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Table of Contents

List of Figures

List of Appendices

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1 Introduction

1.1 Virtual Heritage and Digital Games

Heritage experiences provided by digital games have become increasingly included in academia (Edwards et al., 2021; Meier et al., 2020; Zimmermann, 2021). This thesis aims to further explore the way that digital games and the field of digital heritage could be brought together to both aid research initiatives and simultaneously benefit gaming communities. In order to do this, it is helpful to first understand the developments in the field of digital archaeology and where virtual heritage is situated within the discipline.

The interdisciplinary field of digital archaeology formed in the wake of digital technology. During the 1980s, the arrival of GIS was a major catalyst in the establishment of interdisciplinary work between archaeology and computer science, with the new ability to analyse archaeological landscapes in a digital format (Richards-Rissetto, 2017 as cited in Champion, 2021, p. 14). Today, digital archaeology is in a place where digital methods have proven immensely beneficial, such as in the case of understanding physical preservation, and in the analysis of big data (Lercari et al., 2021; Wernke et al., 2020). In other words, advancements in digital technology have allowed archaeology to expand its methodological techniques.

Within digital archaeology exists virtual heritage. Virtual heritage can be used interchangeably with digital heritage. Digital heritage can be defined as heritage that is experienced in digital form such as, but not limited to, a digital texts, images, videos, software, and that carries the notion of heritage preservation (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2009, p. 1). However, virtual heritage will employ a slight difference in meaning for the purpose of this study. Upon the same definition, it will focus on opportunity to experience something of heritage, rather than the broader definition of digital heritage. Throughout this study, virtual heritage will be used instead of digital heritage to stress the attribute of user experience.

Virtual heritage should be differentiated from digital archaeology. Digital archaeology is a wider field, within which virtual heritage can exist as a sub-field

of heritage. Digital archaeology also encompasses other areas such as digital analysis methods for numerical data analysis, or spatial analysis, or even 3D modelling that may be used to help archaeologists and not necessarily created for the general public. That being said, heritage, and therefore virtual heritage, may also exist as a sub-discipline in other areas of academia beyond archaeology, such as history or linguistics.

It is also important to understand the relationship between virtual heritage and digital archaeology. Because other methods exist within digital archaeology, such as GIS, virtual heritage may not be immediately recognised as a part of digital archaeology. This is a reasonable way to view it because it also falls under the general field of heritage, which lends itself to other academic disciplines—not exclusively to archaeology. It is therefore appropriate to view virtual heritage as a fluid, moving field of academia, and beyond—which introduces the next point.

This study will define virtual heritage as not only entailing academic motives. It can refer to anything relating to or providing a virtual heritage experience, encompassing individuals and groups that are not part of an academic setting. For instance, a video game developer who develops a game that provides a heritage experience is not necessarily creating it out of academic motive. Instead they may have different motives such as, creating a successful product, or from their own interests in a particular culture or time period.

Following the same logic, virtual heritage projects will refer to both academic and non-academic projects that deliver a virtual heritage experience to a given audience. This phrase will be used during this study to refer to both virtual heritage projects within academia and projects concerning digital games, such as cultural and historical mods which will be introduced in Section 1.4 in the context of the *Minecraft* modding community.

Virtual heritage in digital games is not a recent phenomenon. The earliest known historical digital game is *The Sumer Game* (Dyment, 1968). To play, the player had to manage the allocation of resources for the town, set in roughly 3500 BCE Sumer. A more-developed version using a different programming language was released in 1973 and retitled to *Hamurabi* (Ahl, 1973) (Rollinger, 2020, p. 29). Later, the creators redeveloped the game and had the title conform with the more accepted spelling, 'Hammurabi' (Brunelle-Leclerc, 2018, p. 16).

Another early game is *The Oregon Trail* (MECC, 1971). This game was set in 1848 with the purpose of educating its players on the American western expansion. Their commercial edition, released in 1985, challenged players to travel from Missouri to Oregon while exposed to various obstacles (Rollinger, 2020, p. 19).

Modding digital games to add cultural or historical content is also not new. Mods are third-party digital package that the user can add to the game that changes or adds features. A more comprehensive description of mods will be given in section 1.4.

As discussed by Majewski (2017, p. 187), the 2011 game, *Mount & Blade: With Fire & Sword* (Sich Studio & TaleWorlds, 2011), could be played with *Csatádi's Visual and Historical Mod* (Csatádi, 2011) installed, which primarily modified the aesthetics of the game to improve its historical representation. Majewski points out that the mod focuses on improving historical accuracy as it does not make any large changes to the game (2017, p. 187).

In recent years, research involving digital games has become more abundant. *Assassin's Creed Odyssey* (Ubisoft Quebec, 2018) provides historical, cultural, and archaeological experiences by immersing players in vast reconstructions of ancient Greece. The game also offers *Discovery Tour*, an educational game mode that allows the player to learn about the virtual environment of ancient Greece.

Some studies use *Assassin's Creed Odyssey* as a medium for virtual heritage. A paper by Paananen et al. shows how *Discovery Tour* was used to engage a diverse group of participants with the historical and cultural content offered in the game (2023). It was found that the majority of participants enjoyed the experience and wanted to continue their *Discovery Tour* gameplay (p. 245). However, *Assassin's Creed Odyssey* has also been critiqued in academia. Politopoulos et al. highlight the game's juxtaposing lenses of tourist and assassin (2019). The point to be made here is that digital games have become increasingly accepted as subjects and tools for research.

Ongoing discourse critiques the field of virtual heritage. Champion has claimed that virtual heritage is not yet a dependable form of heritage due content being unsustainable through forever-changing, updating technology (2021, p. 10). For example, virtual reality (VR) content is vulnerable due to the uncertainty imposed by the often-changing VR technology (Champion, 2021, p. 5). Naturally, this is an important concern, as heritage cannot exist without some form of preservation. Digital games may provide relief. Game developers need to upkeep compatibility with platforms to make their game more accessible and marketable (Politowski et al., 2021). This means that digital games—especially those that are popular, with a high demand that ensures longevity—can provide greater sustainability for virtual heritage than other methods. Langis-Barsetti has stated that this is true in the case of *Minecraft* (Mojang AB, 2011) (Langis-Barsetti, 2021, p. 64).

There are also critiques on the field of heritage research. Jeffrey points out that heritage projects and management tend to exclude community engagement when dealing with an older past, as it is assumed that there is no present community associated with the matter (2021, p. 2).

Despite these critiques, virtual heritage has established itself in variety of forms. There also appears to have been a recent influx in demand for virtual heritage in response to the COVID-19 pandemic. Government-imposed restrictions, such as stay at home orders and mass-gathering bans, impacted the accessibility of heritage experiences for many people. Due to this, people and the affected institutions had to find ways around the conditions. For example, museums in Italy were pushed to adapt to these restrictions, resulting in an observable movement towards digital deliverance methods, such as virtual tours (Agostino et al., 2021). Beyond the struggle caused by the pandemic restrictions, GLAMs have seen a general decline in visitor numbers and income over the years, which has also pushed them towards methods of virtual heritage to hold or increase engagement (Champion, 2021, p. 25).

Why are digital games turned to as mediums for virtual heritage? Learning how to use software such as, *Autodesk Maya* (Autodesk, 2005), or another software that relies on traditional geometry-based modelling methods, can be quite challenging and therefore demands a considerable amount of time and effort (Champion, 2021, p. 26). While it is no question that such software serve their purpose, their specialisation can mean that heritage professionals encounter roadblocks in conducting research or projects that concern digital 3D modelling. Additionally, these programs, such as *Autodesk Maya* and *Blockbench*, do not include any gameplay capability, in the sense that the user can move around within the environment in a way that mimics reality. This would be crucial to research wanting to observe people experiencing this virtual environment, such as the Bryn Celli Ddu *Minecraft* Project (Edwards et al., 2021).

Digital games, to an extent, can be used to avoid these issue. While digital games also require some extent of learning to play the game, they are naturally intuitive due to marketing goals, such as attracting a player-base. This differentiates from modelling software, which aims to be usable, and not necessarily intuitive or gripping.

Sandbox games are games that allow a larger extent of creativity from the user within the game's mechanics (Rouse, 2023). Sandbox games, such as *Minecraft*, let the user modify the game's environment freely. These games therefore offer the ability to create an environment, or parts of an environment, in a more physical sense that is more intuitive than what 3D modelling software generally offers. In removing the skill wall required by 3D modelling programs,

sandbox games present as a more accessible alternative that foster self-authorship. Using *Minecraft* as a medium for virtual heritage would be attractive for this reason.

Digital synthesis of virtual heritage can be complex, but is relatively less complex when *Minecraft* is used as a medium. *Minecraft* additionally avoids the need for complex 3D modelling due to the simplicity of the game's blocky visual and mechanical components—which can be described as similar to Lego. Software such as *Blockbench* can be used to create models of this blocky style, without as steep of a learning curve that more technical modelling software may require.

Non-sandbox games can also be useful in the same contexts. These tend to be linear games that restrict the user's gameplay to a single storyline or multiple storylines (Rouse, 2023). Where relevant, games with a pre-existing built environment, such as Assassin's Creed: Odyssey, would allow heritage professionals to avoid having to create this environment virtually, as the game already offers one.

Digital games are therefore able to provide a greater advantage to heritage research and projects in some situations, than a 3D modelling program can. Henceforth, this thesis will delve further into *Minecraft*.

1.2 Purpose

While virtual heritage research is abundant, studies often focus on the game itself. This unintentionally excludes gaming communities. Consequently, this leaves a gap in virtual heritage research and thus the opportunity to explore how gaming communities contribute to virtual heritage. This is recognised by Majewski, who claims that the game mods discussed in his study have not been studied by cultural heritage scholars. This is despite both mods containing features desirable for a virtual heritage experience (2017, p. 191). More broadly, Champion identifies this issue:

> '*It has been a common failing of much heritage work dealing with the distant past to assume there is no current community to engage with, and that work can be carried out as if the space in question is neutral or without stakeholders*'. (2021, p. 2)

Gaming communities are essential to their respective games from a sociologist's perspective (Mäyrä, 2016). It is then not far of a reach to question what gaming communities provide in the way of heritage. Especially modding communities— online communities that create and use modifications that alter a given game in some way. *World of Temasek* and *Suvarnabhumi Mahayuth* mods are exemplars of this (Majewski, 2017). Modding communities have influenced how the digital games industry has developed (Sihvonen, 2011, p. 54).

Therefore, this thesis will endeavour to address the disconnection between gaming communities and heritage professionals by focusing on the mod developers of the *Minecraft* modding community. The purpose of this is to bring gaming communities to the attention of heritage professionals, and vice versa, with the hope that such familiarisation can ultimately open up beneficial avenues in virtual heritage.

In order to achieve this, this study is guided by the following research question: Can *Minecraft* modding communities and heritage professionals work together in producing impactful and successful virtual heritage experiences? To help unpack this research question, the following sub-questions will guide discussion in Chapters 3 and 4:

- Why are modding communities interested in developing cultural and/or historical *Minecraft* mods?
- What attitudes do mod developers have towards heritage professionals?
- What can the *Minecraft* modding community offer to virtual heritage?
- What are the similarities between the *Minecraft* modding communities and heritage professionals?

For the purpose of clarity, 'heritage professional' encompasses anyone who is an archaeologist, historian, or anything of the like. This may be academically or in the broader sense of the word professional.

It has been pointed out that virtual heritage lacks evaluation framework (Champion, 2021, p. 8). Although this study will not directly evaluate game or mod content, it hopes to, as a byproduct, provide relevant information that can be used to assist the development of evaluation methods in virtual heritage, especially in avenues concerning digital games.

1.3 *Minecraft's* Current Role

Minecraft (Mojang AB, 2011) is a popular, versatile survival game with a large player-base. It has over 300 million copies of the game sold across different platforms to date (Austin, 2023). *Minecraft* has become a popular tool in the field of virtual heritage, especially following the release of *Minecraft Education Edition* in 2016 (Mojang AB, 2016). It seems plausible that *Minecraft Education Edition* brought *Minecraft* into the realm of 'serious games' which allowed for wider acceptance and use as a platform for education in a variety of subjects.

Mojang AB feature blog-style posts on their *Minecraft Education* website that showcase news, testimonies, and real uses of *Minecraft Education Edition* (Mojang AB, n.d.). Some of these are heritage uses. For example, an elementary school in Hokkaido, Japan was going to close and a teacher let her class recreate the school in *Minecraft* containing their memories so that it was preserved and could be visited virtually, after the closure of the school (Nojiri, 2022). In another post, a middle school class reconstructed the round city of Baghdad from the 8th Century to learn about its historical significance. Miller, the teacher of the class, explains in the post that he plans to add non-playable characters (NPCs) to the virtual city so that the students can further engage with the history and culture of the region, such as the Silk Road. The NPCs will have quests for the students to complete within the city (Miller, 2021).

Accessibility appears to be a major positive factor in the game's popularity. Due to *Minecraft's* low system requirements, the game is accessible on a wide range of devices. In other words, the user does not need a computer with high specifications to run *Minecraft*. Additionally, the game is also playable on different operating systems. *Minecraft* Java Edition can run on both Windows and Macintosh operating systems, while *Minecraft Bedrock Edition* allows the game to be played on the user's smartphone or tablet, or console. Thus, *Minecraft* is able to reach a larger audience than if the game was restricted to narrower system requirements and certain platforms.

At a glance, *Minecraft* is a game of blocks and pixels, which presumably limits detail. The ability to reconstruct something accurate to how it appears in real life seems impossible. However, it is worth pointing out that there is a choice to experience *Minecraft* from any desired spatial scale. This is because the user has the freedom to treat *Minecraft* blocks as being any 'size', meaning that their

build does not necessarily have to conform to the scale of a *Minecraft*-generated world. Considering this, blocks can be treated as small pixels in a large build.

Furthermore, there are plug-ins and mods that help the user to build structures in *Minecraft*. For example, *WorldEdit for Bukkit* (sk89q, 2011) is a popular plug-in in the *Minecraft* community that offers many useful features for building, moving, and editing builds of any scale. *WorldEdit* (sk89q, 2014) is also available as a mod that can be run with *Forge* or *Fabric* instances of *Minecraft*. These tools allow the user to bypass having to build block-by-block, meaning that large-scale builds become much more feasible.

There are a range of virtual heritage studies and projects that utilise *Minecraft*. A few of these efforts are described below.

Among later studies is one from Edwards et al. (2021) which took place during a COVID-19 lockdown in Wales. They reconstructed the Welsh Neolithic tomb, Bryn Celli Ddu, in a *Minecraft* world and then presented it using *Minecraft* Education Edition to a group of school children who were able to join the world to virtually 'visit' the site. The reactions of the group were assessed and they found that the virtual heritage experience that they provided to the children was very valuable and memorable for them, with one of the children expressing their excitement towards visiting the real Bryn Celli Ddu site once COVID-19 restrictions were lifted in Wales. This study shows the impact a virtual heritage experience can have on a target group, and that this form of heritage experience is rather credible.

Romeincraft was launched in 2017 by the VALUE Foundation with the goal of providing a Roman heritage experience that connects with a wide audience. VALUE hosted in-person events where anyone interested could bring along their laptop and help reconstruct the Roman Limes in *Minecraft*. The project includes *Minecraft* worlds of Dutch provinces, and later Belgian provinces, containing Roman history built by the participants and VALUE foundation members (Politopoulos et al., 2019, p. 164).

Beyond Romeincraft, the VALUE Foundation exist to bridge the gap between academics and digital games. The VALUE Foundation began in March 2017 after starting the VALUE project back in 2015, which has since been renamed to Interactive Pasts. Interactive Pasts is a project with multiple functions—such as research, streaming, and *YouTube* (Google, 2006)—that focus on the connection between digital games and the past (VALUE Foundation, n.d.b). In 2016, the group published *The Interactive Past*, and in

2021, they published *Return to the Interactive Past*, that both include a wide variety of discussions regarding the past in digital games (Mol et al., 2017; Ariese et al., 2021).

The Computational Research on the Ancient Near East (CRANE) Project is another initiative consisting primarily of academic endeavours. However, one of their research initiatives presents a reconstruction process of ancient Kunulua in *Minecraft* (Langis-Barsetti, 2021). Langis-Barsetti claims that perfect replication of the city is not the goal of the project, due to inevitable knowledge gaps. Instead, they aim to produce a Minecraft world that serves as an education tool that will be later involve interactive components, such as mini-quests, that will spur player engagement (2021, p. 69).

These efforts demonstrate the ways in which Minecraft is used not only as a medium for virtual heritage but as a way of outreach.

1.4 The Modding Community

Modding a computer game entails the installation of third-party material with the purpose of altering the features or mechanics of the game to a desired extent (Sihvonen, 2011. p. 12). There are three ways of modifying *Minecraft* gameplay; via resource packs, plug-ins, or modded clients.

Resource packs are the least invasive way to modify *Minecraft* gameplay, as game mechanics cannot be altered without involving mods. Only the resources of the base game, such as the textures of blocks and items, some models, or the sounds (i.e., footsteps and animal noises) can be changed in a resource pack, then added to the game to replace the original resources.

A mod can be defined as a digital package that a user can install to alter their *Minecraft* gameplay experience to any extent. To run a mod, or multiple mods, the user must have a third-party instance of *Minecraft* that provides the user with the ability to run them. Popular instances used for this are *Forge Mod Loader* or *Fabric Loader*. When installed, both of these instances will recognise if a mod package has been added to the game files.

For users wanting to implement multiple mods, there are more efficient ways to do this where a third-party client can be used to launch *Minecraft* with a

modpack containing all the mods the user wishes to add to their game. For example, the *CurseForge* application can be used to load modpacks and browse modpacks listed by other users—a function which saves user from having to compile their own modpacks. Third party clients are also useful for modded servers that require the user to install mods on their client in order to play on the server. A modpack shared by the server ensures that the user has all the correct mods installed without them having to source each one individually themselves, which would be problematic, especially considering that the client-side mods would need to match the versions of the ones used by the server.

A plug-in is a digital package that alters an aspect of gameplay on, or adds features to a *Minecraft* server. A *Minecraft* server is a hosted version of the game where users can connect using the server's public IP address to join the world and play alongside other players globally. The user does not have to install anything beyond the base game. This differentiates plug-ins from mods. Users are only required to have an internet connection and know the dedicated IP address of the server the wish to join. For those who have little experience with *Minecraft*, this is a more accessible option for if they want an altered gameplay experience. It, however, comes with the limitation that the user has less input about how the game is altered, as these decisions are ultimately made by the server owner.

Although these definitions may suggest that plug-ins are a subset of mods, it should be noted here that this is not the case, as the communities around plug-ins and mods differ due to what is achievable via each mode of modification as well as other factors affecting accessibility, such as client-side hardware capability; in simpler terms, if the user's computer is able to run multiple mods at once.

From a development perspective, mods and plug-ins differ based on what is achievable in using either form of game modding. Mods, as they have to be installed by the user, are client side whereby they alter or add to the game files on the user's computer. Plug-ins, on the other hand, are server-side, meaning that they only alter or add to files of the server. This difference can be described using the example of the mod, *Dawn of Time*, that adds a variety of different blocks and textures to your game (TheGoldenWorld & Poulpinou, 2019). These custom block textures cannot be added to your game via a plug-in, as the plug-in is not able to add to or alter game resources (files containing textures, audio, models, language, and texture-model behaviour), which are located on the user's computer. Due to *Minecraft's* resources being client-side, a server can only provide a resource pack to the user, which must be consensually downloaded by the user for the custom resources to show up on the server for this user.

As the focus of this thesis is on the potential for modding community involvement in professional and academic projects, the research will delve only into mods, and not the other modes of modification, such as plug-ins or resource packs. While there is likely some degree of exchange between the communities of the three modes, —especially the plug-in and modding communities—all three modes are arguably separate entities. Including the other two modes in this body of research is beyond its scope, although it should be noted here that they are equally interesting and could be the subject of similar research in the future. There is further discussion about this decision in section 2.2.

For someone unfamiliar with *Minecraft*, it may be difficult to grasp what the *Minecraft* modding community actually is. It must first be understood that this community is very decentralised. This means that there is no one common place where this community exists, rather, several. These places include more permanent platforms such as websites where mods can be found, downloaded and discussed. They also include less permanent spaces such as *Discord* servers which can be hosted by anyone for members to interact on. It is common for members of the community to come together on social platforms; predominantly *Discord*. It is observable that members often use a mixture of different platforms to connect.

There are multiple websites where mods can be sourced online and downloaded, some popular ones being, *Curse Forge*, *Modrinth*, *Minecraft Mods* (CurseForge, n.d.; Minecraft Mods, n.d.; Modrinth, n.d.). Upon these sites, mod creators are able to upload their mod for the public to download, generally with their own description, graphics, update thread, review page, and comment section. Both mod creators and mod users are free to have an account on these websites which essentially host the initial connection between creator and user, with users able to publicly ask questions about the mod or give their feedback, and creators able to directly interact with and listen to these users and provide them with updates or changes to the mod. In the mod description, the developer will sometimes provide a pathway to another platform where the mod users can join. Often, this platform is *Discord*; a forum-inspired platform designed to complement digital games by providing a space for communities to interact. An advantage of a developer hosting a *Discord* server for their mod is optimised communication among members, including more organisation than a single discussion thread on a mod website can provide, and faster response times. Such *Discord* servers may consist of different text channels where productive discussions about the mod or mods can take place. For example, in the case of

16

the *Dawn of Time* mod, the developers operate a *Discord* server in which exactly this takes place. Most notably, there are channels where any member of the *Discord* server can suggest and discuss ideas, contribute knowledge on cultures and history, report on bugs they find with the mod, and even apply for a developer, builder or moderator role.

Another platform sometimes utilised by the modding community is *YouTube* (Google, 2006). Using *YouTube* as a tool for outreach bypasses dependence on people actively searching for mods on dedicated mod websites. *YouTube* is a very popular platform used by the general *Minecraft* community that surpassed 1 trillion views in *Minecraft* content on the platform (YouTube Culture & Trends, 2021). It is therefore a beneficial place for a mod developer to share their mod, where their published content can potentially reach thousands to millions of viewers. The *Dawn of Time* mod has an official *YouTube* channel called '*Dawn of Time*' run by the developer, TheGoldenWorld. On here, there are showcases of mod features, podcasts where the developers discuss progress and content, and tutorials using the mod content. Links to other platforms where the mod exists, such as *Discord* and *CurseForge*, are also provided by the *Dawn of Time* developers in the 'About' section of their *YouTube* channel (Dawnoftime8964, n.d.).

Mod users also publish content on *YouTube* of mod gameplay, tutorials or showcases—this is not something only mod developers will do. *YouTube* channels, such as *@AsianHalfSquat* and *@Rexus2*, focus entirely on modding *Minecraft* using mods and graphics enhancement methods (AsianHalfSquat, n.d.; Rexus2, n.d.). Other channels, such as *@DanTDM* and *@SkipTheTutorial* have a broader focus on gaming but contain videos where *Minecraft* mods are showcased or played (DanTDM, n.d.; SkipTheTutorial, n.d.). Such channels are beneficial in drawing people into the *Minecraft* modding community who may have not considered the way that mods can change their gameplay. Other social media platforms may be used in similar ways to *YouTube* regarding the discoverability of mods.

In coming to understand how the community functions, it becomes apparent just how thin the line between mod developer and mod user is. This is explored further in Chapter 3, when the perspectives of mod developers are discussed.

2 Methodology

2.1 Selection and Analysis Methods

The popular sites for sourcing *Minecraft* mods, *CurseForge*, *Minecraft Mods*, and *9Minecraft*, were used to browse a large pool of historical and cultural mods, from which three mods were selected for initial consideration. They were chosen based on their extent of focus on historical or cultural aspects, and amount of downloads indicative of popularity. The popularity needed to be sufficient enough that the mod has a following or sub-community that can be referred to in the questionnaire responses. The selected mods were then loaded into the game using a Forge instance of *Minecraft*. Each mod was played so that an authentic, every-day, gameplay of the mod was experienced, as well as learn about all the components of the mod using creative mode. Creative mode lets the user access unlimited blocks, and fly, while protected from losing health points or becoming hungry. This mode is useful the user only wants to build without having to worry about surviving. It was essential to use creative game mode to accomplish this understanding, as some features of the mods take many hours to encounter during authentic survival gameplay. This was done prior to reaching out to the developers of these mods.

The mods selected for initial play were chosen together for the following reasons. Firstly, they all have some type of cultural content which is intended by the developer(s). Secondly, this study wanted to include mods that were relatively different from each other, so that a broader range of insight into developer perspectives was captured. For instance, selecting mods all representing the same culture would destabilise any conclusions drawn, as this subset would not represent the broad range of cultural mods available within the *Minecraft* modding community.

The similarity of all the mods included in this study was considered due to the need to select an appropriate subset of the mods that will represent the *Minecraft* modding community. For instance, selecting three mods that all focus on the same culture would limit the findings for foreseeable application of the modding community in academic and professional contexts, as three mods with similar focus would not be as representative as three mods that provide

18

dissimilar heritage experiences would be. For this reason, this study looks at mods that deal with a range of cultural and historic aspects in order to provide a more encompassing representation of cultural and historical mods within the *Minecraft* modding community.

The three mods initially chosen were *Millénaire*, *Dawn of Time*, and *Cultural Delights* (kinniken & MoonCutter2B, 2017; NCP_Bails, 2022; TheGoldenWorld & Poulpinou, 2019). Due to no response from the *Millénaire* developers, the *Alaska Native Craft* mod was added later to the study (Whangd00dle, 2021).

Following the evaluations of the mods themselves, a questionnaire was sent to the developers to retrieve information on their intentions behind their mods and their attitudes towards collaboration with a professional in the field of heritage.

The developers of the mods were contacted via social media platforms about their interest in answering the questionnaire, to which all but the Millénaire developers responded in agreement. For ethical reasons, the developers were given a consent form asking for permission to use their responses in this study, prior to completing the questionnaire (see Appendix A).

The five questions in the questionnaire were formulated to encourage responses from the developers that provided insight into their perspective and attitude (i) as a member of the *Minecraft* modding community (ii) towards theoretical contexts involving heritage professionals and scholars (see Appendix A).

It can be desirable to place a word limit on the answers of your respondents to encourage answers that are more concise (Jackson & Trochim, 2002). However, there were no such restrictions included in the developer questionnaire. This decision was made based on the need for detailed responses, where the questions are designed to yield information on the previous and current experiences of the mod developers as key members of the modding community. It was important that the respondents felt unlimited in what they could share, so that they were able to best describe their perspective and experiences. In addition to this, the questionnaire also provided a final field for any additional remarks the developers may have had. The intention of this was to provide a space for respondents to add anything that they consider relevant that they may not have thought fitting enough to include in their answers to the above five questions.

To ensure the responses obtained from developers were genuine, no incentive was offered for the completion of the questionnaire. This is because an incentive may impact the responses of the developers whereby they may subconsciously provide more positive answers to the questions because the

questionnaire is for a heritage study and the questionnaire asks to share their attitude to heritage professionals and scholars. The developers were not pressured in any way to complete the questionnaire—all willingly provided their responses.

The answers to the questionnaires will be discussed individually and then be compared to each other so that similarities and differences can be identified and applied to the second part of the evaluation regarding the role of the *Minecraft* modding community in the field of virtual heritage and their potential in academic and professional settings. Throughout, the developers will be referred to by their gamer names, as these are the names that they have each published their mods under. Their real names are not used.

The analysis begins in Chapter 3, where the responses of the developer are discussed. As stressed by Jackson & Trochim (2002), analysis of text responses to open-ended survey questions is a very difficult and time-consuming process due to the intricacies with interpreting data of this nature, such as the need to acknowledge subjectivity throughout the analytical process. Jackson & Trochim present a method of qualitative data analysis that entails quantification of long text responses (2002). Because the five questions are only answered by four developers, this type of method involving quantification is unnecessary for this study. This is because the responses can be interpreted in their raw state as both the number of questions and respondents are low.

For the same reason, a definitive use of coding the responses will not be used to unpack the developer perspectives. Instead, a more relaxed approach of analysis conducted using elements from Alan Bryman's Social Research Methods (2012) to aid the process. It is unnecessary to boil down the responses to their key elements, as the amount of qualitative data is small.

There are two prevalent criticisms on the coding of qualitative data: (a) that the context in which something was said gets lost through the coding process and (b) that the narrative of the text response also becomes lost (Coffey and Atkinson, 1996, as cited in Bryman, 2012). Because both context and narrative are crucial to the analysis, coding the responses at all will majorly limit the outcome of this study. The responses need to be understood for how the developers have written them, to ensure the best possible grasp on their perspectives. The purpose of this analysis is to unpack prevalent themes in the responses that can be discussed in relation to the academic field of virtual heritage. Coding the responses would likely limit the discussions in Chapter 4, where the developers' perspectives are compared with relevant research efforts in academia. Coding will therefore be avoided. This decision is made as not to restrict the ability to answer the research question.

The analysis will therefore consist of a relaxed version of thematic analysis; a method where the themes in each response are identified and laid out (Bryman, 2012). After discussing the developer responses individually, these themes will be compared across responses to produce a more grounded understanding of cultural and historical mod developers in a wider context. Here, the similarities and differences between the perspectives and experiences of the mod developers will be identified and unpacked. This part is inspired by narrative analysis as described in Bryman (2012). The goal of comparing the responses is to theorise why aspects of the developers' experiences are similar or different. Understanding their experiences in this way is essential to further analysis in Chapter 4.

In Chapter 4, the findings of the previous chapter will be considered in theoretical contexts of heritage project collaborations. This will be done in reference to the projects and research efforts described in Chapter 1. This discussion will be organised using the following aspects, under sub-chapters 4.1 and 4.2:

A. Intentions

B. Disciplinary bounds

C. Openness

For aspect A, the intentions of the mod developers, generally, as well as in regards to representing culture, will be compared to intentions in recent academic work on virtual heritage.

For aspect B, the limitations of mod creation within the space of the *Minecraft* modding community will be discussed alongside that of virtual heritage research in the academic space.

For aspect C, the openness of the developers towards potential collaboration will be discussed in the context of potential research efforts. This aspect focuses largely on the last question of the questionnaire, 'What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod?'.

In both sub-chapters, the discussion will explore different avenues of potential collaboration in reference to the studies and efforts that have involved

Minecraft described in Chapter 1.2. Conclusions will be drawn for each of the aspects with the goal of answering the research question.

Finally, a retrospective conclusion will be made in Chapter 5 that is based on the discussions of Chapters 3 and 4.

2.2 Limitations

This body of research anticipates the following limitations:

- The ability to look at more than four mods could render a wider range of results and thus a richer discussion. However, including more than four mods is not possible given the time limitations of this study. The nature of the gathered results is non-numerical and therefore the analysis of more than three mods would push this study beyond its timeframe and word limitations, which would dampen the depth of analysis. To counteract this limitation, the above will be acknowledged during the interpretations of the results as an open avenue for future study.

- Due to the non-numerical nature of questionnaire responses, some interpretations made may be subjective. This has been previously acknowledged and discussed in Section 2.2.

- An in-depth psychological analysis of developer responses is beyond the expertise employed in this study. This thesis will proceed with an awareness of this.

- Including other forms of *Minecraft* game modification, such as resource packs and server plug-ins, are beyond the scope of this thesis. However, they have the potential to be the subject of a similar study. This will be discussed further in Chapter 5.

3 The Modder's Perspective

3.1 *Dawn of Time*

Dawn of Time (*DoT*) is a mod that adds a plethora of blocks and items to *Minecraft* pertaining to several different cultures from around the world (TheGoldenWorld & Poulpinou, 2019). The current edition of this mod is targeted towards those wanting to build in creative mode. In the creative menu, the *DoT* blocks and items are organised by culture; French, Japanese, Mayan, Roman, German, Persian, and Egyptian. Beyond this, the user has a complete freedom within the game to experiment with and create whatever they desire. The intention of the content, however, is to make building historical buildings from these cultures more possible, as the blocks and items of the base game may not be suitable for doing so in some cases.

A different approach was used for the gameplay of *DoT*, due to it being a mod that is designed for users who enjoy building in *Minecraft*. This mod was played using creative mode for approximately three hours. In this time, the mod's blocks and items were viewed and two historic structures were built using the French blocks (see Figs. 1 and 2). *DoT* can be played in survival mode, however this is challenging as it does not have a dedicated wiki. In this case, users can depend on any in-game hints, the *DoT Discord* community, or relevant *YouTube* videos for help.

Figure 1

Dawn of Time creative menus

Note. Creative menus for French (left) and Japanese (right) blocks and items from the *Dawn of Time* mod (Mojang AB et al., 2023).

Figure 2

Houses using French materials from Dawn of Time

Note. Two historical houses French houses created during the mod selection process using primarily the French *Dawn of Time* blocks and items (Mojang AB et al., 2023).

The *DoT* development team was contacted via *Discord*. TheGoldenWorld was the initial point of contact, with an enthusiastic response, offering a valuable level of transparency and engagement to this study. They were very forthcoming with information and both team members, TheGoldenWorld and Poulpinou, provided elaborate answers to the questionnaire. The following discussion is in reference to the questionnaire responses of TheGoldenWorld and Poulpinou (see Appendices C & D).

TheGoldenWorld has had a long withstanding interest in ancient civilisation, including his local history in France. After discovering Millénaire and its *Discord* community, he eventually became a member of the development team and remained for two years where he helped improve the structures that the mod uses in its village generation. Both developers then parted from the Millénaire development team and founded *DoT*. TheGoldenWorld claims that *DoT* would not have existed if it were not for Millénaire. He also expresses that there is a large niche for historical and cultural *Minecraft* mods—a large factor in the motivation for creating a mod encompassing a broad range of cultures. By providing six cultures (and counting), *DoT* sits centrally within this niche. TheGoldenWorld observes little competition, as there are not many similar mods available.

However, providing this broad a range of cultures is not without challenge. While aiming to respect history, historical accuracy and in-game aesthetic are difficult to balance. They also encounter difficulty when sourcing historical information, as there is a noted lack of historians and archaeologists in their community. This plays into the difficulty of ensuring accuracy and ethical representation of cultures from historic periods. Regardless, TheGoldenWorld expresses that the community surrounding *DoT* is very supportive towards their development process.

Another limitation TheGoldenWorld encounters is difficulty in recruiting additional developers with sufficient skillsets and motivation. He states:

> '*A developer is a precious resource in the MC world but we had no idea about that when we started. We have been desperately trying to recruit new people in this field and it always have been impossible*'. (TheGoldenWorld, 2022, Appendix D)

However, TheGoldenWorld was able to attract positive attention to *DoT* via the streaming site, Twitch. They gained the opportunity to partner with Valaron, a French organisation who were able to offer them a developer for a year to help with *DoT*.

TheGoldenWorld values his longstanding partnership with Poulpinou and the mutual creativity and interests they share. He states that there have been many people come and go during their time as *DoT* developers, including negative encounters with some. However, TheGoldenWorld and Poulpinou have not let such experiences stop them.

Poulpinou initially wanted to get involved with Millénaire's development. Upon reaching out to their development team, offering to improve the village structures and textures, the same level of interest was not returned. Poulpinou decided to move forth with a new plan, where he learnt more about mod-making. He partnered with TheGoldenWorld and they founded *DoT*.

Poulpinou expresses that the community surrounding *DoT* is the main reason why he has remained motivated in the process of creating, updating and maintaining the mod:

> '*I would have stopped long ago if I was working alone, without any positive feedbacks to motivate me'.* (Poulpinou, 2022, Appendix C)

He furthermore expresses that the support he receives from his community is more motivating than any current or potential financial profit that the mod could render.

Poulpinou feels limited by the technical aspect of mod development as pixel art and 3D modelling are not his primary skills. Additionally, he finds that the resources that *Minecraft* provides for mod development are not as sufficient as they could be, especially when diagnosing problems that occur with the coding of the mod, which is a common occurrence in the mod development process.

In his experience, Poulpinou has had other positive matters arise from being a mod developer in the *Minecraft* modding community. He claims that his English language skills have improved, as the common language used by the *DoT* community is English due to the mod having an international reach. With having the community that surrounds their mod, Poulpinou has also gained a lot of historical and cultural knowledge from community members that have come forward. Alongside their own knowledge on history and culture, their community has been a valuable source of knowledge useful to the development of their mod, with many community members offering suggestions via the *DoT Discord* server (see Fig. 3).

Figure 3

A suggestion from yapludepatte on the Dawn of Time Discord server
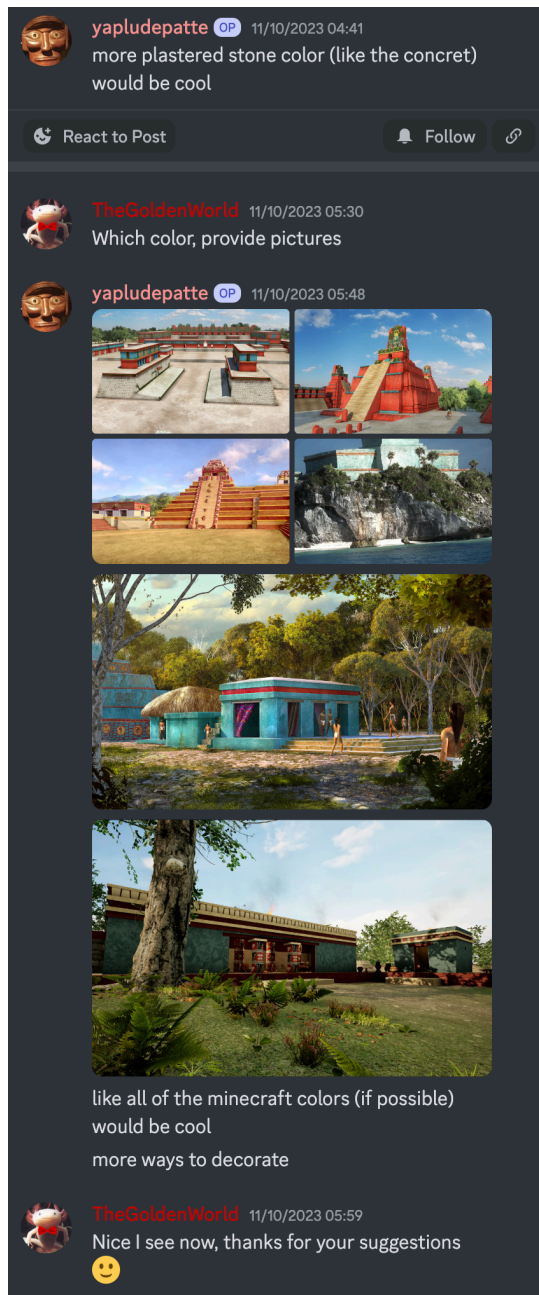
Note. A public suggestion posted by the user, yapludepatte, in the suggestions forum of the *Dawn of Time Discord* server. *DoT* developer, TheGoldenWorld, responds and requests more information on the suggestion. yapludepatte provides 3D renders of Mayan structures as clarification (yapludepatte & TheGoldenWorld, 2023).

The difficulty of recruiting other developers to assist in the development of *DoT* is a large problem that the *DoT* developers have encountered. In their experience it has been hard to get additional developers on board with their mod, as these developers would not share the same motivation and therefore would only make a short-term contribution to development. This is the main downside both developers noted during their experience in the *Minecraft* modding community. Poulpinou also expressed that there is pressure from the community created by their expectation for updates. As *Minecraft* releases new versions, mods often need to be revised to ensure their compatibility with a newer version of the base game. With publishing a *Minecraft* mod, there is an expectation here from the community that the developers release updates that keep their mod compatible with the latest *Minecraft* versions, especially for mods with strong sub-communities.

The *DoT* developers are very open to incorporating a heritage professional's advice into the content of their mod, as they both regard historical accuracy as a very important part of *DoT's* development. They help to ensure this accuracy via the use of custom models and textures, whilst still maintaining the 16 by 16 pixels block guideline of vanilla *Minecraft* textures.

It is also relevant to note the positive attitude towards compliancy that the *DoT* team had towards completing the questionnaire. It exemplifies their willingness towards the idea of accepting contribution from heritage professionals.

3.2 *Cultural Delights*

The *Cultural Delights* mod adds additional crops, ingredients, and foods from different cultures to the game (see Fig. 4) (NCP_Bails, 2022). *Cultural Delights* requires two dependencies in order to work: the *Farmer's Delights* mod and *Brewin' and Chewin'* mod. The ability to have your mod depend on a pre-existing one can enable much more efficient creation of the mod (more on this in Chapter 4.1).

Figure 4

Farmer's Delight creative menu containing Cultural Delights items

Note. Creative menu for Farmer's Delight mod containing *Cultural Delights* food items at the bottom. The empanada is highlighted here (Mojang AB et al., 2023).

Cultural Delights was played in survival mode for approximately three hours. The initial stages of gameplay mostly involved the content from the dependency mod, Farmer's Delights. *Cultural Delights* builds upon the food tree of Farmer's Delights, often requiring crops, ingredients, foods, and food technology from both its dependencies and vanilla *Minecraft* in order to obtain items of the *Cultural Delights* mod. The *Brewin' and Chewin'* dependency adds fermentation mechanics to the game, allowing the user to ferment certain ingredients to produce different types of beer. *Cultural Delights* uses this dependency so that the player is able to ferment cucumbers into pickles using the keg from the *Brewin' and Chewin'* mod.

Cultural Delights has its own advancements, that when followed, can teach the user how to discover or make the food items. This is particularly helpful to anyone not familiar with the dependency mod, Farmer's Delights, which includes the mechanics that *Cultural Delights* relies upon.

After this initial gameplay, creative mode was used to access the full extent of blocks and items added to the game by both Millénaire and *Cultural Delights*, to learn more about the features of the mods, had they not already

been encountered during survival gameplay. Certain ingredients can only be obtained in certain *Minecraft* biomes, meaning that it could take hours of exploring to obtain them all. The food items from *Cultural Delights* appear in the Farmer's Delight and *Brewin' and Chewing'* creative menus, instead of having their own separate menu (see Fig. 5).

Figure 5

Cultural Delights mod content

Note. Crops, ingredients, and food items (left) and an avocado tree from the *Cultural Delights* mod (Mojang AB & NCP_Bails, 2023).

The developer of *Cultural Delights*, NCP Bails, was contacted via the CurseForge website and was willing to provide answers to the questionnaire (see Appendix B). His response is discussed below.

Upon identifying that vanilla *Minecraft* fails to represent cultural variation in food and drink items available in-game, NCP Bails felt motivated to add cultural food items via modding. This thought process was very simple which demonstrates how basic components of culture, such as food, can be overlooked. His motivation to maintain and update the mod is found through playing the mod himself, as well as through *Cultural Delights* users playing it. NCP Bails is an active developer for other mods, notably, Alex's Delight and Alex's

Abnormalities. He has expressed that these mod projects and personal commitments limit him from being able to work on *Cultural Delights* freely.

NCP Bails has found the *Cultural Delights* community to be a majorly positive influence on the mod development process. Members are very willing to put forth their ideas for food that could be added to *Cultural Delights* (see Fig. 6).

Figure 6

Comment by constantine415 on the Cultural Delights mod
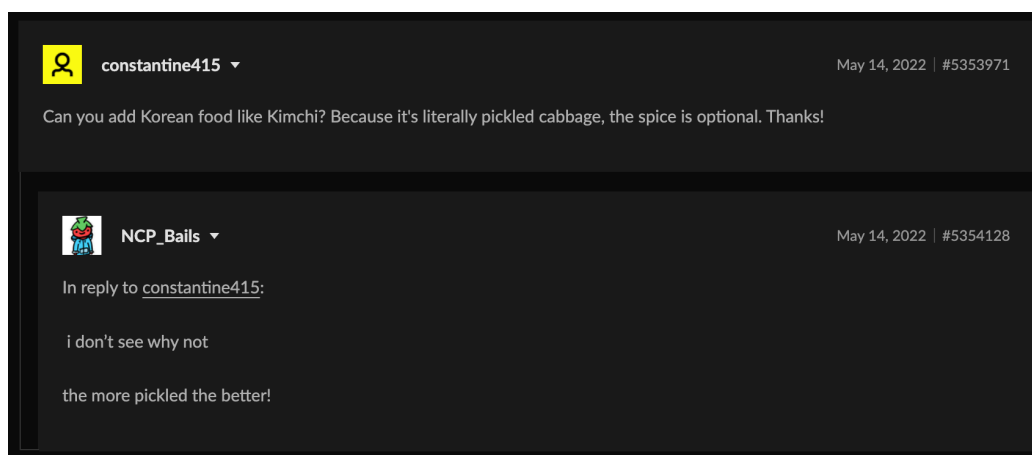
Note. A public comment by the user, constantine415, posted on the *Cultural Delights* CurseForge page. An exemplar of a suggestion and a response from NCP Bails (constantine415 & NCP_Bails, 2022).

NCP Bails finds such suggestions valuable because they help him to ensure that *Cultural Delights* is fulfilling his goal of representing foods of different cultures. This differs to TheGoldenWorld, who finds it difficult to source historical information—more on this in Sub-chapter 3.5.

NCP Bails has not experienced any downsides to having the community that surrounds his mod. In fact, his development team emerged from his community. NCP Bails is also open-minded towards incorporating a heritage professional's advice into their mod development process, provided such involvement promotes a 'fun and engaging experience' (NCP Bails, 2022, Appendix B).

3.3 *Millénaire*

Millénaire is one of the most popular historical and cultural mods, evident from its number of downloads on CurseForge (kinniken & MoonCutter2B, 2017). It replaces the base game's village component, adding new villages to the game that pertain to one of the seven following cultures: Japanese, Byzantine, Inuit, Seljuk, Maya, Indian and Norman. Alongside themes of politics and diplomacy, urban and social expansion, the user experiences these different cultures through interactions with a village and its members.

The mod does not have any dependencies, meaning that no additional mods need to be installed in order to run *Millénaire*. This makes installing *Millénaire* very straightforward, as there is no concern needed for which versions of dependencies to download. *Millénaire* for *Minecraft* 1.12.2 was installed.

Millénaire was played in survival mode for over eight hours, so that all of the different villages could be experienced to some extent. Due to time constraints, not all village types could be fully played through to their final development stages, however, the concept of expansion is consistent across village types. After this initial exploration using flight to shorten the process of finding villages of each culture, further time was spent at a Japanese village and a Byzantine village to build a reputation and help the villages grow to unlock new structures, blocks and items pertaining to their cultures (see Figs. 7 & 8). These culture-specific blocks and items can be obtained via trading to earn the currency, Deniers, which is used to purchase these otherwise unobtainable blocks and items. Each culture also has one or two skills that can be learned at the cost of Deniers. For example, the user can pay a Japanese village to teach you the skill of growing sakura trees, which gives the user the ability to plant sakura saplings.

The villages were traded with and assisted by terraforming land that was unsuitable for their building requirements, such as bodies of water. The expansion of the village is influenced heavily by the blocks and items that you trade or donate to them. After learning the nature of this, creative mode was used to satisfy village building and expansion projects more quickly, to fast-forward to the later stages of user-village interaction.

Figure 7

Millénaire Byzantine village partially developed

Note. A Byzantine village partially developed during survival game play of the *Millénaire* mod. Creative mode used to take screenshot from above (Mojang AB & kinniken, 2023).

Figure 8

Millénaire in-game list of Japanese village types

Note. An in-game list of the six Japanese village types. Each village type has a different focus (Mojang AB & kinniken, 2023).

Multiple *Millénaire* developers were contacted. However, in contrast with *Dawn of Time* and *Cultural Delights*, the developers did not have much interest in contributing their perspectives to this study. Two of the contacted *Millénaire* developers did respond, although neither followed through on providing their response to the developer questionnaire.

This disinterest could be attributed to them simply having no interest in participating in this study, or to a broader lack of motivation. *Millénaire* is a comparatively old mod, that has been around since 2012. The mod has had a turnaround of developers over this time. TheGoldenWorld used to be a developer for *Millénaire*—an exemplar of this. The ownership of the mod has also changed. The original founder sold *Millénaire* to a new owner and is no longer involved in its development. As an ex-member of the *Millénaire* development team, Poulpinou speculates:

> '*I think it's because the mod is not their "own" creation, they don't feel the same responsibility that I feel. I especially remember my experience with the previous developer of Millenaire. He was not motivated anymore, but was guilty about it. He was always saying that he was working on the project, but in reality didn't do anything during more than a year. That's the reason I left Millenaire*'.
> (Poulpinou, 2022, Appendix C)

It is plausible that the development team has lost that original spark of motivation, that the founder may have had in the earlier days of *Millénaire's* development. In other words, the current *Millénaire* owner and developers do not share the same drive to progress the mod as the founder initially had. The change in ownership perhaps helped for a period of time, but the team appear to have fallen into a similar rut. As of November 2023, the latest version of *Millénaire* was published in July 2022. However, recent motion in the *Millénaire Discord* server suggests they plan to release an update soon.

As the most popular and longstanding cultural and historical *Minecraft* mod, it is unfortunate to not include any *Millénaire* developer perspectives in this study. To counter the loss of this perspective, I decided to seek out a fourth mod —*Alaska Native Craft*—to include in the study. I will not discuss *Millénaire* further, as it would be unjust to base an analysis off further assumptions without input from the *Millénaire* developer team.

3.4 *Alaska Native Craft*

Alaska Native Craft (*ANC*) adds animals, items, and blocks to *Minecraft* pertaining to the North American geographical region and Alaskan culture (see Fig. 9) (Whangd00dle, 2021).

Figure 9

Alaska Native Craft creative menu
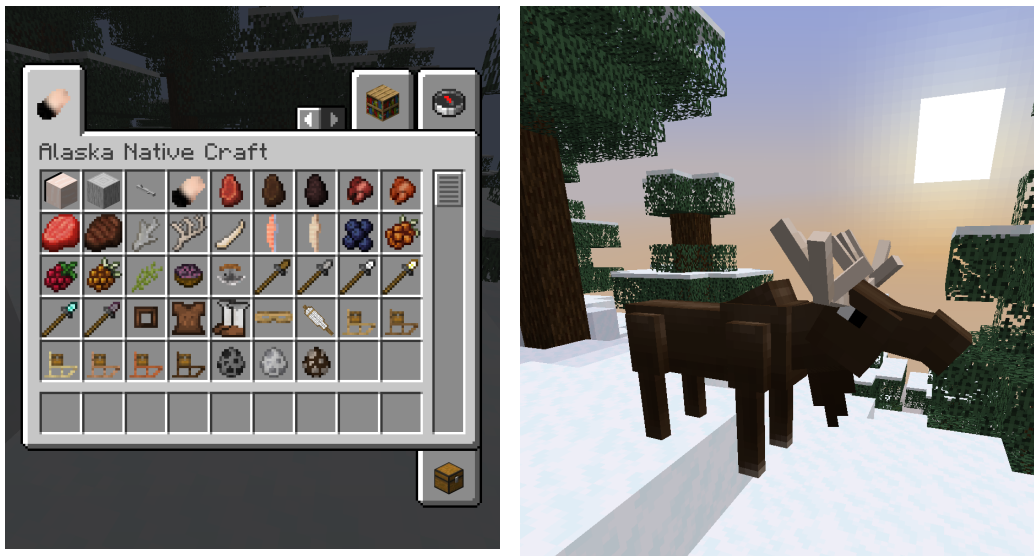
Note. On the left: the creative menu for *Alaska Native Craft* displayed all blocks and items included in the mod. On the right: a moose calf in a snowy biome. Screenshots from author's gameplay (Mojang AB & whangd00dle, 2023).

It is dependent on three mods listed on ANC's CurseForge page–*Cloth Config API*, *Fabric API*, and *Mod Menu*–that require installation before the *ANC* mod can run. *ANC* and its dependencies were installed and played in both survival and creative modes. Much like the *Cultural Delights* mod, *ANC* requires you to be in certain biomes to encounter the full range of the mod's features. For example, seals only spawn in rivers and oceans, and the berries—salmonberries, cloudberries, raspberries, and blueberries—can only be found in taiga and snow biomes.

Similarly to *DoT*, *Alaska Native Craft* currently does not have a wiki set up. Therefore, users must rely on crafting recipes provided in-game and the material in the description and updates tabs of the mod's CurseForge download page. Additionally, there are *YouTube* videos available that provide direct information on the mod's features. Two videos were watched (Bennthic, 2021; Mister Echo, 2021). Seeing features of the mod being used by someone else in these videos was found to be a very efficient way to learn how *ANC* works.

After familiarising with the mod's content, *ANC* was played in survival mode on Fabric version 1.18.2. Firstly, a snowy biome was located. As all the mod's contents are found in cold or snowy biomes, it was important to base the gameplay in a relevant biome. Salmonberries and cloudberries were found, and a moose was encountered.

Not only does the mod bring Alaskan culture into *Minecraft*, but certain features are very practical for game play in general. For example, the snowshoes allow the player to walk over powdered snow blocks without falling through and risking your character freezing. The dogsled is also very practical (see Fig. 10). With a dog attached, it allows the player to travel across snow at higher speeds. The dog sled also has a chest, so it also able to hold blocks or items which is ideal when exploring the world.

Figure 10

ANC dog sled and wooden harpoon

Note. Using a dog sled without a dog during survival game play of the *Alaska Native Craft* mod. Wooden harpoon in hand, and salmonberries and raw seal meat in inventory (Mojang AB & whangd00dle, 2023).

Creative mode was then used to see all the *ANC* items in-game. Some objects were not encountered during game play—such as the driftwood, whale blocks, and better harpoons—due to time restrictions.

With no official *Discord* server to host the *Alaska Native Craft* user base, the developer, Whangd00dle, was contacted directly through the CurseForge website. He gave a positive response to initial contact, willing to switch to *Discord* so that communication could be more efficient. He expressed a rich interest towards the research–like that of the *DoT* team–and completed the developer questionnaire, providing a valuable amount of detail in his answers (see Appendix E).

Whangd00dle's initial motivation came from his idea to make a mod that has different to any pre-existing mod in the *Minecraft* modding space. He has close ties to Alaskan culture and realised that his understanding of Alaskan culture would make for a unique mod idea. Whangd00dle recognised the multiple benefits of creating a mod that brought Alaskan culture in *Minecraft*: he would improve his skillset in modding whilst bringing awareness to aspects of Alaskan culture.

When asked about the sources of his motivation surrounding the publishing and updating of *ANC*, Whangd00dle stated that he finds motivation in the responses of users and the general growth his mod, as well as from his own drive to improve his modding skills. However, he also encounters limitations in this process. As *ANC* is largely a solo project, Whangd00dle finds that time is a major constraint to the development of his mod. Additionally, despite having prior understanding of Alaskan culture, he has found that there are limitations to his own knowledge. This has led him to learn more about Alaskan sub-cultures to enable him to better represent Alaskan culture in *ANC*.

Whangd00dle recognises the engagement of users as a positive aspect of mod development. Some users have put forth their own contributions of code and translations for *ANC* on GitHub. For example, a user of *ANC*, Sunconure11, provided help in porting *ANC* to *Minecraft* version 1.18.2 and integrating it with *Quilt Mod Loader*—a client, effectively the same as *Forge Mod Loader*, that allows users to add mods into their game. This user also contributed to other tasks in mod development. This helped alleviate time constraints and revamp Whangd00dle's motivation, which subsequently led to him working on a new update for *ANC*. Other users leave comments on the mod's CurseForge page containing positive feedback and/or suggestions (Figs. 11-14). Users who are of Alaskan heritage, such as elijerr0 and bruisebruise (see Figs. 11 & 12), are also present in *ANC's* CurseForge comment section. The comments from elijerr0 and

bruisebruise show that *ANC* has provided a positive experience for users that are Alaskan themselves, or identify with an Alaskan heritage.

Figure 11

Comment by elijerr0 on the Alaska Native Craft mod
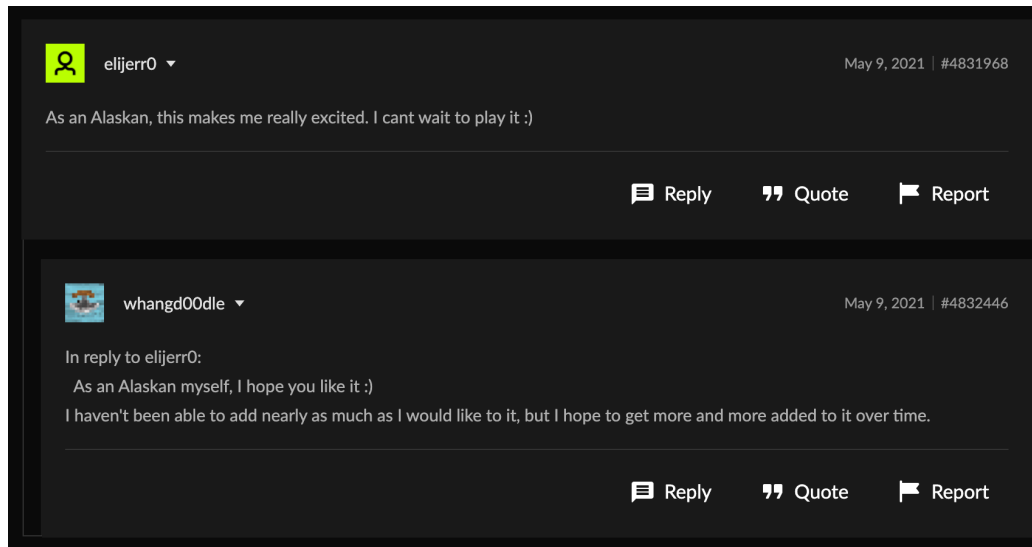
Note. A public comment by the user, elijerr0, posted on the *Alaska Native Craft* CurseForge page that expresses excitement towards the potential of *ANC* providing them a personal heritage experience. *ANC* developer, Whangd00dle has left a reply in which he points out his own heritage is also Alaskan (elijerr0 & wangd00dle, 2021).

Figure 12

Comment by bruisebruise on the Alaska Native Craft mod

Note. A public comment by the user, bruisebruise, posted on the *Alaska Native Craft* CurseForge page that offers a suggestion for mod development (bruisebruise, 2021).

In Whand00dle's experience, the cons associated with mod development include the pressure to provide updates to mod users, as well as the pressure of

responsibility to represent Alaskan culture in accurately. He recognises the potential harm that inaccurate or poor quality of cultural representation could cause, such as on impressionable youth in the *Minecraft* modding community. Therefore, Whangd00dle actively avoids playing into harmful stereotypes of Alaskan culture. For example, the lumping of Alaskan sub-cultures together is detrimental to the accurate representation of these sub-cultures, where the representation of unique attributes of sub-cultures may become dampened. Whangd00dle also is aware of the challenge of balancing cultural appreciation and cultural appropriation, as well as the how his intention may present in the impact on *ANC's* users:

> '*I would very much like to avoid participation in the creation of a new pan-Alaska-Native construct. Balancing cultural appreciation and cultural appropriation is a difficult subject, and intent and impact are often far-removed from each other'.* (Whangd00dle, 2023, Appendix E)

Whangd00dle expressed openness towards any source of help for the development of *ANC*, in the same way he has shown openness towards content suggestions from users (see Fig. 15). In his response to Question 5 regarding openness towards incorporating a heritage professional's advice, he raises the point that a primary source of cultural knowledge, such as knowledge he has received from other Alaskan Native people, is a more valuable source than secondary sources, such as academic research papers authored by someone who has interest in Alaskan culture but is not of Alaskan heritage themselves. He states:

> '*It's a mod informed by the unique cultures of Alaska Native peoples, not by academia'.* (Whangd00dle, 2023, Appendix E)

He recognises that the involvement of heritage professionals would likely not bring much value to his development process, as Alaskan Native people are present in the *ANC* community who offer this cultural insight. This will be further discussed in Chapter 4.

In follow up questions, Whangd00dle stated that there used to be a section in his friend's *Discord* server that was dedicated to the *ANC* community, but this has since been deemed as inactive, and channels were archived. Despite the absence of a *Discord* server dedicated to *ANC*, users of the mod utilise the comment section on the mod's CurseForge page, as well as the

comment sections on *YouTube* videos featuring the mod, to communicate about *ANC's* features and development. Figures 13 and 14 show feedback and suggestions left by users on the *ANC* CurseForge page.
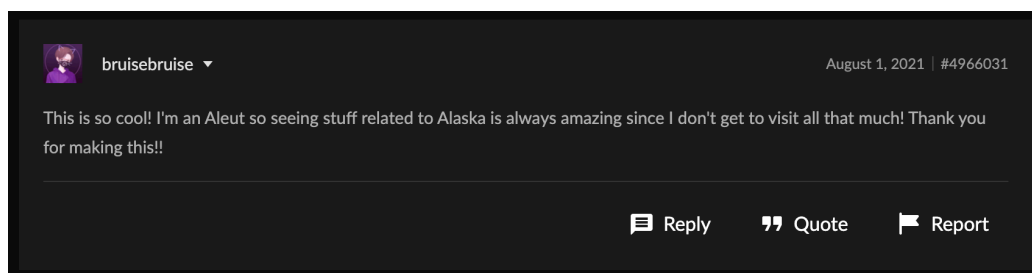
Figure 13

Comment by chiiri_h on the Alaska Native Craft mod
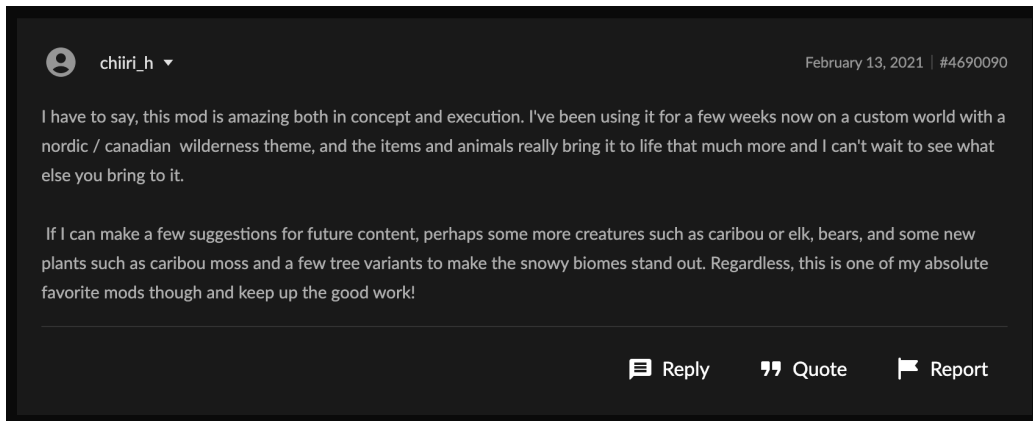
Note. A public comment by the user, chiiri_h, posted on the *Alaska Native Craft* CurseForge page that provides positive feedback and suggestions for mod development. (chiiri_h, 2021).

Figure 14

Comment by AbsorbingSafe11 on the Alaska Native Craft mod
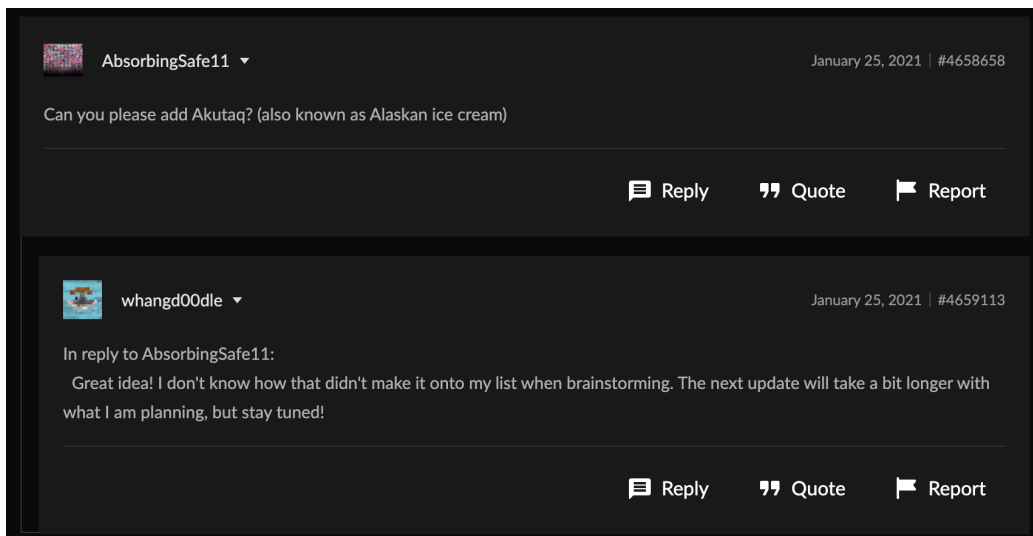
Note. A public comment by the user, AbsorbingSafe11, posted on the *Alaska Native Craft* CurseForge page that offers a suggestion for mod development. *ANC* developer, Whangd00dle has left a reply in which he welcomes the suggestion (AbsorbingSafe11 & wangd00dle, 2021).

There is a lot of engagement in the ANC mod's comment section, some by Whangd00dle himself. This shows that he cares very much about representing Native Alaskan Cultures fairly and accurately.

3.5 Further Discussion and Comparison

Simply laying out the responses of the developers in sub-chapters 3.1-3.4, has called for many interesting details to surface. The developers all have a lot in common. In comparing their experiences, common themes can be identified. The common themes can help to understand developers of cultural and historical mods in their context, the *Minecraft* modding community, more generally. On the other end, identifying and attempting to explain the differences in the developers' experiences allows understanding of the variation among historic and cultural mod developers. Below, four similarities and two differences are discussed.

Discernibly, these developers all have a strong and genuine interest in the culture or history that their mod represents. In the case of *DoT*, both TheGoldenWorld and Poulpinou have similar interests, in the same way that research colleagues might.

The developers also share a similar concern for cultural and historical representation, whereby they tend to be cautious and acknowledge that *Minecraft* has limitations that need to be factored in when deciding how to best represent pieces of culture and history. This means that these developers hold themself to high ethical standards, much like those of heritage professionals.

All the developers place a lot of value in the community that surrounds their mod. Community engagement plays a large role in fuelling their motivation. The developers are very responsive to their communities. They welcome and reply to user feedback and suggestions. The relationship that a developer has with their community could be viewed as a mutually beneficial one whereby users and developers work together to create a mod that fulfils the wishes of both parties.

All the developers face similar limitations in their mod development process. Time constraints and other commitments limit the developers from maintaining their mods to the level they would like. Other commitments may

take priority as mod development is time consuming and does not generate revenue.

The main differences in experiences across the developers concerns the access to historical and cultural information needed to create a well-informed mod that represents heritage respectfully and accurately.

DoT represents several different cultures from past time periods. TheGoldenWorld and Poulpinou therefore encounter the responsibility of representing historic instances of these cultures, which requires a lot of knowledge in order to do so accurately. The historical aspect of the content adds another barrier to obtaining essential knowledge.

On the other hand, NCP Bails does not encounter this issue at all. The users of *Cultural Delights* are very forthcoming with suggestions for new ingredient and food items. This may be because knowledge on contemporary food items is by no means scarce. This can be contrasted with historical architectural information required by the *DoT* developers, which is not something that everyone has detailed knowledge on.

Whangd00dle's experience is different again, and falls into a middle ground, whereby he relies on a combination of his own heritage as well as out-sourced knowledge. Because *ANC* covers only Alaskan cultures, the mod attracts users of Alaskan heritage.

It appears that multiple factors could be at play here, such as the time period that the content relates to, the prevalence of the content today, the demographic that the mod attracts. For instance, the historical content of *DoT* leans on knowledge that is less prevalent today, whereas the cultural content of *Cultural Delights* relies on more contemporary knowledge, and even common knowledge for some of the mod's ingredient and food items. There appears to be a correlation between mod content and developer experiences in this regard.

Another difference that stands out is that *DoT* received an opportunity to partner with an organisation, while the other developers do not mention receiving any similar opportunities. Why is this the case?

Popularity of the mod is a potential factor. Popularity equates to exposure and it could be this exposure that contributed to *DoT* receiving the opportunity to partner with *Valaron*. TheGoldenWorld's activity on *Twitch* may have caused additional exposure for *DoT*. It is possible that the other developers have not taken as many steps as the *DoT* developers towards reaching a wider audience with their mod. In this case, they would be less likely to receive similar

opportunities due to a smaller outreach on mainstream media platforms where organisations like *Valaron* are present.

It should also be acknowledged here that a developer not mentioning such opportunities in their response does not directly imply that they have not had or been offered such. While it would likely be a memorable encounter for a developer, them including it in their questionnaire response would depend on their consideration of a company or organisation as falling within their community that surrounds their mod, due to the wording of Question 4 (Appendix A).

This comparison produces some curious revelations, such as the mutually-beneficial nature of relationship between a developer and their community, and the awareness developers have towards a responsibility of representing culture and history fairly. The points made in this section will be carried through to Chapter 4.

4 Exploring Collaboration

4.1 Intentions

What may already be apparent is the similarity between the way that *Minecraft* mod developers approach their mods and the way that heritage professionals approach their research or projects. For Romeincraft, and The CRANE Project, reaching outreach and engagement were important goals.

Developers are also very interested in user feedback. They are responsive to it, and welcome it as a positive influence on their mod development process. Certain research projects are also concerned with listening to feedback as part of their research method, such as The Bryn Celli Ddu *Minecraft* Project (Edwards et al., 2021). However, the extent to which these developers interact with their user-bases could be inspiring to heritage professionals. Listening to the suggestions of participants, in the way that developers do with their users, might be beneficial to heritage research and projects, especially in the case of maintaining engagement of younger generations with history—an issue pointed out by Langis-Barsetti (2021, p. 64). This way, engagement of participants is improved as they become involved in the research or project design itself.

In conducting research or projects, heritage professionals uphold an ethical standard as best practice. Mod developers also possess this trait. Both *DoT* developers and Whangd00dle have expressed that they are concerned with cultural and historical representation. Their engagement with user feedback can also be seen as part of maintaining their ethical standard. As active members in their own communities, they are likely to see any feedback from users that are possibly dissatisfied with the representation within the mods. Because developers hold themselves to a similar ethical standard as heritage professionals, collaboration would be smooth in this regard, as both parties already understand how to treat cultural and historical information. However, realistically, not all developers may hold themself to the exact same standard. Although, a developers digital footprint is likely indicative of their ethical standard, as observed for the developers included in this study. A heritage professional would likely be able to gauge this prior to reaching out to a mod developer.

It is clear to see how well the intentions of mod developers and heritage professionals align in the carrying out of their work. There are, however, some potential misunderstandings that may need addressing prior to collaboration.

The potential differences in interest areas are important to consider. Mod developers will feel more motivated to develop a mod that falls within their interests or expertise, while, similarly, heritage professionals are going to research topics that falls within their interests or specialisation. It is therefore important for either party to consider alignment of interests in order to maximise the benefits of collaboration (more on these benefits in Section 4.3). The same is true for mod developers that work together, such as TheGoldenWorld and Poulpinou, who have similar interests in history, culture, and also in the way they go about mod development.

Avoiding this potential difference should be done in the same way as one would go about initiating a collaboration within their respective field—collaborate with those who have similar interests and whose skillsets can be brought together to produce a more fruitful outcome.

The level of seriousness may also present as a difference between professional or academic initiatives and Minecraft mods. An independent, every-day user of a mod is not using the mod within a serious framework. They are free to play the game with the mod however they like. It could be said that because of this, research and projects by heritage professionals are certainly more serious approaches to providing heritage experiences. However, I argue that it is not this simple, and not always the case. VALUE created a casual and fun environment for Romeincraft, where the focus was more about participants enjoying the experience than any serious intention. It could also be said that mods are serious when mod developers take their development process seriously, as exhibited in the responses of TheGoldenWorld, Pol, and Whangd00dle, who take the representation of history and culture as well as their user feedback seriously. It seems that in both cases, creation is taken seriously while the environment is made fun. The issue is therefore more to do with *when* it is appropriate for a project to be more fun or more serious. I believe this potential difference is not so important because the level of seriousness seems to vary similarly for research, projects, and mods. It would ultimately come down to the satisfaction of both parties on the matter—if it is a concern—in the case of a collaboration.

In the scenario that a mod developer would create a mod for a research initiative to use, mod developers may be worried about their control over their work. The mod developer may want to make their mod publicly available, but maybe feel like entering into collaboration could limit their option of doing so.

Due to outreach often being a common goal between both parties, this would likely not present as an issue. Past academic efforts demonstrate the willingness of heritage professionals to make their *Minecraft* files publicly available. The *Minecraft* world containing the Bryn Celli Ddu reconstruction is available for public download from the *Cadw* website (Cadw, 2020). The same is true for Romeincraft—visitors to the Romeincraft website can access the downloadable files for the Minecraft worlds in which the Roman Limes in Dutch and Belgian provinces were reconstructed by the participants (VALUE Foundation, n.d.a). This is something that should be clarified prior to collaboration, should a mod developer be concerned about the rights to their work.

4.2 Disciplinary Bounds and Openness

Collaboration would naturally bring the *Minecraft* modding community into the academic space, as well as bring heritage professionals into the *Minecraft* modding space. As in any interdisciplinary study, this widens the potential scope for research, whereby it is made easier for heritage professionals to move beyond limitations within Minecraft. Simultaneously, mod developers are able to move beyond their own limitations: time constraints due to other commitments, and concerns for cultural representation.

Mod developers present the ability to add content to *Minecraft* that can represent a culture far superior than is possible with *Minecraft's* vanilla features. Heritage professionals bring knowledge on the ethicalities of representing cultures, research experience, and possible specialisation in certain cultures or historic periods. Idealistically, a mod developer and a heritage professional could meet in the middle. A mod developer can aid a heritage professional in fulfilling research efforts by broadening the scope for what can be represented in *Minecraft*. The possibilities of cultural and historical representation become limitless. A similar benefit can be seen from the other side: a heritage professional can aid a mod developer in finding the cultural or historical information needed to best represent a given culture or historic period in their mod.

In the circumstance where a heritage professional is limited by their unfamiliarity toward programming, for instance, where the game does not provide specific materials that pertain to the historical period of interest, the

wanted heritage experience cannot be created as well as it could if these materials were in the game. The involvement of a mod developer may help to overcome this limitation, as they possess the skillset to add custom materials to the game. This could push research and projects further regarding what they can achieve, thus positively contributing to the virtual heritage sphere.

The degree of openness that both parties have towards working in collaboration is essential. Learning the attitudes that mod developers have towards heritage professionals, and academia more generally, is key to understanding what is realistic for collaboration. In his response, Poulpinou expressed openness and enthusiasm towards incorporating the advice of a heritage professional into his work:

> '*Having professional advice would improve…[my] work, save me some research time, avoid some mistakes, and allow me to learn a lot of interesting things!*' (Poulpinou, 2022, Appendix C)

TheGoldenWorld holds a similar opinion, stating that he sees the benefit in incorporating knowledge from a heritage professional. In their case, a collaboration could offer them a valuable benefit. NCP Bails also expresses that he is open to the idea of incorporating a heritage professional's advice, however, he raises that the point that the mod should be kept fun. As discussed in the previous section, it appears to be a misconception that work by heritage professionals needs to be entirely serious. Therefore, the same point can be made here. The level of seriousness that either party believes appropriate should be communicated.

It is also relevant to consider the experience, beyond the responses, of contacting the developers. This is, in itself, an example of developer openness. All developers that participated were approachable and willing to provide their perspective. The developers contacted via *Discord* showed a genuine interest in the study and were all willing to volunteer additional information if it was needed. Their attitudes are reflective of their responses to Question 5 regarding incorporation of a heritage professional's advice into their mods.

There are, however circumstances in which a developer may feel less open to collaboration. Wangd00dle raises the point in his response to Question 5 that it is more fitting to incorporate the knowledge of actual Alaskan native people, rather than academics or professionals who do not identify with Alaskan heritage. This point is very valid, as a primary knowledge source provides

authenticity that a secondary source, such as the academic research that would be used by a professional to inform, cannot. Whangd00dle states:

> '*It's a mod informed by the unique cultures of Alaska Native peoples, not by academia*'. (Whangd00dle, Appendix E)

Where a heritage professional may advise on how to respectfully represent a certain culture in a *Minecraft* mod, who would understand how to go about this better than someone who directly identifies with that culture? In circumstances where this is true, a collaboration with a heritage professional may not offer the developer much benefit. Furthermore, it should not be assumed that all cultural and historic mod developers would want to collaborate, or even take advice onboard, despite other included developers expressing enthusiastic openness. Their level of openness is situational and should be acknowledged as such moving forth.

4.3 Potential Benefits and Downsides

Collaboration will impose benefits as well as downsides. These are unpacked below in the context of theoretical situations. The awareness of how potential collaboration may play out is important in further understanding the *Minecraft* modding community.

The most simple elements of what makes up culture may go overlooked. While much thought is paid to its cultural complexity, the very fundamental, basic elements, such as food, could theoretically be missed. The *Cultural Delights* mod exemplifies the opposite of this. The straightforward concept of introducing new ingredients and food items pertaining to several cultures into the game has been seen as a success among the modding community, with over 6 million downloads on CurseForge alone (CurseForge, 2023). The mod brings attention back to the fundamentality of food in culture by showing how this is a simple, yet cherished cultural component. The point being made here, is that involving mod developers could introduce heritage professionals to new perspectives, and thus further contribution could be made to the field of virtual heritage.

Connection with heritage professionals could impose a new layer of networking with the *Minecraft* modding community. Recruiting developers that share a similar motivation is difficult, as experienced by the *DoT* developers. Collaboration between academia and the modding community could also expose mod developers to further collaboration opportunities, whether academic or more broadly.

The *DoT* developers also found their access to accurate historical and cultural knowledge is limiting their ability in representing cultures justly. Mod developers likely do not have access to scientific journals that would hold a lot of information on historical and cultural subject matters, as they are often behind a paywall. Heritage professionals are familiar with researching within the academic sphere. A collaboration with heritage professionals would allow this kind of knowledge to be incorporated much more easily into the development of *Minecraft* mods for use in collaborative research or projects.

Involving pre-existing mods or mod developers in research and projects could help to better represent history and culture within *Minecraft*. Using the Bryn Celli Ddu *Minecraft* project as an example (Edwards et al., 2021), theoretically integrating modding community collaboration helps to illustrate the potential of collaboration. For instance, instead of using *Minecraft* Education Edition, the researchers decide to utilise a mod that adds cultural and/or historical elements to the game, such as objects and materials traditionally Celtic. This theoretical situation gives two clear benefits. Firstly, using the opportunities provided by this mod, the researchers are able to replicate the burial site more accurately by representing key details with modded content. Secondly, involvement of the mod's developer provides a connection to the user-base of their mod.

The pre-existing audience and social platforms that a mod may have could be very valuable to virtual heritage research. Conducting research or a project virtually with *Minecraft* modding communities has its advantage. Mod users will already possess the knowledge of how to install mods, so, as participants, the need for organising devices or pre-installing mods or assisting in their install is bypassed. However, especially in the case where a heritage professional is interested in a specific *Minecraft* mod community, the developer(s) should be asked for permission and involved where needed. Developer involvement here could also be advantageous as a developer is likely already familiar with their own community and so a coordinated effort could elevate the methods and output of said effort.

This could be taken a step further by not actively involving individuals from the modding community—research could take place passively. The fact that users

willingly provide feedback on cultural and historical mods unprompted shows that there is a rich source of first-hand opinions on value within virtual heritage. Therefore, if it is suitable to the research, there is no need to spend resources on finding a target group to sit down and spend time playing the mod, as the target group is already there, has played the mod, and perhaps interacted publicly with the mod's community. For researchers wanting this nature of data, this is certainly something worth looking further into. It should, however, be noted that such research should take measures to ensure that *Minecraft* modding communities do not feel exploited, or treated unethically in any way. Collaboration with the developer in these situations may offer a way around this.

While many advantages lay on the horizon, any damage could be discouraging to mod developers and make them feel less open to collaboration. *Minecraft* modding communities—and other gaming communities—should not be exploited. Majewski expresses that there is an ethical concern in mod developers voluntarily working alongside heritage professionals without fair benefit (2017, p. 197). The questionnaire responses do suggest that user engagement is a heavy factor in developer motivation, with less attribution to financial benefit. This raises the question; would worthwhile user engagement constitute a benefit equal to that of the researcher? Ultimately, this is something that should be determined by the developer. It should be noted that what constitutes equal benefit will vary across collaboration efforts, due to the substance of the research or project, and the differing of beliefs among developers. A collaboration could be viewed positively here, as the involvement of a heritage professional with a mod developer could foster a more stable environment in which user engagement could be determined. This means that developers would know what to expect from collaboration regarding user engagement. For example, The Bryn Celli Ddu *Minecraft* Experience had a predetermined sample of users who were going to be observed exploring the virtual reconstruction (Edwards et al., 2021). In this format, there is certainty in who is going to be observed exploring the virtual reconstruction. The number of people and the demographic is known prior to the user engagement actually occurring, as well as the ability to observe responses to the virtual experience also being promised. This level of certainty in user engagement is higher than in the case of distributing a mod from the context of the modding community, where there is no control over how many people use it, who uses it, and what circumstances of feedback will be received. What should be realised here is that collaboration has the potential to provide different, or unique, opportunities for user engagement that a developer might not observe without collaboration. That being said, it is dependent on whether the developer would be interested in

exploring user engagement this way, and whether the interests of the developer and heritage professional align regarding who will be included in the sample. Jeffrey states:

> '*Much of the work of virtual heritage can be done with communities as well as for communities'.* (Jeffrey, 2021, p. 2)

To avoid exploiting mod developers or their wider community, this idea should be kept in mind. Research and projects should in some way give back to these communities in exchange for their time and involvement.

Unfunded research and projects that want to involve mod developers might not be as constrained as one may assume. With aligned interests and foreseeable user engagement to support their motivation, mod developers would likely be open to collaboration without financial benefit. The mod developers included in this study do not have financial motivation. Their motivation, as previously discussed in Chapter 3, is fuelled by user engagement and their own passions for culture and history. Regardless, this issue on ethics is very important and further research on the goals of mod developers would help to ensure a better understanding of what equal benefit and an ethical collaboration should look like.

5 Conclusion

5.1 Summary of Findings

This study was able to explore the potential for mutually beneficial collaboration in depth, based on the perspectives of the participating developers. There are certainly many circumstances under which *Minecraft* mod developers and heritage professionals can influence each other positively.

In research and projects involving outreach and seeking engagement from willing participants there is great opportunity for collaboration. This research structure best mimics a developer creating a mod as normal for the public, where there are foreseeable benefits for the developer, such as observing different circumstances of user engagement, and deeper immersion in their passions for history and/or culture. Many benefits are also foreseeable for heritage professionals, such as exposure to new perspectives, potential to include specialised game content in research and projects, and new opportunities to collect data,

Based on the questionnaire responses, the mod developers and heritage professionals share many similarities. They both are passionate about culture and/or history, and they abide by ethical standards concerning the respectful representation of culture or history. These similarities should not always be assumed, but they can be determined prior to entering into collaboration.

Mod developers and heritage professionals also can potentially meet in the middle with their skillsets to make valuable contributions to the field of virtual heritage.

There are also things to be mindful of moving forward. Heritage professionals should ensure they have a confident understanding of the Minecraft modding community, especially the communities surrounding the developers that they could potentially collaborate with. As the general community is decentralised, heritage professionals should become familiar with the platforms on which they exist, such as *Discord* and websites where *Minecraft* mods can be browsed and downloaded. *Discord* is especially important if the developer is hosting a community space there.

Heritage professionals should also ensure that the involvement of mod developers in their work is ethical. While this study identified some commonalities between developers, such as motivating factors and openness, it should not be assumed that all developers are the same. It is therefore important for heritage professionals to communicate with the mod developer(s) they wish to collaborate with and ask about what parts of the mod development process they find motivating and rewarding. Collaboration should be mutually beneficial, and to achieve that, heritage professionals need to understand what a developer expects and wishes to get out of the process.

It also makes best sense for heritage professionals to collaborate with mod developers who have similar interests in culture or history. This would ensure that a collaboration is more applicable.

I feel that this thesis has satisfied the research question to a sufficient extent, as it was able to present this valuable insight into the perspectives of cultural and historical mod developers upon which multiple aspects of potential collaboration were explored. From this, foreseeable benefits from collaboration were able to be theorised.

5.2 Future Direction

While this thesis was able to offer insight into potential collaboration, it is not without its limitations. The limitations encountered could inspire future research on potential collaboration between mod developers and heritage professionals.

As mentioned in Chapters 1 and 2, a similar research purpose could be used to explore the potential of collaboration between heritage professionals and Minecraft server owners, plug-in developers, and resource pack creators. Like this study has attempted, research into these other communities could assist creators and heritage professionals into mutually beneficial relationships. Future research efforts could also be made on other gaming communities, beyond *Minecraft*.

There are other angles to approach research that seeks to understand the *Minecraft* modding community. Rather than looking at *what* values, the angle of *who* values could be explored. For instance, further research could look at the demographics of user-bases of historical and cultural mods. It is important that the *Minecraft* modding community is researched further so that a better

understanding of it is present in academia. A deeper understanding would provide a strong foundation upon which valuable collaborations can occur.

Abstract

Minecraft has proven to be a valuable tool in the field of virtual heritage (Edwards et al., 2021; Langis-Barsetti, 2021; Politopoulos et al., 2019). This thesis explores potential collaboration efforts between academia and the modding community by first attempting to understand the perspectives of *Minecraft* mod developers. This study is guided by the research question: in what ways can the *Minecraft* modding community and heritage professionals influence each other?

Four willing developers of historical and cultural *Minecraft* mods provided their perspective via questionnaire. Their responses are analysed with guidance from the established qualitative analysis methods: thematic analysis and narrative analysis (Bryman, 2012). Potential collaboration is then theorised based on the intentions, disciplinary bounds, and openness of both mod developers and heritage professionals.

It is found that *Minecraft* mod developers and heritage professionals share many similar traits. Analysis of the developer perspectives also helped to reveal multiple ways in which collaboration efforts would be mutually beneficial. These findings are important, as this knowledge not only helps to introduce academia to the developer's side of the *Minecraft* modding community, but can also be used by academics and mod developers to bring about future collaboration efforts that enhance both the modding community and the virtual heritage field.

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Figures

Figure 1: Mojang AB, TheGoldenWorld, Poulpinou. (2023). *Dawn of Time creative menus* [Screenshots]. From Minecraft with Dawn of Time mod.

Figure 2: Mojang AB, TheGoldenWorld, Poulpinou. (2023). *Houses using French materials from Dawn of Time* [Screenshots]. From Minecraft with Dawn of Time mod.

Figure 3: yapludepatte, TheGoldenWorld. (2023). yapludepatte's suggestion and TheGoldenWorld's response on the Dawn of Time Discord Server [Screenshot]. From the Dawn of Time Discord sever.

Figure 4: Mojang AB, NCP_Bails, vectorwing. (2023). *Farmer's Delight creative menu containing Cultural Delights items* [Screenshots]. From Minecraft with Cultural Delights and Farmer's Delight mods.

Figure 5: Mojang AB, NCP_Bails. (2023). *Cultural Delights mod content* [Screenshots]. From Minecraft with Cultural Delights mod.

Figure 6: constantine415, NCP_Bails. (2022). *Comments #5353971 and #5354128* [Screenshot]. https://www.curseforge.com/minecraft/mc-mods/cultural-delights/comments

Figure 7: Mojang AB, kinniken. (2023). *Millénaire Byzantine village partially developed* [Screenshots]. From Minecraft with Millénaire mod.

Figure 8: Mojang AB, kinniken. (2023). *Millénaire in-game list of Japanese village types* [Screenshots]. From Minecraft with Millénaire mod.

Figure 9: Mojang AB, whangd00dle. (2023). *Alaska Native Craft creative menu* [Screenshots]. From Minecraft with Alaska Native Craft mod.

Figure 10: Mojang AB, whangd00dle. (2023). *ANC dog sled and wooden harpoon* [Screenshots]. From Minecraft with Alaska Native Craft mod.

Figure 11: elijerr0, wangd00dle. (2021). *Comments #4831968 and #4832446* [Screenshot]. https://legacy.curseforge.com/minecraft/mc-mods/alaska-native-craft

Figure 12: bruisebruise. (2021). *Comment #4966031* [Screenshot]. https://legacy.curseforge.com/minecraft/mc-mods/alaska-native-craft

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Figure 14: AbsorbingSafe11, wangd00dle. (2021). *Comments #4658658 and #4659113* [Screenshot]. https://legacy.curseforge.com/minecraft/mc-mods/alaska-native-craft

Appendices

Appendix A. Consent form and questionnaire sent to each participating mod developer.

Consent Form for Questionnaire Response Usage

I would like to have your consent to incorporate (via quote or paraphrase) and discuss your responses to the Minecraft Mod Developer Questionnaire in my MA Thesis. This may also consist of the mention of your preferred name (name, gamertag, kept anonymous, or other preferred form). Please note that if you wish to be kept anonymous, the name of the mod you are a developer of will still be used.

Any personal information you may provide (i.e. contact information, gender, and/or age) will be kept private and will not be published. It will only be stored for research purposes for up to 3 years.

If you wish to gain access to your questionnaire response or revoke your consent at any time, please contact Laura Wolf via the following e-mail address: l.j.wolf@umail.leidenuniv.nl

If you would like to know more about your rights with regards to your personal data under the European Union's General Data Protection Regulation, please visit gdprinfo.eu

If you understand and consent to the above, please answer "yes" to the first question that regards consent in the questionnaire. Thank you for taking the time to provide me with your valued response.

Questionnaire

i. Discord username (or other username for identification):

ii. I give my consent in regards to the Consent Form for Questionnaire Response Usage. *(Checkbox answer format)*

1. What sparked the initial idea to include history and/or culture in your mod?

2. What motivated you/your team to publish the mod and release updates? Furthermore, is there anything that limited or limits you in this process?

3. What pros and cons have you found in your experience with having the community that surrounds your mod?

4. Are there any memorable encounters with people in your mod's community that come to mind, and if so, what are they?

5. What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod? (If this is something that you have already done, please share some of this experience.)

6. Additional Comments.

Appendix B. Questionnaire Response from NCP Bails, developer of the *Cultural Delights* mod.

#	Field/Question	Response
i	Discord username (or other username for identification)	NCP Bails
ii	Consent Provided	Yes
1	What sparked the initial idea to include history and/or culture in your mod?	I felt that food items from other cultures did not have the proper representation in the vanilla game, or in any major well made mod.
2	What motivated you/your team to publish the mod and release updates? Furthermore, is there anything that limited or limits you in this process?	Seeing the items ingame while playing or seeing others play with the mod installed grew motivation in my team and I to keep adding and updating features to the mod. The only things that limit me from releasing updates are real life commitments and other mod projects.
3	What pros and cons have you found in your experience with having the community that surrounds your mod?	A major pro of the community surrounding my mod is the cultural representation that has been recommended. People from all over the world have recommended features that represent their cultures, and as my team implements these, I feel that more people will connect with this mod. I cannot think of any cons.
4	Are there any memorable encounters with people in your mod's community that come to mind, and if so, what are they?	Each member of my modding team are people who saw the mod and felt inspired to help create it, and I think that those encounters were the most meaningful.
5	What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod? (If this is something that you have already done, please share some of this experience.)	I would definitely incorporate a professional's advice into my mods, as long as it makes for a fun and engaging experience.
6	Additional Comments.	[Null]

Appendix C. Questionnaire Response from Poulpinou, developer of the *Dawn of Time* mod.

#	Field/Question	Response
i	Discord username (or other username for identification)	Plpn#5646
ii	Consent Provided	Yes

1	What sparked the initial idea to include history and/or culture in your mod?	It's not really a spark but more a process in my case. I'm quite curious and like many different things : video games, programming and art/creation processes. I especially like architecture and when I started playing Minecraft more than 10 years ago, I almost immediately added a mod called Millenaire that brings the notion of culture in the game. But the building were really ugly and I wanted to improve their style. So I started to build more complex buildings. But the block were ugly and I wanted more freedom, so I started making textures and model for a ressource pack. People seemed to like my work, so I decided to share it. A few month later, I had no response from Millenaire's team and felt that nothing was evolving. So I took the decision to make my own mod to be free to do what I want : I learned how to program and made a mod for Minecraft in which I put all my creations.
2	What motivated you/your team to publish the mod and release updates? Furthermore, is there anything that limited or limits you in this process?	At first, it was curiosity and the positive feedbacks I received when I was showing my work. Now, many years after, I can easily say that the most motivating thing is the community. I would have stopped long ago if I was working alone, without any positive feedbacks to motivate me. The thing that limits me the most is that I'm basically doing all the mod on my own, and it's a lot of work. I'm mostly limited by time and by my own competences. I'm not a programmer (or at least was not) and I'm still lacking some theoritical knowledge. It's quite frequent that I'm stuck on a development problem because the documentation on Minecraft's code is lacking and I'm not good enough to understand the problem quickly on my own.
3	What pros and cons have you found in your experience with having the community that surrounds your mod?	The most important thing is that I learned many many things thanks to this mod : I greatly improved my pixel-art style, my skills in modeling, I learned how to program in java on my own (which allowed me to enter a very good school in my studies) and I learned many things about the different cultures and their architecture (for example how is built a pagoda). It even gave me a few € but to be honest it's more a bonus that a real goal in my case. I also made many encounters, nothing that changed my "real" life but I can say that I gained some valuable "life" lessons and knowledge from this encounters. Finally, I also improved my English skills.

The cons are I thing the "psychological" pression. It's difficult to move on because many people are counting on me to add some new content or port it to newer version of Minecraft. When I don't have the time to work on the mod for more than a month, I feel bad about it... |
| 4 | Are there any memorable encounters with people in your mod's community that come to mind, and if so, what are they? | Yes, making a mod is something that brings a lot of encounters. Many disappointing one, but a few are very interesting. Disappointing first, because many people that appear really motivated disappear after a few week, once they understand the amount of work needed. Many programmers wanted to join our project, but after doing a few lines, they started to be less active and left. I think it's because the mod is not their "own" creation, they don't feel the same responsibility that I feel. I especially remember my experience with the previous developper of Millenaire. He was not motivated anymore, but was guilty about it. He was always saying that he was working on the project, but in reality didn't do anything during more than a year. That's the reason I left Millenaire !

In the positive side, I encountered some very nice people. For example TheGoldenWorld that joined my project from the start and we are still friend and know each of us very much. I would also talked to a few people really knowledgeable on different cultures that wanted to correct some mistakes in the mod. I also encountered a few influencers that I didn't think I would meet ! |
| 5 | What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod? (If this is something that you have already done, please share some of this experience.) | I have nether done this before (only some knowledgeable fans gave us advice but they were not professional). But to be honest, I would be really really motivated ! I like to make some quality content and if I keep some freedom in my modeling/texturing process for aesthetic reasons, I try to stay as close to the reality as I can. Having professional advice would improve make work, save me some research time, avoid some mistakes, and allow me to learn a lot of interesting things ! |

#	Field/Question	Response
6	Additional Comments.	I hope it will help you :) You can contact me on discord if you want to discuss a bit more about it !

#	Field/Question	Response
i	Discord username (or other username for identification)	TheGoldenWorld#9905
ii	Consent Provided	Yes
1	What sparked the initial idea to include history and/or culture in your mod?	I always loved ancient civilisation as a kid, I have been admirative to the Mayan architecture, Japanese Edo period style or even all the sumptuous castle in my living country France. When I discovered the Millenaire mod just after I started to play Minecraft when I was young, I felt in love. It was everything I could have ever wondered but 10 times better ! When I grown up, I decided to learn more about Millenaire. I discovered a website full of life, with a wiki, forum, community content, addons and more. This day, I reached a discord linked in the forum, it was the beginning of a long story. After spending a lot of time in the discord, I started to become a part of the development team, working on the architecture part of the mod. I where recreating each building to make those looks better. After two years in the dev team, I decided to left it with my friend Poulpinou that I had encounter during this time period. We had left the project due to some disagreements with the development team. We decided together to create our own mod, based on our own building style and vision. It's been now 5 years that this fantastic journey in continuing ! We are only at the beginning of our project and such amazing stuff are going to come soon. We are looking forward like never.
2	What motivated you/your team to publish the mod and release updates? Furthermore, is there anything that limited or limits you in this process?	My main point is that : how many mods about historical cultures are existing in Minecraft ? Poulou and me feel that we have found the sweet spot, there is nearly an infinite space for us with nobody to copy our style or picking out our ideas. We are kinda alone in this field because we are adding nearly 7 civilisations with armors, mobs, furniture, items, and crops where most of the mod focus on adding 1 civilisation and mostly architecture blocks and items. Since we are respectful from our source material which is history it's sometimes really complicated to choose at which point we want to be accurate. Most of the time we need to make a choice between history or fanciness. Also the lack of historian / archaeologist people in our community can make the process of finding new blocks really complicated, like for our precolumbian culture.
3	What pros and cons have you found in your experience with having the community that surrounds your mod?	Cons : RECRUITING DEVELOPER. This have been nearly an infinite hell to try to find external development help on this mod. A developer is a precious ressource in the MC world but we had no idea about that when we started. We have been desperately trying to recruit new people in this field and it always have been impossible. It's only recently that we found help a few month ago, thanks to all the new visibility earned from my twitch activity for the mod. We recently succeeded to sign a partnership with the french organization Valaron which provide us the addition help of one developer for 1 year ! Such an amazing reward after all this time trying to find help. Pros : Infinite amount of love from our community

66

4	Are there any memorable encounters with people in your mod's community that come to mind, and if so, what are they?	Poulpinou for sure, long friendship of nearly 7 years. We never have been in conflict. A friendship based on an unstoppable creativity. We succeeded to create Dawn of Time by ourself, between a lot of betrayal and deception by multiple people that came and left our story, it only remains creativity. Even with off period (like the pandemic during 2 years), we always have succeeded to stand again :)
5	What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod? (If this is something that you have already done, please share some of this experience.)	YES YES YES YES ! We are definitely looking to incorporate more knowledge into our mod and make our work based on existing cultures. We already asked some help regarding the Mayan culture and the Egyptian one, but we are still looking for more help, this is a need to make progress in DoT.
6	Additional Comments.	I wanted to thank you for putting the light on small creators like us. The community is a huge part of this project and we are trying at maximum to give a place to each one. I wish you good luck for your projects !!

Appendix E. Questionnaire Response from Whangd00dle, developer of the *Alaska Native Craft* mod.

#	Field/Question	Response
i	Discord username (or other username for identification)	Whangd00dle#8008
ii	Consent Provided	Yes
1	What sparked the initial idea to include history and/or culture in your mod?	Originally, the idea was sparked simply to have a unique, standout mod. I also wanted it to contain new content that touched many aspects of Minecraft, like new blocks, items, entities, world generation, etc. The Minecraft modding scene is so saturated, I was having a really tough time coming up with a unique idea. Then, I realized I have the experience of being closely tied with many Alaska Native peoples and learned a lot about their cultures. I also know that Alaska Native peoples have little to no representation outside of Alaska, and especially in media. This was a 4 birds with one stone situation.
2	What motivated you/your team to publish the mod and release updates? Furthermore, is there anything that limited or limits you in this process?	The primary motivators are both user enjoyment and personal fulfilment. I really love reading comments on the CurseForge page of the mod, of Alaska Native people or people who used to live in Alaska commenting on how aspects of the mod let them partially relive memories of the land, and feel seen and represented. I also find it really fun and fulfilling to keep working on this mod and watch it grow and evolve a my personally skills develop. The primary limitations have been both time and knowledge based. As of submitting this form (April, 2023), I am an undergraduate student. This is an almost entirely solo project, and I have not had much time to dedicate to keep improving the mod. As for the knowledge limitation, I hadn't realized just how limited my knowledge of the various Alaska Native cultures was until I started trying to translate culturally significant things into features and mechanics. I knew whalers used harpoons. I didn't know that harpoon heads would detach from the shaft, and also be attached to buoys by rope to add drag to the whale so that it would tire itself out.

| 3 | What pros and cons have you found in your experience with having the community that surrounds your mod? | There have been lots of great pros with the community around the mod. Many comments express how the mod has provided positive experiences to users. Some users have even opened pull requests on the mod's GitHub page and contributed translations and code.

However, there have been a few cons ass well. There's the pressure to keep providing content and updates, a well as the worry of how the mod may influence users. Minecraft players are an incredibly diverse community, and within that community are a lot of impressionable youth. The last thing I want to do is introduce harmful stereotypes to these users. |
|---|---|---|
| 4 | Are there any memorable encounters with people in your mod's community that come to mind, and if so, what are they? | A user, Sunconure11, opened a port of the mod to Minecraft 1.18.2, as well as porting to the Quilt mod loader. They took care of a lot of menial tasks that were stopping me from wanting to work on the mod, and it definitely jumpstarted my work into the next update of the mod. |
| 5 | What are your feelings towards incorporating a professional's advice into the historic and/or cultural aspects of your mod? (If this is something that you have already done, please share some of this experience.) | I absolutely love incorporating advice into the mod. While I haven't incorporated professional advice, I have often advised with Alaska Native students about cultural aspects, and gotten input from them to shape mod features. I used to have cloudberries and salmonberries be separate plants, as academically distinguished. However, culturally, they are both known as just salmonberries. Whether its the small bushes in the tundra, or the large bushes in the forests. I feel this make the mod more appealing and fits with the philosophy of the name more. It's a mod informed by the unique cultures of Alaska Native peoples, not by academia. |
| 6 | Additional Comments. | Evolving the mod has always posed a pretty tough balancing act. On one hand, 'gamifying' cultural aspects to make them integrate into the Minecraft environment often requires generalizations, which tends to be bad when dealing with multiple unique cultures. Things like the pan-Indian construct, a general stereotype that mashes aspects of many native American cultures into one have been long considered harmful and offensive in nature, and I would very much like to avoid participation in the creation of a new pan-Alaska-Native construct. Balancing cultural appreciation and cultural appropriation is a difficult subject, and intent and impact are often far-removed from each other. |