented. **Formats and Standards:** The platform resources a variety of multimedia formats including: visual, audio, text and video. Each representation format has been selected against the most effective communication method. This accounts for different demographics abilities and promotes greater educational engagement.
Principle Five Sustainability: '*Strategies should be planned and implemented to ensure the long-term sustainability of cultural heritage-related computer-based visualisation outcomes and documentation, in order to avoid loss of this growing part of human intellectual, social, economic and cultural heritage*' (London Charter, 2009: 10)	Sources originating from archives and institutions (Chapter 3 Section 3.2) are preserved by the organisations themselves. Archaeological data obtained from Sylt investigations have shared copyright between the author and Staffordshire University. Once this research is complete, the data will be preserved and stored in accordance with university data management policies. In the future, this platform will inevitably become obsolete, although the evidence acquired from investigation will still retain value. Therefore, the long-term sustainability of information is maintained through the archaeological record.

Principle Six Access: '*The creation and dissemination of computer-based visualisation should be planned in such a way as to ensure that maximum possible benefits are achieved for the study, understanding, interpretation, preservation and management of cultural heritage*' (London Charter, 2009: 11)	Principle six is addressed through visualising structures that no longer exist, thus communicating a sense of time and space (Ibrahim *et al*, 2011). The archaeological data deriving from fieldwork (such as the virtual tour's panoramas) naturally document the site's current appearance, thus creating a record for features that may decay over time. Currently, the site has no heritage management strategy and does not display any information boards. Therefore, the platform presents a unique opportunity to digitally visit the site and learn about Sylt's history, which is unavailable when visiting the site.

Developed by the Spanish Society of Virtual Archaeology (SEAV), the Seville Charter is an extensional framework of the London Charter (2009), specifically catering for archaeological heritage. Focusing on virtual archaeological aspects, the Seville Charter outlines eight principles which should be applied to computer-based visualisations of archaeological heritage (Table 6.2).

Table 6.2: *The Seville Charter's (2011) eight guiding principles and construction of the Sylt platform.*

Seville Charter (2011) Principle	Informed Contribution
Principle One Interdisciplinarity: '*Any project involving the use of new technologies, linked to computer-based visualisation in the field of archaeological heritage, whether for research, conservation or dissemination must be supported by a team of professionals from different branches of knowledge*' (Lopez-Menchero & Grande, 2011: 3)	A multidisciplinary forensic archaeological team conducted fieldwork at Sylt between 2010-2015 (Chapter 5). Specialists were used during data collection ensuring accurate site recording and documentation. A multidisciplinary team was also resourced to develop the platform, comprising the author, a computer-coder and designer.
Principle Two Purpose: '*Prior to the development of any computer-based visualisation, the ultimate purpose or goal of our work must always be completely clear*' (Lopez-Menchero & Grande, 2011: 3)	The platform outlines the rationale and justification for the project, through the 'About' and 'Infographic' tabs. These pages explain why the project initially commenced, how the archaeological data was obtained, and why specific visualisations have been applied.
Principle Three Complementarity: '*The application of computer-based visualisation for the comprehensive management of archaeological heritage must be treated as a complementary and not alternative tool to other more traditional but equally effective management instruments*' (Lopez-Menchero & Grande, 2011: 4)	The visualisations of Sylt are complementary to the site through several factors: - The overgrown vegetation and a remote location (an island) may deprive viewing and/or visiting the site. - The site displays no information boards explaining Sylt's history, and thus, visitors may not understand/see surviving remnants of the camp. Currently, no site preservation or restoration has commenced, as political sensitivities surround these issues (Chapter 5 Section 5.3). The digital capture of Sylt's remnants both documents the features and provides an insight into Alderney's former appearance and spatial configuration.

Principle Four Authenticity: '*Computer-based visualisation normally reconstructs or recreates historical buildings and environments as we believe them to have been in the past. For that reason, it should always be possible to distinguish what is real, genuine or authentic from what is not. In this sense, authenticity must be a permanent operational concept in any virtual archaeology project*' (Lopez-Menchero & Grande, 2011: 4)	(This principle has already been partially addressed through the London Charter (2009) principle 4 (Table 6.1)). The 3D reconstruction of Sylt does not intend to portray a photorealistic representation, due to limited existing information providing sufficient details. The 3D reconstructions resource EPE methods, only displaying Sylt's spatial characteristics. As outlined in the Seville Charter (Section 4.4.1), 'archaeology is complex and not an exact and irrefutable science' and thus the site reconstruction only displays 'known' investigative information (Lopez-Menchero & Grande, 2011: 4).
Principle Five Historical rigour: '*To achieve optimum levels of historical rigour and veracity, any form of computer-based visualisation of the past must be supported by solid research and historical and archaeological documentation*' (Lopez-Menchero & Grande, 2011: 4)	Using Google SketchUp's Sandbox function, an accurate terrain for each 3D reconstruction was created, with details extracted from a 1943 topographical map of Alderney (WO311/13). Each 3D model's base map used an aerial image from the corresponding year, which was accurately scaled through known measurements of existing features (such as roads and the airport landing strip). Each 3D structure was created individually using Google SketchUp, with the measurements acquired from 2013 fieldwork (Chapter 3 Section 3.2). By 'stamping' each model into the 3D terrain, the accuracy of each structure was clarified by aligning the model to the correct position upon the aerial image. Principle 4.5.3 of the Seville Charter (2011) states virtual reconstructions 'cannot systematically show lifeless cities, lonely buildings or dead landscapes because this is a historical falsehood' (Lopez-Menchero & Grande, 2011: 4). This aspect of principle 5 remains nuanced within virtual Holocaust representations, which is evident through the Bergen Belsen 3D reconstruction and the laser scanned Auschwitz-Birkenau model; with only the latter displaying a living landscape using avatars and vegetation.
Principle Six Efficiency: '*The concept of efficiency applied to the field of virtual archaeology depends inexorably on achieving appropriate economic and technological sustainability. Using fewer resources to achieve increasingly more and better results is the key to efficiency*' (Lopez-Menchero & Grande, 2011: 5)	The platform resources historical data most predominately, eyewitness testimony, camp plans, aerial reconnaissance, maps, military reports, photographs and audio (Chapter 3 Section 3.2). This information has been combined with archaeological fieldwork data to develop narratives for the virtual tour and 3D reconstruction.
Principle Seven Scientific Transparency: '*All computer-based visualisation must be essentially transparent, i.e. testable by other researchers or professionals, since the validity, and therefore the scope, of the conclusions produced by such visualisation will depend largely on the ability of others to confirm or refute the results obtained*' (Lopez-Menchero & Grande, 2011: 5)	Sylt visualisations have not been tested by other professionals. However, this information will be made available for any persons to confirm the platform's accuracy.

Principle Eight Training & Evaluation: '*Virtual archaeology is a scientific discipline related to the comprehensive management of archaeological heritage that has its own specific language and techniques. Like any other academic discipline, it requires specific training and evaluation programmes*' (Lopez-Menchero & Grande, 2011: 5)	Principle 4.8.2 of the Seville Charter (2011) states 'when computer-based visualisations are designed as instruments for the enjoyment and knowledge of the public, the most appropriate method of evaluation will be visitors' studies' (Lopez-Menchero & Grande, 2011: 5). The research aims and objectives alongside the qualitative data presented below addresses this principle.

6.3 Holocaust Representation Perspectives: An Evaluation of the 'Explore Lager Sylt' Platform

Various qualitative research methods were deployed to acquire student, expert and public perspectives surrounding the case study platform. Although the overall outline and justification for qualitative research methods and data analysis were addressed in Chapter 3 (Section 3.4), further details are provided here regarding the pilot study, sample sizes, data analysis and qualitative results. Chapter 3 (Section 3.4.1) also outlined Staffordshire University's ethical research policies including: code of conduct (Appendix 1), consent forms (Appendix 2), debriefing (Appendix 3), information sheets (Appendix 9), confidentiality and minimising risk.

6.3.1 Pilot Study

As described in Chapter 3 (Section 3.4.2) a pilot study was used to assess the methodological protocols and whether they were suitable for wider public application (Jacob & Furgerson, 2012; Van Teijlingen & Hundley, 2002; De Vaus, 1993). Essentially, this endeavoured to: clarify the focus group and interview questions; highlight any required documentation amendments, for example, the code of conduct; and to test the platform's technical functionality and appropriateness (Jacob & Furgerson, 2012; Van Teijlingen & Hundley, 2002; De Vaus, 1993). No issues were detected throughout the functionality testing of the platform. Subsequently, participants stated that they found nothing offensive or inappropriate within the platform, therefore, validating it for wider public use. Through undertaking this small-scale test, the researcher was provided with an opportunity to become familiar with the focus study group procedures (Ibid).

Participants were recruited on a voluntary basis and initially approached through verbal communication, with any expressed interest followed up via email. A pilot study was conducted with Staffordshire University students, undertaking Humanities studies. In total one male and two females were recruited for the pilot study (n=3). The participants all held different religious beliefs, including, secular, Agnostic and Christian. They all identified their ethnicity as white-English. Their age ranges included two participants between 15-20 and one participant 36-40. They all had a similar educational background, holding A-Level qualifications. Table 6.3 outlines this personal information of pilot study participants.

Table 6.3: *The composition of pilot study participants.*

Religion	Gender		Age		Ethnicity	Education
	Male	Female	15-20	36-40	White-English	A- Levels (or similar)
Secular	1			1	1	1
Agnostic		1	1		1	1
Christian		1	1		1	1

Table 6.4 outlines the themes, parent and child nodes coded from participant pilot study responses. The table also displays the number of sources and references coded for each node. Due to the similar questions asked within the pilot study and wider focus groups, the pilot study responses have been incorporated within the overall research results (Section 6.5), in accordance with qualitative research approaches (Frankland & Bloor, 1999).

Table 6.4: *The themes, parent and child nodes coded from the pilot study dataset.*

Theme	Parent Node	Child Node	Child Node	Sources	References
Accountability	Archaeology			1	1
		Evidence		1	5
	References			1	2
	Representation	3D Reconstruction		1	1
		Testimony		1	1
	Sources	Photographs		1	2
		Testimony		1	2
	Textual Information			1	1
Communication	Digital Methods	3D Reconstruction		1	3
		Aerial Photographs		1	1
		Testimony		1	1
		Video		1	1
		Virtual Tour		2	5
	Engagement			1	2
	Archaeology			1	5
	Interaction			1	3
	Narrative			1	3
	Navigation			1	1
Education	Digital Methods	3D Reconstruction		1	3
		Aerial Photographs		1	1
		Testimony		1	2
		Video		1	1
		Virtual Tour		1	4
			Spatial	1	1
		Empathy		1	2
		Learnt Information	Sylt Presence	1	2
	Most Remembered	3D Reconstruction		1	2
		About Page		1	1
		Aerial Photographs		1	2
		Infographic		1	1
		Testimony		1	1
		Timeline		1	1
		Virtual Tour		1	1

	Sense of Being There	Virtual Tour		1	3
Presentation	Appropriate	Testimony		1	1
	Offensive	No		1	3
	Replace Site Visit	Encourage		1	3
		Site Information		1	1
		Unable to Visit		1	2
		Yes		1	1

6.3.2 Focus Groups - UK Secondary Schools

Focus study groups were conducted at three UK secondary schools, with each school being selected due to its religious denomination. The schools comprised a secular, Christian and Orthodox Jewish. However, due to separating students by gender at the Jewish school, two focus study groups were conducted. The deliberate targeting of different religious denominations endeavoured to understand if different religious values influenced student perspectives. The participant inclusion criteria included: sufficient English speaking and reading ability; above the age of 11 (adhering to current UK Holocaust curriculum age (House of Commons, 2016)); and necessary visual and hearing abilities for engagement with the platform.

Overall, participants comprised 17 males and 12 females (*n*=29). Of these participants, 13 considered themselves Jewish, seven Christian and nine seculars. Many participants (*n*=25) identified themselves as white-English, two as white-Jewish, one as Black-African and one mixed Caribbean. From an educational perspective, 13 participants did not hold any qualifications, 12 held GCSE's (or similar) qualifications and four held A-Level (or similar) qualifications. Table 6.5 outlines the composition of all the focus group participants.

Table 6.5: *Composition of focus group participants.* ***Key****: W-E = White English; W-J= White Jewish; B-F = Black African; W-B = (Mixed) White + Black Caribbean.*

Religion	**Gender**		**Age**		**Ethnicity**				**Education**		
	Male	Female	11-14	15-20	W-E	W-J	B-F	W-B	None	GCSE	A-Level
Judaism	7	6	13		11	2			13		
Secular	5	4		9	9				6 3	6	3
Christian	5	2		7	5		1	1		6	1

6.3.3 Interviews - United States Holocaust Memorial Museum (USHMM)

Interviews conducted with USHMM employees were coordinated by the participant's role at the museum, with varied employment positions including: documentation specialists, researchers, historians, (physical and digital) exhibition developers, and educational outreach professionals. The amalgamation of participant expertise provided the data with rich, diverse and unique insights regarding Holocaust representation (Braun & Clarke, 2006; Patton, 1990). The participant inclusion

criteria included: sufficient English speaking and reading ability; sufficient visual and hearing abilities for platform engagement.

A total of nine male and seven female participants were interviewed (*n*=16). Diversity in age range was important to acquire alternative perspectives especially in relation to engagement and interaction with the virtual environment, alongside evaluating the platform's content. The varied age ranges comprised two 26-30 years old, one 31-35, three 36-40, three 46-50, one 56-60, four 56-60 and one 61-65; and one participant did not respond to this question. Similarly, the importance of diversity amongst religious beliefs provided valuable perspectives regarding Holocaust representations. Five participants identified themselves as Jewish, one Mainline Protestant, seven as secular, one Orthodox Christian and two participants provided no response. Most of the respondents identified themselves as white, with one Chinese and two not answering the question. Table 6.6 provides the composition of interview participants.

Table 6.6: *Composition of interview participants.* ***Key****: NA = Not Answered; U.G = Undergraduate; P.G = Postgraduate.*

Religion	**Gender**		**Age**								**Education**			**Race/Ethnicity**		
	Male	Female	26 - 30	31 - 35	36 - 40	46 - 50	51 - 55	56 - 60	61 - 65	NA	U.G	P.G	NA	White	Chinese	NA
Judaism	3	2	1		1	1		1	1		3	2		5		
Mainline Protestant		1				1						1		1		
Secular	3	4		1	2	1	1	2			2	5		7		
Orthodox Christian	1		1									1			1	
N/A	2							1		1		1	1			2

6.3.4 Questionnaire Surveying - United States Holocaust Memorial Museum (USHMM)

Questionnaire surveying was conducted amongst USHMM visitors. As participants were visiting the museum, they were considered to have a personal interest in Holocaust history. Therefore, these participants provided an ideal sample for those who may view the 'Explore Lager Sylt' platform. The participant inclusion criteria included: sufficient English speaking and reading abilities; above the age of 15 or accompanied by a parent/guardian who could provide consent; and sufficient visual and hearing abilities for engagement with the platform.

In total, 11 males and 15 females took part in the survey (*n*=28). These individuals held a wide range of religious beliefs, age ranges, educational and ethical backgrounds. Three participants identified themselves as Jewish, one as Mainline Protestant, four as Evangelical Protestant, one Orthodox Christian, eight as Catholic, one Denominational Christian, seven as secular and two individuals not completing this section. One participant identified themselves as being both secular and Jewish. A

variation in age ranges amongst participants, included eight 15-20-year-olds, two 21-25, seven 26-30, one 36-40, one 41-45, one 46-50, one 51-55, three 56-60, three 61-65 and one participant did not respond to this question. A variation in educational backgrounds existed amongst participants, including 11 achieving High School qualifications, ten undergraduate qualifications, five postgraduate qualifications, one participant with no qualifications and one participant not responding to the question. Table 6.7 provides an outline of the participant's composition from questionnaire surveying.

Table 6.7: *Composition of questionnaire participants.* ***Key****: NA=Not Answered; NQ = No qualifications; H.S = High School; U.G = Undergraduate; P.G = Postgraduate.*

Religion	**Gender**			**Age**											**Education**				**Race/Ethnicity**		
	Male	Female	N/A	15-20	21-25	26-30	36-40	41-45	46-50	51-55	56-60	61-65	NA	NQ	H.S	U.G	P.G	NA	White	Other Race	N/A
Judaism	1	2		1	1			1							1	1	1		3		
Mainline Protestant		1				1											1		1		
Secular	4	3			1	3	1		1		1				2	5			6	1	
Orthodox Christian		1		1											1				1		
Evangelical Protestant	2	2				1				1	1	1			2	2			4		
Catholic	2	6		6		1						1		1	5	1	1		8		
Judaism/ Secular	1										1						1		1		
Denominational Christian	1											1					1		1		
N/A			2			1							1			1		1	1		1

6.4 Data Analysis

As the same questions were asked throughout the pilot studies, focus group, interview and questionnaire surveying, all datasets were analysed through a grounded theory approach and thematically coded (Chapter 3 Section 3.5). A verbatim transcript was created for each dataset and checked twice for clarity and accuracy of what was either spoken (focus group and interview) or written (questionnaire survey). Through transcribing the data, an initial opportunity to become familiar with any apparent themes and codes was established (Charmaz, 2014; Braun & Clarke, 2006). Following this process, each transcript was uploaded into the qualitative coding software Nvivo© (Figure 6.2) (Chapter 3 Section 3.5). After the coding process was repeated several times, theming of the data commenced to identify broader patterns (for example, similarities and differences between codes) (Saldaña, 2015; Braun & Clarke, 2006). Each theme and code were refined and

renamed (if necessary) ensuring the project's aims and research questions were addressed (Braun & Clarke, 2006).

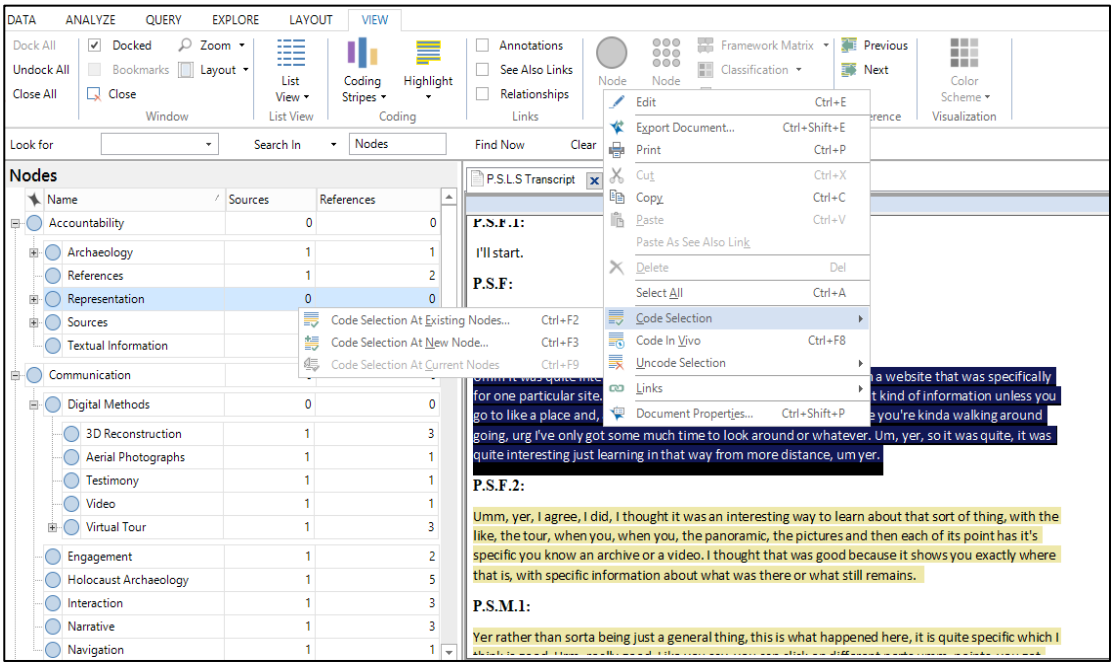


Figure 6.2: *An example of the coding process conducted in Nvivo©.*

6.5 Results

From the data analysis, the pilot study, focus group, interview and questionnaire transcripts were coded and arranged according to their relevance against each research question. Therefore, the results are presented according to each of the four overall key themes deriving from the analysis. These are outlined below (in bold) against the corresponding research question.

Accountability: What is the perceived value of disseminating forensic archaeologically-derived Holocaust data, through virtual heritage technologies?

Communication: Can virtual heritage environments effectively, coherently and accountably disseminate forensic archaeological Holocaust data?

Education: How do users learn about the Holocaust from interacting with virtual heritage environments and what is the perceived dissemination value?

Presentation: What ethical visualisation methods and presentational qualities should be contemplated when constructing virtual heritage Holocaust environments?

6.5.1 Nodes

To code and theme each dataset, nodes were assigned to the relevant text (Figure 6.2). Each node acts as a label, summarising the information highlighted in a dataset through an appropriate word (or words) (Saldaña, 2015; Braun & Clarke, 2006). In total, 175 nodes (codes) were created across all datasets, comprising 35 parent nodes (general codes), and 140 child nodes (specific codes) (Table 6.8).

Table 6.8: *The overall number of nodes generated throughout the Sylt qualitative datasets in relation to key themes.*

Theme	Number of Parent Nodes	Number of Child Nodes
Accountability	11	15
Communication	6	42
Education	7	68
Presentation	5	20
Additional Comments	1	0

Throughout data analysis, it became apparent that the most predominately coded nodes comprised the themes of communication and education. This is attributed to the types of questions asked throughout qualitative research. Many shared codes existed between both themes, for example, the virtual tour was described simultaneously as a method of communication and education. Therefore, a significant overlap between these themes existed. The overall coded percentage of each theme is displayed in Figure 6.3. Table 6.9 outlines all the themes, parent/child nodes, number of sources and quantity of references for each node.

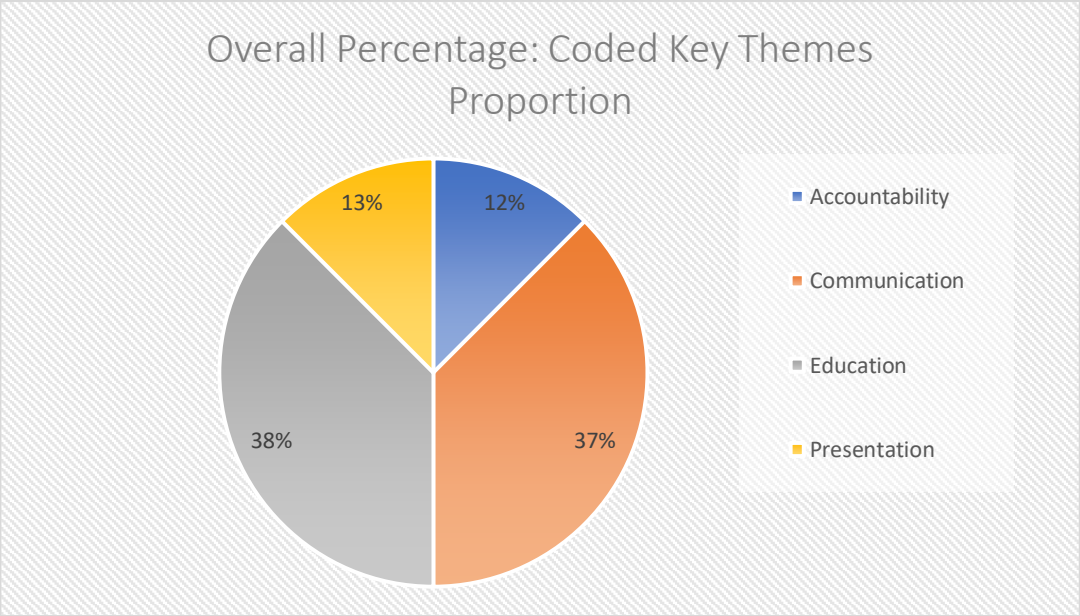


Figure 6.3: *Overall proportion of coded themes.*

Table 6.9: *The 'Explore Lager Sylt' platform themes, parent and child nodes coded across all qualitative datasets.*

Theme	Parent Node	Child Node	Child Node	Sources	References
Accountability	Archaeology			10	28
	Believable			6	15
	Fact			2	2
	Former Knowledge			7	10
	Origin			6	9
	References	Valid		10	16
		Invalid		2	3
	Representation	3D Reconstruction		3	3
		Timeline		1	2
		Video		3	4
		Virtual Tour		2	4
		Platform		4	7
	Sources			12	26
		Aerial Photographs		3	3
		Archive		8	11
		Maps		1	1
		Photographs		6	14
		Testimony		9	9
	Textual Information			4	12
		Unknown Information		1	1
	Transparency			3	11
		Achieved		4	7
		Not-Achieved		6	17
	Unbelievable			2	11
Communication	Audience			2	3
		Suitable		7	9
		Unsuitable		5	13
		Types		8	20
	Language	Ambiguous		10	57
		Unambiguous		13	21
	Multimedia			3	5
		3D Reconstruction		9	19
			Benefits	3	8
			Colour	2	4
			Limitations	15	67
		Aerial Images		6	18
		Infographic		5	7
			Presentation	7	21
			Colour	2	4
			Images	2	4
		Introduction Video		5	13
			Limitations	1	4
		Map		1	1
		Photographs		2	18
			Limitations	2	5
		Testimony		13	53
		Text		1	3
		Timeline		5	15

			Presentation	10	22
		Video		5	53
		Virtual Tour		13	58
			Empathy	2	5
			Limitations	8	23
	Narrative	3D Reconstruction		2	3
		Timeline		2	2
		Virtual Tour		1	1
		Platform		8	12
	Navigation			1	1
		3D Reconstruction		6	20
		Easy		1	12
		Fairly Easy		1	4
		Neutral		1	9
		Virtual Tour		9	23
		Platform		14	40
	Platform	Colour		1	1
		Context & Content		10	74
		No Improvements		1	3
		Presentation		11	32
		Text Style		1	4
Education	Empathy			1	3
		Audio		1	4
		Limitations		2	20
		Photographs		1	1
		Testimony		4	7
		Video		1	2
		Virtual Tour		2	5
	Engagement & Interactivity			10	26
		3D Reconstruction		2	4
		Photographs		1	1
		Spatial		4	5
		Testimony		3	3
		Virtual Tour		4	7
	Archaeology			18	74
		Audience		5	7
		Evidence		9	21
		Limitations		8	15
		Spatial		7	13
		Victims		8	10
	Learnt Information	Commandant		5	12
		Heard of Sylt		1	23
		Increased Knowledge		1	27
		Structures		1	1
		Sylt Presence		12	23
		Testimony		2	3
		Victims		2	2
	Most Remembered	3D Reconstruction		6	10
		Aerial Photographs		7	10
		Archaeology		4	8
		Infographic		2	5

		Introduction Video		6	14
		Sylt		1	2
		Mapping		3	3
		Photographs		3	4
		Presentation		1	1
		Specific Content		1	10
			Commandant	3	7
		Testimony		6	9
		Timeline		1	2
		Virtual Tour		14	34
	Multimedia Useful to Learn From			3	15
		3D Reconstruction		5	9
			Development	3	6
			Spatial	3	5
		Aerial Images		5	10
		Audio		1	11
		Infographic		4	5
		Interaction Preference	Infographic	1	1
			Photographs	1	1
			Timeline	1	2
			Video	1	8
			Virtual Tour	1	18
		Introduction Video		4	9
		Map		1	1
		Photographs		1	1
		Testimony		10	28
		Timeline		5	7
		Video		2	2
		Virtual Tour		6	21
			Empathy	3	7
			Engagement	9	21
			Spatial	3	6
		Platform		9	28
	Sense of Being There			7	13
		3D Reconstruction		4	7
		Commandant		2	2
		No		4	15
		Photographs		2	2
		Terrain		2	2
		Testimony		2	2
		Virtual Tour		11	23
		Yes		1	21
Presentation	Appropriate	3D Reconstruction		1	2
		No		1	4
		Testimony		2	2
		Video		1	3
		Virtual Tour		2	3
		Yes		12	58
	Offensive	No		19	26
	Religious Considerations			2	4

	Replace Site Visit	Distance		2	4
		Empathy		2	5
		Encourage Visitation		4	9
		No		14	31
		Site Information		4	6
		Site Visit Preparation		2	3
		Unable to Visit		7	9
		Yes		9	21
	Technical Issues	3D Reconstruction		2	2
		Internet		2	2
		Introduction Video		1	1
		Video		3	6
		Virtual Tour		4	7

6.6 Themes

The overall four key themes deriving from data analysis are presented and briefly discussed in relation to the parent and child nodes identified throughout the coding process.

6.6.1 Accountability

Chapter 2 (Section 2.2.2) outlined that forensics and archaeology are concerned with event reconstruction through evidence (Crossland, 2013; Connor & Scott, 2001). However, the case study site presented obstacles towards event reconstruction including the site's current appearance, limited apparent surviving landscape evidence, fragmented testimony, alongside conflicting narratives. Participants were asked if they believed the information presented within the platform. This explored perspectives regarding if participants did, or did not, believe the information presented, and why these beliefs were maintained. Overall, the data highlighted that information credibility is considered through several themes including: archaeology, former knowledge, the origin of information, references, sources, types of representations, explanations, justifications alongside information transparency.

6.6.1.1 Archaeology

Overall, 41% of participants considered that archaeology provided physical evidence of Sylt camp (*n*=31) (Figure 6.4). This is supported by the common use of the words 'believable' and 'evidence' when describing archaeology (Figure 6.5). Participants considered that archaeology: provided information that would be otherwise unknown, highlighted non-apparent surviving camp remnants, thus producing credible information. Participants explained that archaeology assisted in developing an understanding of historical events through visualising investigative evidence and findings. A small number of USHMM participants (*n*=3) described archaeology as providing accountability by supporting the archival documentation presented throughout the platform.

Within the physical realm, archaeology's primary role in Holocaust investigations is to identify, locate and record sites, structures and landscape features; thus, providing evidence of atrocities (Sturdy Colls, 2015; 2014; Ranta & Takamaa, 2007; Haglund *et al*, 2001). This study highlighted that in the digital realm, participants considered archaeology to continue this role, as evident by their responses (Figure 6.5). As focus group participant P.S.M.1 explained 'because obviously the site was tried to be destroyed…if you just went and took these pictures and said this was here and this was there, you could kinda think well how do I know that?...without that archaeological side were your showing things have been uncovered and the lay of the land, the greenery has changed because of this, I think that kinda adds…credence to it'.

The data highlighted that USHMM employees held greater belief that archaeology provided evidence of the Holocaust, by comparison to the student or public participants (Table 6.10). Secondary school students expressed that data visualisation 'helps' make the investigative findings more 'believable' and 'understandable'. This demonstrates that despite the case study site's obstacles, archaeology still performed an effective role in presenting an accountable evidence-based Holocaust narrative.

***Table 6.10**: Percentage of participants who considered that archaeology provided physical evidence of Sylt.*

Qualitative Method Type	Percentage of Participants
Focus Study Groups	41%
Interviews	56%
Questionnaire Surveys	36%

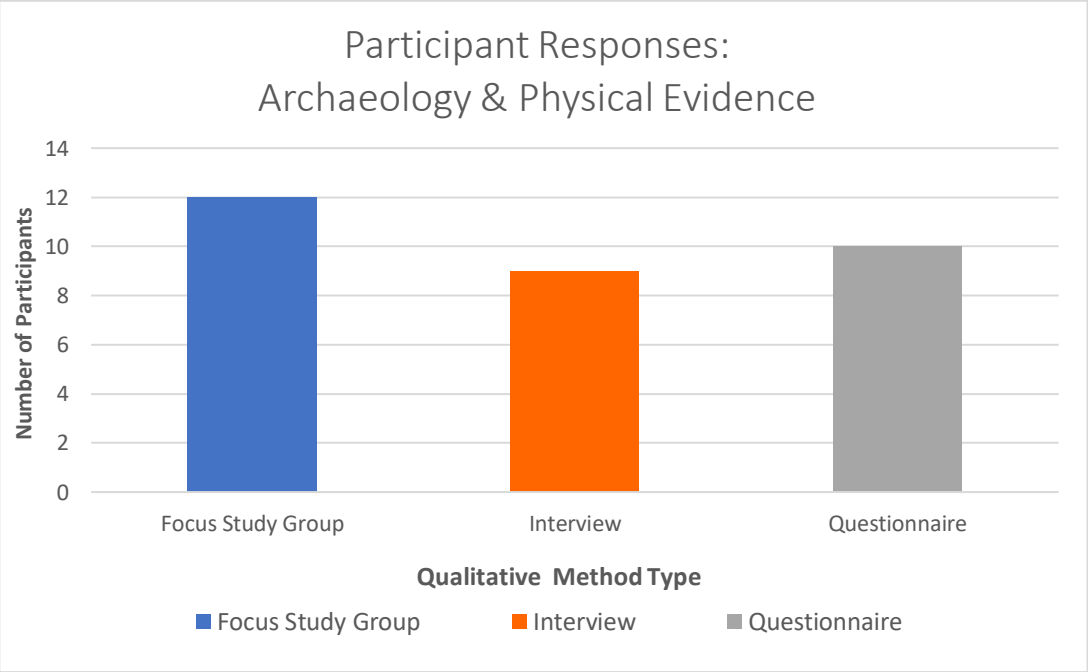


***Figure 6.4**: Coded participant responses to archaeology providing physical evidence of the Holocaust.*

Figure 6.5*: A word cloud displaying the parent node archaeology under the theme accountability.*

6.6.1.2 Former Knowledge, Origin of Information, References & Sources

Some participants (*n*=9) drew upon their former knowledge to confirm the believability of information presented within the platform (Figure 6.6). Rather than accepting what was exhibited, these participants were more disposed to agree with the platform information if it corresponded with their existing historical knowledge. For example, ‘so from what I read in the encyclopaedia of camps and ghetto's published by the museum…it pretty much synced up with the timeline’ (participant US10).

Participants (*n*=7) considered the origin of information an important factor to confirm the credibility of information (Figure 6.6). This was demonstrated through comments concerning the presence of the Staffordshire University logo on the platform, and belief that the USHMM point of contact (Director of Future Projects), had validated the research (Figure 6.7). A focus study group participant stated, ‘but there's also obviously the university at the bottom…you trust the university more than you trust like Wikipedia’ (participant B.S.L.S.M.3).

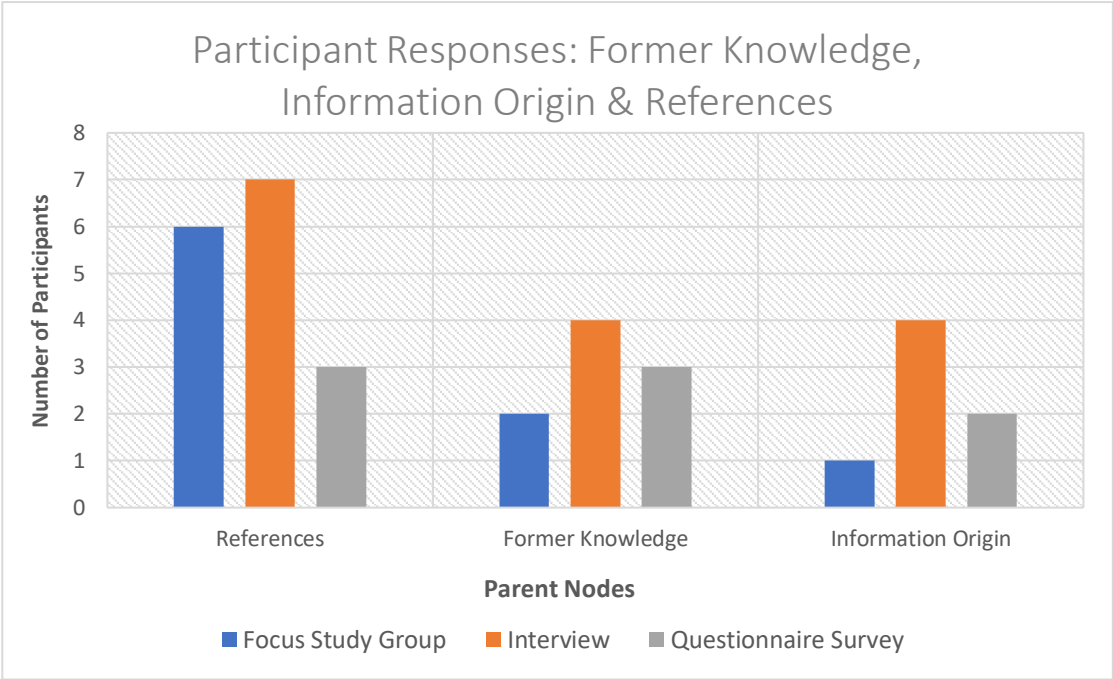


***Figure 6.6**: Coded participant responses to former knowledge, information origin and references.*

The type, quantity and presentation of source materials are considered a primary factor regarding why participants believed the platform information (*n*=59) (Figure 6.8). The different source types which assisted the information credibility included: aerial reconnaissance, archive documents, maps, photographs and testimonies. The overall quantity of source materials presented within the platform produced belief within the representation. Participants considered that if all the information was fictitious, it would be difficult for each of these sources to corroborate each other. For example, 'I was compelled by the quantity of historical information…I was you know, convinced that the archival materials…were genuine...the depth of archival materials…the kind of extensive sourcing of those archival materials were I think, compelling indicating the information was truthful' (participant US12).

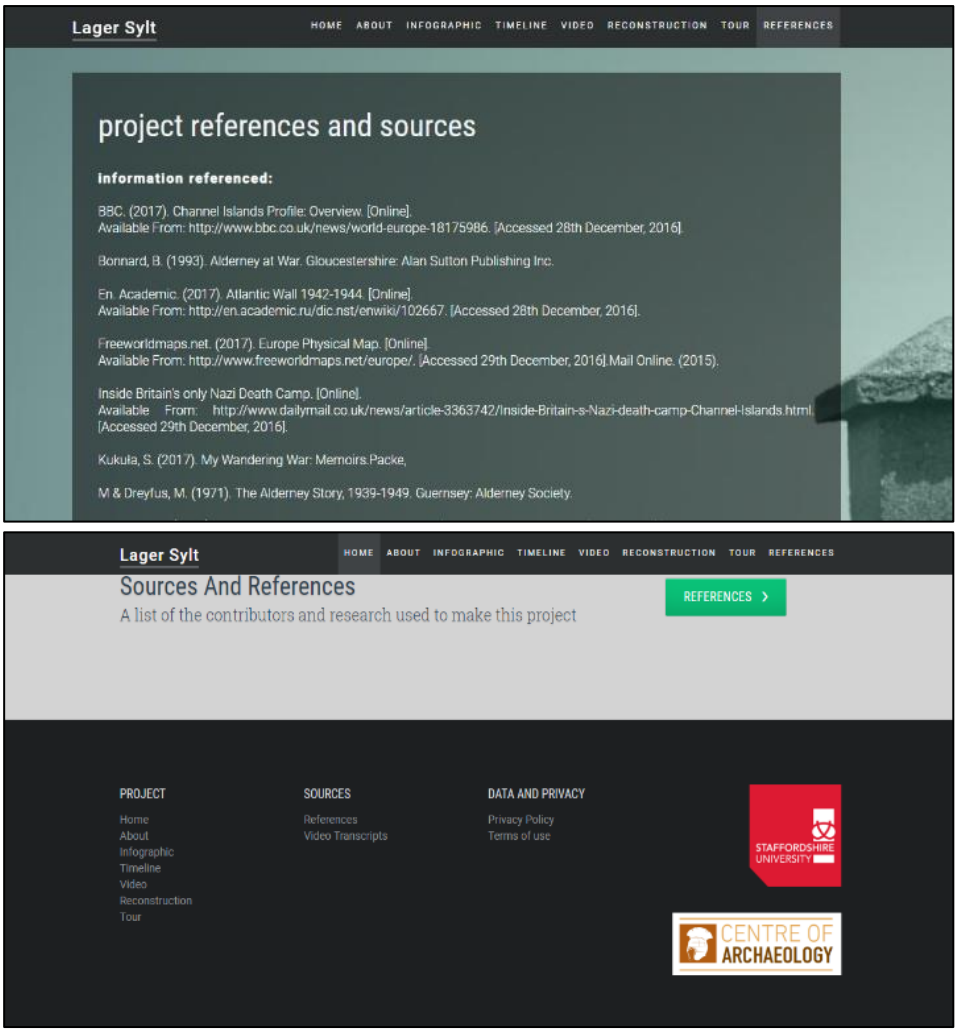


***Figure 6.7**: 'Explore Lager Sylt' platform credibility - **(top)** references and source page; **(bottom)** Staffordshire University logo.*

All sources displayed within the platform had the corresponding location where the information had been acquired from (Figure 6.7). Participants (n=16) considered this referencing and subsequent cross-referencing, as validating the content (Figure 6.6). This was also particularly evident amongst focus group participants, whose comments described referencing schoolwork. However, two interviewee participants spoke about being 'dismayed' with the quality of references. These concerns derived from the USHMM's Encyclopaedia of Camps and Ghettos publications not being included within the reference list, alongside questioning the reliability of certain references.

As participant US2 explained, 'I would be a little cautious in terms of…referencing this elsewhere because from what I see for example the whole product isn't referenced unless you looked at Encyclopaedia of Camps and Ghettos, which is the major work on concentration camp sites'. Participant US9 explained 'you know, went to the references section…I was a little bit dismayed to see that…under the references, we have things like, an article from the Daily Mail' (participant US9). This reference refers to an image displayed within the platform's 'Introduction Video', which was

edited to display the location of different camps on Alderney (Figure 6.9).

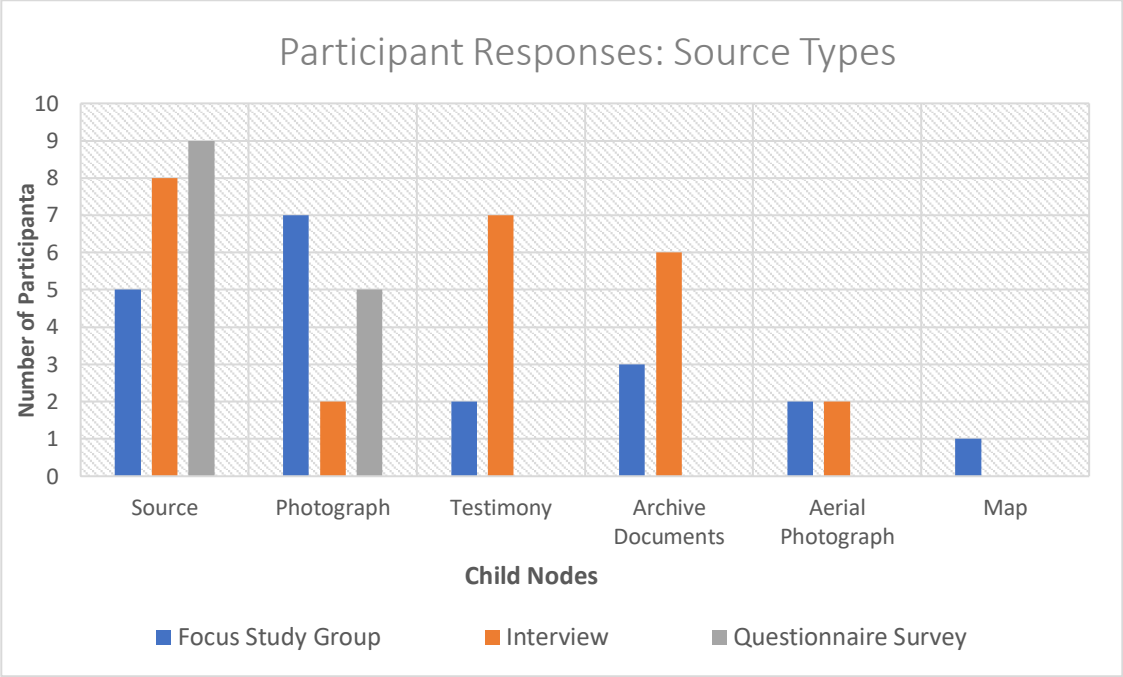


***Figure 6.8**: Coded participant responses to different source types.*

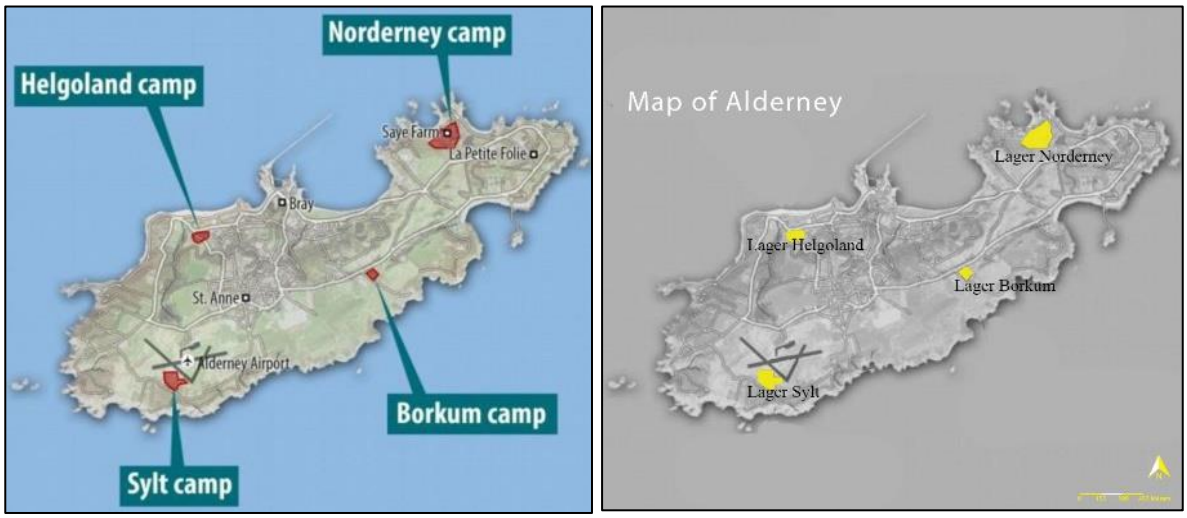


***Figure 6.9**: (**Left**) Mail online image of four camps on Alderney (Mail Online, 2015). (**Right**) The modified image displayed in the platform's introduction video.*

Although a participant's former knowledge and the origin of information assisted the believability of content, they were not an essential factor amongst focus group and questionnaire participants; contrasting interview participants. Out of these three child nodes, participants described references more frequently than former knowledge and origin of information (Table 6.11). Most of these

responses (*n*=16) described referencing as assisting the reliability of information; as interviewee participant, US13 explained, 'well you source it pretty well and I see you have a reference list…you're sorta always showing…where this photograph comes from…or personal information is coming from, so to me that makes it, it believable'.

Table 6.11: *Overall percentage of participants describing former knowledge, the origin of information and references.*

Sub-Theme	Focus Study Group	Interview	Questionnaire	Overall Percentage of Participants
Former Knowledge	7%	25%	11%	12%
Information Origin	4%	25%	7%	9%
References	21%	44%	11%	21%

6.6.1.3 Representation, Transparency & Believability

The data highlighted that participants (*n*=26) considered the presentation quality, virtual tour, 3D reconstruction, timeline and videos to assist information believability (Figure 6.10). This displayed that the application of visual aids alongside their representation quality influenced opinion surrounding information believability. This is supported by a comment from participant B.S.L.S.F.1 'I think there was lots of…visual aids like seeing it through a visual tour...you can't really dispute that it's not there'. However, a difference between the believability of the virtual tour (*n*=10) and 3D model (*n*=4) was apparent.

Information transparency was coded through two nodes consisting of where it was (*n*=6) and was not achieved (*n*=8) (Figure 6.11). Similarly, participants were asked if they believed the information presented on the platform, with coded responses including those who did (*n*=12) and did not (*n*=4) (Figure 6.11); with belief in content primarily deriving from referencing, source materials, participant former knowledge and origin of information (Section 6.6.1.2).

Participants (*n*=6) referred to transparency by agreeing with the information disclosed within the platform. For example, 'there are several references to air raid shelters and so that seemed pretty plausible' (participant US4). Transparency was also considered clarifying unknown information, for example, 'I believe that you…explained when there's issues of doubt…so you elaborated when there are things that maybe aren't known for sure, and you made a point to do that' (participant US10).

Conflictingly, USHMM interview and questionnaire participants (*n*=8) discussed a lack of transparency concerning certain information disclosed within the platform. This transparency issue mainly concerned the Commandant's tunnel, with some comments querying why the tunnel existed and why access was located in the prisoner's section of Sylt. Interviewee participant US3 explained,

‘when I'm talking to our contributors for the encyclopaedia…sometimes they will say, you know we don't really have a firm answer on this point or we have two pieces of evidence that conflict…should we put it in there? I say well yes absolutely put it in there...make it clear that you don't have all the answers that somethings are a mystery’. Three interviewee comments (US2, US3 and US4), explained that by stating any uncertainty, that content believability is enhanced.

The data displayed that although participants (*n*=12) considered that the platform’s content was believable, other participants (*n*=8) considered that information transparency was not wholly achieved (Figure 6.11). One USHMM interview participant referred to the lack of transparency regarding an image presented, ‘there are also things that might be a little bit problematic for example if the photographs do not directly relate to the site there's always a question of why is it there, is it just to illustrate then it does not really have informational value for me at least…but I understand the point that if you want, I don't know a guy in OT uniform, you don't have, they are slim pickings’ (participant US2).

This comment refers to Figure 6.12 displayed within the Introduction and Prisoner Barrack’s video (virtual tour-scene six). This image from the Bundesarchiv is titled ‘France-Atlantic Wall under construction. A member of the Organization Todt (armband) giving instructions to a French (?) Worker’ (Bild 101II-MW-2355-10). Although the image is closely aligned to the types of construction works and prisoner nationality present on Alderney during the occupation (WO311/13: Rpt No. PWIS (H)/KP/702), its relationship to Sylt itself is considered unknown.

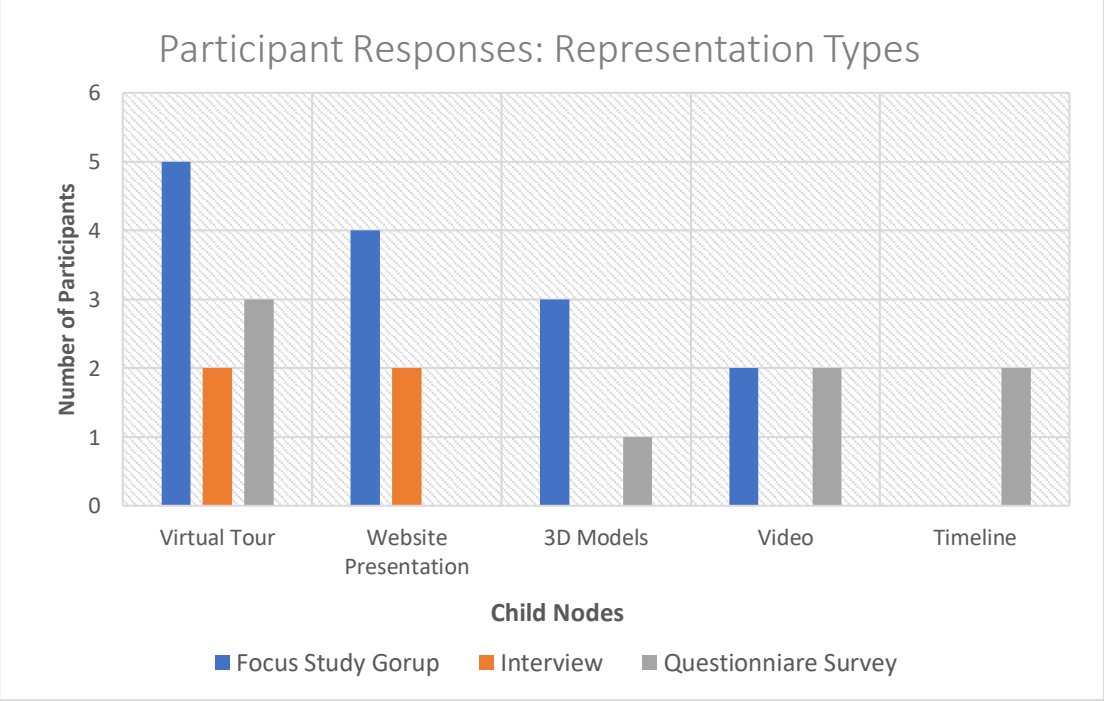


***Figure 6.10**: Coded participant responses to representation types.*

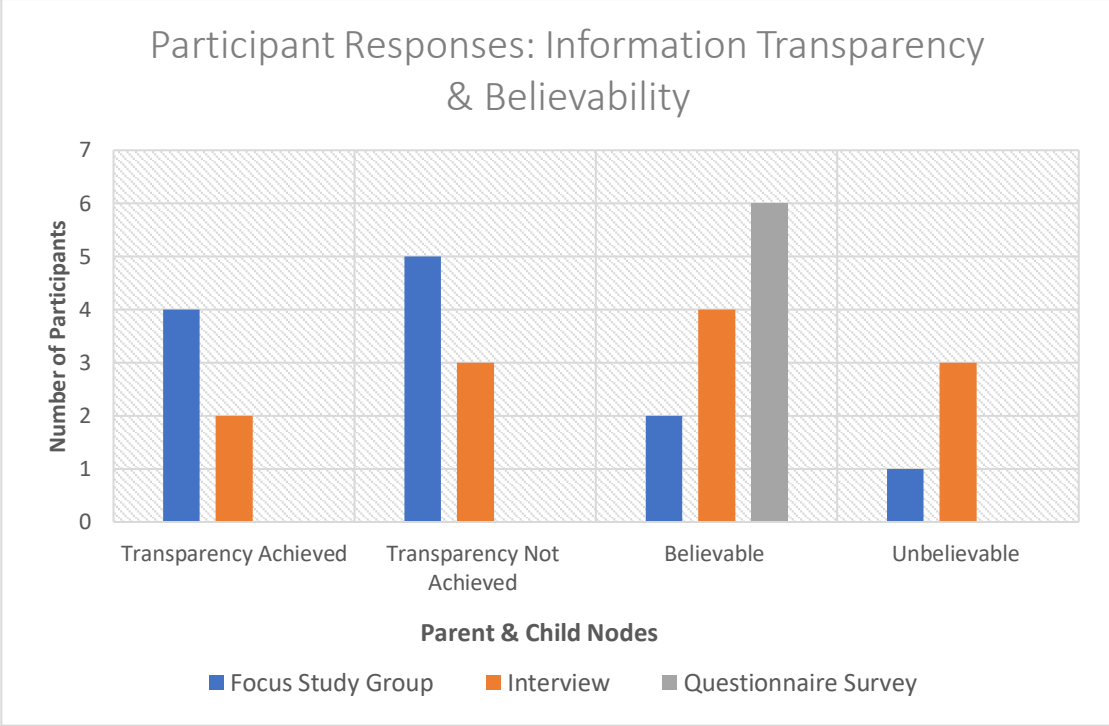


***Figure 6.11**: Coded participant responses to information transparency and believability.*

***Figure 6.12:** OT employee and French labourer (Bild 101II-MW-2355-10).*

6.6.2 Education & Communication

Chapter 2 highlighted the global status of Holocaust education, stressing requirements for greater shared collaboration between scholars and secondary school teachers, alongside greater guidance, assessment framework and curriculum time for teachers (Section 2.1). To disseminate the archaeological findings, it is essential that the Sylt platform effectively communicates data and provides a useful secondary school educational resource.

As outlined in Section 6.5.1, an overlap between the themes education and communication occurred during coding. As this data encompasses similar qualities, the information from both themes is presented simultaneously. The data displayed that seven parent nodes were coded in relation to communication, including: audience/age appropriateness, language, multimedia types, narrative, navigation, the overall platform and alternative digital devices. Similarly, the coding process produced seven parent nodes for the theme education, including: empathy, engagement and interactivity, archaeology, learnt information, most remembered, multimedia materials useful to learn from and a sense of being there.

6.6.2.1 Language

Participants were asked if the platform's language was understandable, producing the nodes ambiguous and unambiguous. Two main areas where participants considered the platform language as ambiguous (*n*=11) comprised the archive documents and the author's written text (Figure 6.13). A focus group and interviewee participant described being confused by terms within the archive documents. As participant US10 explained, 'there was one word I stumbled over…food store, clothing store…used in a…testimony...as like a warehouse, meaning a warehouse, not a store where you go in and buy things'. Other ambiguous terms within the archive documents requiring further clarification included International Bible Students (meaning Jehovah Witnesses) and certain German translations.

However, greater ambiguity derived from the author's written text, with specific issues relating to academic style and the words: 'volunteer', 'Sylt', 'Holocaust' and 'concentration camp'. Although three interviewee participants stated that the language used was rather academic for secondary school understanding, only two focus study participants (H.H.L.S.F.2 and H.H.L.S.F.3), aged 11-14, agreed that the language used was 'advanced', but also stated that they 'really understand all of it'.

Two interviewee participants expected to view information regarding the Sylt island located in the North Frisian Islands; not a camp located on Alderney. As participant US10 explained, 'I knew it was…a camp or an island in…Northern Germany...when I heard Sylt or saw Sylt in the invite…that's

my association with it'. This ambiguity derives the Nazis naming the Alderney camps (Sylt, Borkum, Norderney, Helgoland) after the North German islands.

Interview (*n*=10) and focus group (*n*=8) participants described the language as understandable (Figure 6.13). Although uncommon terminology was displayed in the platform (for example, topography) many participants were familiar with this term due to their current studies, or from their personal vocation. Participants expressed ease when reading archive documents (especially those written in German), as key aspects of these documents were translated for an English-speaking audience. 'The language I thought was clear to understand...it wasn't hidden [in] fancy words or…too elaborate…for many people, I think…would be able to understand it' (participant US10).

Two terms within the platform created ambiguity for some interviewees. The term 'Holocaust' led three participants to query the appropriate use of this word. These participants (historians), voiced concerns regarding using this term for a camp predominately constructed for political prisoners, as they considered this term for the extermination of the Jews only. 'There's some reference to the Holocaust concentration camp. So as if there's a natural kind of combination or, identity between the two that I think will need to be kept apart. Clearly, it should be explained what is going on there, but the Holocaust usually evokes the impression of organised killing of mass Jews, which as far as I know isn't the case here', (participant US2). This was supported by participant US4 comment, 'I would use that term [Holocaust] as a sort of deliberate programme to…annihilate…the Jewish population in Europe…parenthetically maybe some other groups, but…as an anti-Jewish project…which is not the same thing as…the Nazi camp system and system of terror'. The term concentration camp was also raised concern for one interviewee participant, who stated, 'the other reservation was whether it is legitimate to call this a concentration camp' (participant US4).

Much ambiguity concerns the biblically loaded term Holocaust[32], which, common international usage began after the 1970s American television series 'The Holocaust' (Shandler, 1999). The USHMM defines the Holocaust as 'the systematic, bureaucratic, state-sponsored persecution and murder of approximately six million Jews by the Nazi regime and its collaborators. During the era of the Holocaust, German authorities also targeted other groups because of their perceived 'racial inferiority': Roma (Gypsies), the disabled, and some of the Slavic peoples (Poles, Russians, and others). Other groups were persecuted on political, ideological, and behavioural grounds, among them Communists, Socialists, Jehovah's Witnesses, and homosexuals' (USHMM.org, 2018). One may perceive that the term Holocaust can be applied to Jewish and non-Jewish victims, but only if

[32] The origins of the Greek term 'Holocaust' means 'a Jewish sacrificial offering which was burnt completely on an altar', implying that genocide of the Jews was a form of martyrdom (OxfordDictionaries.com, 2018; Lang, 1999).

Jewish victims themselves are referred to (Magilow & Silverman, 2015; Lang, 2005; Richardson, 2005; Lang, 1999).

This ambiguity is reflected in the 2015 UNESCO and Georg Eckert Institute report regarding Holocaust curricula, which outlines 'irregular naming of victim groups' explaining that 'mentions of the Holocaust are frequently not accompanied by clear references to groups of victims' (Carrier *et al*, 2015: 38) (Chapter 2 Section 2.1.1). The International Holocaust Remembrance Alliance (IHRA) website outlines 'how to teach about the Holocaust in schools', states that an unambiguous definition of the term Holocaust is required in education (HolocaustRemembrance.com, 2018). The 2010 Task Force for International Cooperation on Holocaust Education, Remembrance and Research (ITF) stated that 'there is no set, official definition for the Holocaust either within the UK or UK education system' (ITF, 2010: 7). The (2016) UCL study into UK Holocaust education, outlined that different terms were used to describe various Holocaust victims and the events between 1941-1945, with only Jewish victims, described as being persecuted under the term Holocaust (Foster *et al*, 2016).

The usage of the term 'concentration camp' was further queried by participant US4, 'I think you have to ask yourselves is it legitimate to call this a concentration camp on British soil?' The author considers this term appropriate as Sylt fulfils the definition of a concentration camp[33] and coinciding with archive documentation. These documents also refer to Sylt as a concentration camp, (or KZ) (for example, WO311/13: Rpt No. PWIS (H)/KP/702). Interestingly, the 'Encyclopaedia of Camps and Ghettos, 1933-1945' opening sentence on Alderney states, 'the only concentration camp on British soil existed between March 1943 and June 1944 on the Isle of Alderney' (Megargee & White, 2018: 1361). However, the platform does present a contradiction in terms, as the 'About' page states 'uniquely, Sylt was the only concentration camp ever constructed on British soil' and the 'Introduction Video' states that Alderney was 'under British Crown Dependency'. Therefore, greater clarification is required.

[33] The USHMM defines a concentration camps as 'a camp in which people are detained or confined, usually under harsh conditions and without regard to legal norms of arrest and imprisonment that are acceptable in a constitutional democracy' (USHMM.org, 2018b).

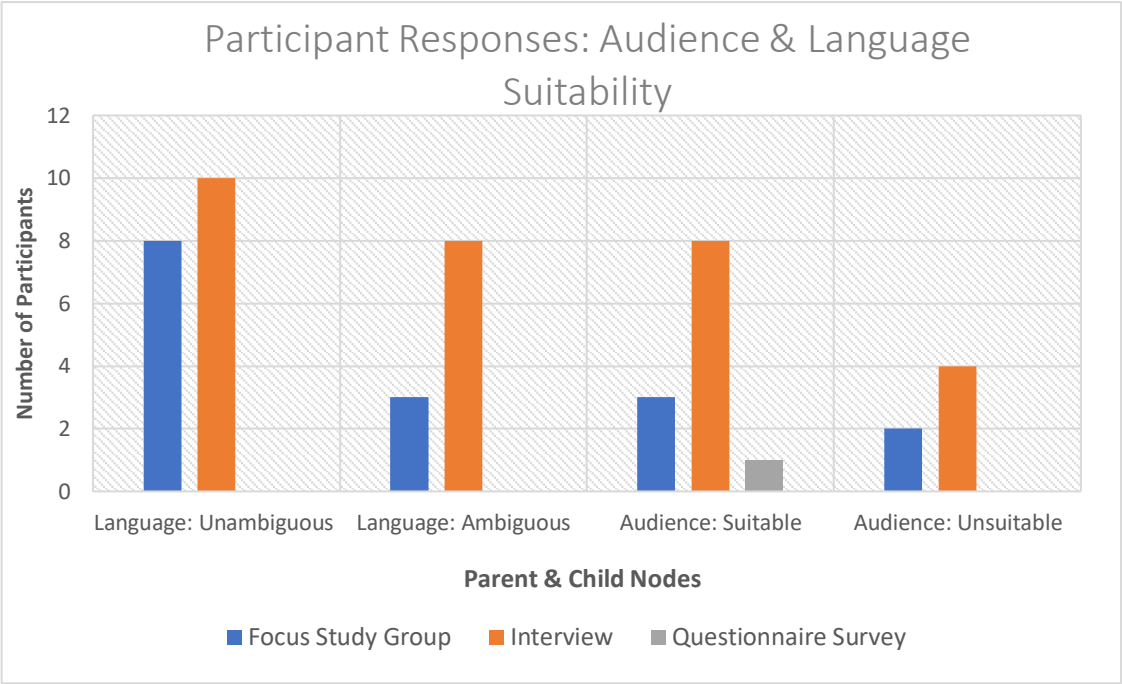


Figure 6.13: *Coded participant responses to audience suitability and language clarity.*

6.6.2.2 Learnt Information

Due to varying demographics (age, education and employment background), participants were not directly asked about any pre-existing knowledge or learnt information from engaging with the platform. Although, participants frequently demonstrated the knowledge they acquired from platform interactions. The main knowledge demonstrated during focus groups (*n*=10) and interviews (*n*=7) included learning about the presence of Sylt, alongside the proximity of Nazi occupation in relation to Britain. This is evident in a focus group participant comment, 'I sat there when I found out where it was, going did they really get that close to England? And I'm thinking they surely, no one learns that they got quite close' (participant B.S.L.S.M.3). This is further evident through questionnaire surveying with all participants stating that they had not previously heard of the site before (*n*=28), and all but one participant stated that the platform increased their knowledge about the camp (*n*=27). Therefore, the virtual heritage platform is considered to have raised awareness of Sylt and subsequently commemorating events.

6.6.2.3 Holocaust Education & Archaeology

Participants were asked if they felt that archaeology was a good way to learn about a Holocaust site. Broadly, participants agreed that archaeology was a good way to learn about a Holocaust site (*n*=47) (Figure 6.14), using words such as 'interesting', 'good', 'understand', 'evidence' and 'helps' to describe their reasoning (Figure 6.15). This is further reflected through interviewee US5's comment, 'absolutely, I think…you don't understand what a place is like unless you get a sense...of what the

building materials were like, why people made the decisions they did and… the only way you can get that is through archaeology, absolutely'. Other participant comments explained that archaeology provided physical evidence of historical events by verifying surviving landscape features. This information was considered valuable for educational purposes through the spatial and 3D visualisation of data and archive sources.

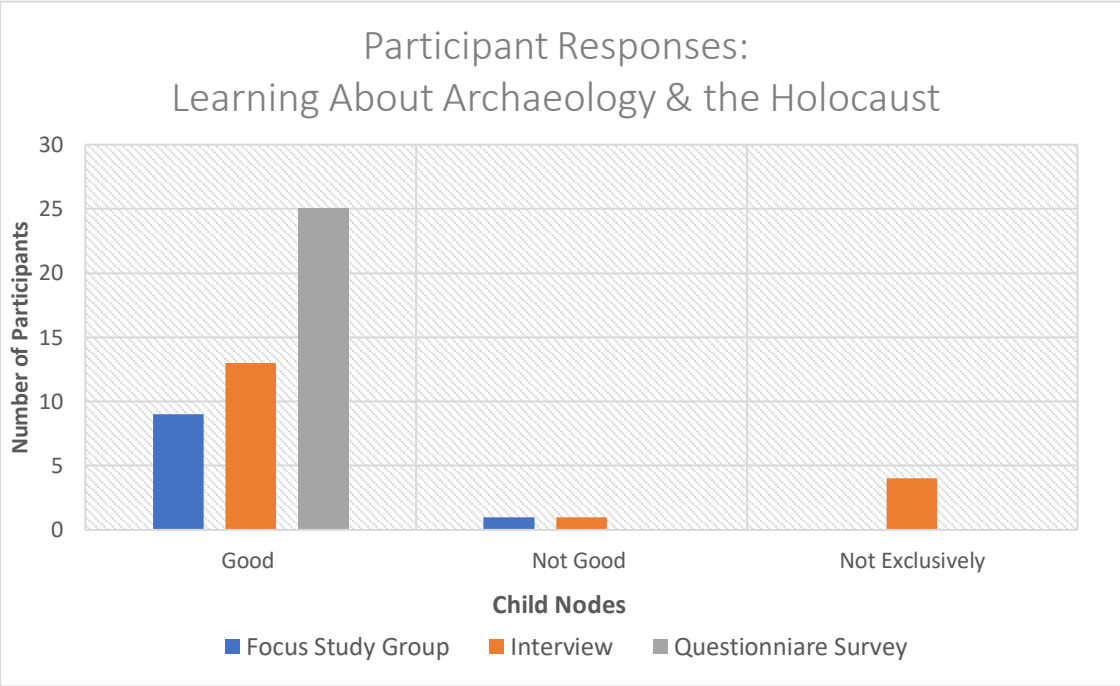


***Figure 6.14**: Coded participant responses to archaeology as a method of Holocaust education.*

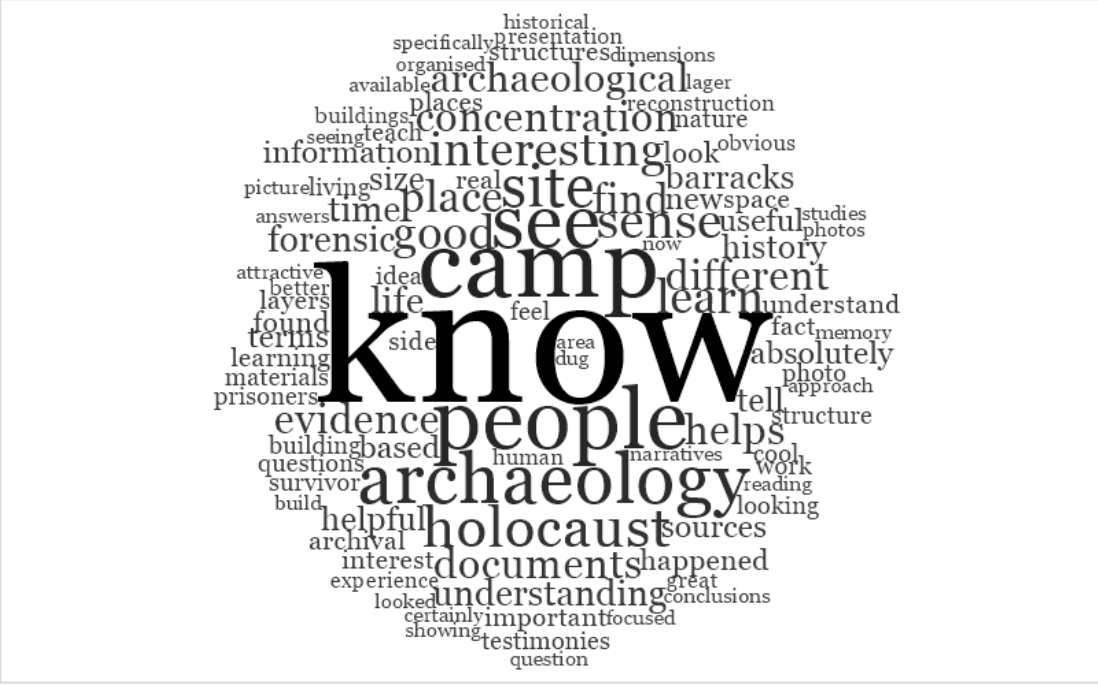


***Figure 6.15**: A word cloud displaying responses relating to archaeology and Holocaust education.*

Several interviewees (*n*=3) described the platform's approach as potentially drawing in new audiences, 'I think it probably draws in a whole new audience that we don't usually have…I can see this…appealing to people who are much more steeped into the sciences or have an interest in…the local landscapes and have no interest in histories' (participant US11). Additionally, these participants addressed the potential of archaeology raising new questions from its findings. Participants also commonly described learning about Sylt's layout, structures, expansion and how the camp's appearance changed over time.

Four participants stated that archaeology was not exclusively a good way to learn about a Holocaust site and required a combination of other materials (such as testimony) (Figure 6.14). The presentation of testimony was considered essential to learn about Sylt, with some participants desiring a greater balance between testimony and archaeology. This is reflected through a focus group comment, 'it's interesting that it spends more time talking about…dimensions of places like the specific size and shape and measurements than it does…the comings and goings of people' (participant B.S.L.S.M.5). This was supported by two interviewee participants who expressed a desire to learn more about prisoner brutality. Similarly, one interviewee participant stated that 'it seemed organised to teach about, specifically the application of forensic archaeology' (participant US9).

Stemming from these responses, a focus group and interviewee participant considered that archaeology was not a good way to learn about a Holocaust site. A focus group participant stated, 'to know about the concentration camp, it's not really like the archaeological side of it, more like what actually happened...what they went through…not really how it was made out' (participant H.H.L.S.F.3). A comparable interviewee response explained 'as a historian, I feel that ultimately I would learn more from testimonies and documents in which people, you know whatever the foibles of memory...described what they had gone through' (participant US4).

6.6.2.4 Multimedia Materials, Representations & Experience

The codes: narrative, navigation, empathy, engagement, interactivity, most remembered, sense of being there and multimedia useful to learn from, are all presented together, through the multimedia type they are associated with. During qualitative surveying, participants clarified the category type when describing specific multimedia. These multimedia category types are outlined through the text and figures below (6.16-6.20).

Participants (*n*=14) considered the evidence-based 3D reconstructions to effectively communicate useful spatial information regarding the construction of Sylt between 1942-1945. As an interviewee participant explained, 'I think it was…helpful to get a sense of the different kind of layers of space in a concentration camp, in terms of…the way that the structures emerged the way they changed across time…I think the evidence-based reconstruction…gave a very compelling sense of how the

concentration camp changed throughout the war…I think all of that…presentation was a useful way of communicating that information in the historical narrative' (participant US12). By comparison of other multimedia materials (Figure 6.16), the 3D reconstruction only accounted for 7% of overall participant responses regarding communication (Figure 6.17).

The 3D reconstruction was presented through a yearly chronological narrative, which participants considered appropriate. Besides one focus group participant comment describing the ease of the 3D reconstruction navigation, all other interviewee comments (*n*=6) expressed that 'there was too much scrolling in one, in one scroll' (participant US11). Participant US11 further explained, 'I would look at…dividing it up into some sort of narrative chapters. Because maybe a lot of the information is distilled in one block'. Three participant comments further described a lack of clarification regarding how to interact with the 3D models.

Five participants described the 3D reconstruction as engaging and interactive (Figure 6.18), and nine considered the visualisations a useful learning tool (Figure 6.20). This accounted for 5% of the overall coded responses relating to multimedia materials useful to learn from (Figure 6.21). In response to most remembered (Figure 6.22), 6% of participants referred to the 3D reconstruction (Figure 6.23). Lastly, through being asked if participants had a sense of being there, four responses described the 3D reconstruction (Figure 6.24), comprising 7% of overall responses to this question (Figure 6.25).

Many participants expressed greater clarity and understanding of information when viewing aerial images. This is evident in a focus group participant comment, 'the aerial images mainly because put up against like an old RAF snapshot that you've found…that's what that place looked like, now look at the place now…they still look fairly similar and I think that's where I reckon I'll be able to go there and say I can agree…that bit there was there like just from the aerial shots' (participant B.S.L.S.M.3).

Another focus group participant explained difficulties in interpreting feature depth within aerial images. As the 3D reconstructions were presented on top of an aerial image, the participant explained 'it was easier…that made a lot more sense' (participant P.S.F.1). The data highlighted that aerial images were an effective form of communication (*n*=19) (Figure 6.16), accounting for 7% for these coded responses (Figure 6.17). This is supported by participants stating that aerial images were useful to learn from (*n*=14), comprising 8% of responses within this theme (Figure 6.21). Comments regarding aerial images and what participants remembered the most accounted for 9% (*n*=8) of responses (Figures 6.22 and 6.23). Differently, maps were considered a less effective form of communication accounting for only 2% of overall responses (Figure 6.17), (*n*=3) in this theme (Figure 6.16). Similarly, maps only formed 1% (Figure 6.21) (*n*=1), of responses regarding multimedia materials most useful to learn from (Figure 6.20).

The audio was referred to on several occasions throughout coding. One focus group participant described listening to survivor audio accounts and the empathetic qualities conveyed by presenting real testimony. ‘The thing which made it so actual believable was the fact that it made you think what he was actually witnessing…the fact of how much distress it actually caused in the voice’ (participant C.C.L.S.M.2). Figure 6.26 presents a word cloud of participant responses relating to the theme of empathy. Additionally, questionnaire participants considered audio a useful multimedia material to learn from (*n*=11) (Figure 6.20), providing 6% of the overall coded responses (Figure 6.21). The infographic provided a suitable presentation format for communicating forensic archaeological methods and techniques (*n*=6) (Figure 6.16). This is reflected in a focus group participant comment, describing the infographic as ‘short and clear and just it gave you depth to information as well’ (participant B.S.L.S.M.2). The infographic was considered to provide a useful multimedia format to learn from (*n*=7) (Figure 6.20), providing 4% of the overall responses within this theme (Figure 6.21). Furthermore, 5% (Figure 6.23) of participants described the infographic within most remembered responses (*n*=5) (Figure 6.22).

Although the infographic provided an effective communication tool, interviewee comments queried the presentation choices, describing the colours, images and quantity of text as being 'cartoony' and 'flashier' than other multimedia presented in the platform (Figure 6.27). As participant US5 explains, ‘I think it needs to be briefer, and…the design of it is in such stark contrast to the rest of the site. You've got these bright yellow colours…that really jar with the rest of the…design’ (participant US5). Consequently, participants generally agreed this form of presentation made the infographic look 'less serious' or 'light-hearted'.

Participants considered the timeline (*n*=15) (Figure 6.28) to contain relevant historical context thus providing 8% of responses for the theme multimedia communication (Figure 6.17). Although this format was considered useful to learn from (*n*=14) (Figure 6.20), both focus group and interview participants expressed confusion regarding the layout, ‘I was reading all the way down…I didn't realise’ (participant H.H.L.S.F.4), and information quantity, ‘the timeline was very good, but I also felt like that was too much information…in one sitting’ (participant US11).

The presentation of the timeline through a chronological format was explained by one participant as ‘the only place where I really get…a narrative sense of well what was Sylt and what happened there, and what do we know about it’ (participant US9). Overall, participant responses regarding narrative are detailed in Figure 6.2. The timeline was also described by a small number of participants (*n*=2) as most remembered (Figure 6.23).

Coded participant responses (*n*=18) displayed that photographs provided a useful form of communication (Figure 6.16). A focus group response explained that victim photographs contained

empathic value, which is further evident through Figure 6.26. 'The photographs of invading…German forces and the people…gives…a more personal side to it to show that people actually affected by the events and it...felt more real because instead of it just being written information to see the actual impact of it was quite effective' (participant B.S.L.S.M.5). Although the word 'photographs' was labelled within themes, multimedia useful to learn from (*n*=18) (Figure 6.20), and most remembered (*n*=3) (Figure 6.22), two questionnaire participants voiced similar requests, 'I'd like more photographs, [to] see how the camp functioned and dealt with the inhabitants' (participant USQ14).

Both testimony and archive documentation were widely discussed throughout the qualitative datasets. Although a small number of participants described some ambiguous terminology within archive documentation (*n*=2) (Section 6.6.2.1), its application was considered important, evoking empathy and emotional understanding (Figure 6.26). This is demonstrated through a pilot study participant's comment, 'for me, it's the authentic parts…the first-hand accounts…when you…see that and read the bits that go with it, that…hits home a little bit more' (P.S.M.1). Additionally, participant C.C.L.S.F.2 described 'especially because it was highlighted [the text] …it was just easier to read everything…you point out the key points…so it just made it easier for me to read it'.

The presentation of testimony aided understanding by supporting other multimedia materials, as focus group participant C.C.L.S.M.3 explained, 'you see two officers holding a coffin, and you'd see people talking about it in…the following document and I thought that was a good way to have that visibility'. This multimedia type assisted engagement between the participants and platform (*n*=3) (Figure 6.18), comprising 10% within this theme (Figure 6.19). Overall, testimony and archive documentation provided 13% of responses (*n*=24) (Figure 6.17) in relation to communication. Its application comprised 12% (Figure 6.21) of responses in relation to multimedia materials useful to learn from (*n*=20) (Figure 6.20). It was most remembered by nine participants (Figure 6.22) and provided a sense of being there for 3% (Figure 6.25) of interview participants (*n*=2) (Figure 6.24). However, a recurring comment regarding testimony was a requirement for a greater number of accounts to be presented within the platform.

Video was extensively considered an effective and preferred multimedia method of communication (*n*=44) (Figure 6.16), accounting for 23% of responses throughout this theme (Figure 6.17). By viewing survivor, audio and subtitled videos, participants considered that empathy was conveyed through qualities including the pitch and tone of the survivor's voice. Therefore, video is considered an effective multimedia to convey empathy (Figure 6.26). Focus group participants often referred to the ease of video engagement, 'the videos were good, I don't know whether or not that was your voice on them but it was very easy to listen too...I preferred that more than reading …I'd rather have that as an audio form and a video form because it means that I don't have to just sit and read it all, I

can just hear most of the main stuff' (participant B.S.L.S.M.3). Participants (*n*=32) considered that video was a useful multimedia format to learn from (Figure 6.20), accounting for 19% of responses within this theme (Figure 6.21). Participants frequently cited video as their most remembered encounter (*n*=18) (Figure 6.22).

The virtual tour was the most coded multimedia format throughout data analysis. Frequently, participants described the virtual tour's engagement and interactivity qualities (*n*=8) (Figure 6.18), accounting for 28% of responses within this theme (Figure 6.19). This is reflected through interviewee participant US11, 'I could have probably learned that information in the other way, but I felt much more encouraged to learn the information here…it was…fun to learn the information...I feel like the visual aspect brings in people who otherwise might not have the patience to read something. And, the fact that you can layer things, so you had audio and you had documents, kinda gives a great sense of how one should use primary source materials…teaching an advanced high school class or maybe a beginner college class with these kinds of aids is very compelling'.

The virtual tour was described as portraying a non-linear and self-driven narrative, which was valued by participants, especially focus group students (Figure 6.29). The tour's navigation was considered easy to operate, as highlighted by interviewee participant US6, 'the interactive tour…it's, easy to use and straightforward and…for some websites…using…a similar interactive map…it's not easy to use because there's a learning curve…for me, I can just…focus on the content…without any extra time to learn this tool'. However, two interviewee participants described initial confusion surrounding the presence of the tour's hotspots, 'I thought maybe this is you know, a little thing left over from the prototype development that I don't have to pay attention to' (participant US5).

The virtual tour was described by participants as an effective form of communication (*n*=47) (Figure 6.16), accounting for the majority (25%) responses within this theme (Figure 6.17). Similarly, it was considered the most useful multimedia to learn from (*n*=42) (Figure 6.20), with some participants describing the tour as producing empathic qualities (Figure 6.26). The tour was the most remembered aspect of the platform (*n*=28) (Figure 6.22), providing 30% of responses to this question (Figure 6.23). Additionally, the multimedia created a sense of being there (*n*=20) (Figure 6.24).

A small number of responses described difficulties in perceiving how the camp would have appeared during the 1940s, due to the extent of vegetation growth. As participant US12 explained, 'the representation of it was very vivid and clearly the camp and structures are very well documented and…the physical remnants that allow you to…get a sense of the…ways in which the space functioned for the prisoners, and…SS officers that were responsible for…controlling the camp and…it also gives you a sense of how the passage of time had affected the space and…the representation, the vegetation…the remnants of the structures and I think it was…clear that you

were…present in the camp and you were…present in the camp space but at the same time that you were still looking at a structure that has worn down of the course of 70 something years'.

Several comments regarding the platform itself were coded throughout the theme's communication and education. The platform's navigation was considered by participants as 'straightforward', 'easy' and 'clear'. The platform's linear narrative was often described as 'organised' by participants (Figure 6.29). One interviewee described the different narrative types present throughout the platform as requiring, 'a little bit more integration where…you see all the individual elements…work together. You have the video which is obviously then driven by a narrative and a voice over. So, you have a narrative in there. You have a timeline that also has a narrative because it is chronological. You have other things that are more isolated, and again it's partly…the nature of this kind of tool where…you kind of combine a hierarchical approach to…the things that can…be edited and jumbled together. I think that's the way it works, it's not the way a book works for example with its own limitations, this one has more possibilities ' (US2).

Overall, the platform's communication was considered successful, although some interviewees (*n*=3) expressed the need for greater content describing Alderney (not only Sylt) during the occupation. These participants also contemplated if the quantity of information contained within the platform was essentially required for the 'average' person. However, the platform's organised presentation was commented as the most remembered aspect for one focus study group participant (Figure 6.22).

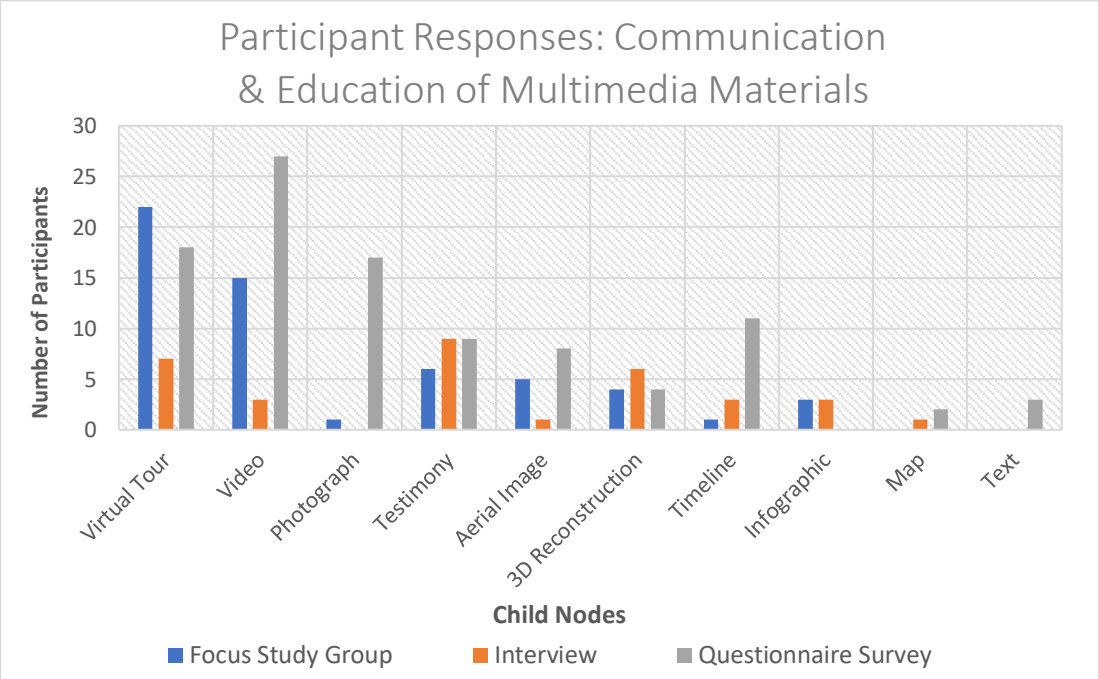


Figure 6.16: *Coded participant responses to most effective communication and education multimedia materials.*

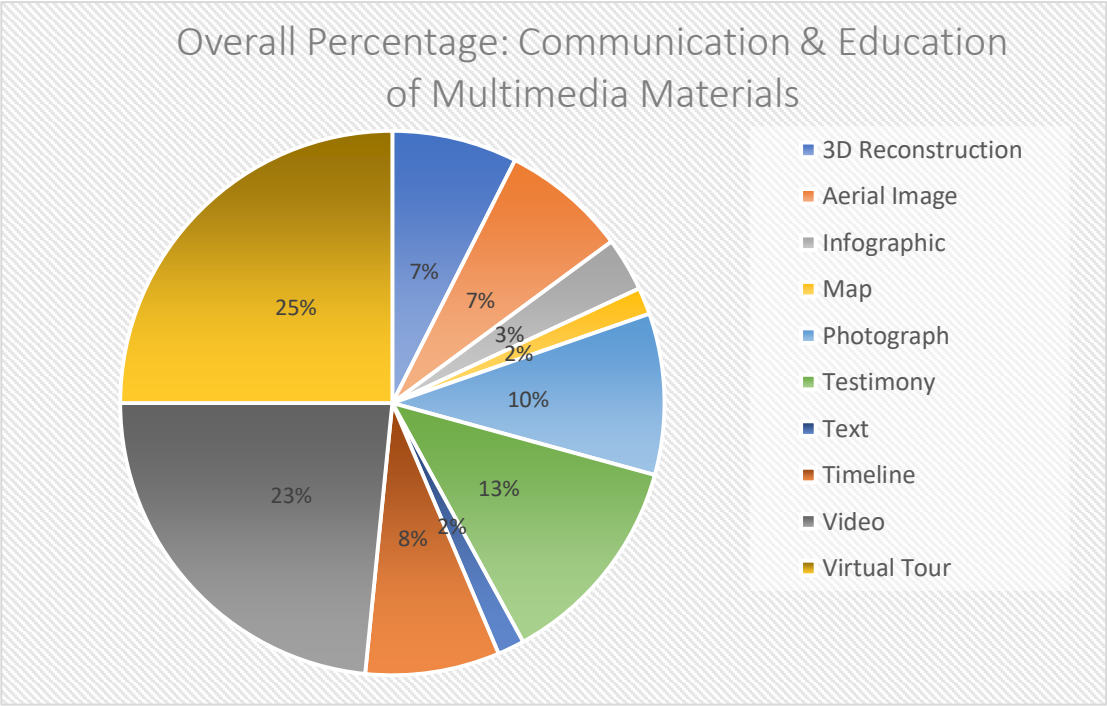


***Figure 6.17**: Overall percentage of most effective communication and education multimedia materials.*

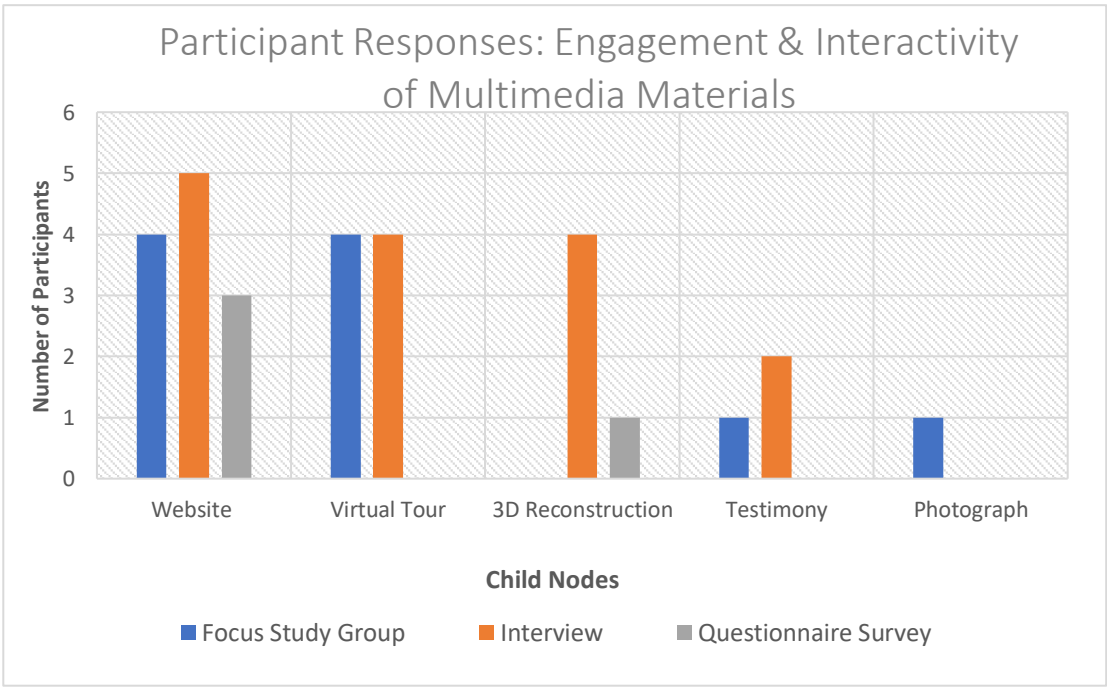


***Figure 6.18**: Coded participant responses to engaging and interactive multimedia materials.*

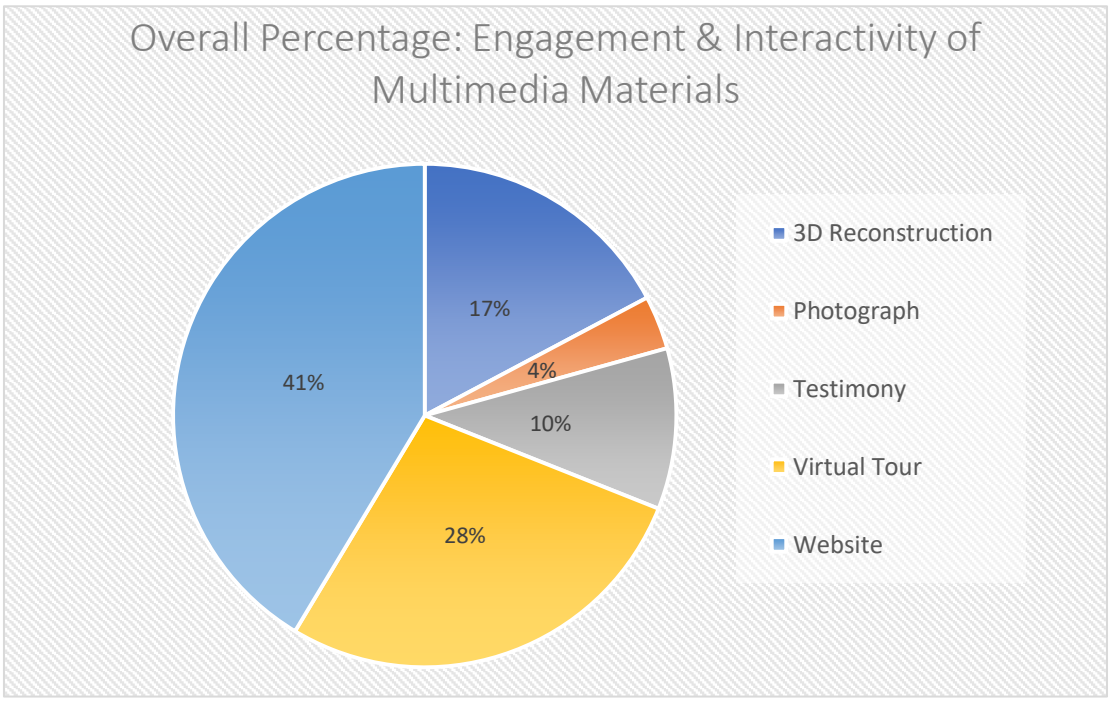


***Figure 6.19**: Overall percentage of engaging and interactive multimedia materials.*

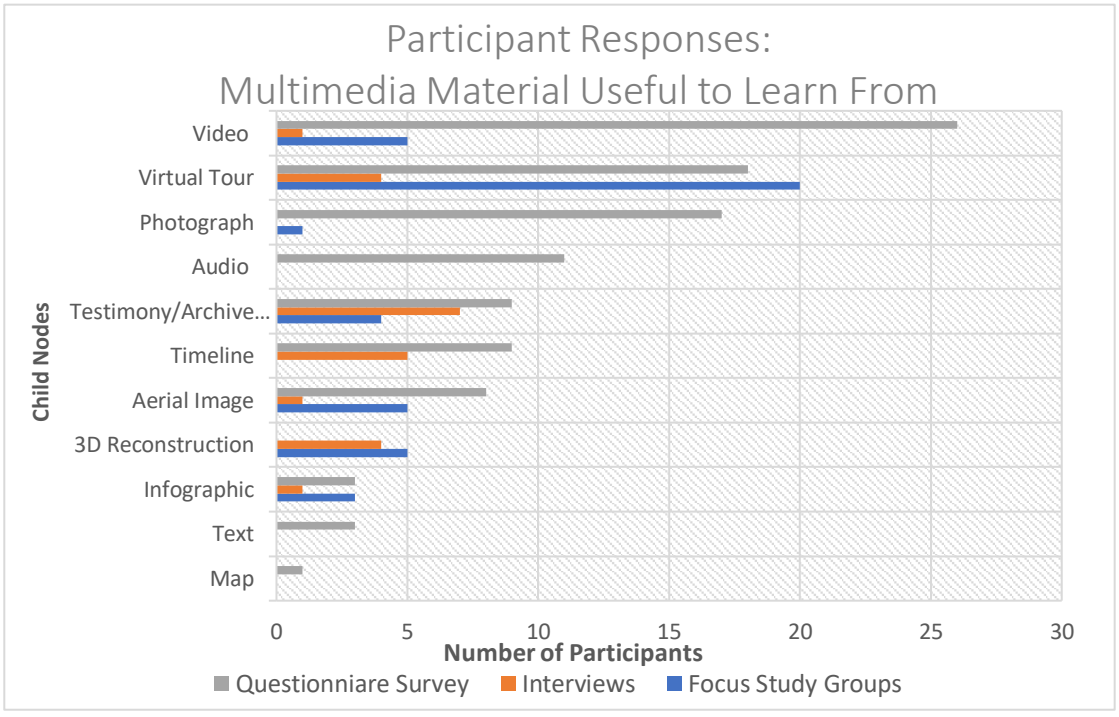


***Figure 6.20**: Coded participant responses to multimedia materials most useful to learn from.*

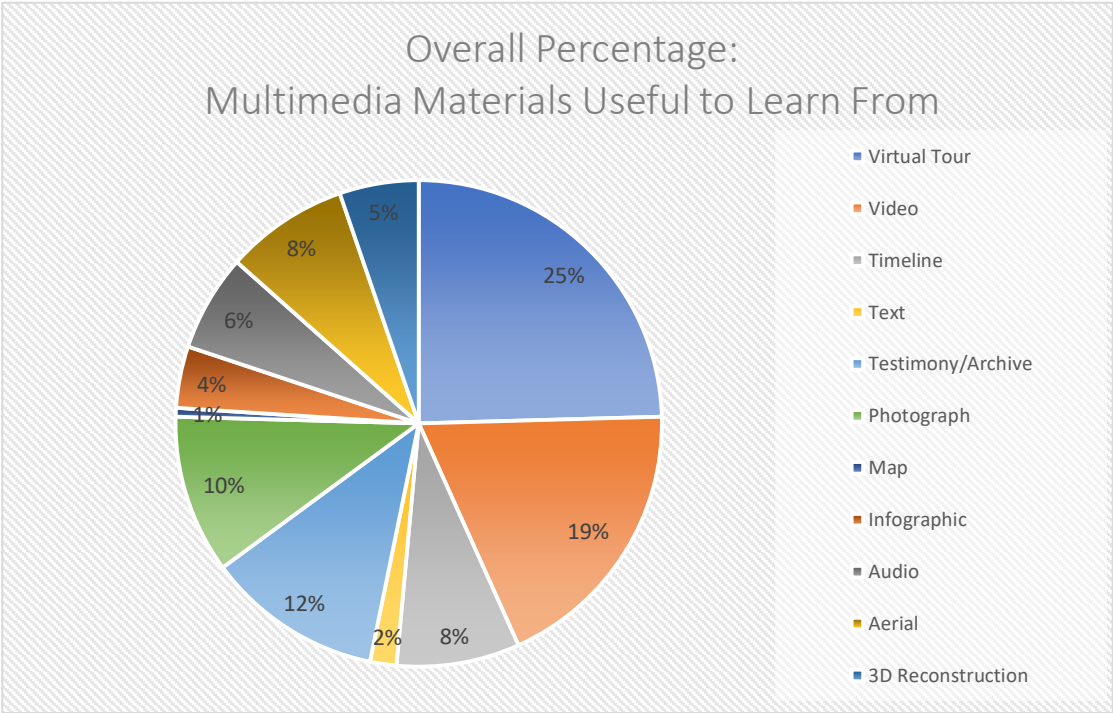


***Figure 6.21**: Overall percentage of multimedia materials useful to learn from.*

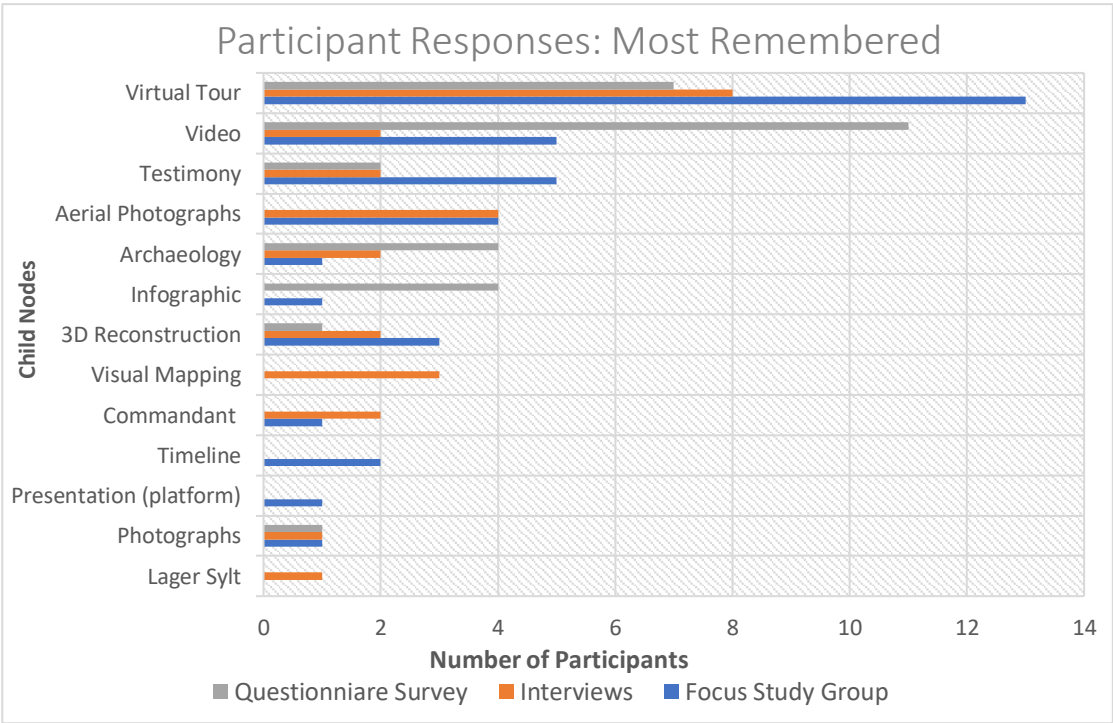


***Figure 6.22**: Coded participant responses to most remembered from the platform.*

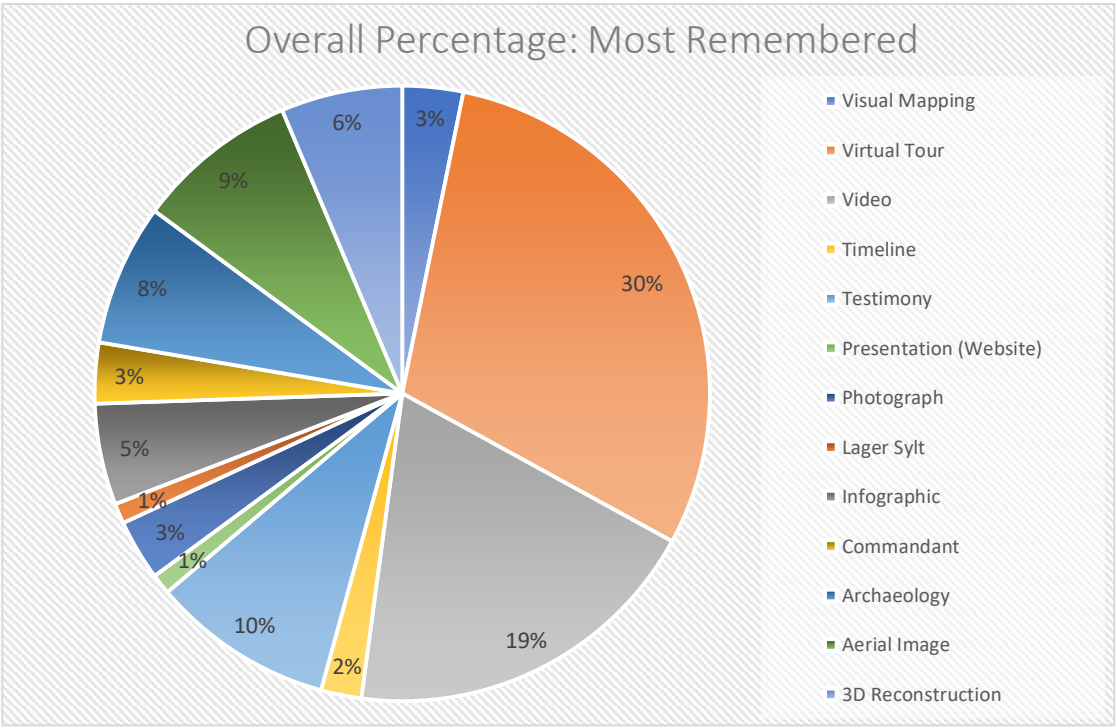


***Figure 6.23**: Overall percentage of most remembered from the platform.*

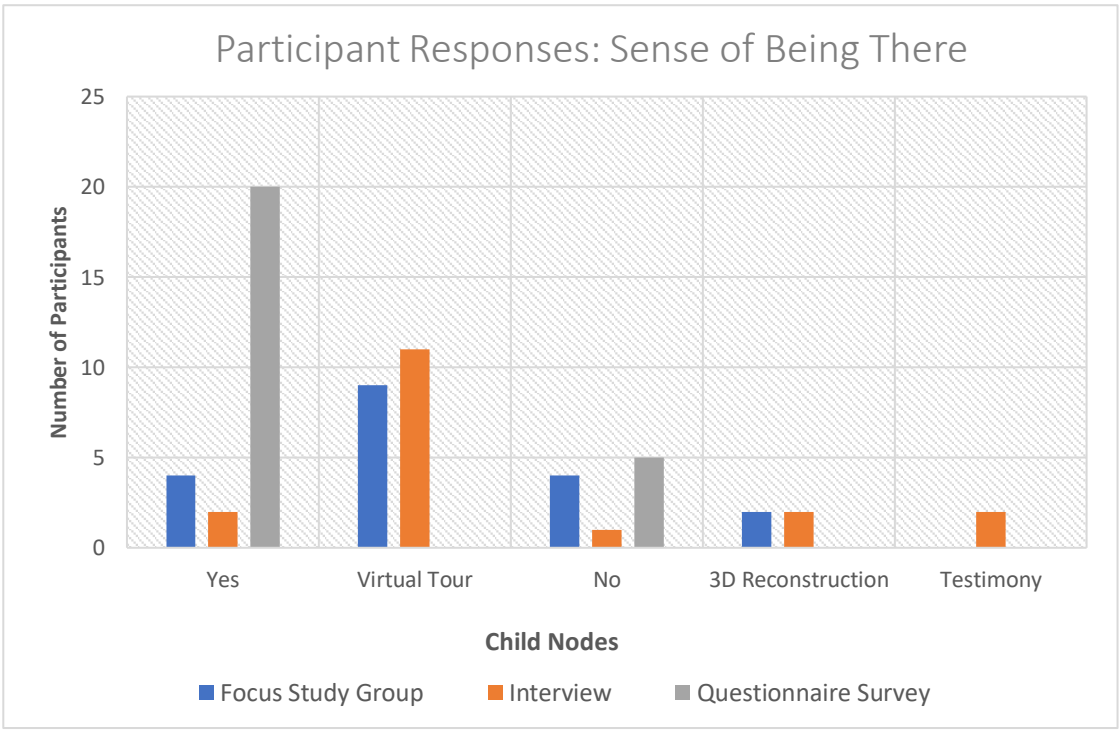


***Figure 6.24**: Coded participant responses to a sense of being there.*

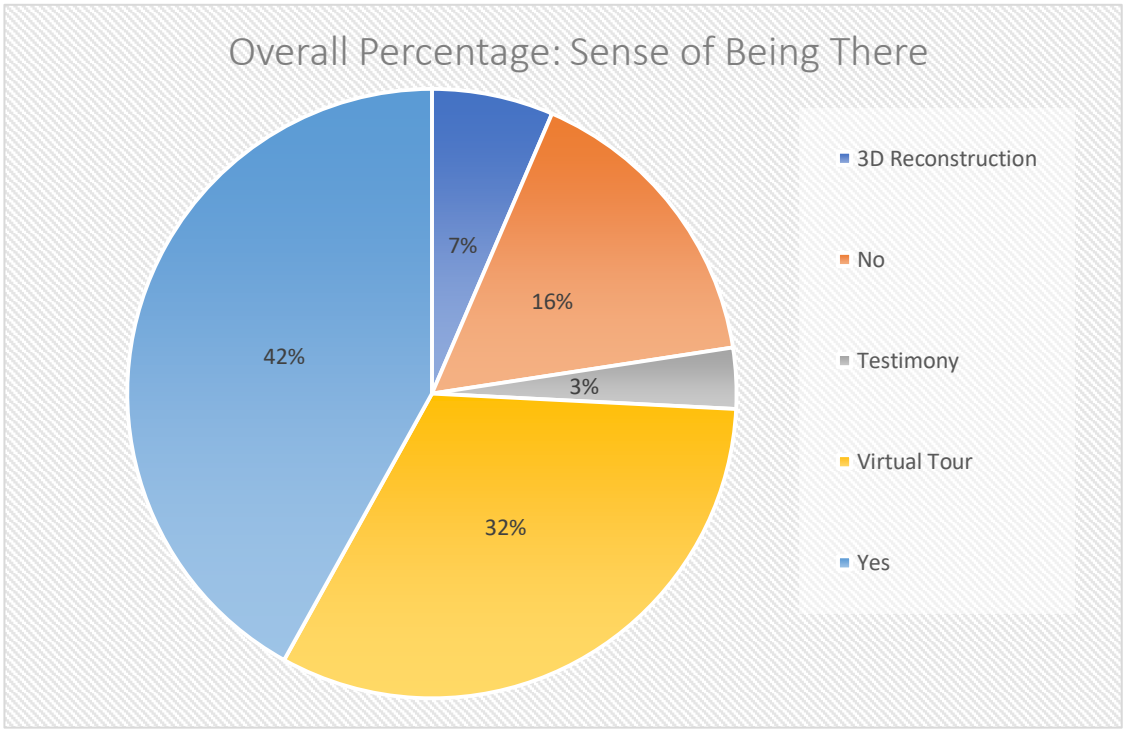


***Figure 6.25**: Overall percentage of a sense of being there.*

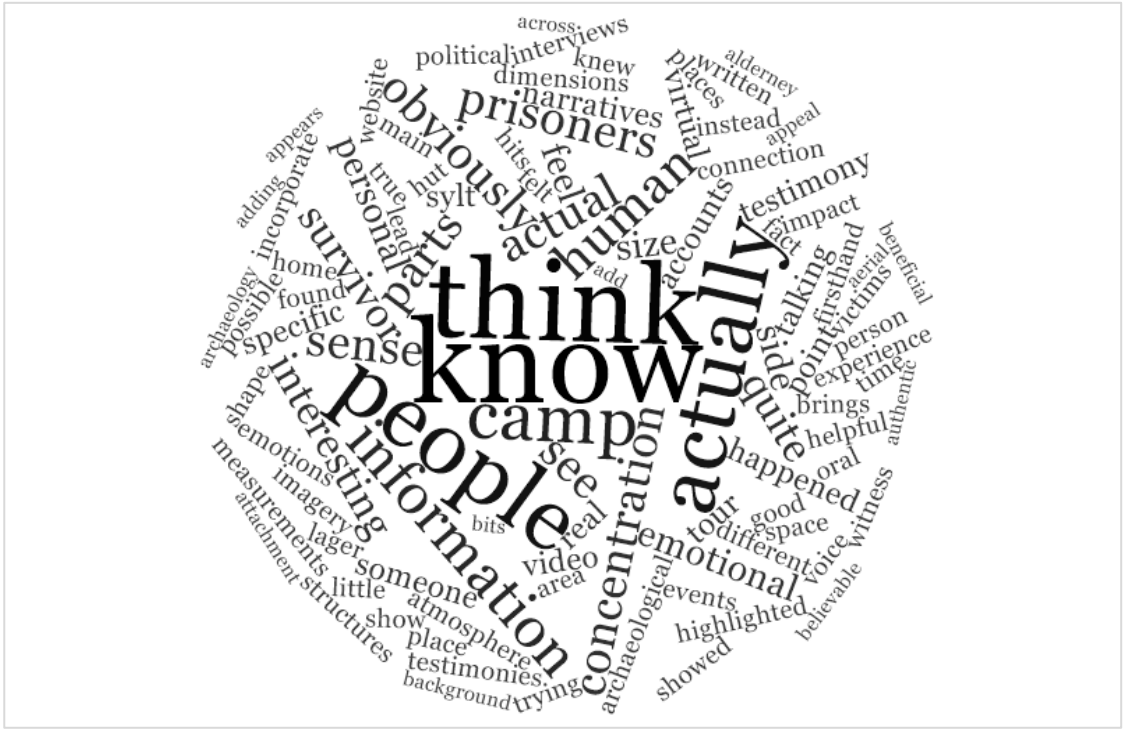


***Figure 6.26:** A word cloud displaying responses to the parent node empathy*

what is forensic archaeology?

Forensic archaeology is the application of **archaeological techniques to crime scenes** to recover evidence, which can be used in courtrooms to assist in explaining events.

Many methods used within forensic archaeology are applied to **Holocaust site investigations**, creating a sub discipline subject:

Holocaust archaeology differs from forensic archaeology in that the information is collected for humanitarian reasons instead of the courtroom. Increasingly emphasis of **non-invasive methods** are being applied to investigations due to ethical issues involved.

Holocaust archaeology

On-site methods

Remote sensing:

Scanning and surveying the earth's surface remotely to record landscape information through:

Passive sensors - respond to natural environmental elements such as light and heat. For example a thermal sensor can be attached to an Unmanned Aerial Vehicle (UAV) and detect objects with greater temperatures than zero.

Active sensors - create their own energy to illuminate surfaces. For example a Light Detection and Ranging (LiDAR) sensor can be attached to high-flying aircrafts, which measures distances between a surface and aircraft (useful to display landscape indentations).

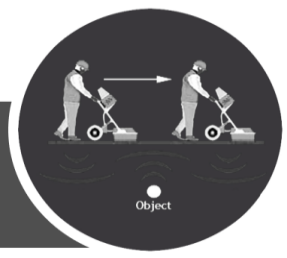
Additionally satellites are used to capture landscape information, producing data such as aerial images.

Photogrammetry:

Using 360° photography to visually document site scenes and features, which can be used to create virtual tours and 3D models.

Geophysical surveying:

Using scanning equipment (for example Ground Penetrating Radar (GPR)) to detect and map features, such as graves below the surface; without disturbing the ground.



Laser scanning:

Captures highly accurate measurements by omitting many lasers between the target (a feature or landscape) and the scanner. The data produces point cloud data and is used to create 3D models.

Ground surveying:

Conducting a systematic search of a site looking for features of interest and physical evidence, such as personal artefacts.

Sketching:

e.g. scale drawings

Photography

Off-site methods

Desk-Based Analysis (DBA):

Searching for relevant site information e.g. online, literature, academic text, reports, photographs, aerial images and maps.

Archive research:

Searching historical records for relevant site information.

Traditional archaeological methods, such as **excavation may not always be appropriate** due to ethical sensitivities such as Jewish burial law; which states graves should not be disturbed. Therefore non-invasive methods are applied when it is known, or suspected, that mass graves may be present within the area.

It is important to understand that **not all evidence is buried beneath the surface**. Surviving evidence often still remains upon landscapes of former Holocaust sites.

Information collected enables us to **understand** Holocaust landscapes and environments, e.g. the scale of a camp and **how people lived, died and survived.**

This can then be compared against other forms of evidence, such as aerial images and eye witness accounts, to develop a better understanding of events.

Figure 6.27: *The Infographic from the 'Explore Lager Sylt' platform.*

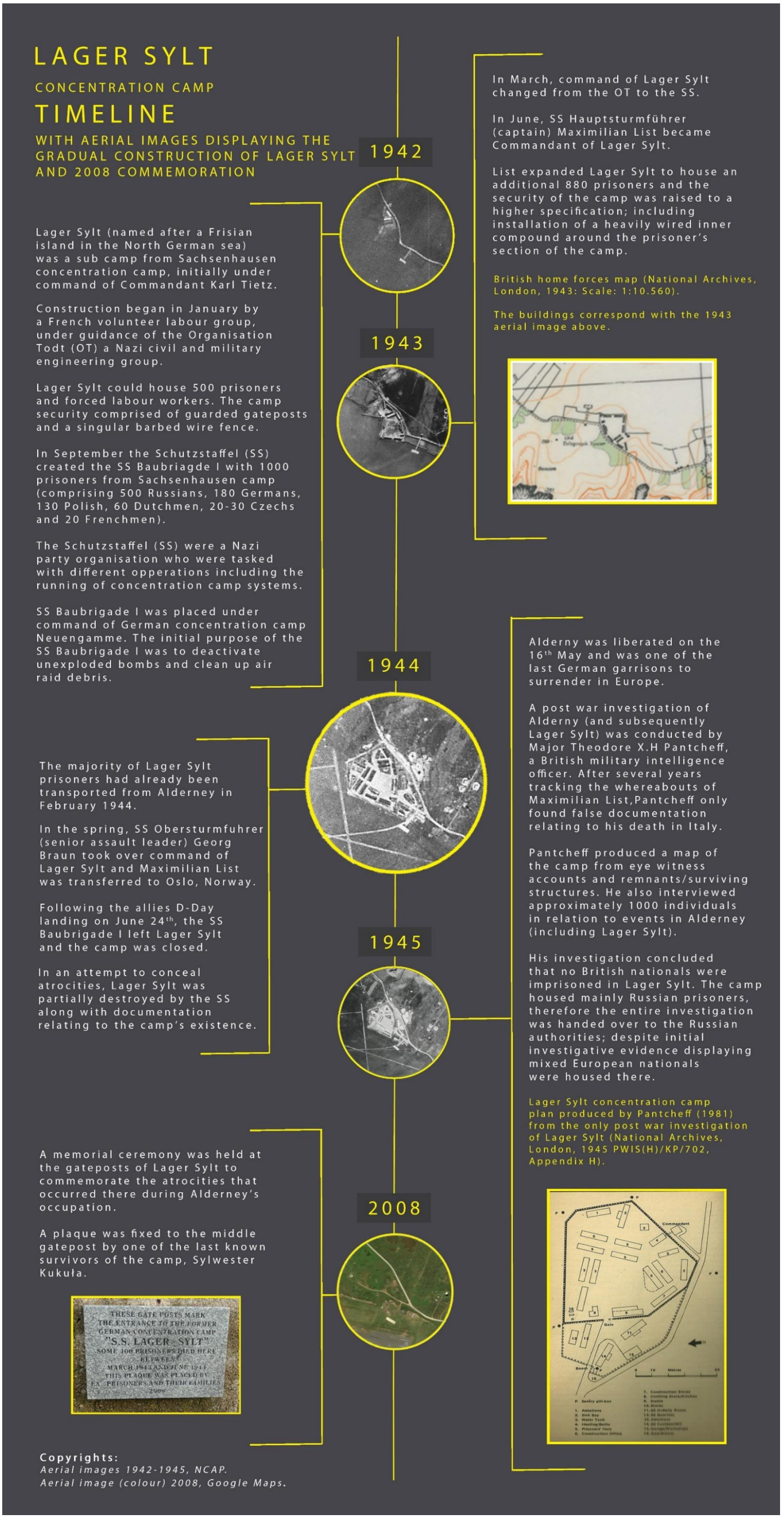


Figure 6.28: *The Timeline from the 'Explore Lager Sylt' platform*

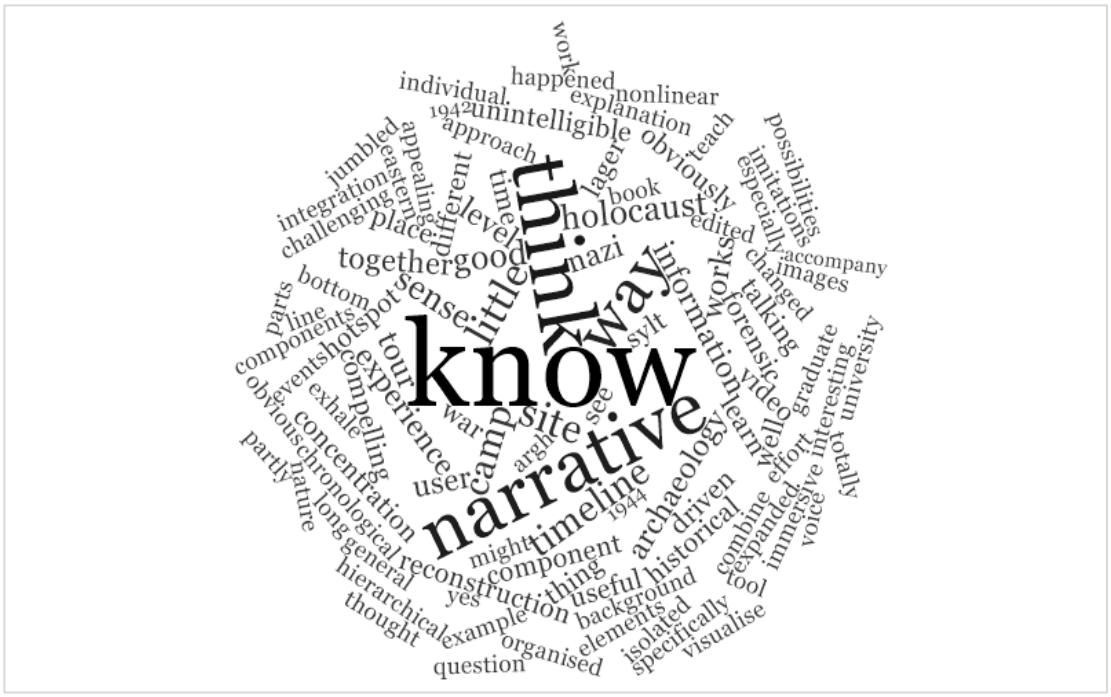


Figure 6.29: *A word cloud displaying responses to the parent node narrative.*

6.6.3 Presentation

Chapter 2 (Section 2.3) outlined the potential sensitives that may derive from exhibiting tangible Holocaust heritage materials within the public domain. Thus, effective presentation of materials is considered paramount. The theme presentation produced the nodes: appropriateness, offensive, technical issues, religious considerations and replacing a site visit.

Participants from all qualitative datasets considered the platform as being appropriate, apart from one questionnaire participant who ticked in-between the yes and no box. Participants considered the platform appropriate by: providing relevant information, not presenting gruesome images, interlinking source materials, displaying a relatively unknown concentration camp, demonstrating how forensic archaeology assists contemporary Holocaust investigations, providing an evidence-based approach to a destroyed Holocaust site and Holocaust commemoration. Participants unanimously stated ‘no’ when asked if they found anything offensive within the platform. However, several technical issues stemmed from exhibiting the platform within different environments. Participants of Hasmonean High School had different internet permissions than those of the other schools, and therefore, some videos hosted on YouTube.com were subsequently blocked. Additionally, all school’s internet bandwidth was slow loading the platform’s content.

Participants considered the amalgamation of alternative virtual representations appropriate to convey Sylt's information. This was highlighted by interviewee participant US11, 'I've been to similar sites…when I produce oral histories, sometimes we go into fields, where there were let's say mass shootings, and we talk to a person who was there…and looking at those pictures was very reminiscent of that too, so much so, that I actually went directly to my boss and I said we need a 360 camera to do this…because I really like the impression I'm getting from being there'.

6.6.3.1 Religious Considerations

Three interviewee participants voiced concerns regarding the correct use of the word 'Holocaust' within the platform (Section 6.6.2.1). These participants considered the term to explicitly denote the eradication of Jewish victims and thus expected to encounter information regarding Jewish prisoners. As participant US9 stated, 'I don't even know if it says there were any Jews in this camp or not'. Besides these comments, no other religious concerns were disclosed.

6.6.3.2 Replace a Site Visit

Participants were asked if this platform would replace a physical site visit (to Sylt). This question produced the nodes: distance, empathy, encourage visitation, no, site information preparation of site visit, unable to visit and yes.

Participants (*n*=2) considered that due to the proximity between Sylt and their country (America), that the platform would replace a site visit. Similarly, seven participants considered that for those unable to visit the site, this platform would replace a site visit (Figure 6.30). Nine participants considered that the platform would replace a site visit, due to Sylt's current condition (Figure 6.30). These participants explained that greater information about the site can be acquired through the platform, as no information boards or visitor centre currently exists.

Two participants explained that the platform would not replace a site visit but would provide a useful resource to prepare for a site visit (due to the site containing no information) (Figure 6.30). Two participants believed that after viewing the platform that it would not replace a site visit, due to the empathy encountered when visiting the site (Figure 6.30). These participants considered senses, such as touch, can only be achieved through a physical visit. Four participants believed that from viewing the platform, they were more encouraged to visit the site (Figure 6.30). The platform was considered a 'good' starting point to learn about Sylt's history, which could then be enhanced through a visit. Overall, nine participants agreed that the platform would replace a site visit, however, 14 participants believed that a site visit could never be replaced (Figure 6.30).

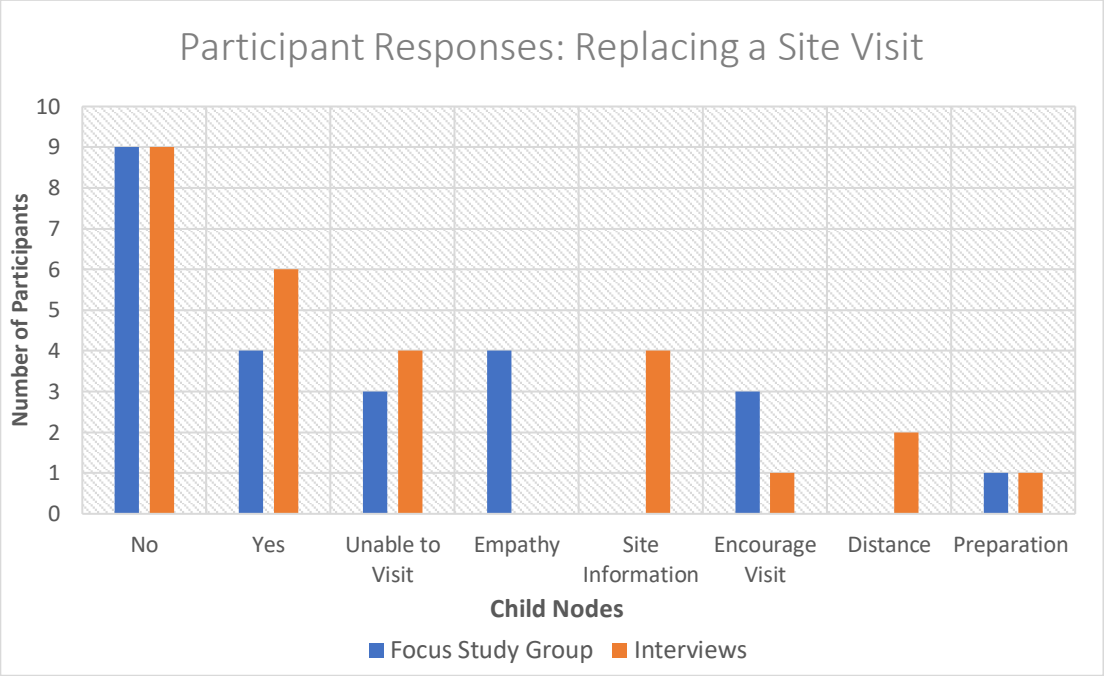


***Figure 6.30**: Number of coded participant responses to replacing a site visit.*

6.10 Summary

This study exhibited the case study site platform to 76 participants, comprising three pilot study focus group participants, 29 (UK) secondary school focus group participants, 16 interviewees from the USHMM and 28 questionnaire participants from the public.

The study displayed that despite Sylt's current appearance, conflicting narrative complexities and historical sensitives, that the combination of forensic archaeology and virtual heritage provided an effective manner to disseminate investigative findings. Forensic archaeological methods were considered a good approach to learn about a Holocaust site, through visualisation of data. Importantly, the believability of archaeological evidence was enhanced by displaying archive documentation and source references. This was considered to both authenticate and add credibility to the information displayed.

The use of virtual heritage visualisations allowed conflicting contemporary and historical evidence to be displayed simultaneously, allowing participants to decipher Holocaust sources. This transparent approach was accepted and valued by participants, who understood that not everything is known about the Holocaust; with many nuances deriving from this epoch. To achieve this transparency, several computer-based representations were required (a virtual tour and a series of evidence-based 3D reconstructions). To support these visualisations, a combination of text, audio, video and image multimedia was resourced, addressing different audience age ranges and learning styles. These

representations, particularly the virtual tour, were considered an effective, fun, engaging and interactive method of self-learning. The application of virtual heritage representations (either photo-realistic or abstract) was not considered suitable to 'replace' a site visit but could enhance education and commemoration of sites where no heritage or commemoration currently exists.

Although many advantages exist for disseminating forensic archaeologically-derived Holocaust data through virtual heritage technologies, the case study platform did encounter several issues. The debate surrounding definition of the word 'Holocaust', was highlighted as inappropriate, given Sylt did not house Jewish victims during the Second War World. In essence, this means no recognised or encompassing term exists for non-Jewish Holocaust victims. Additionally, this study highlighted narrative complexities when resourcing varied representations and different source materials, with some participants considering that the platform was to demonstrate forensic archaeological processes; not perform an educational and commemorative platform. This was further reflected by comments for more testimonies to be presented within the platform.

7.0 Discussion: Introduction

The beginning of Chapter 2 highlighted the essence of this research by questioning, 'how *can* the Holocaust be represented?' From a visualisation perspective, Farmer (2010: 115) argues that 'the "Holocaust" has never not been "represented" [through the] victims, perpetrators and bystanders' themselves. Therefore, a remaining question concerns, 'how *should* the Holocaust be represented?' From a forensic archaeological perspective, the Holocaust is a historical criminal event, and thus representation should be approached within a similar manner. As Braun (1994: 172) exerts 'historiography is bound up with notions of objectivity, reality, and truth'. However, perceiving the Holocaust as a historical criminal event requires examination of the crime scene, with the associated evidence coherently presented. Thus, Holocaust 'objectivity, reality, and truth' is derived from understanding the macro to micro of evidence. This chapter draws together the ethical challenges encountered in Chapters 3, 4, 5 and 6. The key ethical themes deriving from the 'Anne Frank Secret Annex' and 'Explore Lager Sylt' qualitative data are then compared against the existing literature (Chapter 2).

This chapter discusses the 'seeing is believing' concept, highlighting the importance for authentic, accurate and transparent Holocaust representations. Discussions regarding the authenticity of representation follow, exploring different notions of authenticity and visualisation boundaries. The significance of aesthetics is contemplated, specifically how design influences perception. The virtual heritage terms 'interactivity' and 'engagement' are discussed, understanding how these terms are developed and if they are essential to virtual Holocaust environments. Navigation is outlined by providing general directions for future developments within virtual environments. This follows the importance of multimedia diversity, contemplating how much evidence is 'enough'. This chapter continues to outline the role of empathy and testimony, by comparing responses between the Anne Frank and Explore Lager Sylt qualitative data. Narrative styles and Holocaust experience follow, highlighting the benefits and limitations when using linear and non-linear narratives. The perceived value of research is then assessed, drawing together key themes and describing how these have influenced the exhibition of Sylt's case study investigative data. The chapter also outlines any modifications required to develop an ethically validated platform of Sylt, in light of the user responses generated as part of this research. Finally, eight recommendations for the development of future Holocaust computer-based representations are outlined.

7.1 Believability & Evidence

To understand the moral underpinnings of Holocaust representations, the author sought to understand what participants either believed or disbelieved and what they considered valuable evidence. This understanding could assist the Holocaust historical record through clarifying, disputing or generating new Holocaust narratives. To generate insights into participant perceptions regarding information

believability, it was important to compare an established narrative (Anne Frank) against Sylt's relatively unknown narrative. Despite Sylt's lesser-known narrative, the term 'evidence' was extensively coded throughout the data but was only coded once within the Anne Frank data, referring to a lack of. Participants frequently used the terms 'belief' and 'evidence' in conjunction and considered the following qualities essential to enhance both: supporting source materials, referencing, cross-referencing, the number of sources and the origin of information (Chapter 6 Section 6.6.1).

Braun (1994: 172) asserts that 'evidence and proof is used to establish the 'truth' of historical representation'. Therefore, a requirement to understand what constitutes 'evidence' from different participant perspectives was important, given that archaeology can reveal new insights about past events (Sturdy Colls, 2015; González-Ruibal, *et al*, 2008). Qualitative data obtained from the Sylt platform demonstrated that participants considered archaeological findings provided 'evidence' of events, making Sylt's narrative more 'believable' (Chapter 6 Section 6.6.1.1). As focus group participant P.S.F.2 explained, 'the archaeological point of view helps…prove the evidence a little bit more…and makes it a lot more believable'.

However, a paradox was observed as nine participants compared the archaeological investigative findings against Sylt's 'official' narrative being challenged (Chapter 5 Section 5.3). This highlighted that despite archaeology's ability to reveal new insights about the Holocaust, established narratives can still take precedence over 'evidence' (Van der Laarse, 2015). This was further highlighted through participants expressing 'belief' in the Anne Frank platform, through being a previously encountered narrative. Focus group participant B.S.A.F.F.1 explained, 'the points they made backed up…what was in the diary'. Although, focus group participant B.S.A.F.F.6 who had no former knowledge of Anne Frank considered, 'it was convincing like, it wasn't like everything had the evidence there'.

The author considers archaeological findings from Holocaust investigations as a historical counterbalance, tangibly connecting historical testimonies and sources to landscapes and artefacts. These sentiments were shared amongst research participants, for example, 'there's certain details that you wouldn't really be able to find out without having evidence from what's actually at the site' (focus group participant C.C.L.S.F.3); 'it makes it real for people…otherwise…you're just being told' (focus group participant H.H.L.S.M.6); 'there's this depression and this is why we think it's this underground chamber' (USHMM interviewee US1). Through exhibiting evidence, archaeology transformed participants' thoughts into visual perception. Thus archaeology 'sets the scene', whilst testimonies and sources 'tell the story'.

Despite participants considering archaeology to provide evidence of atrocities, archaeological findings can be considered ambiguous in nature, as evidence can encompass 'many truths' (Sturdy

Colls & Branthwaite, 2018: 442). During archaeological fieldwork at Treblinka extermination camp, a cooking pan was discovered with no identification markings and could not accurately be dated. During the processing of archaeological finds, a visiting Holocaust survivor considered that the pan established proof, that victims 'were to be transported to the east where they would start new lives' (Sturdy Colls & Branthwaite, 2018: 443). From an evidential perspective, this provided one possible interpretation, but the survivor considered this the only possible explanation. Addressing alternative perspectives, the art installation 'A Pan', was presented alongside multiple evidence interpretations, to engage discussion and highlight ambiguities when interpreting Holocaust findings (Ibid).

The 'A Pan' exhibition provides a physical example regarding how to approach disseminating Holocaust evidence and potential interpretations within the public domain. This thesis research supports and builds upon this perspective by outlining that participants do not require a 'definitive' answer when presenting Holocaust evidence. Section 6.6.1.3 (Chapter 6) highlighted that believability was also enhanced when content transparency was outlined; thus, if 'many truths' or unknown ambiguity surrounds archaeological findings this should be conveyed. This approach to Holocaust dissemination is undertaken by the USHMM, as participant US3 explained if the evidence is unknown or conflicting, this is highlighted within USHMM's literature and publications.

In 1959, Ball-Kaduri described overhearing a conversation between Wiener Library and Hebrew University employees regarding the perceived value of Holocaust testimony; 'if I find only one piece of evidence, it does not mean anything to me…but if I have a hundred then the evidence is conclusive' (Ball-Kaduri, 1959: 89). Ball-Kaduri pondered the value of individual accounts, especially through Holocaust contexts where only a limited number (even one) witness survived (Kushner, 2006; Ball-Kaduri, 1959). By framing this perspective through a physical site, the Nazis endeavoured to destroy all traces of Treblinka extermination camp and from approximately 800,000-1,000,000 victims, only 67 individuals survived constituting a 'small' number of testimonies (Sturdy Colls & Branthwaite, 2018). From an archaeological perspective, the number of historical sources is irrelevant. This is demonstrated by Sturdy Colls (2012: 229) archaeological investigation of Treblinka, which used historical sources (such as testimony) within fieldwork, to discover that not all of the camp was 'entirely destroyed and that physical evidence of the camp does survive'. Therefore, archaeology can generate greater evidence of the Holocaust, which can enhance the 'value' of historical sources.

An uncomfortable truth within Holocaust history is the reliability of historical testimony and documentation. As Shneer (2015) explains, Nazi documentation was often misleading, through purposeful deceit, biased writing or absent information. Historian Raul Hilberg describes 'flawed samples' within testimonies, as victims, perpetrators and bystanders encompass their own perspectives and personal 'attitudes and reactions' (Hilberg, 1985: 236; Myers, 2008). Myers (2008;

235) further elaborates that due to concentration camp hierarchies, ‘not all prisoners can be considered equal, as thus those who survived are the elite’, contrasting ‘the subaltern’, who did not survive (Sofsky, 1999). Thus, the Holocaust historic record is composed from the survivors, not the deceased. Much debate surrounds the accuracy of Holocaust eyewitness testimony (for example, LaCapra, 2014; Bernard-Donals, 2007; Douglas, 2005; Levy & Sznaider, 2005; Roseman, 1999), with often limited supporting evidence available to strengthen victim accounts (given that generally victim’s possessions and Nazi camps were destroyed (Sturdy Colls, 2015; Roseman, 1999)). Sufficient research now exists, demonstrating archaeology’s ability to clarity, challenge or refute historical sources through surviving evidence (Chapter 2, Table 2.2).

The visualisation of archaeological data from Sylt investigations, particularly the 360° panoramic photo virtual tour and abstract 3D reconstructions, generated belief in content. The qualitative data supported the perspective that the virtual heritage representations assisted believability amongst participants, as focus group participant H.H.L.S.M.1 explained, ‘once you actually see it, you can believe it’ (Chapter 6 Section 6.7.3). This ‘seeing is believing’ concept is associated with the field of Electronic Presentation of Evidence (EPE) within the field of forensics (Schofield & Fowle, 2013; Schofield & Mason, 2012; Schofield, 2011; Speisel & Feigenson, 2009). Although Chapter 2 (Section 2.4.3.3) highlighted that limited conclusive research exists regarding computer-based courtroom representation biases, research supports the perspective that visualisation of evidence assists juror believability. For example, Bente *et al* (2001: 157), aimed to identify ‘whether computer animations evoke similar responses from subjects as original video’, with results displaying marginal differences between computer animations and live footage.

In 2011, Schofield described typical courtroom representations as ‘fairly-abstract’ (Schofield, 2011: 54). Contemporary and future courtroom concerns stem from realism and photorealistic visualisation advances, as jurors may be ‘lulled into the…seeing is believing attitude, causing a potential relaxation of their critical faculties’ (Schofield, 2011: 100; Speisel & Feigenson, 2009). Similarly, cultural heritage research highlights that participants hold greater preferences for ‘believable and convincing environments’ (Roussou & Drettakis, 2003). The qualitative data generated from the Sylt platform highlighted that a variation between the believability of the virtual tour (n=10) and 3D models (n=4) existed. By comparison of the Sylt and Anne Frank data, believability and authenticity were further maintained through the platform’s creator, historical sources, references, former knowledge and information transparency. Therefore, within Holocaust representations, the ‘seeing is believing’ concept necessitates more than simply presenting visual information. Participants further required sources and evidence to support the representations.

7.2 Authenticity

As the 'Explore Lager Sylt' platform would be their first time the majority of participants encountered Lager Sylt's narrative, the authenticity of representation was essential to ensure reliable and accurate information was conveyed. The word 'authentic' frequently emerges from the literature that describes virtual heritage computer-based representations (Tan & Rahaman, 2009; Roussou, 2007; Tost & Champion, 2007; Affleck & Thomas, 2005; Roussou & Drettakis, 2003). Roussou (2007: 279), considers representation qualities such as authenticity to be dependent on 'target audience and purpose', and that authenticity can be considered a subjective construct, depending on the availability of data and whose past is represented. Therefore, authentic qualities encompass different connotations dependant on definition and context. To evaluate the authenticity of the Sylt platform, clarification of the definition and context is required. The Oxford Dictionary defines 'authenticity' as 'of undisputed origin and not a copy; genuine', but continues to state, 'made or done in the traditional or original way, or in a way that faithfully resembles an original…based on facts; accurate or reliable' (Oxforddictionaries.com, 2018a).

When developing the 'Explore Lager Sylt' platform the author was restricted by the limited number of available sources, specifically victim testimony and photographs. Consequently, the authenticity regarding victim experiences was not essentially achieved in a similar manner to the authenticity of computer-based representations. As outlined by Raul Hilberg (1985) (Section 7.1), the Holocaust is constructed from different perspectives (for example, victims, perpetrators and liberators). To maintain the narrative's authenticity, the narration of the Sylt platform was partially formed through victim, perpetrator, bystander and investigator testimonies. This was valued by participants, as USHMM interviewee US12 explained, 'you have former SS officers describing…the camp and describing their experiences and you had the survivors describing this as well…all of that I think, was useful, compliment to the spatial representation'. The amalgamation of different accounts was required to combat biased, fragmented and/or conflicting issues (Section 7.8), to maintain the narrative's authenticity.

In 1997, Roberts and Ryan asserted that (some) archaeologists had formerly prioritised virtual representation showmanship over archaeological credibility and authenticity (Bentkowska-Kafel *et al*, 2012; Roberts & Ryan, 1997), with photorealism perceived as the 'holy grail' of representation (Rahaman *et al*, 2012; Roussou, 2007; Affleck & Thomas, 2005; Roussou & Drettakis, 2003). A longstanding debate ensued between archaeologists desiring accuracy over photorealism and technologists prioritising photorealism over accuracy (Bentkowska-Kafel *et al*, 2012; Rahaman *et al*, 2012; Affleck & Thomas, 2005). Consequently, the London Charter (2009) confronted these technologically evolving ethical debates by promoting 'intellectual and technical rigour' within representation (London Charter, 2009). Interestingly, Vico (2018) highlights that the paradoxical

term authenticity is non-existent within the London Charter (2009) but does appear within principle four of the Seville Charter (2011) (Lopez-Menchero & Grande, 2011). Vico (2018: 25) further highlights that 'these documents provide general guidelines but no prescriptive rules or standards to guide the practitioner'.

Principle five (historical vigour) of the Seville Charter (2011), outlines that virtual environments 'cannot systematically show lifeless cities, lonely buildings or dead landscapes because this is a historical falsehood' (Lopez-Menchero & Grande, 2011: 4). Although the Seville Charter broadly caters to archaeology, Holocaust archaeological representations challenge this principle. If the Holocaust is perceived as a criminal event, then the authenticity and accuracy of information disseminated are vitally important. Within forensic and policing EPE representations, if the information is unknown then it is not included within a visualisation. The inclusion of details such as avatars may influence an individual's understanding and overall impression of a Holocaust site, thus this information should be excluded from Holocaust representations. Apart from questionnaire participant USQ27, who stated 'I would have liked to be able to enter the [3D reconstruction] buildings as well', no other participants referred to historical vigour.

From an audience perspective, the perceived authenticity of a virtual environment ultimately differs between individuals, dependant on personal definitions. Individual definitions may be influenced by qualities such as age, gender and nationality (Budruk *et al*, 2008; Chhabra *et al*, 2003; Waitt, 2000), alongside external validation from institutions and/or authorities (Guttentag, 2009; Bruner, 1994). The qualitative results from this study generally displayed that Holocaust computer-based visualisations were not judged solely by production quality or artistic merit. Predominantly, participants were not concerned with artistic explanations or photorealism representations, with acceptance based on a more profound subjective assessment of different characteristics; primarily evidence and sources underpinning the representations.

This was noticeable from comments describing the combination of 3D evidence-based representations with historical sources (Chapter 6 Table 6.2 principle five). As focus group participant P.S.F.1 stated, 'I think it's just probably the nature of an aerial image that's quite difficult to tell depth…but it was easier when the reconstruction was underneath'. This displays how historical and contemporary visual data can be authentically combined whilst highlighting that authenticity was not primarily linked to photorealism representation but to visualisations corroborating source materials. Thus, photorealism production was not intrinsically linked to authenticity, but to the verification of sources and evidence (Moffat & Shapiro, 2015). This supports studies that suggest abstract representations offer alternative educational qualities than photorealism representations (Economou & Pujol, 2008; Lee *et al*, 2005; Osberg, 1997), which is vital for Holocaust representations, as many details remain unknown.

As Levy (2001) highlights, computer-based visualisations are constricted by the availability of archaeological data. Within Holocaust archaeology, abstract representations are particularly significant for sites which have incomplete or fragmented sources. Throughout the development of the Sylt case study platform, many authentic representations issues were encountered, including the availability of sources detailing the site's appearance. This research displayed that despite Sylt's limited 'obvious' surviving landscape evidence, and its relatively unknown appearance, computer-based visualisations still performed an effective communication and education function. However, as Levy (2001) explained more than one computer-based representation may be required for effective communication. The qualitative responses from Sylt's data highlighted that both computer-based visualisations complimented one-another, with the 3D reconstructions visualising the past and virtual tour the present. Despite the literature stating audiences desire photorealism over non-photorealistic representations (Rahaman *et al*, 2012; Affleck & Thomas, 2005; Roussou & Drettakis, 2003), this thesis data does not support this perspective. Although greater belief within the virtual tour representation was maintained, participants also expressed similar satisfaction from the abstract 3D reconstructions. This supports the perspective of audience preferences for 'believable and convincing environments', which can ultimately differ from photorealism (Roussou & Drettakis, 2003: 2).

The literature considers that representations are usually not accompanied by sufficient explanations, such as the degree of artistic licence (Rivero & Lopez Benito, 2013; Bentkowska-Kafel *et al*, 2012; Affleck & Thomas, 2005; Van Scoy 2000). Although both the Sylt and Anne Frank platforms outline the rationale and development for the virtual environments (including the extent of artistic licence), limited participant comments reflected the value in presenting this information. Participants were asked, 'why do you believe in the information presented?' With only one participant referring to the degree of artistic licence explanation provided in the Sylt platform. Focus group participant P.S.M.1 described, 'you explain on one photo that we know for definite that the white buildings, they were the size and shape and then the other ones we've used, you know put together through other things. The fact that you've explained that, I didn't necessarily think they just made that bit up because you know, something is there…the old footage, the first-hand accounts…I think that that does authenticate the other bits'. To maintain the authenticity of Holocaust representations, information regarding how a computer-based representation was developed should be apparent but should be presented adjacent to a platform's narrative.

7.3 Aesthetics

The aesthetical appearance of Holocaust and heritage representations can significantly influence a user's impression of the credibility of content (Goulding, 2015). Therefore, contemplation of the design was extensively deliberated during the 'Explore Lager Sylt' platform construction, to ensure the content was presented in a neutral way (Chapter 6 Section 6.2). Principle 3.3 of the London

Charter also describes preserving the 'intellectual integrity' of research sources through contemplating aesthetic, design and presentation factors when constructing computer-based representations (London Charter, 2009: 7). Participant responses regarding the Sylt platform highlighted that a small number of participants considered the colour yellow[34] was inappropriate for Holocaust representations. For example, USHMM interviewee participant US1 stated, 'yellow is just too sunny…it's a serious topic and the yellow makes it less serious'. The colour yellow belongs to the 'warm end of the spectrum', alongside colours such as orange and red, whilst at the 'cool end of the spectrum' are colours such as black, blue and green (McNeill, 1972).

Scarce research exists surrounding the use of colours within Holocaust representations. However, research from psychology (Cyr *et al*, 2010), design (Wang *et al*, 2010) advertising and marketing (Lichtle, 2007: 91), claim that 'colours are known to possess emotional and psychological properties', which are often related to culture and gender (Singh, 2006). Research from these fields frequently concludes that cooler spectrum colours are viewed more favourably than colours from the warmer spectrum (Singh, 2006; Marcus & Gould, 2000; Goldberg & Kotval, 1999). Simon's (2001) research, evaluated four website designs through one hundred and sixty participants, highlighted design characteristics such as colour, encouraged greater trust and positive perceptions of the information being viewed. Although, research conducted by Cyr *et al* (2010: 1) regarding 'user trust, satisfaction and e-loyalty' through website colours and cultural impact, concluded that all study participants were inclined to dislike websites with yellow colour schemes.

The websites evaluated in Chapter 2 (Section 2.5.3), primarily resourced cooler spectrum colour schemes upon their homepages. However, websites such as USHMM.org and Tellingstories.org also incorporated colours from the warm end of the spectrum within specific website features (mainly text) (Figure 7.1). Contrastingly, the 'Anne Frank Secret Annex' platform resourced both cool and warm colours in the website header (Figure 7.1). This approach is comparable to the Sylt platform, which applied both warm and cool colour spectrums throughout representation (Figure 7.1). This highlights an area in need of greater research, to understand how different colour schemes emotionally and psychologically influence audience perceptions of online Holocaust representations.

This research highlighted the importance of considering the design and layout of online Holocaust representations. Data from both Sylt and the Anne Frank platform displayed that participants considered a well-organised and well-presented platform assisted content believability, especially amongst younger audiences. Research conducted by Goulding (2015: 90) into Holocaust education and denial, using online sources stated, 'individuals generally do not engage in rigorous or time-consuming information evaluation processes but, instead rely on superficial factors such as the

[34] The colour yellow was used within the infographic, timeline and virtual tour designs (for example, hotspots and heading titles of primary source materials).

website design and navigability to determine the quality and credibility of the content' (Metzger *et al*, 2010).

Although research into Holocaust website credibility can be considered a relatively small field, studies indicate that content believability is enhanced through well-presented websites (De Bruyn, 2011; Fogg *et al*, 2002; Borrowman 1999). For example, research conducted by Fogg *et al* (2002) evaluated 2,684 participants who viewed two websites (of a similar nature). The Stanford University study concluded that 46.1% of participants considered the website design an essential quality in establishing credibility (Fogg *et al*, 2002). Therefore, one may conceive that audiences using online Holocaust resources may partially determine the believability and credibility of content, prior to interaction. This emphasises the importance of multi-disciplinary developments of online Holocaust representations and a requirement of a designer.

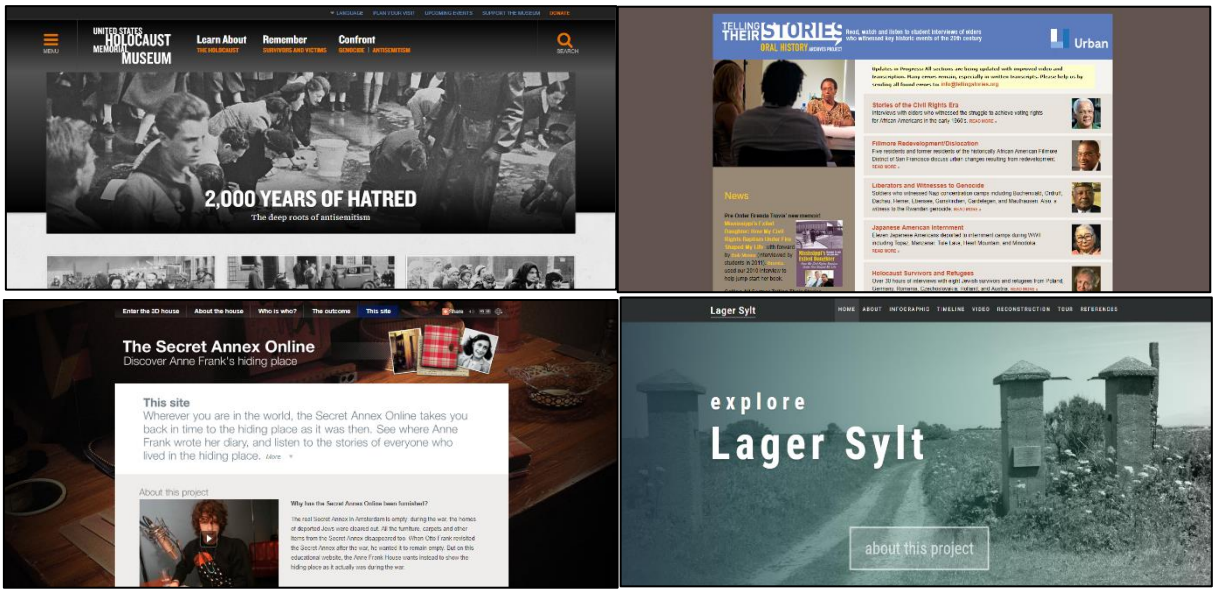


Figure 7.1: (Top left) *The USHMM homepage using orange fonts (USHMM.org, 2017).* ***(Top right)*** *Telling Stories homepage displaying orange fonts (Tellingstories.org, 2015).* ***(Bottom left)*** *The Anne Frank Secret Annex website displaying a banner using warm colours (AnneFrank.org, 2018a).* ***(Bottom right)*** *The 'Explore Lager Sylt' homepage presented in cool colours (author's own image).*

7.4 Interactivity & Engagement

Chapters 4 and 6 highlighted that participants frequently used the words 'interactive' and 'engaging' when describing the Sylt and Anne Frank platforms. These terms refer to a perceived benefit for presenting information through virtual heritage representations (Rizvic *et al*, 2013; Schofield, 2011; Tan & Rahaman, 2009; Tuck & Kuksa, 2009; Tost & Champion, 2007; Roussou, 2007, 2002). Within the literature, these terms are descriptively applied but lack context (Roussou, 2007). The Oxford Dictionary defines 'interactive' as '(of two people or things) influencing each other…allowing a two-way flow of information between a computer and a computer-user; responding to a user's input'

(Oxforddictionaries.com, 2018b). Thus, in virtual heritage realms, this term refers to the flow of information between the audience and computer. The Oxford Dictionary defines 'engagement' as 'occupy or attract (someone's attention)… establish a meaningful connection' (Oxforddictionaries.com, 2018c). This term has a greater clarity of definition within the literature and is associated with qualities such as narrative (or storytelling), game (or challenges) and authenticity (Ibrahim *et al*, 2015, 2011; Rizvic *et al*, 2013; Tan & Rahaman, 2009; Tost & Champion, 2007; Roussou, 2007).

Both the Sylt and Anne Frank participants used the terms 'interactive' and 'engaging' to describe the virtual tour, photographs, videos and testimony. Also, Sylt participants used these terms to describe the 3D reconstructions. Both datasets displayed that interactivity was initially formed through the virtual environment but maintained through narrative, multimedia materials, navigation, empathy and authenticity. Responses regarding both platforms were identical when asked, 'did you get a sense of being there?' Outside of expected responses (of the 360° panoramic photo virtual tour and multimedia), eyewitness testimonies also enhanced interaction and engagement by creating immersion through empathy. Roussou (2002: 94), describes immersion as 'the illusion of being in the projected world, being surrounded by the image and sound in a way, which makes you believe that you are really there'. As interviewee participant US16 explained, 'I was in the…material trying to see what…can I read about here and I certainly had a sense of losing space and time'. This highlights that not all Holocaust source materials require extensive production, with original testimonies and empathy performing a valuable role (Section 7.7).

Panoramic imagery of the current site did not enhance interactivity and engagement, as both terms were used to describe the virtual tour and 3D reconstructions. Although authenticity performs a valuable role for interactivity, engagement and immersion (Roussou, 2007; Affleck & Thomas, 2005), virtual heritage Holocaust representations are not limited by abstract representations. Maintaining these qualities requires attention towards attributes such as narrative and empathy, suggesting that immersion is also created through emotional engagement. These characteristics have significance within education (Stone & Ojika, 2000; Tost & Champion, 2007), as Roussou, (2002: 5) highlights that individuals acquire and learn information through 'problem-solving', 'critical thinking', 'learning by doing' and a 'hands-on' approach. As USHMM interviewee participant US11 explained, 'I felt much more encouraged to learn the information here'.

The terms 'interactive' and 'engagement' are frequently associated with the field of video game, which can also generate many educational related qualities, similar to virtual heritage (Champion, 2016; 2003; Jacobson *et al*, 2009; Tan & Rahaman, 2009; Economou & Pujol, 2008; Tavernise & Bertacchini, 2017). However, Holocaust representation through video game has often resulted in controversy (Times.co.uk, 2018; Guardian.com, 2008). A distinction exists between games

developed solely for Holocaust education (for example, 'Imagination is the Only Escape') and those using the Holocaust narrative as the story or plot of a game (for example, 'Sonderkommando Revolt'), with the former being the focus of discussion. A direct difference between virtual heritage representations and virtual games is perceived through how audiences influence narrative decisions. The 'Explore Lager Sylt' platform can be interacted with by audiences without the narrative outcome being influenced, thus distinguishing it from a game. Therefore, one may perceive that engagement is secondary to interaction, and not a guaranteed experience. Research considers simulation, such as video games, produce inadequate pedagogy practices within Holocaust education, for attempting to 'experience' victim brutality and atrocity 'is shocking in its naivety' (Totten, 2002: 122) and 'debases the memory of the Holocaust' (Cowan & Maitles, 2012: 126) (Section 7.8).

7.5 Navigation

Ibrahim, Ali and Yatim (2011: 275), describe navigation difficulties as a 'classic virtual reality problem'. Effective navigation (or wayfinding) is considered of vital importance to provide users with an immersive experience (Ibrahim *et al*, 2015; Tan & Rahaman, 2009; Economou & Pujol, 2008; Economou & Tost 2011; Champion 2002; Costalli *et al*, 2001). To tackle this issue, Schofield (2014), suggests that movement should be restricted, rather than users becoming lost if they assumed control of the virtual environment. In addition, Ibrahim *et al* (2015: 12), explains that participants ceased interaction if they encountered navigation difficulties or felt lost in a virtual environment, suggesting there should be an overview 'mini-map' and teleport function. By displaying a map, users can visually navigate and orientate themselves within a virtual realm thus focusing attention towards content rather than 'navigation fatigue' (Ibrahim *et al*, 2015: 12; Costalli *et al*, 2001). Despite its relevance within the literature, navigation is not detailed within the London (2009) or Seville (2011) Charter.

Chapter 6 highlighted that the virtual tour navigation was perceived differently than the 3D reconstruction, which was considered too long, with some confusion regarding how to operate the 3D models. Both the virtual tour and 3D reconstruction provided a 'splash' (or instruction) screen, explaining how navigation and interaction are achieved. Upon accessing the virtual tour, participants were greeted with a splash screen, with the instructions only removed by clicking the image. In contrast, the 3D reconstruction instructions required clicking a button to open the screen. For movement within the virtual environments, multiple options were available within the virtual tour consisting of: toolbar buttons allowing left and right movement, clicking the screen for movement or interacting with the floorplan map (located top left of the screen). The 3D reconstruction only supported one function for interaction, by using the left, right and scroll-wheel button on a mouse. These qualities may account for the different participant navigation perceptions.

The navigation of the Anne Frank virtual tour produced mixed responses supporting both effective and ineffective movement. Two primary variations exist between the Sylt and Anne Frank virtual tours, including the navigation mode and floorplan (or map). The navigation mode within the Secret Annex, permitted users to move left-right and up-down, whereas the Sylt platform restricted movement to left-right. The additional freedom of movement within the Secret Annex tour presented difficulties for some participants (Chapter 4 Section 4.5.2.3). A difference between each virtual tour's floorplan was also apparent. The Sylt platform displays a 2D aerial image, whilst the Secret Annex displays a 3D interactive model of the house. Both floorplans provided a teleport function, allowing participants to be transported from one location to another. Besides appearance, the main difference between these floorplans derives from the Sylt plan being permanently displayed, with the Secret Annex plan only accessible through clicking a button.

7.6 Multimedia Materials

Archaeologists have a moral obligation to ensure the most appropriate communication medium has been applied to convey investigative data, which can be understood by audiences from different demographics. To identify the most appropriate communication medium, the 'Explore Lager Sylt' platform incorporated various types of multimedia formats including: video, audio, image and text. Chapter 6 (Section 6.8.4) outlined participant responses surrounding these different materials, which in essence, is highlighted through USHMM interviewee participant US6 comment, 'a combination of all the digital media is really helpful to people…not like to a specific…media'. The Sylt and Anne Frank data highlighted that the most desired form of communication included video, testimony and archive documentation, which will be discussed here. This research demonstrated that participants expressed greater preferences for traditional sources (such as testimony) and multimedia representations (such as video). When developing the Sylt platform, video provided an effective solution to simplistically communicate vast quantities of sources and evidence acquired from DBA and fieldwork investigations; thus, reducing cognitive overloading (Lau's *et al*, 2014).

Video was considered the most desired and effective form of communication, correlating with existing studies regarding e-learning and multimedia preferences (Ljubojevic *et al*, 2014; Hsin & Cigas, 2013; Steffes & Duverger, 2012; Bravo *et al*, 2011). Besides increasing positivity and motivation amongst students (Steffes & Duverger, 2012; Bravo *et al*, 2011), video encompasses qualities that assist student engagement. Research by Hsin and Cigas (2013: 258), examined six online introductory courses (between 2005-2012) highlighting that inclusion of video 'had a noticeable effect on improving student retention'. Video integration within the online courses did not directly increase grades, however, a greater quantity of students both finished and passed the courses (Hsin & Cigas, 2013).

From a study of 12 lectures, 487 participants, across three different subjects, Bravo *et al* (2011) described video as supporting teaching. The study suggested that video-assisted student motivation, creating a positive educational effect, translatable across any other discipline. The application of video provided efficient explanations of technical processes, far quicker than verbal or written formats. Although data regarding the 'ideal' video length is missing from research, recordings of lectures are considerably longer in duration than those presented within e-learning platforms. Hsin and Cigas (2013: 254), consider long videos unsuitable for education due to 'difficulty in maintaining a student's attention, lengthy file loading, and difficulty in searching for information' (Fang, 2009). This also incorporates Lau's *et al* (2014: 5) multimedia concerns regarding the 'cognitive overload problem'. The average video length from Hsin and Cigas (2013) study was three minutes and 42 seconds, contrasting Sylt's platform with an average of two minutes.

Technological advances and multimedia representations have created a contradiction within Holocaust memory. Mayer-Schonberger (2009: 4) states that 'because of digital technology, society's ability to forget has become suspended, replaced by perfect memory'. Although Krondorfer (2008: 241) outlines that extensive archival preservation of Holocaust testimonies is 'seen as permission to forget'. This point is demonstrated through the enormity of Holocaust testimonies available globally with the University of Southern California (USC) encompassing 55,000 audio-visual testimonies (USC.Edu, 2017), the Fortunoff Video Archive holding 4,400 audio-visual testimonies (Yale.Edu, 2017), Yad Vashem has 36,000 testimonies, of which, 12,000 are digitalised (Yad Vashem.org, 2017), the Holocaust Oral History Archive of Gratz College (Pennsylvania) holds 900 (Gratz.Edu, 2017); and the USHMM holds over 8,500 (USHMM.org, 2017a). One may conclude that from one of the most documented events in history, the enormity of the data is 'so huge that it is impossible to remember' (Krondorfer, 2008: 241).

Increasingly, worldwide archives are actively opening official wartime and post-war documents to the public. In 2007, the Bad Arolsen archives (Germany) opened 17.5 million records detailing 'forced labourers, concentration camp victims and political prisoners' (BBC.co.uk, 2007), with records formerly utilised to trace missing persons, for reparation damages and to reunite families (Ibid). In 2017, thousands of United Nations (UN) archive documents used the during Nuremberg trials (1945-1946), were released to the Wiener Library (London, England), providing further insights into notorious camps such as Treblinka and Auschwitz (Guardian, 2017). The enormity of victim, perpetrator and bystander accounts, alongside an additional wealth of archival evidence, presents a requirement to actively select testimonies and documentation regarding what materials most suitably illustrate a point. Within this instance, the potential for memory manipulation occurs through prioritising one evidence type over another (Mayer-Schonberger, 2009; Krondorfer, 2008; Myers, 2008; Suleiman, 2006; 2006a; Winter, 2000).

Whilst developing the Sylt platform, it became apparent that the vast availability of evidence naturally forced an active selection of materials to occur. Given the number of archival sources and fieldwork data obtained from Sylt investigations (Chapter 3 Section 3.2), not all information could and should be exhibited. The selection of materials was coordinated, categorised and selected by a source's spatial relevance (Chapter 6 Section 6.2.1, Table 6.1 - principle three). Sources were further contemplated for the sensitivities which they may produce, for example, accounts describing prostitution at Sylt. The platform does not directly address sexual relationships between individuals at Sylt, apart from one audio account (scene seven, virtual tour) (JAS L/D/25/L/65). The deliberate withholding of sources, such as photographs of SS guards and female prostitutes, considers aspects of living memory and subject consent, and therefore, are 'ethically compromised' (Crane, 2008: 92).

One may argue that memory manipulation of this type is inevitable, simply owing to the number of sources available. From another perspective the emergence of new and old sources allows archaeologists to asked new questions of historical sources, furthering Holocaust understanding (Sturdy Colls, 2015; González-Ruibal, *et al*, 2008). The European Holocaust Research Infrastructure (EHRI) provides online access to Holocaust documentation through tens of thousands of archive sources, providing a solution to 'the fragmentation and wide geographic dispersal of archival sources' (EHRI.eu, 2015). However, Kushner (2006: 285) draws attention to testimonies which are often formed simultaneously, 'at present, the use of survivor accounts has been distorted-they are ironed out and rearranged so as to provide narrative cohesion'. This highlights that testimonies may not be most effectively presented linearly (Section 7.8).

7.7 Empathy & Testimony

Empathy is considered to evoke cognitive (knowing) and affective (caring) qualities within storytelling, which is considered essential in Holocaust education (Garcia & Rossiter, 2010). As Zillmann (2006: 152) explains, 'empathic engagement is what fuels interest in tales...the empathy concept can thus be considered pivotal to any interest in, and likely gratification from, storytelling via the media of communication'. Many shared empathic similarities between Holocaust narratives and virtual environments can be considered. As Chapter 6 (Section 6.8.4) outlined, the Sylt platform demonstrated that empathic qualities derived from engagement with specific multimedia, including survivor video accounts and eyewitness testimony. These isolated examples dramatically differ in comparison to the Anne Frank data, which demonstrated that empathy was frequently conveyed throughout engagement (Chapter 4 Section 4.4.2.2). Mortara *et al* (2014: 324), highlights a rationale for these variations stating, 'empathy with a game character and plot may be very helpful for understanding historical events, different cultures…architecture, art and heritage' (Roussou, 2007).

In this sense, the Anne Frank platform presents a 'character' through Anne herself which creates a single person narrative that audiences can relate to. Throughout engagement, participants using the Anne Frank platform were repeatedly exposed to empathic sources (for example, victim photographs both before and during the Holocaust), reinforcing Anne as a 'human being' (Raz, 2004). Focus group participant C.C.A.F.F.1 explained, 'you get that sense of…humanistic', although, participant C.C.A.F.M.4 highlighted that, 'it's not more factual but...you're more involved in it so you feel a bit more you care about it'. This character quality was absent from the Sylt platform and consequently, empathy was only demonstrated through isolated testimony interactions. This supports that empathy is mainly achieved through testimony (Chapter 2 Section 2.1.5), but further maintained and enhanced through a single 'character' narrative and supporting sources. Multiple testimony narratives can still develop empathy between the user and the virtual environment, although the relationship is isolated, rather than consistent.

Both the Anne Frank and Sylt platform presented virtual environments, where participants could select and interact with the content. This approach is apparent through other virtual Holocaust commemorative representations, such as the USC's Holocaust survivor hologram of Pinchas Gutter[35]. Stephen Smith, the executive director of the USC stated, 'the purpose of this interactive conversation is to allow the user to explore [Gutter's] experience with their own curiosity. To get a deeper sense of empathy…' (CNN.com, 2017). Vorderer *et al* (2001: 346), concluded that although interactivity (within TV movies) engaged audiences, they may become detached from empathy as they 'struggle with new technology and making decisions about the ongoing narrative'; thus, becoming removed from the storyline.

Contrastingly, Hand and Varan's (2009: 12) research on interactive narratives, suggests that 'empathy becomes the link between interactivity and structure', as-long-as audiences have no ability to alter the overall narrative. Confirming this perspective, the Anne Frank data displayed that empathic attachment can 'drive' a narrative, as focus group participant H.H.A.F.F.4 explained, 'I found it a bit more interesting because there was like an actual video…what they was saying was really interesting like it kinda lures me in'.

As outlined in Chapter 2 (Section 2.1.5), Holocaust eyewitness testimony creates empathy far greater than any other available resources (Short & Reed, 2017; Foster *et al*, 2016; Suissa, 2016; Imber, 2013; Kushner, 2006). Both the Sylt and Anne Frank data support this perspective through participant comments describing the pitch and tone of audio testimony as assisting empathic engagement (Gubkin, 2015). Actress Ellie Kendrick provided the audio for the Anne Frank platform (AnneFrank.org, 2017a), which was interpreted as 'relatable' and 'emotional', whereas Sylt's

[35] The University of Southern California (USC) created the 'Dimensions in Testimony' resource which displays holographic representations of 15 Holocaust survivors. Audiences can interact with the holograms through conversation, with responses produced by pre-programmed answers (SFI.USC.edu, 2018).

platform presented audio eyewitness testimony, described as 'believable' and 'real'. It can be considered that 'actor' audio within Holocaust representations perform an important role in developing empathy, although, audio testimony delivered by eyewitnesses produces authentic empathy.

The Anne Frank data displayed that empathy was achieved through virtual heritage representation. However, as previously stated, this derived from a character narrative, composed of different sources, capturing 'humanistic' qualities. Additionally, the platform used empathic characteristics, such as music and an actor voiceover within the tour's videos, evoking greater emotional engagement between the audience and narrative. This did not create a more authentic or believable narrative, in contrast to the 'Explore Lager Sylt' platform, which was more aligned to courtroom representations; with empathy conveyed through witness testimony (Schofield & Fowle, 2013; Schofield & Mason, 2012). From an EPE perspective, the Anne Frank platform approach is described as 'Disneying-up' information, creating biases towards content (Schofield & Fowle, 2013: 108). This is evident through focus group participant B.S.A.F.F.1, who stated, 'the references to the diary make it, so you remember it as well, so you actually thought she was actually saying this'; thus, hearing can also be believing.

On reflection, the author considers the requirement to manufacture empathy when constructing the Sylt platform was underestimated. This was attributed to believing that 'evidence speaks for itself' and the 'seeing is believing' inclination (Section 7.1), with archive documentation, testimony and audio accounts authentically conveying events. Although Chapter 6 outlined that Sylt's platform generated emotional interactions through testimony, responses highlighted that empathy, testimony and (subsequently) narrative require attention. For example, USHMM interviewee participant US12 stated, 'I don't really get a sense of…the depth of survivor narratives' and participant US15 explained 'normally, it seems like people have…a better response to like personal stories... than just the…raw data'.

This qualitative data supports virtual heritage's literature perspective that empathy is a product of narrative and storytelling (Champion, 2016; Pujol *et al*, 2012; Roussou, 2007). Whilst these empathic qualities assist in creating an emotional engagement with a narrative, the author argues that they essentially differ from being able to put yourself in another person's shoes. Gubkin (2015: 108), describes students trying to form associations between their own experiences and Holocaust events, stating, 'I was appalled by the shallowness and complete lack of understanding'. However, Gubkin (2015) recognised that students trying to form associations with a Holocaust victim's experiences was moot, given their differences in personal experiences.

The term trauma is central as to why audiences struggle to make associations with Holocaust events. As Chapter 2 (Section 2.1.3) highlighted, a fine line exists between empathy and trauma and

acceptable boundaries of graphic representation (Sturdy Colls & Branthwaite, 2018; Gubkin, 2015; Linenthal, 1995). Trauma is defined as 'a deeply distressing or disturbing experience', a term which could be used to describe the everyday experiences of Holocaust victims (CambridgeDictionary.org, 2019). However, as Holocaust narratives which display graphic images, have been shown to be unsuccessful in Holocaust education (Chapter 2, Section 2.1.3), Gubkin (2015: 109) questions how students can 'learn about historical trauma in meaningful, non-objectifying ways that do not put the students at increased risk of trauma'. This research displays that trauma experienced by Holocaust victims was effectively conveyed through video and audio accounts, without traumatising the audience. Although participant responses did not refer to imagining themselves in the shoes of a Holocaust victim, the accounts encompassed emphatic qualities, useful for maintaining engagement with a narrative.

7.8 Narrative & Experience

In preparation for the Nuremberg Trails (1945-1946), evidence was acquired by the prosecution to form a narrative of events (Douglas, 1995). The narratives can be broadly categorised through eyewitness, evidence-based and spatial. As the name suggests, eyewitness narratives are composed from those who viewed atrocities, including victims, perpetrators, liberators, bystanders and investigators. Evidence-based narratives are created from supporting information that upholds claims, which can range from sources such as documentation to film footage. Lastly, spatial narratives present landscape evidence, which can include structures, man-made alterations, artefacts, mass/graves, depressions and vegetation change. Standard practice within most (Western) criminal trails, concerns a prosecution and defence who debate using the same event evidence 'that their side's story is the only valid version' (Chaemsaithong, 2019: 244).

This aspect is nuanced when representing forensic archaeological data from Holocaust sites, outside of prosecution purposes; as no prosecution or defence deliver a narrative to accompany the findings. Initially, to tackle this issue during the construction of the 'Explore Lager Sylt' platform, a framework was established through the author producing voiceovers to narrate the video content. The videos presented upon the homepage and within the virtual tour, were instrumental in providing context. The homepage displays an introduction video, which outlines an overview of the events leading to the construction of Sylt camp. The virtual tour's videos explain the archaeological findings and their relevance. Unlike a prosecution or defence, the voiceovers were required to take an unbiased stance, and simply present the evidence, mirroring forensic archaeology's role as an expert witness in courtrooms (Chapter 2 Section 2.3.4).

Secondly, victim, perpetrator and investigator testimonies were presented through a digitalised copy of an original testimony, which also formed a narrative within the platform. The inclusion of victim

testimonies was essential due to possessing authentic and empathetic qualities required for effective Holocaust education (Chapter 2 Section 2.1.5). Thirdly, a narrator derived from the archaeological data itself. This approach mirrors courtroom presentations, allowing the evidence to 'speak for itself' (Schofield & Fowle, 2013) (Chapter 2 Section 2.4.3.3). This narrator highlights differences between the data and evidence but suggests no prioritisation of one perspective over another (Chapter 6 Section 6.2.1, Table 6.1 – principle three). All these narratives were presented through varied multimedia and computer-based representations, which produced further complications through mixing linear and non-linear narrative arrangements (Denard, 2016; Rahaman & Tan, 2011; Economou & Pujol, 2006; Osberg, 1997).

Information presented through a (chronological) linear narrative was produced from the timeline, introduction video and series of 3D reconstructions. Information presented through a (thematic) non-linear narrative was presented in the infographic and (spatially) through the virtual tour. Chapter 6 (Section 6.6.2.4) displayed that linear narrative representations frequently attracted positive responses from USHMM interviewee participants; 'you have the video which is obviously then driven by a narrative…you have a timeline that also has a narrative because it is chronological…' (participant US2); 'the timeline is the only place where I really get…a narrative sense' (participant US9); 'maybe a fixed narrative rather than a bunch of options would be better' (participant US4). Differently, non-linear narrative representations were positively received by focus group, interviewee and questionnaire participants; 'I thought the tour was a really different way of…getting across your information but in a way that people can pick and choose what parts they find interesting to look at' (participant P.S.F.2) and 'it's a nonlinear experience…I really like that' (participant US6).

This research highlighted that archaeological Holocaust materials can be sufficiently presented through both linear and non-linear formats, with requirements for each narrative dependent on specific factors. The 3D reconstructions, that displayed Sylt's construction, were suitability represented through a linear format, which could not have been simplistically achieved through a non-linear format. However, the non-linear virtual tour was considered effective for displaying Holocaust materials without suggesting priority between different evidence and sources (Sturdy Colls, 2015). Focus group participant P.S.M.1 explained, 'you got photographs, you got accounts, you got some audio, you got some video, rather than just sitting reading plenty of text about one thing or a general, this is very informative on a number of different levels'. This layering of multimedia materials addressed complexities encountered when representing Sylt's narrative, such as fragmented testimony, which would have been apparent if presented in a linear narrative. Using a thematic spatial narrative provided the opportunity to amalgamate alternative perspectives, regardless of chronological order. Therefore, a spatial narrative can effectively disseminate archaeological Holocaust investigative materials, when limited or incomplete details about a site exist.

Physical Holocaust heritage site narratives are coordinated through a curator, who selects the heritage content and implements the narrative through specific mediums (for example, information boards). Ibrahim and Ali (2018: 11) highlight that similar representations through virtual heritage technologies alter the manner in which content is selected and discarded, 'the viewer constructs the narrative and decides what to view first, what to omit and what to ponder'. Tuck and Kuksa (2009: 337), elaborate on this viewpoint, by comparing virtual heritage environments to a 'promenade theatre, where the audience inhabit the space, rather than just watch a performance', through greater engagement options with various multimedia narrative materials.

Azaryahu & Foote (2008: 180), describe the complexities surrounding physical spatial narratives, with configurations controlled by topographical features 'including: buildings, markers, memorials, and inscriptions positioned with great care to provide a spatial story-line or to capture the key locational and chronological relations of an historical event'. However, digital realms do not face these constraints through thematically geotagging points anywhere within a virtual environment. Spatial thematic geotagging within Sylt's virtual tour provided the opportunity to acknowledge alternative perspectives (for example, victim and perpetrator), separating sources and evidence from time, whilst still performing a valuable role to the overall narrative.

The Anne Frank data highlighted a potential issue surrounding this approach, as participant H.H.A.F.F.2 explained, 'I also felt confused…about…the timeline though….I feel like they could have said a bit more about the time...one part was in the same room as in like when they just came in and then the second part was like before they were leaving...I don't know if it was just me, but I was getting confused'. Additionally, participant C.C.A.F.M.1 explained, 'with the house [virtual tour] it was alright, but I was just clicking on all these random rooms…I preferred a video because it gave more of a structure to it'.

Within both physical and digital realms, a principle complexity of non-linear narratives concerns spatial-temporal sequencing, through undefined narrative configurations (Meyer, 2016; Rizvic *et al* 2013; Azaryahu & Foote, 2008). Linear based narratives are often structured with a beginning and end. This contrasts non-linear narratives, which have no determined start and finish, but a narrative formed through content interaction. Therefore, audience behaviour and narrative interactivity can be considered unpredictable, as Rizvic *et al* (2013: 1), outlines 'our experience from previous virtual museum projects showed that visitors often do not explore all displayed objects, but only a small subset'. Due to the complexities regarding starting and finishing points, not all content should be presented within the virtual environment itself (such as a tour), as not all content is guaranteed to be viewed (Rizvic *et al*, 2013).

These findings mirror the existing literature regarding complexities of spatial narrative representations and demonstrate potential consequences when insufficient methods to combat narrative configuration issues have been addressed (Meyer, 2016; Bodenhamer *et al*, 2013; Rizvic *et al* 2013; Azaryahu & Foote, 2008). The Anne Frank platform provided an introduction video on its landing page, instantly providing audiences with an understanding of the Holocaust, the Frank family and the annex (AnneFrank.org, 2017a). The Sylt platform required a similar approach to initially clarify the platform's narrative. This could have been achieved through succinctly outlining the Holocaust, World War Two, Alderney and Sylt, alongside addressing the rationale for forensic archaeological investigations within the video. Additionally, the Anne Frank platform provided participants with a checklist, ensuring that all videos were viewed within the virtual tour. The Sylt platform requires resources an identical approach. Overall, the presentation of multimedia outside a virtual environment strengthens and supports the narrative's content.

Meyer's (2016: 10), states that digital storytellers 'create a narrative corridor…[and] we may have to embrace the idea that we no longer write ONE story but design a narrative corridor for potential stories'. If unconsidered, these 'hit and run' interactions have the potential to obscure meaning, through a loss of context within a virtual environment. This was evident within the Sylt data through two main aspects. For example, several participants queried the platform's intentions, as interviewee participant US9 considered the platform was 'organised to teach about, specifically the application of forensic archaeology', whereas, focus group participant P.S.F.1, stated 'it was quite interesting, to…like learn about something from a website that was specifically for one particular site…normally you don't get that kind of information unless you go to like a place'. Some participants requested greater implementation of content already available, 'I would like to see more oral testimony from surviving camp prisoners', alongside questionnaire participant USQ25, 'there might be more recorded testimonies by the prisoners' (interviewee participant US9).

Meyer's (2016: 9) continues to describe interactive (digital) narratives, 'as the medium of the 21st century', subsequently replacing film as the 20th-century medium. Meyer's continues to describe this technological shift as marking 'the end of time', with narratives based on space rather than time (Meyer, 2016: 9). However, as Bodenhamer *et al* (2013: 3), explains, 'a key part of the challenge of thinking spatially and leveraging spatial technology is to design and frame narratives about individual and collective human experiences that are spatially contextualized'.

An ethical crux within Holocaust representation concerns whose 'experience' is being disseminated, as Section 7.4 briefly highlighted when describing 'experiencing' the Holocaust through a video game. Many physical and digital examples exist, where users are provided with a sense of Holocaust 'experience'. These include Santiago Sierra's (2006) gas chamber art installation in a former synagogue (Cologne, Germany), which provided individuals with the opportunity to experience a

gassing sensation to protest the 'banalisation of the Holocaust' (Guardian.Com, 2006). Digitally, Studio 101's virtual reality simulation provides 'a new approach to Holocaust education', which, 'although no explicit violence scenes are used, [the user] will be the protagonist of the daily horror of the extermination camp…[this] experience is impressed in the mind in a completely innovative way compared to traditional media, without the stage fiction', (WitnessAuschwitz.com, 2018).

Whilst these examples of 'experience' have encountered controversy and present somewhat paradoxical perspectives (for example, experiencing the Holocaust with no violent scenes), 'The Last Goodbye', which depicts Holocaust survivor Pinchas Gutter's testimony through a virtual reality experience, won gold at the (2018) Shots Awards[36]; for 'Best Use of Emerging Technology'. The USC Shoah Foundation created 'an experience that enables viewers to virtually walk with Gutter as he tours the railway car, gas chambers, shower room and backs of Majdanek' (Sfi.usc.edu. 2018). A fundamental difference between the USC Shoah's VR experience, and Sierra's (2006) and Studio 101 (2018) representations derives through who's playing the 'role' of the victim. By presenting the audience as the victim, Holocaust stories automatically become inauthentic, creating a biased historical perspective. As outlined in Chapter 2 (Section 2.1.5), empathy cannot be forced as 'shocking' a user restricts understanding and education (Gubkin, 2015; Linenthal, 1995). Thus, the audience's role must always be as the observer.

7.10 Raising Awareness

As outlined by Wheeler (1956: 234) in Chapter 2, 'it is the duty of the archaeologist, as of the scientist, to reach and impress the public, and to mould his words in the common clay of its forthright understanding'. Thus, one may consider that archaeologists are morally bound to communicate their findings to the public. This thesis demonstrated that prior to engagement with the platform, the majority of participants had never heard of Sylt. For example, 'personally, I've never heard of these Channel Islands. Most focus has been on mainlands. This is good for education' (USHMM questionnaire participant USQ28); 'it's just interesting that it's not something that you know that much about because when you do hear about concentration camps and whatever its usually quite far away like Germany…but the fact that it's on…British territory…it's part of something you don't necessarily know' (focus group participant P.S.F.1); 'I'm like oh my god…what happened at this place and where is this place right that's right off of England, and these things happened there' (USHMM interviewee participant US16); 'I've been to Alderney and didn't see that particular thing we were looking at today', (focus group participant B.S.L.S.M.6).

[36] Shots launched in 1990, is internationally concerned with the 'world's most creative advertising, TV commercials, music videos, short films and animation' (Shots.net, 2018).

The above participant comments highlight experiencing an unknown Holocaust narrative, which has previously been manipulated through (British and Alderney) political agendas, to reside outside of public memory. Post-war, the UK maintained the allied image of being unvanquished and as Carr (2014) explains, 'war memory in the Channel Islands has been intrinsically linked with that of the UK and is one in which Britons are perceived as victors…not victims' (Carr, 2014: 162). Consequently, manipulation of historical events, such as Sylt's, produce societal 'myths, misconceptions and inaccuracies' (Foster *et al*, 2016: 1). As Tunbridge and Ashworth (1996: 6) explain, heritage is shaped by 'what contemporary society chooses to inherit and pass on'.

Since 1945, survivors have expressed a desire for Sylt's narrative to be recognised and commemorated. This is evident through: Sylt victim Sylwester Kukuła unveiling a plaque in 2008 (Carr, 2012); Otto Spehr's BBC broadcast describing the concentration camp on British soil (Barkham, 2017); and victim comments surrounding the lack of investigation and perpetrator arrests (Bonnard, 1993). However, Alderney's wartime commemorations have focused on islander evacuation and homecoming (for example, BBC.co.uk, (2015) and Alderney.Gov, (2005)). The research argues that physical remnants of the Holocaust serve as 'surviving monuments or 'living memorials'' to the deceased (Carr, 2014: 84). Despite the abundance of archaeological evidence at Sylt, surviving remnants remain concealed underneath vegetation, burying memories (Schofield, 2002). On the 'Visit Alderney' website, Sylt is promoted as a tourist attraction stating, 'this was the smallest and most infamous of the four Nazi Labour Camps on Alderney during WW2 holding Jewish prisoners' (VisitAlderney.com, 2018a); albeit contesting historical documentation by explicitly claiming that camp housed Jewish prisoners. Despite the lack of heritage management and commemoration, Alderney still advertises the site to attract visitors.

The 'Explore Lager Sylt' platform, displayed that forensic archaeologically-derived Holocaust data is of interest to secondary school students, the public and those employed within Holocaust-related fields. Despite issues such as the site's appearance and historical documentation inconsistencies, a genuine desire for learning, from all demographics, was observed. This highlights that regardless of popular and dominate Holocaust narratives, Holocaust archaeology informs a significant role in conveying past Holocaust atrocities through virtual heritage technologies. Despite initial concerns from certain USHMM interviewee participants, these individuals expressed the value of this approach; for example, 'I think it looks like a very good tool and a useful one' (participant US2); 'I enjoyed it…great work' (participant US3); 'you've done an impressive amount of work and raised a lot of interesting, really interesting questions' (participant US4); 'I think you have a really nice, strong, prototype here. I think with some tweaking it can really be dynamic, I think it's great' (participant US5); and 'it's all fascinating, I want to go back and actually read more' (participant US8).

Sturdy Colls (2015: 335), highlights that although Holocaust education is predominantly composed of survivor testimony and historical accounts, 'another advantage of producing a variety of forms of dissemination is that tutors at all levels (from university to school level) will then be able to select suitable materials for their students'. Archaeology is essential within this context, through acquiring diverse evidence types, which can be reproduced and represented through alternative formats, catering to different pedagogy styles. One may perceive that archaeology cannot replace traditional Holocaust educational sources but can enhance understanding of these sources. As USHMM interviewee participant US9 described, 'whether it's a prisoner being punished, being tied to the gate, or…archival documents to a structure like…the canteen…I thought that was really strong because it's hard to make geography come alive'.

The linear and non-linear narrative style variations within the 'Explore Lager Sylt' platform commonly created discussions amongst participants regarding educational value. As interviewee participant US11 explained, 'I could have probably learned that information in the other way, but I felt much more encouraged to learn the information here [virtual tour]. I felt like…it was fun to learn the information…I feel like the visual aspect brings in people who otherwise might not have the patience to read something. And, the fact that you can layer things…gives a great sense of how one should use primary source materials'. However, not all participants shared this opinion, as participant US4 explained, 'as a historian I feel that ultimately, I would learn more from testimonies and documents'.

Traditional Holocaust narrative formats (for example, testimony) can be argued to limit cognitive learning, by presenting information through one pedagogy style (text). Representations within the Sylt platform were considered successful in providing diverse pedagogy styles, as focus group participant B.S.L.S.M.2 stated, 'it makes it more interesting to…actually like see the things happening as opposed to just reading them it gives them just depth to information'. Furthermore, this form of dissemination promotes self-education, allowing a user to learn at their own speed.

Literature deriving from education, neuroscience, and cognitive psychology, highlights the importance of contemplating cognitive styles and how individuals process information differently (Kozhevnikov *et al,* 2014; Waring & Evans 2014). Although an understanding of influences that affect cognitive styles are shaped through, 'family, schooling, professional work context, societal affiliations, local cultures, and as members of a global society' (Evans, 2015: 4), it is considered that individuals are not limited to one specific (processing) cognitive style (Kozhevnikov *et al,* 2014). Research acknowledges that individuals are not categorised as either visual, verbal or kinaesthetic learners, but instead resource a range of different cognitive styles to perceive, process and remember information (Waring & Evans 2014; Kozhevnikov *et al,* 2014). Therefore, variations within

Holocaust narratives and multimedia representations provide diverse forms of learning opportunities, not essentially available through traditional Holocaust narrative formats.

7.11 Platform Modifications

From the data analysis, discussion and comparison of findings against the existing literature, certain modifications are required to ensure the platform is ethically robust. These modifications endeavour to ensure content clarity and that presentation and communication is ethically maintained for education and commemorative purposes. Each modification is categorised against the platform's different pages, including: Home/Landing (page), About, Infographic, Timeline, Introduction Video, 3D Reconstruction, Virtual Tour, References, Platform (generally) and Other. These modifications are outlined in Table 7.1**.**

Table 7.1: *Explore Lager Sylt' platform modifications required based upon the qualitative data and existing literature.*

Platform Page	Modification
Landing	Platform title requires changing from 'Explore Lager Sylt' to 'Explore Lager Sylt (Alderney; Channel Islands)', to avoid confusion with the German island of Sylt (Chapter 6 Section 6.8.1).
	The tabs located across the top of the platform require rearranging, ensuring that they match the corresponding homepage cards. The title of each tab requires greater clarification outlining what is contained within (Chapter 7 Section 7.3).
About	The statement, 'Lager Sylt was the only concentration camp ever constructed on British soil', requires changing to 'Lager Sylt was the only concentration camp constructed on soil under British Crown Dependency', (Chapter 6 Section 6.8).
Infographic	The Infographic presentation requires artistic conformity to the design of the Timeline. To appear more serious, alterations of colour, images and text are required (Chapter 6 Section 6.8.4.4).
	The Infographic requires moving to the About Page, removing any impressions of the platform's narrative being about archaeology (Chapter 6 Section 6.8.3 and Chapter 7 Section 7.8).
Timeline	The direction of the Timeline's text requires changing from left-to-right, to up-and-down (Chapter 6 Section 6.8.4.4).
	The overall quantity of text needs reducing (Chapter 6 Section 6.8.4.4).
Introduction Video	The video requires moving from its current location and placed within the landing page. It should automatically begin playing upon arrival to the platform, combating non-linear narrative issues (Chapter 7 Section 7.8).
	Further strengthening and clarifying the platform's narrative, requirements for forensic archaeological investigations, post-liberation investigation conflictions, literature inaccuracies and the sites current appearance needed outlining (Chapter 7 Section 7.8).
	The images 'Nazi planes in flight' (Bild 141-0678 / CC-BY-SA 3.0) and 'OT supervising prisoner' (Bild 101II-MW-2355-10) require labelling as 'representation only', ensuring audiences are not misinformed (Chapter 6 Section 6.7.4).
	The section outlining how the models were built require moving and presenting in the About Page. This removes the archaeological narrative emphasis, as audiences 'trust' the accuracy and degree of artistic licence within the representations (Chapter 7 Section 7.2).

3D Reconstruction	The 3D Reconstruction section needs separating, categorising and presented through relevant years (Chapter 6 Section 6.8.4.1 and Chapter 7 Section 7.3).
	Similar to the virtual tour, instructions for the 3D models should be displayed upon the page (not accessible through a button) (Chapter 7 Section 7.5)
Virtual Tour	A content checklist should be provided ensuring that all desired content has been viewed (Chapter 6 Section 6.8.3 and Chapter 7 Section 7.8).
	Hotspot styles and colour require changing. Each hotspot should reflect the type of material contained within. For example, a video icon should be displayed for a hotspot containing a video (Chapter 6 Section 6.8.4.8 and Chapter 7 Section 7.3).
	Survivor audio accounts should automatically start playing within the background of relevant scenes, ensuring audiences are aware of the use of testimonies (Chapter 6 Section 6.8.3, 6.8.4.6 and Chapter 7 Section 7.8).
References	The reference list requires strengthening, with further reading materials and sources outlined within the page (Chapter 6 Section 6.7.2). References such as the Daily Mail should be removed from this list, as the copyright no longer applies due to extensive editing.
Platform (Generally)	Greater clarification of archive documentation and translated German terms is required (Chapter 6 Section 6.8.1).
	A definition of the term 'Holocaust' should be made apparent within the platform, with an outline of the prisoner types held at the camp (Chapter 6 Section 6.8.1).
	All text requires reducing and written in a less academic format (Chapter 6 Section 6.8).
	The platform requires a greater emphasis on victim testimony (Chapter 6 Section 6.8.3, 6.8.4.6 & Chapter 7 Section 7.8). This can be achieved by changing hotspot styles, with testimony content displaying a specific icon alongside automatically playing (audio) testimony within specific virtual tour scenes.
	The unknown purpose of the Commandant's tunnel should be transparently disclosed (Chapter 6 Section 6.7.4).
	Colours used throughout the design of the platform should derive from the cooler colour spectrum (Chapter 6 Section 6.8.4.4 and Chapter 7 Section 7.3).
	A page dedicated to outlining different themes, categories and multimedia content within the platform should be provided, ensuring audiences can easily locate information and check what has and has not been viewed (Chapter 6 Section 6.8.3 and Chapter 7 Section 7.8). Further research is required regarding using databases within education and research (Chapter 8 Section 8.3).

7.12 Recommendations: Representing Forensic Archaeologically-Derived Holocaust Data

This research demonstrated the educational and commemorative effectiveness of using virtual heritage technologies to disseminate forensic archaeologically-derived Holocaust data (Chapter 7). Initially, the construction of the 'Explore Lager Sylt' platform was underpinned by the London (2009) and Seville (2011) Charter. However, as this thesis has previously stated, both Charters focus on computer-based representations from the creators' perspective, not the users. Subsequently, this research identified and suggests eight recommendations for individuals endeavouring to disseminate archaeological Holocaust data through virtual heritage technologies. These recommendations specifically cater to Holocaust sites, which may have limited surviving features, are overgrown or

where heritage is undesired. These recommendations are not intended to replace the London (2009) or Seville (2011) Charter principles but provide an extensional framework.

1. **Computer-Based Representations**: The type of computer-based representation can be dictated by the project aims and the availability of archaeological and historical data. This can directly influence what is achievable through representation possibilities. Subsequently, multiple representation types may be required to effectively convey a Holocaust narrative. Production quality should not be prioritised over authenticity, as both photorealism and abstract representations produce believable and engaging characteristics. All representations require underpinning by contemporary and primary evidence and sources to generate belief and understanding.
2. **Aesthetics**: The design and layout of a virtual environment should be contemplated, as the reliability and credibility of content are initially formed through aesthetics. Interdisciplinary partnerships between archaeologists and designers may be required. Additionally, colours from the cool end of the spectrum should be prioritised over warmer spectrum colours.
3. **Sources & Evidence**: Wherever possible historical and contemporary evidence should be combined and presented to support information. Although greater belief in content is maintained by the quantity of evidence, individual sources should also be presented. All sources should be adequately referenced, and a reference list provided. Any sources used as a representation only should be clearly labelled to avoid confusion between sources directly linked to a Holocaust site and those presented as an illustration only. Sources should be contemplated for their sensitivity, especially in relation to living memory and subject consent, which should form a key consideration when deciding which materials to exhibit.
4. **Multimedia Materials**: Virtual environments should endeavour to incorporate a diverse range of multimedia materials, catering to different pedagogy needs. If this option is unavailable, then video is considered the most desired form of communication.
5. **Empathy**: This quality primarily derives from victim eyewitness testimonies and can be enhanced through several considerations. Although multiple ‘character’ narratives can produce empathy, a single ‘character’ narrative displaying testimony and photographs of a victim before and during the Holocaust, produce greater empathic associations. Empathy can be further increased through ‘manufacturing’ testimonies, for example, voice-overs, music and natural sounds. When comparing actor and survivor audio accounts, the survivor audio provides evidence-based (or authentic) empathy. Additionally, certain computer-based representations have the potential to produce empathy, by visualising a recognisable but ‘challenging’ sense of time and space.
6. **Content**: Any unknown or conflicting information should be made apparent to users, as this can enhance engagement and believability between the audience and narrative. The

presentation of historical documentation should be carefully checked, ensuring any cultural references, foreign languages or words with alternative meanings are conveyed. Additionally, the platform should provide a definition of the term 'Holocaust' as this varies, with no universally agreed definition. Following this, an outline of the victim classifications interned within a particular space should be presented.

7. **Narrative**: Prior to development, an understanding of the desired narrative format should be decided. Use of linear narratives should avoid any long sections of information, which should be organised and presented thematically. Non-linear narratives are useful to present fragmented, incomplete or conflicting information, due to chronological ordering having no relevance. However, non-linear narratives require external presentation of information to clarify the narrative; as not all material is guaranteed to be viewed. A content checklist and/or a database of materials should be presented within a virtual environment, ensuring users have the opportunity to view all content. Audiences should take a passive narrative role as an observer of the Holocaust, not portrayed as a victim.
8. **Navigation**: Virtual environments should permanently display a floorplan, indicating the current directional orientation. Movement within a virtual environment should prioritise left and right, over 360° and have the option of teleport function movement.

7.12 Summary

This discussion explored the ethical dilemmas the author encountered when representing forensic archaeologically-derived Holocaust data through virtual heritage technologies. This was achieved by comparing Chapters 4 and 6 participant responses from secondary school students, USHMM employees and visitors, against the existing literature. This chapter outlined the key ethical themes that should be contemplated when disseminating forensic archaeologically-derived Holocaust material through virtual heritage technologies. These include: believability and evidence, authenticity, aesthesis, interactively and engagement, navigation, multimedia, empathy and testimony, narrative and experience. This chapter further outlined and justified the necessary modifications for the 'Explore Lager Sylt' platform and presented eight recommendations for future Holocaust archaeological representations.

Exploring notions regarding believability and evidence, the qualitative results displayed that participants conformed to the 'seeing is believing' concept (Schofield & Fowle, 2013; Speisel & Feigenson, 2009), thus, demonstrating the importance for authentic and transparent representations within Holocaust studies. This research further highlighted that photorealism, the perceived 'holy grail' of computer-based representations, was not essentially desired by participants, who expressed greater preference of 'believable and convincing environments' (Roussou & Drettakis, 2003: 2).

Participants considered ‘believable’ and ‘convincing’ environments were maintained through representations which corroborated sources and evidence. This suggests that photorealism representations are not essentially linked to authenticity.

The study continued to discuss ‘how much evidence is enough?’ Drawing awareness of archaeology’s ability to complement the historical record by generating contemporary Holocaust data, which can enhance, corroborate and authenticate existing historical sources. This is of particular importance for Holocaust sources and testimonies, which have been described as misleading or flawed (Shneer, 2015; Myers, 2008; Hilberg, 1985). This highlights the nature of authenticity within Holocaust representation, which from the perspective of this thesis, is a subjective construct, dependent upon the amount of accessible information and ‘whose’ past is represented. However, archaeology can inform a significant role in producing authentic representations, through combining contemporary visualisations with historical sources.

This research demonstrated that the application of archaeology with Holocaust representations makes a narrative more ‘believable’ through providing ‘evidence’ of atrocities. Participants considered archaeology to provide evidence that would not otherwise be known. Therefore, a key aspect of archaeology derives from providing tangible (visual) evidence, which assists in understanding, education and believability. To a certain extent, this contrasts traditional Holocaust narratives which are primarily composed of testimony and archive sources. This research highlighted that traditional Holocaust narratives are still very much required within Holocaust representations; thus, archaeology cannot replace traditional methods but can enhance their dissemination. The combination of forensic archaeology and virtual heritage performs a vital role in tackling issues such as ‘many truths’ within archaeological assessments of evidence (Sturdy Colls & Branthwaite, 2018: 442). This is attributed to virtual heritage’s ability to display conflicting evidence simultaneously, without suggesting priority between information (Sturdy Colls, 2015). Virtual heritage representations provide a suitable format for Holocaust dissemination, especially for politically sensitive sites lacking suitable heritage and commemoration.

This research agrees with the consensus that empathy is achieved through victim eyewitness testimony (Short & Reed, 2017; Gubkin, 2015; Hector, 2000; Gregory, 2000; Short, 1999). The research displayed that empathy is also generated through a single ‘character’ narrative, which can be enhanced through continuous visualisation of the character prior to, and as a victim. This allows audiences to see the individual as a person, not only a victim (Imber, 2013). This research further identified that empathy is important to enhance narrative engagement between the user and content. Thus, empathy is also perceived as a product of story-telling (Zillmann, 2006). The virtual environment itself can assist in creating empathy, as demonstrated through the Anne Frank platform. This was achieved by creating a sense of time and place, within an enclosed environment. Greater

research is required to understand if open landscapes can achieve similar outcomes. Finally, this research addresses that 'raw' data, such as eyewitness testimony, is not as effective as manufactured empathy. Therefore, representations should resource other empathic qualities such as music, natural sounds and actor voiceovers.

Holocaust representations cannot be limited to a specific narrative style; however, non-linear narratives can effectively display fragmented, missing or conflicting information, irrespective of chronological order. Non-linear narratives encompass spatial-temporal sequencing issues, with no obvious start or end point. Content may be missed and not viewed in its entirety. To counterbalance this issue, content (for example, an introduction video), should be externally presented within a platform's virtual environment. As Meyers (2016: 10) highlighted, non-linear narratives are not singular but comprise a 'narrative corridor' with content presented in isolation. Virtual environments require presentation of checklists and/or databases, to ensure opportunities to view missed content. Although this research highlighted that certain older participants expressed a greater preference for linear narratives, non-linear narratives are considered relevant for learning and education. Regardless of narrative type, Holocaust narratives should never portray the audience as the victim, only the observer.

8.0 Conclusion

'The Holocaust did not have to happen; nor did any other genocide. These disasters have emerged from human choices and decision, many of them related to standing by and the complicity that goes with that action. Those facts mean that nothing human, natural, or divine guarantees respect for the ethical values and commitments that are most needed in contemporary human existence, but nothing is more important than our commitments to defend them, for they remain as fundamental as they are fragile, as precious as they are endangered' (Roth, 2015: 7).

8.1 Introduction

Archaeologists working in forensic settings and at Holocaust sites have demonstrated their ability to investigate, locate, interpret and disseminate evidence through mediums such as: courtrooms, museums, commemoration/memorial spaces, academic publications and television programmes. Through technological advancements, virtual heritage and digital humanities processes have become more attainable, empowering archaeologists to communicate findings through temporal and spatial visualisations. Given the extensive data generated from Holocaust site investigations, these advances are considered valuable to archaeologists to disseminate their findings (Sturdy Colls, 2015; Sturdy Colls & Colls, 2013). Despite these advances, many ethical complexities derive from virtual Holocaust representations, which until now have remained largely unexplored.

This research sought to move this debate forward by evaluating the 'Anne Frank Secret Annex' and 'Explore Lager Sylt' virtual heritage case study platforms. The Anne Frank platform conveys a traditional Holocaust narrative, created from eyewitness testimony and historical sources. The Sylt platform displays forensic archaeologically-derived Holocaust data, combined with traditional Holocaust narrative materials, as developed by the author. Both platforms were evaluated through qualitative research methods, which acquired rich, diverse and unique participant responses. These responses highlighted the perceived ethical complexities surrounding Holocaust representation, alongside outlining the benefits and limitations of using virtual heritage technologies to disseminate Holocaust narratives.

Addressing the aims, objectives and research questions, a diverse methodological approach was undertaken. This consisted of five stages including: literature/website review, forensic archaeology data collection, virtual heritage representation, qualitative data collection and data analysis. The research questions were:

- What ethical visualisation methods and presentational qualities should be contemplated when constructing virtual heritage Holocaust environments?
- What is the perceived value of disseminating forensic archaeological Holocaust data, through virtual heritage technologies?

- Can virtual heritage environments effectively, coherently and accountably disseminate forensic archaeological Holocaust data?
- How do users learn about the Holocaust from interacting with virtual heritage environments and what is the perceived value of dissemination?

From the outset, this research endeavoured to interpret the ethical complexities associated with exhibiting Holocaust archaeological data. To underpin and guide this research, information was initially acquired from the subjects: Holocaust education, Holocaust and forensic archaeology, digital Holocaust representations and virtual heritage (Chapter 2). This literature review highlighted that few published studies concerning digital Holocaust representations focused on the ethical considerations of disseminating forensic archaeologically-derived Holocaust data through computer-based visualisations. Furthermore, through evaluating contemporary online Holocaust platforms, it was apparent that many variations existed regarding representations (for example, what (type) and how historical sources were presented (Chapter 2 Section 2.3.1). To identify an existing framework for representation, the London (2009) and Seville (2011) Charters provide guidance for developing computer-based representations of cultural heritage. However, these charters do not cater for Holocaust representations and are considered incomplete, lacking 'prescriptive rules or standards to guide the practitioner' (Vico, 2018: 25).

To identify complexities surrounding representation, these issues were initially explored through the 'Anne Frank Secret Annex' platform created by the Anne Frank Fonds, to UK secondary school students. Using focus study group methods, 28 participants were recruited from three different schools based upon the school's religious ethos (Chapter 4). Secondly, a case study platform was developed by the author, using computer-based representations, to convey archaeological data acquired from investigations of Sylt concentration camp (2010-2015) (Sturdy Colls & Colls, forthcoming; Sturdy Colls, 2015; Kerti, 2013 unpublished; Sturdy Colls, 2012). The 'Explore Lager Sylt' platform created by the author, was presented to 32 secondary school participants through focus study groups, 16 USHMM employees through interviews and 28 USHMM visitor through questionnaire surveying (Chapter 6).

8.2 Key findings

From analysing the qualitative data generated throughout this research, four key themes were identified, including: accountability, communication, education and presentation. The key findings from each of these themes are outlined below and summarised in Figure 8.1. To maintain consistency within results (Chapter 6 Section 6.5), the themes, communication and education, are presented simultaneously.

8.2.1 Accountability

- Forensic archaeological data provides evidence of the Holocaust, which can enhance the belief of information.
- The credibility of forensic archaeologically-derived Holocaust data is enhanced by: the origin of information, (for example, a considered reliable source (such as an academic institution)); inclusion of historic primary sources; corroboration between sources; the number of sources; and referencing of sources.
- Participants referred to their own knowledge of the Holocaust to verify new Holocaust information.
- The presentation of multimedia materials and the overall platform design, alongside the representation quality of virtual heritage visualisations, assists the believability of information.
- Information transparency assists the believability of content and can encourage self-learning.
- Both abstract and photorealism computer-based representations produce believability and can enhance engagement when supported by adequate source materials.
- The 'many truths' interpretation of archaeologically-derived Holocaust data is supported by virtual heritage visualisations (particularly virtual tours), which allow multiple sources to be displayed simultaneously (Sturdy Colls & Branthwaite, 2018: 442).

8.2.2 Education & Communication

- Visualisation of forensic archaeologically-derived Holocaust data assists understanding of Holocaust events.
- Original Holocaust perspectives can be provided by forensic archaeological data combined with historical sources.
- Language and unfamiliar cultural terms from primary source materials require clarification.
- Using the term 'Holocaust' requires clear definitions within representation; especially when used to describe atrocities where no Jewish victims were affected.
- When combined with sources, virtual heritage visualisations can assist interpretation of historical materials.
- Eyewitness testimony presented through video, audio, image and text, can all communicate empathy. This quality assists narrative and content engagement and can be manufactured through: the pitch and tone of voice; using a single 'character' narrative and certain computer-based virtual heritage representation.
- Testimony presented by Holocaust survivors produces evidence-based empathy far greater than 'actors' presenting testimony.

- The multimedia format video is the most desired form of communication, due to simplistically conveying multisensory information.
- Non-linear narratives encourage self-learning greater than linear narratives.
- Non-linear narratives provide an effective solution to presenting Holocaust materials when evidence is fragmented, conflicting or incomplete.
- The navigation of a virtual environment assists with content engagement. Therefore, multiple navigation options should be available (such as a teleport function), with left and right controls prioritised over 360° movement. Additionally, a floorplan should be permanently displayed, highlighting the user's orientation.

8.2.3 Presentation

- Colour, design and layout of a digital environment all enhance content believability and engagement; with content reliability judged through the presentation and organisation of a platform.
- To ensure the seriousness and sensitivity of the Holocaust, the information should be presented using colours from the cool end of the spectrum.
- Language should be non-academic to address different user's age ranges and the text should be kept to a minimum.
- Representations should avoid long scrolling linear narratives, which should be distilled and presented thematically.
- Non-linear narratives require content to also be presented outside of the representation itself, as not all content is guaranteed to be viewed.
- The user (or audience) interacting with a virtual environment should be presented as an observer, not a victim, within a narrative.
- Virtual environments can replace site visits if a Holocaust site is: unmaintained, lacking in heritage or information boards and/or limited 'obvious' surviving features are apparent. Representations can also provide a means to prepare for, and/or encourage a site visit.

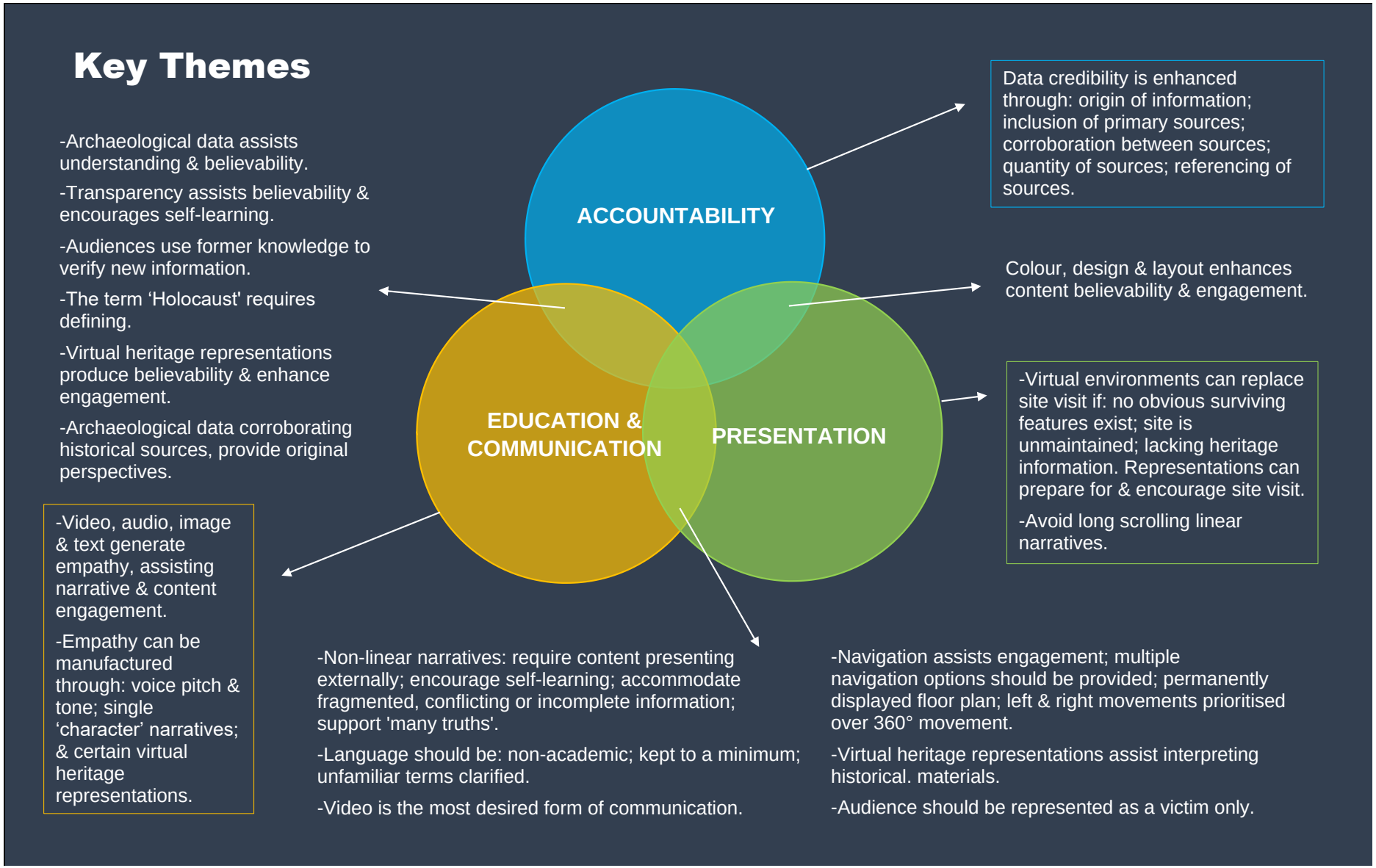


Figure 8.1: *A Venn diagram summary of the key research themes coded from the qualitative data.*

8.3 Limitations & Further Research

As Chapter 3 outlined, qualitative methodologies were used to acquire and interpret data relevant to this research. To combat conformation biases associated with this type of research, the author ensured a varied approach to data collection ((Mehra, 2002; Breitmayer *et al*, 1993). The research strategy employed three distinct forms of data collection, comprising: focus study groups, interviews and questionnaire surveying. Using multiple methods, often described as triangulation, a multifaceted approach to the phenomena being explored was produced (Fossey *et al*, 2002; Breitmayer *et al*, 1993). Fossey *et al* (2002: 727) explains that triangulation enhances 'the quality of data…in the idea that gathering information from multiple sources…in multiple ways…will illuminate different facets of situations and experiences and help to portray them in their complexity'.

Often subjected to academic debate within qualitative research is the 'ideal' sample size. As Baker *et al*, (2012: 15) described, 'every experienced researcher knows this question has no reasonable answer, no magic number you can do and then you're out of danger'. In total, research was conducted with 104 participants (Chapter 3 Section 3.2.4). The author argues that these research participants boast quality over quantity, though participant diversity (for example, vocation, education, age, cultural and religious beliefs) (Charmaz, 2014; Ritchie *et al*, 2013; Denzin & Lincoln, 2000). However, quantity and demographic variations existed between the Anne Frank and Sylt participants, with the latter evaluating a higher number of participants from different countries and statuses. Furthermore, questionnaire surveying amongst Alderney inhabitants (n=12) presented many ethical challenges, thus resulting in a lower sample of participants than desired (Chapter 5 Section 5.5).

A potential drawback within this research is highlighted by Esterberg (2002: 3), 'if you want to know about what people actually do, rather than what they say they do, you should probably use observation'. This study's qualitative research methods focused solely on participants vocalising their beliefs, as opposed to their interactions being observed (Ritchie *et al*, 2013; Denzin & Lincoln, 2000). During the methodology design, the author contemplated using studies such as talk-aloud protocol or producing data such as heat maps. These processes would have provided alternative perspectives allowing participant interactions to be compared to perceptions. However, given the infancy and lack of research within this field, participant perceptions were prioritised over their actions, as participants were questioned about their interactive experiences.

The author did not impose any participant time restraints for interacting with either platform thus, the amount of time spent interacting with a platform varied between participants. For example, USHMM employees and visitors were essentially unrestricted in their time using the platform. However, secondary school participants were restricted through available lesson time. Consequently,

secondary school participants may have missed certain platform content, and focus group discussions were rigorously conducted according to the time available; ensuring every question was asked.

Chapter 7 (Section 7.8), highlighted that participants did not view all materials presented within both platforms (Rizvic *et al*, 2013). Subsequently, participant responses were limited by the materials viewed. This may have created biases within responses, such as the platform's intentions (Chapter 6 Section 6.6.2.3). The author counterbalances this perspective by further contemplating his own confirmation biases when constructing the platform. Additionally, several participant responses focused on the colours used in the representations. Whilst these responses provided a valuable contribution towards ethical representations, the content itself may have been detracted from.

This research provided an initial framework for archaeologists desiring to disseminate Holocaust data through virtual heritage technologies. Given the infancy within this field, further research is required to build upon this thesis's perspectives. Initially, further work should address the platform's modifications outlined in Chapter 7 (Section 7.11). Once completed, teaching materials and packages should be developed to assist educators in secondary school classrooms, thus tackling several contemporary barriers, identified by teachers, within Holocaust education; including: insufficient guidance, assessment frameworks and curriculum time (Foster *et al*, 2016; ITF, 2010). Further research is required regarding how teaching packages and virtual environments displaying forensic archaeologically-derived Holocaust data are effectively integrated within classrooms.

Research using observational studies such as heat maps would increase understanding regarding how platform interactions are conducted, highlighting information such as most and least viewed content. Additionally, ensuring further representation transparency, Holocaust platforms should display all presented sources and evidence through a database. This would provide users with further educational and/or research opportunities, as materials can be easily searched and identified. The extensive range of archaeological Holocaust data was not fully represented within the Sylt platform. For example, Chapter 1 and 2 highlighted that archaeologists are increasingly resourcing non-invasive methodologies to account for investigative sensitivities (Sturdy Colls, 2015). Data deriving from commonly used non-invasive equipment, such as Ground Penetrating Radar (GPR), was not displayed. Greater research is required to understand the benefits and limitations associated with displaying complex archaeological data (Figure 8.2). This can be achieved using alternative case study sites, which would also present new ethical representation challenges; as no two Holocaust sites are considered alike. This highlights that research surrounding ethics, the Holocaust and virtual environments will continue to evolve as more sites become exhibited.

To explore to a greater extent the ethical complexities within Holocaust representation, many studies can be performed that evaluate the ethical issues associated with archive materials and sources. Chapter 7 (Section 7.6) highlighted that photographs of prostitutes at Sylt camp were not considered

appropriate for exhibiting within the case study platform, due to living memory and consent issues (Crane, 2008). This highlights that further research requires conducting to interpret the boundaries and considerations when presenting archive materials (for example, liberation film footage, mass/single graves and victims as prisoners). Although these sources may contain particular relevance within archaeological investigation (i.e. to ascertain the location of structures), their representation may not be appropriate within educational and commemorative contexts.

As outlined in Chapter 3 (Section 3.1), this research did not intend to focus on if or how archaeological data can combat Holocaust denial. This was attributed to the limited understanding regarding how the public perceived archaeologically-derived Holocaust data, outside of a courtroom environment. However, this research did display that participants considered archaeological data to provide evidence of the Holocaust, therefore, further studies should be conducted to understand archaeology's role and value in tackling Holocaust denial.

This research purposefully used desktop computer representations to explore ethical Holocaust representation complexities. However, other established technologies, such as virtual reality headsets, present further ethical requirements to understand alternative types of Holocaust representations; especially in relation to concepts such as, 'seeing is believing'. The relationship between game and computer-based environments may become more closely intertwined, challenging pre-existing concerns of representing the Holocaust through game format (Totten, 2002; Cowan & Maitles, 2012). Coinciding with both Holocaust and courtroom representations, an increased understanding of aesthetics is required, specifically how colours, presentation and design influence content perceptions.

The author considers that representing archaeological Holocaust data through virtual heritage environments, empowers the archaeologist far greater than other dissemination methods (such as television documentaries). However, as Sturdy Colls (2015: 325) states, 'although archaeologists…have some control over the ways in which their results are presented…once they are in the public domain, they have the potential to be used and abused in ways over which they have no control'.

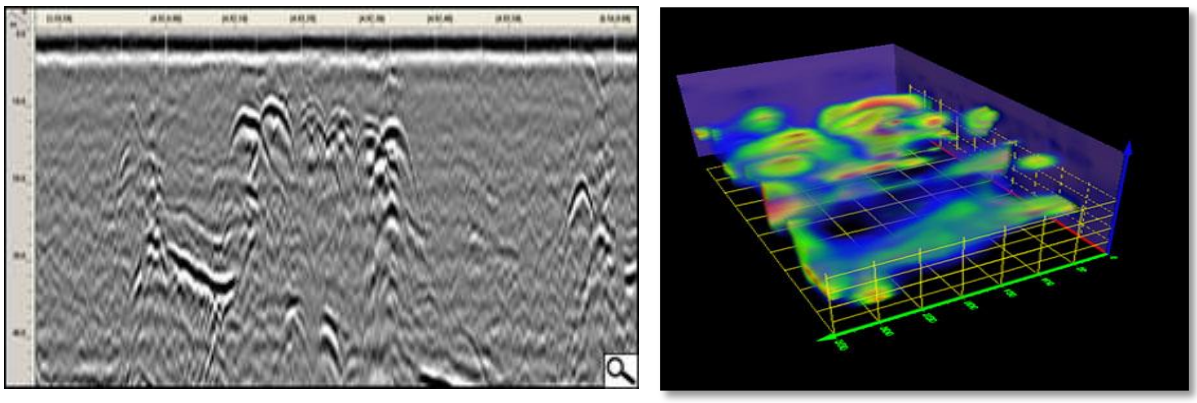


***Figure 8.2**: GPR data is commonly produced from forensic archaeological investigations of Holocaust sites. Additional research is required to understand if either unprocessed (**left**) (Alphageofisica.com, 2018) or processed (**right**) (Ollerhead.Ca, 2016) is useful or relevant within representations.*

8.4 Significance of Findings

Chapter 1 (Section 1.1) and Chapter 2 (Section 2.2) highlighted that since 2000, an increase of archaeological Holocaust investigations has occurred. Whilst many previous investigations were conducted for rationales such as criminal sentencing, alongside tracing victims and survivors, a transition is observed regarding why investigations are initiated. Most recently, investigations have been conducted for 'scientific reasons or executed within the framework of heritage management, both serving commemoration and remembrance' (Eickhoff, 2016: 280; Schute, 2017).

Although significant Holocaust research is continuously conducted, increasing our understanding of events, society's knowledge of the Holocaust is stagnating. For example, despite research such as the USHMM's mapping and documenting Nazi ghettos, camps and killing centres across Europe (Megargee & White, 2018; Megargee, 2009), the results from a 2018 study stated, 'almost half of US adults (45%) and millennials (49%) cannot name one of the over 40,000 concentration camps and ghettos in Europe during the Holocaust' (Claimscon.org, 2018). Similarly, studies such as the UCL's research into Holocaust secondary school education expressed requirements for 'redressing dominant myths, misconceptions and inaccuracies in British popular culture and society' (Foster *et al*, 2016: 3). One may perceive that although original and more comprehensive research into the Holocaust exists, the communication of this information has become defective.

As González-Ruibal *et al* (2008: 248) and Sturdy Colls (2015) acknowledge, archaeologists, perceive that 'oral and written data do not tell us everything about the past'. Thus, archaeological investigations can reveal, highlight, even challenge belief in existing Holocaust narratives. The results from this research support the above claims, as participants considered archaeology to provide evidence of the Holocaust that would not otherwise be known. As Sturdy Colls (2015: 325) further highlights, 'the benefits of carrying out [archaeological] investigations and their ability to enhance

knowledge of this period will only be realised when suitable forms of presentation are devised in order to disseminate the results to a wide variety of audiences'.

This research initially demonstrates the role of archaeology within Holocaust education and commemoration. A growing understanding currently exists that many aspects of the Holocaust cannot be known 'from conventional analyses of historical sources alone' (Sturdy Colls, 2015: 326). This research highlighted that participants considered archaeology to provide unique insights into the Holocaust that would not otherwise be known, thus demonstrating the significance of the field (Chapter 6 Section 6.6.1.1). Despite certain participants (mainly historians) considering historical sources provided greater context and understanding of the Holocaust, these participants also recognise the relevance of presenting archaeological findings (Chapter 7 Section 7.10).

This study acknowledges that society in on the cusp of change, with declining numbers of Holocaust survivors (SFI.USC.edu, 2018; House of Commons, 2016). Therefore, this research has endeavoured to draw awareness to the rise in digital/virtual Holocaust representations, which tackle this issue, ensuring remembrance and commemoration continues (SFI.USC.edu, 2018; Belsen-Project.com, 2012). However, many of these representations solely rely on historical sources and testimonies to convey 'familiar' narratives, re-represented through innovative methods. Archaeology takes a broader approach by unearthing new evidence, which provides alternative insights of atrocities. Therefore, archaeology not only serves as a tool to ensure the continuing memory of the Holocaust but additionally incorporates historical sources and testimonies within the overall framework of representation.

This continues Beech's (2002: 199) philosophy, that Holocaust sites fulfil both a 'remembering' and 'not-forgetting' function. However, by viewing the Holocaust through the perspective of a criminal event, archaeology goes beyond the traditional realms of representation. This is considered extremely important, given the limited understanding that current communities encompass about this period of history (Claimscon.org, 2018; Foster *et al*, 2016; Carrier *et al*, 2015). This study displayed that participants considered archaeology to provide evidence of atrocities, and thus can combat, challenge and eventually assist in reducing 'myths' and 'misconceptions' prevalent within society (Foster *et al*, 2016; Ebbrecht, 2010; Levy & Sznaider, 2006).

This study not only demonstrated archaeology's relevance in Holocaust representation but highlighted how using virtual heritage and digital humanities resources, that communication of information can be effectively conducted. Both case study platforms highlighted the benefits of using digital representation, ensuring that important Holocaust educational qualities were still maintained; for example, empathy (Short & Reed, 2017; Dulberg, 2002). Additionally, through having an ability to resource a wide range of computer-based and multimedia formats, educational qualities such as engagement and interactively were demonstrated, addressing different pedagogy styles (Pujol &

Champion, 2012; Ibrahim *et al*, 2011; Bonini, 2008; Economou & Pujol, 2008). This research ascertained to a greater extent, how Holocaust materials should be exhibited, by exploring representation complexities such as narrative formation and authenticity. Therefore, this research has provided 'a suitable form of presentation', and more broadly, a framework for future Holocaust archaeological representations (Sturdy Colls, 2015: 325).

8.6 The Future

A (UK) poll conduct by the Holocaust Memorial Day Trust (HMDT), published its findings on the 2019 Holocaust Memorial Day. The poll revealed that '5% of UK adults do not believe the Holocaust took place and one in 12 believes its scale has been exaggerated' (BBC.co.uk, 2019). These issues are not confined to the UK, with a similar study conducted in America. This 2019 study highlighted that from 200 future educators 'only 30% knew that the Jewish people were the primary victim of the Holocaust. Even fewer know the correct century in which the Holocaust took place. Auschwitz was the only concentration camp they identified' (Theconversation.com, 2019).

These studies paint the picture that the future of the Holocaust is bleak, destined for misconceptions and misunderstanding to permeate within society. The author argues that the evidence-based approach benefits of presenting forensic archaeologically-derived Holocaust narratives are urgently required, to ensure that the events of the Holocaust are remembered as accurately as possible. As archaeologists disseminate their investigative results, societies awareness, understanding and education of the Holocaust can be increased. By disseminating platforms online and accompanied by teaching packages, a greater level of Holocaust education can be provided to schools, confronting the barriers faced by Holocaust educators (Chapter 2 Section 2.1.1), bridging the gap between teacher and academic knowledge (Foster *et al*, 2016; ITF, 2010).

The importance of ensuring that Holocaust representations are ethically maintained is highlighted through current misunderstandings. These historical lessons should never be sacrificed of authenticity, accuracy, reliability and transparency of information, over other qualities such as showmanship, photorealism or sensationalism. Through this sense, the author argues that the quality of representations should be prioritised over quantity, which can be achieved through universal frameworks. This study also demonstrates that technology assists in representing narratives from Holocaust sites, still bound by political, religious or cultural sensitivities. This again provides the opportunity to tackle contemporary Holocaust issues, through representing aspects such as the scale of atrocities.

The author considers that Holocaust archaeology will form a significant role within the future of Holocaust understandings. However, the role of the archaeologist now stretches far beyond acquiring evidence, but also through ensuring adequate, ethical representation of the findings is maintained.

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L/D/25/L/65 - Audio account by Gordon Prigent.

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PC98/173/6057/8 Trustees of the Royal Air Force Museum - The ‘Russian’ cemetery located on Longy Common.

Glossary

2D	Two-dimensional
3D	Three-dimensional
3D Reconstruction	Interactive abstract computer-based visualisations
360° Panoramic Photo	Panoramic photographs with a 360° rotation from a fixed position
ABA	American Bar Association
ADS	Archaeology Data Service
AIA	Archaeological Institute of America
AMA	Alderney Museum Archives
ASA	Association of Social Anthropologists of the UK and the Commonwealth
BABAO	British Association for Biological Anthropology and Osteoarchaeology
CAD	Computer-Aided Design
CGI	Computer-Generated Imagery
CIfA	Chartered Institute for Archaeologists
DBA	Desk-Based Analysis
DTM	Digital Terrain Model
EAA	European Association of Archaeologists
EDM	Electronic Distance Measurer
EPE	Electronic Presentation of Evidence
ESRI	Environmental Systems Research Institute
FSS	Forensic Science Service
GIS	Geographical Information Systems
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HEART	Holocaust Education and Archive Research Team
HET	Holocaust Education Trust
HMDT	Holocaust Memorial Day Trust
iC-ACCESS	Accessing Campscapes: Inclusive Strategies for Using European Conflicted Heritage
ICOMOS	International Council on Monuments and Sites

IHRA	International Holocaust Remembrance Alliance
IWM	Imperial War Museum
IVE	Immersive Virtual Environments
JIVE	Juries and Visual Evidence Project
LGBT	Lesbians, Gays, Bisexuals and Transgender
NCAP	National Collection of Aerial Photography
NPR	Non-Photorealistic Rendering
NSKK	National Socialist Motor Corps
OT	*Organisation Todt*
Photorealism	Panoramic scenes constructed from photographs
Photorealistic	Rendering of 3D scenes with the location controlled by the user
PoW	Prisoner of War
RAF	Royal Air Force
RPA	Register of Professional Archaeologists
SAA	Society for American Archaeology
SEAV	Spanish Society of Virtual Archaeology
SIFT	Scale-Invariant Feature Transform
SIG	Special Interest Group
SLR	Single Lens Reflex
SS	*Schutzstaffel*
TA	Thematic Analysis
UCL	University College London
UNESCO	United Nations Educational, Scientific and Cultural Organization
USC	University of Southern California
USHMM	United States Holocaust Memorial Museum
Virtual Heritage-Representation	Broadly describes all of these forms of computer-based visualisations
VR	Virtual Reality
WAC	World Archaeological Congress

Appendix 1: Code of Conduct

This form is a code of conduct which you are expected to abide by during focus group discussions. The code of conduct is an agreement between the researcher and participants, that you will treat each other (and the facilitator) in a respectful manner throughout discussions. Although the discussions require you to share your thoughts, opinions and beliefs regarding the virtual heritage platform you have viewed, you must be mindful that there is potential to upset other group participants through the choice of language used.

By signing this document, you agree to the following seven points below:

[**1**] Please ensure any electronic devices (such as a mobile phone) have been either turned off or set to vibrate.

[**2**] Please engage within the discussion and express your views respectfully.

[**3**] Please listen and respect each other participants views. It is acceptable to disagree with someone else's opinion but please convey your personal opinions with sensitivity.

[**4**] Please ensure that only one person is talking at a time. Therefore, allow each person to finish their point before stating yours.

[**5**] Please ensure any of your thoughts are verbally conveyed, as body language and gestures will not be detected through the voice recorder.

[**6**] If at any point you feel distressed or uncomfortable please leave the discussion and enter the safe zone. Additionally, if you require further assistance, please contact a member of staff who will address your concerns.

[**7**] Please ensure that no physical contact is made with other participants or facilitators of the focus study group.

CODE OF CONDUCT AGREEMENT

I have read and agree to abide by the code of conduct (please sign below):

_____

Participant's Name (Printed)*

_____ _____

Participant's signature* **Date**

_____ _____

Name of person obtaining consent (Printed) **Signature of person obtaining consent**

Appendix 2: Consent Form

PROJECT TITLE: Ethical considerations of displaying forensic archaeological Holocaust materials through Virtual Heritage technologies

By signing below, you are agreeing that:

[**a**] You have read and understood the project Information Sheet provided;

[**b**] You have been given the opportunity to ask questions about the project and these have been answered satisfactorily;

[**c**] You are taking part in this research study voluntarily (without coercion) and have the right to withdraw at any time without providing reasons. This also includes the right to withdraw any information/data that you have provided;

[**d**] That the information provided by you during the research will be used as part of Janos Kerti's research project (Ethical considerations of displaying forensic archaeological Holocaust materials through virtual heritage technologies) and that you understand that personal information may be looked at by researchers or other responsible individuals;

[**e**] You are happy for this material to be published as part of a PhD thesis about exhibiting sensitive conflict archaeological data, which may result in anonymized quotes being included within the thesis;

[**f**] You agree to the personal information questionnaire to be incorporated within the research project which may result in publication of data.

_____

Participant's Name (Printed)*

_____ _____

Participant's signature* **Date**

_____ _____

Name of person obtaining consent (Printed) **Signature of person obtaining consent**

Appendix 3: Debriefing Form

Project Title: Ethical considerations of displaying forensic archaeological Holocaust materials through virtual heritage technologies

Researchers' Name: Janos Kerti (lead researcher)

Dr Caroline Sturdy Colls (principle supervisor)

Dr Ruth Swetnam (supervisor)

Researchers' Contact Email: Janos.Kerti@research.staffs.ac.uk

Thank you for taking part in this study. The research project aim was to record your thoughts, beliefs and opinions through a focus study group, which concerned discussions surrounding a virtual Holocaust platform you have interacted with.

For detailed explanations, or if you would like to know the results of the study please use the contact details for the researcher (Janos Kerti) outlined above.

All participant information collected will be kept confidential at all times with complete anonymity maintained outside the focus study group. The data obtained from the study will be stored on a password protected computer and will only be accessible to the researchers outlined above.

If you feel that you have been affected my any of the materials or discussions within this study and wish to talk in confidence, you may wish to contact one of the following organisations:

Samaritans: www.samaitans.org

Mind: www.mind.org.uk/help/advicelines

Thank you once again for your participation.

Appendix 4: Focus Study Group Questions

Engagement Questions:

1. Do you believe that the website was appropriate?
   (**Prompts:** Anything offensive? Was the language understandable? How effective is the navigation and interaction of the website?).

Exploration Questions:

2. Did you get a sense of 'being there'? If so did this help learning?
   (**Prompts**: (i.e.) Did the virtual tour/3D model create a sense of visiting the site? Hotspots (linking information to a specific area); (Q) would this replace visiting a site?)

3. Do you think the use of archaeological information is a good way to learn about a Holocaust site?
   (**Prompts**: methods/equipment; examining surviving landscape remains, combining desk based and fieldwork research; development of 3D model from fieldwork data)

4. Which digital materials were useful to learn from? Why?
   (**Prompts**: photographs, video, audio, text, infographic, timeline, archive documents, aerial images)

5. Do you believe the information on this website? Why?
   (**Prompts:** virtual tour, 3D reconstruction, archive documents, photographs, videos, audio, text, infographic, timeline, references)

Exit Question:

6. What one aspect of the website did you remember the most?
   (**Prompts**: everyone to answer)

Appendix 5: Interview Questions

Q) Can you please introduce yourself by your name and your job role at the museum.

Engagement Questions:

1. Do you believe that the website was appropriate?
   (**Prompts:** Anything offensive? Was the language understandable? How effective is the navigation and interaction of the website?).

Exploration Questions:

2. Did you get a sense of 'being there'? If so did this help learning?
   (**Prompts**: (i.e.) Did the virtual tour/3D model create a sense of visiting the site? Hotspots (linking information to a specific area); (Q) would this replace visiting a site?)

3. Do you think the use of archaeological information is a good way to learn about a Holocaust site?
   (**Prompts**: Methods/equipment; examining surviving landscape remains, combining desk based and fieldwork research; development of 3D model from fieldwork data)

4. Which digital materials were useful to learn from? Why?
   (**Prompts**: For example, photographs, video, audio, text, infographic, timeline, archive documents, aerial images)

5. Do you believe the information on this website? Why?
   (**Prompts:** virtual tour, 3D reconstruction, archive documents, photographs, videos, audio, text, infographic, timeline, references)

Exit Question:

6. What one aspect of the website did you remember the most?

7. How do you feel the platform could be improved?
   (**Prompts**: understanding materials and information)

Appendix 6: USHMM Questionnaire Surveying Questions

Please answer *all* the following 13 questions:

1. Before viewing this website, had you heard of Lager Sylt concentration camp?

   Please tick ☐ Yes ☐ No

2. Has viewing this platform increased your knowledge of Lager Sylt?

   Please tick ☐ Yes ☐ No

3. Do you believe the content and presentation of this website was appropriate?

   Please tick ☐ Yes ☐ No Please explain why:
   .....
   .....
   .....
   .....

4. Do you think the use of archaeological information is a good way to learn about a Holocaust site?.....
   .....
   .....

5. Did you get a sense of 'being there'? Please tick Yes ☐ No ☐

   Did this help with learning? Please explain why:
   .....
   .....
   .....

6. Did you find any of the website believable? Please explain why:
   .....
   .....
   .....

7. Did you find any of the website unbelievable? Please explain why:
   .....
   .....
   .....

8. What aspect did you remember the most?
   .....
   .....
   .....

9. What materials were most useful to learn from? (tick all applicable):

Video	☐	Archive Documentation	☐
Photographs	☐	Infographic	☐
Aerial Imagery	☐	Timeline	☐
Audio Accounts	☐	Text	☐

Any other (please state): .....

.....

10. Please rate the navigation effectiveness of the website:

Please circle:

Easy	Fairly Easy	Neutral	Fairly Difficult	Difficult
1	2	3	4	5

11. Which part of the website did you prefer to interactive with the most? (e.g. virtual tour, 3D reconstruction).
.....
.....
.....

12. If you were describing this website to a friend, what 3 words would you use?
.....
.....
.....

13. How do you believe the website could be improved?
.....
.....
.....
.....

Appendix 7: Personal Questionnaire

Please tick the relevant box or write a description:

Religious Belief:

☐ No religion

☐ Christian (including Church of England, Catholic, Protestant and all other Christian denominations; please tick the box and specify below in the any other religion section)

☐ Buddhist

☐ Hindu

☐ Judaism

☐ Muslim

☐ Sikh

Any other religion .....

Gender:

☐ Male ☐ Female

Age Group:

☐ 15 - 20 ☐ 21 - 25 ☐ 26 - 30 ☐ 31 - 35 ☐ 36 - 40 ☐ 41 - 45 ☐ 46-50

☐ 51 - 55 ☐ 56 - 60 ☐ 61 - 65 ☐ 66 - 70 ☐ 71 - 75 ☐ 76 - 80 ☐ 81-86

Any Other.....

Educational Background:

☐ No Qualifications

☐ GCSE / O Level (or similar)

☐ A Levels (or similar)

☐ Undergraduate Degree (or similar)

☐ Postgraduate Degree (or similar)

Any Other.....

Ethnic Group:

White:

☐ English/Welsh/Scottish/Northern Irish

☐ Irish

☐ Gypsy or Irish Traveller

Any Other:

.....

Mixed/Multiple:

☐ White and Black Caribbean

☐ White and Black African

☐ White and Asian

Any Other:

.....

Asian / Asian British:

☐ Indian

☐ Pakistani

☐ Bangladeshi

☐ Chinese

Any Other:

.....

Black/African/Caribbean/Black British:

☐ African

☐ Caribbean

Any Other:

.....

Other: *Please provide any other group not outlined above*

.....

What is your interest in this project?

.....

.....

.....

.....

Appendix 8: Alderney Questionnaire

Please indicate age (circle one):

18-28 29-39 40-50 51-69 70+

Please indicate Alderney residency period (circle one):

Since birth 5 years 10 years 20 years 40 years

- As a resident of Alderney do you believe that there are connotations of living within a former Third Reich heritage landscape?

.....

.....

- Have you ever visited online digital heritage resources? If YES provide details:

.....

.....

- Do you consider the application of digital heritage resources (for example virtual tour, CGI reconstruction, laser scanning) to be an educational tool?

.....

.....

- Do you believe that a digital resource could/should replace visits to former Third Reich camps located on Alderney?

.....

.....

- Do you think there would be any positive or negative effects on Alderney's community through composing a digital heritage resource?

.....

.....

- Additional Comments:

.....

.....

Appendix 9: Participant Information Sheet

PROJECT TITLE: Ethical considerations of displaying forensic archaeological Holocaust materials through virtual heritage technologies

My name is Janos Kerti and I am a PhD researcher at Staffordshire University, studying forensic archaeology and virtual heritage. My research is titled *'ethical considerations of displaying forensic archaeological Holocaust materials through virtual heritage technologies'*.

Aims of Research

Forensic archaeology is widely used to investigate genocide crimes. This means that forensic archaeologists visit former Holocaust sites to collect evidence that still remains today. Often, archaeologist look for evidence both above and below the surfaces. This information allows archaeologist to try and understand what has happened at the site.

From investigation many different evidence types are collected. Before visiting a site, materials are obtained from searching literature, the internet and archives. Different types of information are collected which can include documents, war/legal reports, literature, photographs, aerial images, maps and former site investigation reports. When visiting a site different information is recorded such as sketches, excavation information, measurements of buildings and geophysical data. Geophysics simply means looking at details about the earth's surface. This is collected through equipment such as ground penetrating radar (GPR). This radar scans the earth's surface and records information below the surface, without disturbing the ground.

This research project will look at how forensic archaeology can display investigative materials through virtual heritage technologies. Virtual heritage means showing information about our past through virtual technologies such as 3D models and virtual tours. Often displayed within these virtual environments are other digital materials such as videos, images and text. This all helps tell a story about the sites history.

However, when displaying information from Holocaust investigations many challenges are faced by archaeologists and you may accidently upset people. This research looks at how archaeologists can present these materials ethically, so that people can learn about the Holocaust through archaeologists' eyes.

Invitation

You are being invited to participant within the above outlined research project *'ethical considerations of displaying forensic archaeological genocide materials through virtual heritage technologies'*.

Why have I been invited?

You have been invited to participant within research due to the knowledge you can contribute to the project. The virtual heritage platforms have relevance within education and can broaden knowledge of Holocaust history. Therefore, as a student you can be considered most suited to hold valuable information in determining how appropriate the virtual platforms are as an educational resource.

Do I have to take part?

The choice to participant within research is of your child's own accord. If your child does decide to participant then you will be required to sign a consent form (on their behalf), a code of conduct and complete a brief information sheet (encompassing data as age, gender and religion). Please be aware that once the data has been submitted, due to the anonymous approach, it cannot be withdrawn.

What is Required?
Research requires your child's participation within focus study groups, from which your child will be required to view one of two virtual heritage platforms. After viewing a platform your child will be required to enter into a small group discussion regarding what was exhibited within the platform. The discussion will be guided by seven questions. Overall, viewing each platform and the following discussion will take no longer than 1 hour and 15 minutes.

Participation risks
It must be made clear that your child will be viewing a virtual heritage platform that contains information regarding the Holocaust. Although the platform has been carefully examined to ensure no visually distressing images are displayed, your child will encounter (age appropriate) materials (such as legal documents and eye witness accounts) which maybe of a distressing nature. All information disclosed during discussions will be kept anonymous.

How will the information be used?
The information provided during discussions will provide content for the above titled thesis research project. Any information provided during discussions will be anonymous. No identification of participants will be available through any published materials or dissemination of data.

Who will have access to the information?
To ensure confidentiality of data all information provided will be stored within accordance of Staffordshire University's ethical guidelines; simply, all information will be protected through password access and will only be viewed by the researcher and his supervisory team. Information will be stored until the end of the research project (August 2018), upon which information will then be securely placed into care by the project supervisors (Dr Sturdy Colls and Dr Swetnam). Any disposal of information will ensure that you are not identifiable through research.

What if there is a problem?
If you have any questions as a result of reading this information sheet, please feel free to contact Janos Kerti on 07759005132, or email on Janos.Kerti@research.staffs.ac.uk.

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Research is conducted under Staffordshire University:
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