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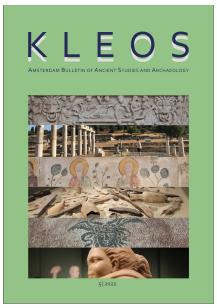

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Recreating an excavation in *Minecraft Education Edition*

Anna Silberg Poulsen

Abstract

Minecraft has been used for reconstructing archaeological sites for outreach purposes several times. *Minecraft* alongside other games has been used in the classroom for educational purposes in primary and secondary schools, as well as in high schools.[1] This paper discusses the application of *Minecraft* as an educational outreach tool within the field of archaeology, and how it can be enhanced by adding a narrative.

This paper presents a *Minecraft Education Edition* map, where a player experiences a virtual field school and learns about archaeological fieldwork practices. The purpose of the map can be twofold: either to test pre-existing knowledge of fieldwork techniques, or as a general outreach tool used in schools or museums.

The excavation carried out in the virtual field school is based on a small portion of the Neolithic levels of the multi-period site of Çatalhöyük, Turkey. The project includes a small fictional story to provide instructions and introduce players to the setting of the *Minecraft* excavation. It is found by interacting with the first NPC (Non-Player Characters) the player encounters. Due to the design of *Minecraft*'s 1 m^3 blocks it is impossible to include the vast number of finds found at an excavation; this might change with future updates, as the developers Mojang Studios have announced that archaeology will be coming to *Minecraft*.[2]

While it has not been possible to test the map on students due to the COVID-19 pandemic, the project was streamed by the *VALUE foundation* with Colleen Morgan and Anna S. Poulsen as guests at the *#ArGaCon2020*.[3] The project indicates that *Minecraft Education Edition* is well suited for communicating archaeological fieldwork by using a popular game for school or undergraduate

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▶ *Profile page*

1 Sáez- López et al. 2015; Boom et al. 2018.

2 The game studio which developed the game and continues to update it; Mojang Studios 2020.

3 VALUE Foundation 2020.

students.

Introduction

Using video games to communicate archaeology might not be the most immediate thought for most, but in recent years scholars and cultural institutions have become more aware of the benefits of using video games to illustrate history.[4] Archaeologists have begun to explore video games as material culture, the virtual worlds they contain and their physical copies. This type of research is also known as archaeo-gaming.[5] Although video games are virtual worlds created primarily to be entertaining, most contain educational elements, in the form of moral questions, concepts of levelling up skills or managing cities and empires.[6] Using games to discover different experiences and immersing oneself in the story, is a good way to learn, and can supplement the more traditional ways of teaching. It does so by allowing the player to experience and interact with the material in a more kinaesthetic way compared to the traditional teaching methods.[7]

A game which has been used to communicate archaeology to a wide audience is *Minecraft*.[8] This article explores a project made in *Minecraft Education Edition*, with the aim of visualising the archaeological excavation process and creating a digital environment to teach archaeological methods within the constraints of the game.[9] Most of the archaeological *Minecraft* maps are mainly focused on creating reconstructions of historical monuments or on exploring a world with recreated monuments within it, the presented map focuses on the act of excavating and interpreting the remains.[10] The project is partially based on the late Pre-Pottery Neolithic levels (6940–6400 cal BCE) of the 4040 north area of the eastern mound, of the multi-period site of Çatalhöyük, Turkey (see figure 1 for a map of the site).[11]

The aim of this paper is not to provide a comprehensive guide on how to adapt archaeological material to Minecraft or detail the benefits of using games in education in general, as there are

4 Politopoulos et al. 2019, 164.

5 Reinhard 2018, 2.

6 Politopoulos et al. 2019, 164.

7 Sáez- López et al. 2015.

8 See Edwards et al. 2021; Langiso-Barestti 2021; McGraw et al. 2017; Politopoulus et al. 2019; Morgan 2015.

9 *The Education Edition* of *Minecraft* is a version of the game created with education in mind, see ▶ https://education.minecraft.net/en-us/discover/what-is-minecraft. Contact the author for access to the Minecraft map.

10 Politopoulus et al. 2019, 167; Langis-Barestti 2021, 63–64; McGraw et al. 2017; Morgan 2015; Graham 2014, 2015; Edwards et al. 2021; and for lesson material created by the *Minecraft* education edition community see the available lessons under History and Culture.

11 See Der/Issavi 2017,192, table 1 for dating of the occupational levels across the site.

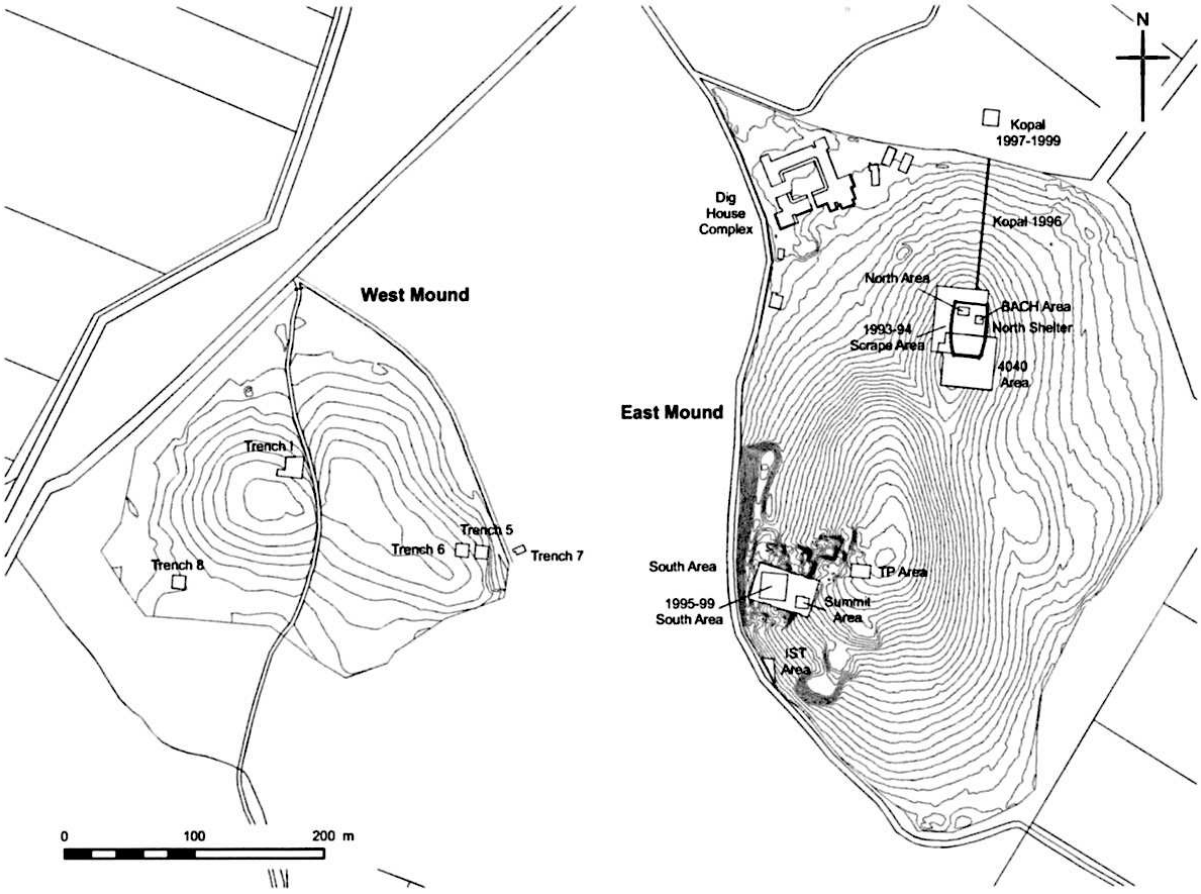

Figure 1
Plan of Çatalhöyük showing the two mounds and the excavation areas (created by Camilla Mazzucato, the Çatalhöyük Research Project).

several articles available on both topics.[12] Rather, this paper focuses on the application of *Minecraft* as an educational outreach tool within the field of archaeology, and how it can be enhanced by adding a narrative. Firstly, an outline will be provided of the game *Minecraft* and its usage in archaeological research. Secondly, the Virtual field school map created in *Minecraft Education Edition* will be presented. Thirdly, the methods and theoretical approaches applied in the creation of the map and its virtual world, and how the map can be used for teaching will be discussed. Finally, the results will be contextualised in a discussion section related to a wider debate of interactive pasts and education and videogames.

MINECRAFT AND ARCHAEOLOGY

Minecraft is a popular open world sandbox game, where the player can roam freely in its virtual world. *Minecraft* is one of the most widely-played games in the world.[13] Players are free to dig holes and explore the underground and build structures wherever they

12 For what concerns studies adapting archaeological material to *Minecraft*, see Graham 2014 and Edwards et al. 2021. A small selection on the use of games for educational purposes include: Boom et al. 2018; McKinney et al. 2020; Politopoulos et al. 2019.

13 Langis-Barsetti 2021, 64.

please.[14] The game does not have an obvious storyline or quests to complete, it invites the player to create their own meaning and their own goals.[15] The game world consists of 1x1m blocks of different kinds, creating a simple pixelated look. The player needs to dig to gain materials like stone, iron, and copper. Because digging is central in the game, it is ideal for exploring the principles of stratigraphy, an important component of understanding any archaeological excavation.[16]

Several archaeologists have developed *Minecraft* projects with the aim of using the popular game to invite different audiences to become more aware of cultural heritage, in a different way than the traditional methods such as presentations and publications.[17] In 2015 a Scottish team of archaeologists, together with the edutainment company *Immersive Minds*, made several *Minecraft*-based projects under the title *Crafting the Past* for the Scottish heritage festival *Dig It!* 2015.[18] The makers incorporated several Scottish sites and had players interact with their reconstructions and excavations.[19] All the maps contain stories, and the player is usually guided by NPCs (Non-Player Character), although elements are left for the player to explore on their own. The adaptation of St Kilda is a good example of their work, since it includes narratives of local voices and features an excavation.[20] The download page of the different worlds has an introduction to the region and an explanation of what the player can expect. The maps also include introductions to intangible heritage of the regions, available in the form of audio files.[21]

Crafting the Past inspired a new project in 2019, *RoMeincraft* by the *VALUE foundation*, which focused on reconstructing Roman sites along the Limes in the province of South-Holland in the Netherlands at a 1:1 scale.[22] The aim was to create more awareness of the Roman past amongst local communities.[23] The project did

14 McGraw et al. 2017, 168.

15 Politopoulos et al. 2019, 167.

16 Harris 1979.

17 Politopoulus et al. 2019, 167; Langis-Barestti 2021, 63–64; McGraw et al. 2017; Morgan 2015; Graham 2014; Graham 2015, and lesson material created by the *Minecraft* education edition community see the available lessons under History and Culture.

18 Edutainment is the combination of entertainment and education, *Immersive Minds* primarily use *Minecraft* as a platform for their edutainment projects. McGraw et al. 2017, 167.

19 McGraw et al. 2017, 173–174, the Minecraft maps are available for download at their website, ▶https://www.craftingthepast.co.uk/.

20 Dig it/Immersive Minds 2022, St Kilda.

21 Crafting the Past 2021.

22 *VALUE Foundation* is a Dutch non-profit organisation founded in 2017, expanding on the pre-existing VALUE (Videogames and Archaeology at Leiden University) project, ▶https://value-foundation.org/; Politopoulos et al. 2019, 167–168.

23 Politopoulos et al. 2019, 167.

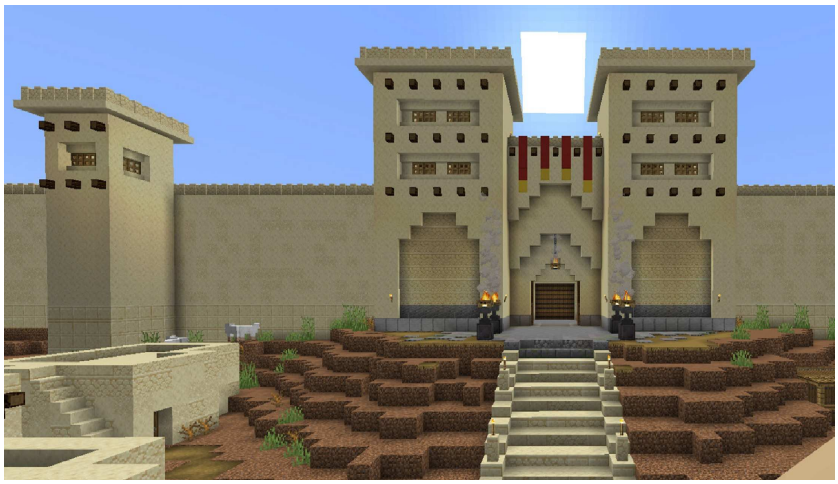

Figure 2
Reconstructed gate from Kunulua (Tell Tayinat), created by Dominique Langis-Barsetti, CRANES project (after Langis-Barsetti, 2021, figure 5, edited by the author).

not include a narrative to entice the player to reconstruct buildings, but the participants had plans and reconstruction drawings to help them reconstruct the Roman forts.[24] The player was free to interpret the plans and instructions, which, for example, led to the creation of a rollercoaster inside a Roman fort.[25]

One of the most recent examples of the use of *Minecraft* for archaeological reconstruction is *CRANE*'s recreation of the Neo-Hittite city Kunulua, (figure 2) an adventure map which will be available for players to download, when the project is finished, so that they can learn more about the Iron Age culture.[26] *Minecraft* was chosen for this project due to its popularity, with the expectation that using a popular platform will encourage people to discover more about the Neo-Hittites.[27] Once the map is finished it will include mini-quests, which the player can take in order to learn more in an engaging manner, such as learning Luwian hieroglyphs by helping a scribe NPC sort the royal archives.[28]

Another recent example is the *Bryn Celli Ddu Minecraft experience*, which was developed by the team behind the Bryn Celli Ddu Public Archaeology Landscape Project during lockdown in 2020.[29] The aim of the project was to develop a digital version of the project which could be a digital world in which to show the site as well as be a place for school children to meet and learn about heritage within the lockdown restrictions present at the time. The

24 Politopoulos et al. 2019, 167.

25 Politopoulos et al. 2019, 167–168, 172.

26 *CRANE* (the Computational Research on the Ancient Near East), directed by Tim Harrison, University of Toronto. According to the latest updates on the project, the elaboration of the map is still in progress, but once there are news, they will be posted to the *CRANE* website. For additional information, see Langis-Barsetti 2021, 62.

27 Langis-Barsetti 2021, 65.

28 Langis-Barsetti 2021, 69.

29 Edwards et al. 2021, 2, 7.

landscape around the site was recreated based on methods described by Shawn Graham, which involves transforming a DEM into a 3rd party program *Worldpainter* and use it to create custom maps for *Minecraft*.[30] The process made it possible to transfer the world created in Worldpainter into *Minecraft Education Edition*, and thereby implementing the real world environment of the valley of Afon Braint, Wales, where Bryn Celli Ddu is located, into Minecraft.[31] The addition of the original landscape, rather than an autogenerated one meant that the players could get a sense of wandering through the landscape and "discovering" the site.[32] The creators also included additional elements, like signs and a Neolithic house, to explain what life had been like during the Neolithic and make the map easier to use for teaching purposes.[33]

The projects described above all showcase why *Minecraft* can be used as an effective outreach tool to bring archaeological research to new audiences. However, they all seem to involve modifying the base game to include elements such as NPCs and custom blocks, not to mention using 3rd party programs to add custom maps to the game to recreate real world landscapes. Some of these steps, except creating a custom map, can be avoided by using the *Education Edition*, as shown by the Bryn Celli Ddu map, since that version of *Minecraft* was created with education in mind and has functions specifically for adding NPCs and note-taking. These features make it possible to write instructions or lesson plans and document the process.[34] The *Education Edition* comes with its own set of problems as it is based on the Bedrock version of *Minecraft*, which makes it more difficult to modify. Moreover, an education licence is needed to play the game.[35]

It is not just archaeologists and other heritage specialists who have realised *Minecraft*'s potential as a place to communicate archaeology and cultural heritage. On October 3rd 2020, the *Minecraft* team presented a first look of the *Minecraft* update *Caves & Cliffs (1.17)*.[36] The development team presented the new update which included adding an archaeology system to the game in the form of a new tool, the brush, and archaeological excavation areas where the player can use the new tool to find relics of the past and rare materials.[37] The inclusion of the archaeology system in the game has since been pushed back, and it is currently unknown

30 Graham 2014.

31 For more information about the progress see Edwards et al. 2021, 8–9, 13.

32 Edwards et al. 2021, 12.

33 Edwards et al. 2021, 11.

34 Kyle 2020; Minecraft Wiki 2020; Edwards et al. 2021, 1.

35 Minecraft Wiki 2020; Sáez-López et al. 2015; Edwards et al. 2021, 13.

36 Mojang studios 2020.

37 Mojang Studios 2020.

when this will be implemented.[38] The implementation of archaeology directly in the game without the use of user created modifications is an exciting prospect, especially considering how Minecraft already has been used to communicate cultural heritage to a wider audience.[39]

Creating a virtual field school in Minecraft Education Edition

The *Minecraft Education Edition* map presented in this paper was created with a target group of schoolchildren, from ages 5 and up. However, the age group who would benefit the most are 12+ since they would be able to dive into the more theoretical aspects of the map. Moreover, the map can also be used to explain archaeological theories and the excavation process to archaeology students, and other interested parties.

The *Minecraft Education Edition* was used to construct an excavation area, which is based on a part of the Çatalhöyük excavations (figure 3). Çatalhöyük is an archaeological site located in the Konya plain in central Anatolia, close to the modern town of Çumra in Turkey. The site is spread over two mounds: the Neolithic East mound and the Chalcolithic West mound on the west side of the Çarşamba River.[40] The site was discovered by James Mellaart in 1958. The first excavation season ran from 1961 to 1965, and excavations are still ongoing.[41] The site was chosen for this project because of the large amount of available data, as the site is very well published, and most of the archaeological data is freely available on the website's research portal and through publications.[42] Furthermore, the Çatalhöyük Research Project has used 3D recording techniques to record the excavation process.[43] The project has also allowed for non-traditional research projects like Colleen Morgan's *Second Life* project, and Ruth Tringham's *Dead women do tell tales*, which both explore engagement and interpretations, to mention two examples of several projects.[44] These non-traditional projects also show the importance of daring to think outside the box and encourage archaeologists to approach their material in different ways, whether it is to make a digital reconstruction, or construct a narrative around a burial.[45]

38 Mojang Studios 2021a.

39 Dig it!/Immersive Minds 2015; Politopoulos et al. 2019; Langis-Barsetti 2021; Sáez-López et al. 2015; Morgan 2015; Edwards et al. 2020, 4–6.

40 Lercari 2017, 10, for a detailed chronology see Der/Issavi 2017, 192.

41 Mellaart 1967, 11; Hodder/Cessford 2004, 19–20; Çilingiroğlu et al. 2020, 1.

42 Çatalhöyük Research Project 2021.

43 Forte 2014.

44 Morgan 2009; Wolle/Tringham 2000, 213–215; Tringham 2014, 162.

45 Morgan 2009; Tringham 2014.

Figure 3
Map comparison between the excavation plans, left Çatalhöyük area 4040, right Minecraft adaptation of the same area, at 1:1 scale. Map of site (Map of the Çatalhöyük area 4040 created by Camilla Mazzucato, Çatalhöyük Research Project, adapted by author).

The design of the excavation site in the minecraft map, was based on the published excavation reports from Çatalhöyük regarding structures and their last use phase.[46] The aim was to adopt the real-life site as accurately as possible, which is why the structures were reconstructed at a 1:1 scale whenever possible. The soil above was freely adapted and small finds in the form of skulls and pottery were spread out throughout the layers; soil changes were marked by using different blocks (figure 4). The landscape around the virtual field school was originally intended to replicate the landscape of the Konya plain, where the site of Çatalhöyük is located. However, the map file was imported incorrectly from *Worldpainter*, and as a result, the map found in the game no longer resembles the landscape of the Konya plain but rather a strange auto-generated world, with a sharp drop to the rest of the map (figure 5). Fortunately, the imported file with its strange borders provides a limited exploration area for the player, in comparison to the otherwise vast digital adaption of the Konya Plain, and the limitless auto generated world which is standard in *Minecraft*. The new map allows for a freer adaptation of the archaeological material from Çatalhöyük and forces a more creative and innovative approach to incorporate the autogenerated landscape into a wider historical narrative of places and people.

The player can explore the landscape by participating in an archaeological survey of the area around the village where the player starts their game. Furthermore, a quest which focuses on resource procurement was included to allow the player to explore

46 Cessford 2007; Eddisfort 2014; Farid 2014a; Farid 2014b; House 2014.

Figure 4

Image of a section of the excavation in Minecraft, and a wall showing the different blocks and with a sign showing the block name, and what they mean in an excavation context (created by author).

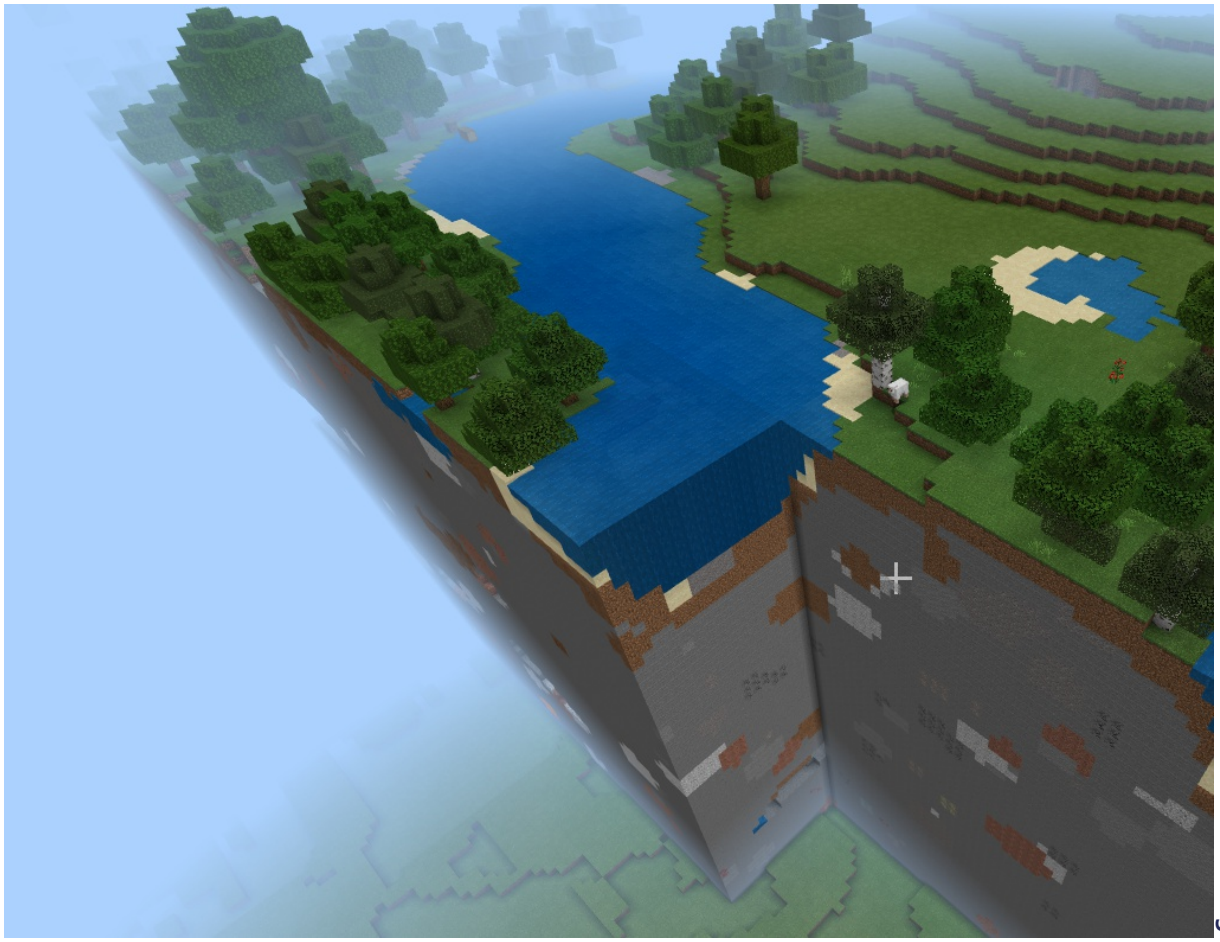

Figure 5

World border of Education map (created by author).

Figure 6
Images of various sites found in the map (created by author).

the steps involved in creating a product, it allows them to follow the *chaîne opératoire* from sheep to banner. The survey quest was implemented to encourage the players to explore the *Minecraft* landscape, and to give the players a sense of exploration, the quest allows them to utilise archaeological survey techniques, and to satisfy their sense of discovery, and it hopefully inspires them to think about the historic landscape around them in the real world. The archaeological sites created for the survey side quest are not related to Çatalhöyük or attempts at recreating real world sites. The sites include a functioning aqueduct, a small mediaeval hamlet with a ship setting, and a ruined temple (figure 6). The added structures function in similar ways to the auto-generated structures in *Minecraft*.[47] It is also possible to conduct experimental archaeology by creating a custom banner. This side quest takes the player through the process which goes into creating textiles from shearing the sheep to get wool, to gathering plants to make dye.[48]

The map is populated by NPCs which the player can interact with. Most of these are archaeologists, and their role is to inform the player about different kinds of archaeological specialisations, and how they contribute to the interpretation of archaeological remains. In most cases, they also present external links to artefacts

47 Minecraft Wiki 2021a; Mojang 2021b.

48 Poulsen 2020.

found at Çatalhöyük, which exemplify their profession. Figure 7 illustrates how this works in game by showing the interaction with the flint specialist. Players are encouraged to talk to the various NPCs standing around the excavation and in the dig house, who will help them with more information about excavation techniques and remind them of the importance of recording the excavation process. The auto-generated world is populated by *Minecraft*'s non-hostile 'mob', villagers, cats, sheep, and added NPCs, and the player starts their game in a typical *Minecraft* village where they encounter an NPC "The Mayor", who gives them instructions on how to play the map. The excavation area, the exploration of which is considered the main task to complete, is located east of the town, and is based on the 4040 area of the north part of the East mound of Çatalhöyük (see figure 3). The mayor NPC also introduces the player to the fictional story of why and how the excavation came about within the fictional narrative. The story was created to make the map feel more immersive to the players and provide them with an instruction on how to approach the map and the gameplay within it. The guide also serves as an introduction to archaeological fieldwork practices, which the player can learn more about by interacting with various archaeologist NPCs.

Digging in Minecraft

Much of the gameplay in a standardised version of *Minecraft* revolves around collecting resources, including digging to find raw materials in the ground. *Minecraft* has a coordinate system, which is displayed on screen and can be used to navigate the world. Furthermore, this coordinate system tells the players where they are in relation to the world height.[49] It seemed obvious to make use of this game mechanic when creating an archaeological excavation, since most players are familiar with the game mechanic, and would be able to use it to document locations of finds, and sites.

A small-scale test was made in *Minecraft Java edition*, based on the information available on Building 77 from Çatalhöyük.[50] Figure 8 is a screenshot taken from a recording of the test excavation illustrating how an excavation could be carried out.[51] The test proved it was possible to construct something which was similar to a real excavation, with soil changes and cultural layers. It also demonstrated that it was possible to do this in a way which seemed natural to the regular *Minecraft* player, since it uses tools

49 Minecraft Wiki 2021b.

50 House 2014.

51 Figure 3 can be seen as a short video by following this link: ▶https://www.youtube.com/watch?v=bKiVa8wFtIw.

Figure 7
Illustrates the interaction between the player and the Flint Specialist NPC (created by author, the website referred to is the Çatalhöyük Research Project, photo by Jason Quinlan, ▸ http://www.catalhoyuk.com/node/48).

already implemented in the game, such as pickaxes and shovels and regular blocks to represent soil.

Adding a narrative to ignite imagination

A narrative; a short fictional story, was added to frame the excavation and make the player feel part of the team of NPC archaeologists who are tasked to excavate the site. The fictional story in the game is brief, introducing the excavation and the archaeological team working on it.[52] The narrative leaves it up to the player to decide what they want to do in the map, appealing to people's desire to discover and explore, and inspiring the archaeological imagination, in line with *Minecraft*'s fluid playstyle of.[53]

The guides are optional, as is the choice of the player to interact with the NPCs. This means that it is up to the player to choose how they interact with the virtual environment around them. Furthermore, the short fictional introduction serves as worldbuilding for the autogenerated map. While the excavation is based on the real excavation of the 4040-north area of Çatalhöyük, it is up to the player to interpret the excavation and survey, based on the knowledge they have acquired in the game, and the narrative they have developed while playing.

The guide for teachers, instead, discusses which parts of archaeology cannot be taught by using *Minecraft* as a medium. For instance, there is a problem with implementing small finds, as the standard block size is 1 m^3.[54] There are only a few selections of smaller objects, such as skulls, flowerpots, and bonfires, which can serve as representatives of the large amount of pottery sherds

52 Poulsen 2020.

53 Perry 2019, 356; Witcomb 2007, 357–359; Hearne 2019, 154–156.

54 Poulsen 2020.

found in excavations dealing with ceramic periods, and the mass of animal bones found during excavations. It is also impossible to illustrate things like finds washing and flotation sampling for archaeobotanical remains. Despite these challenges *Minecraft* can still be used to exemplify how archaeologists work in the field. Perhaps when the archaeology update is added to *Minecraft*, it might be possible to use special archaeology blocks which have the in-game equivalent of small finds.[55]

Discussion of the virtual excavation experience in Minecraft

The *Minecraft Education Edition* map illustrates how *Minecraft* can be used to explain archaeological fieldwork in a way which incorporates archaeological theory and methods. It differs slightly from how Mojang has presented their idea of incorporating archaeology in the game. Their concept seems to function similarly to other autogenerated structures in the game with little or no explanations of archaeological practise.[56] The presented map can be used as a field simulator, since it replicates the parts of the field school experience, similar to the *Southampton-York Archaeological Simulation system*, which consisted of a computer-based model designed to teach students of archaeology about fieldwork practices before going into the field.[57] Using the *Education Edition* map in teaching would entail several advantages. Thanks to the accompanying guides that explain the process and theories behind the archaeological process, students would have the opportunity to strengthen their analytical skills before going on fieldwork in the real world. They would be able to practice excavation, recording, and interpretation skills with respect to both archaeological excavations and landscape surveys. Creating a digital alternative to real life excavation, like this *Minecraft* map, is beneficial not just for outreach purposes, but also for teaching the principles of an excavation remotely in case of another lockdown prohibiting access to field schools and excavations, as well as an additional teaching tool in to explain and explore excavation techniques and theories.

The map gives students an opportunity to learn in an immersive environment, providing a more embodied learning experience, when compared to traditional teaching methods, mediated through classroom teaching. A digital excavation makes it possible for non-archaeologists to learn how archaeologists work in the field, and be part of it, without potentially disturbing cultural heritage.

55 Mojang Studios 2020.

56 Mojang Studios 2020

57 O'Flaherty 1988, 491.

Figure 8
Test excavation in Minecraft, screenshot from video [▸ https://www.youtube.com/watch?v=bKiVa8wFtIw] (created by author).

The different aspects of the *Minecraft* field work map offer the player a different approach to archaeology which might not be so familiar to the public. The survey quest allows players to explore the digital environment around them, and hopefully this exploration of landscape would inspire the player to think about their surroundings in a different way when they are done playing. The other side quest, centring on the creation of a banner, is meant to make the player think about resource procurement and how products are made, but also how a banner can be used to signify relations between people, whether it is through sports teams or flags. This quest is more creative and might appeal to a different audience, who prefer a task with less running around, all the while it is still tied up on archaeological principles.

Recreating an excavation in *Minecraft* at a 1:1 scale is a time-consuming task, approximately a full working week, for the excavation area in this project. Creating a true reconstruction of a historical site is impossible, especially when working with the game constraints in *Minecraft.* Moreover, the excavation in the *Minecraft* map only shows a snapshot of the living phase dated to the late Neolithic and the infill of the structures, which is an inaccurate portrayal of the complexity of the real site, where buildings have several building phases and floor levels.[58] Despite this, I believe this attempt at recreating an excavation shows how it is still possible to learn some of the basic methods used by archaeologists in the field, even though the excavation itself is simplified.

Using games like the *Minecraft Education Edition* excavation map, and the other projects mentioned in this paper, to attract a different audience offers opportunities for people to engage in archaeology in a different way in comparison to visiting museums, watching documentaries, and reading books. It gives the player

58 House 2014.

power to experience archaeology almost as a physical experience, by making them conduct the excavation and their own interpretations of their findings.[59]

Conclusion

The *Minecraft Education Edition* excavation map presented in this paper illustrates how already existing game mechanics can be exploited to create an archaeologically focused experience. This project represents an original alternative to other archaeology maps out there, which are generally focused on communicating a time period by recreating a site or several as seen in *RoMeinecraft*, the Bryn Celli Ddu experience, and CRANE's Kunulua project.[60] The presented fieldwork map is accompanied by a fictional narrative, constructed to introduce the player to the setting of the map and help them imagine themselves as a part of the excavation team. In a classroom setting, it would hopefully encourage the player to explore the world and help them feel more connected to what they are doing, as well as inspire them to think about heritage in the landscape around them.

The *Minecraft Education Edition* excavation map shows that it is possible to use *Minecraft* to illustrate how archaeologists work and allow the player to experience the excavation process. Additionally, this project illustrates that it is possible to teach players about the principles of stratigraphy through videogames, by showing them how the different layers of soil change, illustrated by the different block types in *Minecraft*.[61]

It is obvious that the virtual excavation experience needs to be tested further, but since it was created as a student project, as a part of my master's degree studies at the University of Copenhagen, during the first 2020 COVID-19 lockdown, it lacked the resources and connection to be play-tested by school children or undergraduate students. Despite this, I believe that this *Minecraft Education Edition* map is an innovative showcase of what the *Education Edition of Minecraft* can offer archaeologists, and it illustrates how a popular game can be used to communicate different aspects of archaeology beyond recreating real world sites. I think it could be an alternative way to get acquainted with excavation methods and general considerations about fieldwork. Of course, it cannot, and should not replace fieldwork, but it can provide a virtual world to train in and a possibility to explore things from a different perspective. It will be interesting to see what happens in the *Minecraft* community once the archaeology update

59 Morgan 2010; Morgan 2009; Perry 2019; Hearne 2019.

60 Politopoulos et al. 2019; Langis-Barsetti 2021; Edwards et al. 2020.

61 Harris 1979.

is released, and how it can be used by researchers.

Bibliography

Boom, K. H. J./C. E. Ariese/B. van den Hout/ A. A. A. Mol/ Politopoulos, A., 2018: Teaching through Play: Using Video Games as a Platform to Teach about the Past, in S. Haugeneuer (ed.), C*ommunicating the Past in the Digital Age: Proceedings of the International Conference on Digital Methods in Teaching and Learning in Archaeology* (12th–13th October 2018), London, 27–44.

Cessford, C., 2007: Building 1, in I. Hodder (ed.), *Excavating Çatalhöyük: South, North and KOPAL Area Reports from the 1995–99 Seasons*, British Institute at Ankara, McDonald Institute for Archaeological Research, 405–530.

Der, L./J. Issavi, 2017: The Urban Quandary and the 'Mega-Site' from the Çatalhöyük Perspective, *Journal of World Prehistory* 30, 189–206.

Eddisfort, D., 2014: Building 49, in I. Hodder (ed.), *Çatalhöyük Excavations - The 2000–2008 Seasons*, British Institute at Ankara, Cotsen Institute of Archaeology Press, 313–356.

Edwards, B./B. B. Edwards/S. Griffiths/F. F. Reynolds/A. Standford/ M. Woods, 2021: The Bryn Celli Ddu Minecraft Experience: A Workflow and Problem-Solving Case Study in the Creation of an Archaeological Reconstruction in Minecraft for Cultural Heritage Education, *Journal of Computing and Cultural heritage* 14 (2), article 23.

Farid, S., 2014a: Buildings 52/51, in I. Hodder (ed), Ç*atalhöyük Excavations - The 2000–2008 Seasons*, British Institute at Ankara, Cotsen Institute of Archaeology Press, 357–397.

Farid, S., 2014b: Building 82, in I. Hodder (ed), *Çatalhöyük Excavations - The 2000–2008 Seasons*, British Institute at Ankara, Cotsen Institute of Archaeology Press, 505–510.

Forte, M., 2014: 3D Archaeology : New Perspectives and Challenges — The Example of Çatalhöyük, *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 1 (2), 1–29.

Harris, E. C., 1979: *Principles of Archaeological Stratigraphy*, London.

Hearne, R. L., 2019: 'The archaeological imagination': New ways of seeing for mental health recovery, in T. Darvill/K. Barrass/L. Drysdale/V. Heaslip/Y. Staelens (eds.) *Historic Landscapes and Mental Well-being*, Archaeopress, Oxford, 153–162.

Hodder, I./C. Cessford, 2004: Daily Practice and Social Memory at Çatalhöyük, *American Antiquity* 69 (1), 14–17.

House, M., 2014: Building 77, in I. Hodder (ed.) *Çatalhöyük Excavations - The 2000–2008 Seasons*, British Institute at Ankara, Cotsen Institute of Archaeology Press, 485–503.

Langis-Barsetti, D., 2021: Building Kunulua Block by Block, *Near Eastern Archaeology* 84 (1), 62–70.

Lercari, N., 2017: 3D visualization and reflexive archaeology: A virtual reconstruction of Çatalhöyük history houses, *Digital Applications in Archaeology and Cultural Heritage* 6 (August 2016), 10–17.

McGraw, J./S. Reid/J. Sanders, 2017: 'Crafting the Past - Unlocking New Audiences', in A. A. A. Mol/C. E. Ariese-Vandemeulebroucke/K. H. J. Boom/A. Politopoulos (eds.), The Interactive Past: Archaeology, *Heritage & Video Games*, Leiden, 167–184.

McKinney, S./S. Perry/A. Katifori/ V. Kourtis, 2020: Developing Digital archaeology for Young People: a model for fostering Empathy and Dialogue in Formal and Informal Learning Environments. In: S. Hageneuer (ed.), *Communicating the Past in the Digital Age: Proceedings of the International Conference on Digital Methods in Teaching and Learning in Archaeology (12-13 October 2018)*, London, 179–195.

Mellaart, J., 1967: *Çatal Hüyük: A Neolithic Town in Anatolia*, London.

Morgan, C. L., 2009: (Re)Building Çatalhöyük: Changing virtual reality in archaeology, *Archaeologies: Journal of the World Archaeological Congress* 5 (3), 468–487.

O'Flaherty, B., 1988: The Southampton-York Archaeological Simulation System, in *Computer Applications & Quantitative Methods in Archaeology* 1988, 491–497.

Perry, S., 2019: The Enchantment of the Archaeological Record, *European Journal of Archaeology* 22 (3), 354–371.

Reinhard, A. D., 2018: *Archaeogaming: An introduction to Archaeology in and of Video Games*, New York, Oxford.

Politopoulos, A./ C. Ariese/K Boom/ A. A. A. Mol, 2019: 'Romans and Rollercoasters: Scholarship in the Digital Playground', *Journal of Computer Applications in Archaeology* 2 (1), 163–175.

Poulsen, A. S., 2020: *Gaming and archaeology*, unpublished, exam for Project based course, Near Eastern Archaeology, Department of Cross-Cultural and Regional Studies, University of Copenhagen.

Sáez-López, J./ J. Miller/E. Vázques-Cano/M. Domíngeuz-Garrido, 2015: Exploring application, attitudes and integration of video games: MinecraftEDU in Middle School, *Educational Technology and Society* 18 (3), 114–128.

Tringham, R., 2014: Dido and the Basket: fragments towards a non-linear history, in Brown, S., Frederick, U., and Clarke, A. (eds), *Object Stories: artifacts and archaeologists*, California: Left Coast Press, 161–169.

Recreating an Excavation in *Minecraft Education Edition*: A Response

Csilla E. Ariese

Abstract

In their paper, Poulsen presents a unique custom-made map, designed in and for *Minecraft's Education Edition*. In the blocky virtual world of *Minecraft*, this map takes the player into a fictional landscape where they are asked by the mayor, as part of a fictional narrative, to conduct an archaeological excavation of a dig site. Although the landscape and narrative are fictional, the *Minecraft* dig site itself is modelled on a section and cultural layer of the well-known real world archaeological site of Çatalhöyük. Furthermore, the player is asked to engage in some very real archaeological methods to excavate, document, and interpret their *Minecraft* dig site. The author's approach to map making in *Minecraft's Education Edition*, including their mixing of fact and fiction, is highly original in the field of interactive pasts.

Thanks to a 'Streaming the Past' episode of the *VALUE Foundation* featuring the author as guest, I was able to view the excavation map 'in action' and get an even better feel for the excellent design of the map.[1] Poulsen has created a fantastic – but idealized and risk-free – setting in which players can learn and practice basic archaeological excavation methods and approaches. Much of the chaotic complexities of real life, however, are absent due to the nature of Minecraft.

Before reflecting on the pros and cons of the author's methodology, I would like to begin by briefly expanding on the context of their contribution in three areas: as part of education through video games, within the field of interactive pasts, and compared to other creative projects that combine archaeology with *Minecraft*.

Dr. Csilla E. Ariese is a museologist specializing in community engagement and practicing decoloniality. She is Senior Lecturer at the Reinwardt Academy had has worked as postdoctoral researcher at Leiden University and the University of Amsterdam in the BRASILIAE, ECHOES, and NEXUS1492 projects. Her PhD was titled The Social Museum in the Caribbean (2018). She is co-founder of the VALUE Foundation and editor of the books The Interactive Past (2017) and Return to the Interactive Past (2021).

▶ *Profile page*

Video Games & Education

There is plenty of research – too vast to summarize here – that

1 VALUE 2020.

explores the benefits and drawbacks of learning and formal education through video games. As Poulsen mentioned, video games offer the learner a tactile component of (generally mild) physical activity which is beneficial to kinaesthetic learner types.[2] However, video games – and even more so those using Virtual Reality – are complete virtual worlds in which several, if not all, senses are activated simultaneously. This deep immersion offers an engagement that is generally effective for all learner types, as well as an environment that provides entertainment besides education. As Mata Haggis-Burridge has effectively illustrated, all games are a mix of education and entertainment – even if these two are rarely equally balanced.[3] Although the potential drawbacks of education through video games are duly noted, it should be clear that the author's decision to create an educational experience in a video game has significant benefits over traditional classroom settings – all the more so considering the COVID-19 pandemic and the need to find safe out-of-class alternatives.

Interactive Pasts

The field of interactive pasts, which brings together a vast range of engagements between interactive digital media (video games) and the past (archaeology, history, heritage), is relatively new but has been highly productive.[4] Academics, students, players, and game developers have all been involved in using, exploring, rethinking, and learning about and through the past. Let me illustrate the variety of approaches with a small selection. Andrew Reinhard has used the game *No Man's Sky* to apply real world archaeological survey techniques as part of the collaborative *No Man's Sky* Archaeological Survey project.[5] Ashlee Bird has explored the problematic and harmful representations of Indigenous peoples in various video games, choosing to create an Indigenous mod for *Super Mario Bros*.[6] John Aycock uses computer science methods to reconstruct early video games through their remaining code and/or artefacts.[7] Florence Smith Nicholls has worked with topics such as

2 Howard Gardner developed the foundation model of multiple intelligences (1983) which was used by Neil Fleming in 1987 to design the VARK-model according to which learners can be categorised into different learning types (visual, aural, read/write, and kinaesthetic). Fleming 1995; Gardner 2011 [1983].

3 Haggis-Burridge 2021, 78.

4 For a historical overview of the field, see Mol et al. 2017.

5 Reinhard 2018, 101.

6 Bird 2021.

7 E.g. Aycock/Kroepfl 2021.

queer gaming and dark tourism, as well as researching the application of archaeological methodologies (mapping and photography) in video games.[8] As one of the founders of the *VALUE Foundation*, we have had our own explorations with interactive pasts, which include heritage outreach, academic conferences, workshops for students with game developers, teaching interactive narratives, and research on various games.[9]

Minecraft & Archaeology

As Poulsen already mentioned, there have been several projects to date which combine archaeology/heritage with *Minecraft*. Individual players, academics, and cultural institutions such as museums have made maps and built structures. Indeed, as the author astutely recognized, the majority of these projects have focused on **building**: the British Museum hosted a server to (try to) reconstruct the entire museum, TateCraft attempted to reconstruct the Tate's galleries and individual artworks whilst Crafting the Past has reconstructed (mainly) Scottish heritage sites. Our own *RoMeincraft* focused on reconstructing Roman archaeological sites in the Netherlands.[10] Some maps of other (mostly famous) heritage sites made by players are shared for download with the community. *Minecraft*'s creative mode (possibly aided with the use of some mods) is highly suitable for building and the popularity of *Minecraft* makes it relatively easy to find players or engage the public in builds.

Excavating, however, is another matter. Crafting the Past's map of an excavation of the Roman fort at Watling Lodge is a notable exception, as is computer scientist Christopher Gutteridge's buried Roman villa which he created last minute for a university Family Day by replacing all the 'air' blocks of a Villa map with 'dirt'.[11] Although digging is a core mechanic of *Minecraft*'s survival mode to gather resources, creating archaeological excavations in (either creative or survival mode) *Minecraft* has been challenging and has only rarely been successfully achieved. As a sandbox game with a (potentially) giant world in which the player

8 Florence Smith Nicholls' research can be accessed through their webpage, ▶https://florencesmithnicholls.com/category/archaeogaming/.

9 Much of the VALUE Foundation's work can be found through our websites,▶https// :interactivepasts.com/ and ▶https://value-foundation.org/.

10 Miller 2014; The VoxelBox 2014; all of Crafting the Past's projects are available through their website,▶https://www.craftingthepast.co.uk/; Politopoulos et al. 2019; all of the maps of the RoMeincraft project are available through the website, ▶https://romeincraft.nl/.

11 For Crafting the Past's Watling Lodge map see,▶https://www.craftingthepast.co.uk/watlinglodge; Gutteridge 2016.

can destroy and build, it is difficult to 'direct' play towards digging a specific area, to a specific depth, carefully and slowly. Players familiar with the game are used to 'digging' or destroying at high speeds, removing entire rows or columns without looking at the individual blocks more closely. Thus, an entire cultural layer in a *Minecraft* excavation could be gone before you know it. The challenges are even greater when players – especially strangers – need to co-operate in the same world.

Benefits

Poulsen's approach of using the *Education Edition* offers some unique possibilities to counter some of the challenges of the base game. Whereas the regular game requires mods to alter the in-game world and its rules, some of these possibilities are inherently embedded in the *Education Edition*. For instance, for our *RoMeincraft* projects – which used the regular game in creative mode – we needed to use mods to disable TNT blocks or portals.[12] Alas, we did not think of doing this until *after* a participant at an event had blown up several structures others had painstakingly built. Even so, a child managed to add code that spawned colour-changing sheep (arguably, a much cuter counterplay). For the excavation map, Poulsen was able to set important rules. For instance, only inside the excavation area of the dig site can a player dig or destroy blocks. Furthermore, the blocks that can be dug 'feel' more resistant and cannot be demolished as quickly, the tactile element guiding the player to excavate in a slower tempo. The player's inventory is also restricted, so the dig site cannot be built full of structures and rollercoasters.

The educational materials the map provides its players, as well as in-game instructions and examples, are furthermore essential components of this excavation. Naturally, it is possible in regular *Minecraft* to put down a sign with writing on it, but Poulsen has expanded on this with the sign showing and describing soils and layers (see figure 5). Even more important are the opportunities in the map to record and document the site, using an in-game camera and a field journal in which the player can write detailed records of every layer, profile, feature, and find. Thanks to the NPCs who each have their own expertise to share, the player is given a full course in excavation methods and approaches.

The fictional narrative and landscape in which the player is steered towards the dig site are helpful to ensure that the excavation map can function as a field school where the main goal is to learn methods, rather than as a real excavation where the

12 Boom et al. 2020, 39–41; Politopoulos et al. 2019.

main goal is to learn about the people who used the site. The player is not placed under great pressure to correctly interpret the site archaeologically. Naturally, interpretation is an important part of archaeological research, but by using a fictional narrative the players can practice arguing their own explanations.

Finally, the Education Edition shows players who are new to *Minecraft* the basic commands they will need to navigate the world, right in the game screen. This is an important feature for those excavation students who may never have played *Minecraft* before. Being able to play the map solo also ensures that the player is not hindered by others.

Challenges

There are two core challenges in Poulsen's approach of using *Minecraft's Education Edition* to create a custom map of an excavation. Firstly, the nature of *Minecraft*'s design and its 1 m^3 blocks make it challenging to recreate a real archaeological site accurately to scale. In their article the author already mentioned this by writing that small finds could only be represented by skulls and a block type representing a cultural layer. However, locating and carefully excavating small finds is an important technique for students to learn in field schools. Even many common archaeological features such as post holes or hearths tend to be smaller than a single *Minecraft* block. The need to rely on predominantly square shapes also makes it difficult to accurately recreate rounded or more complex shapes. As a result, the player's job of recording features in the virtual dig site is quite different from what they would need to be able to do in real life. The confusing complexities of real archaeological sites, of which Çatalhöyük with its crisscrossing structures and overlapping layers from different construction periods is a prime example, do not translate well to *Minecraft* (if at scale). This is already clear in the adaptations Poulsen had to make between the real and the virtual dig site (see figure 4). It would be interesting to experiment how this issue might be tackled by choosing to recreate real sites in *Minecraft* at bigger scales, or by choosing to construct entirely fictional sites in which the absence of certain types of finds and features could 'make sense'.

The second main issue has to do with the virtual excavation's intended audience and the context of use. It is not entirely clear from the article what the author envisioned when setting out to create this map. Is this map to be used by school children at home? By university students in class? By families in museums? Both students and children are mentioned, but no ages or settings are specified. These parameters would have been important to define at the start to be able to assess whether Poulsen's approach and

the resulting map are appropriate, as well as to understand what the educational impact of the map may be. From my limited insight into the map through the aforementioned stream, it is my impression that it would work best as a virtual field school in a formal setting at a university level. Specifically, novice archaeology students could play the map in a computer lab under the mentorship of a teacher. This teacher would be an important part of the learning experience, functioning as supervisor of the excavation, ensuring that students follow excavation protocol (i.e., to photograph each layer before excavating to the next layer), providing additional personal experience from real life excavations, and helping students with anything that may come up during the virtual dig. It is unfortunate that due to a COVID-19 lockdown the map could not be disseminated and play tested. I am sure many would enjoy playing this map and learning how to excavate a site like an archaeologist – without risking sunburns or scorpion stings!

Bibliography

Aycock, J./H. Kroepfl, 2021: The Desolation of Vixens, in C. E. Ariese/K. H. J. Boom/B. van den Hout/A. A. A. Mol/A. Politopoulos (eds.), *Return to the Interactive Past: The Interplay of Video Games and Histories*, 45–56, Leiden: Sidestone Press.

Bird, A., 2021: Synthetic Spaces and Indigenous Identity: Decolonizing Video Games and Reclaiming Representation in C. E. Ariese/K. H. J. Boom/B. van den Hout/A. A. A. Mol/A. Politopoulos (eds.), *Return to the Interactive Past: The Interplay of Video Games and Histories*, 103–116, Leiden: Sidestone Press.

Boom, K. H. J./C. E. Ariese/B. van den Hout/A. A. A. Mol/A. Politopoulos, 2020: Teaching through Play: Using Video Games as a Platform to Teach about the Past, in Sebastian Hageneuer (ed.), *Communicating the Past in the Digital Age: Proceedings of the International Conference on Digital Methods in Teaching and Learning in Archaeology* (12–13 October 2018), 27–44, London: Ubiquity Press.

Gardner, H. E., 2011 [1983]: *Frames of Mind: The Theory of Multiple Intelligences*, New York: Basic Books.

Haggis-Burridge, M., 2021: Personal and Social Recent History in Fragments of Him: Defining and Exploring 'Immersion' in Video Games, in C. E. Ariese/K. H. J. Boom/B. van den Hout/A. A. A. Mol/A. Politopoulos (eds.), *Return to the Interactive Past: The Interplay of Video Games and Histories*, 75–88, Leiden: Sidestone Press.

Mol, A. A. A./C. E. Ariese-Vandemeulebroucke/K. H. J. Boom/A. Politopoulos, 2017: Tutorial: An Introduction to Archaeology, Heritage, and Video Games, in A. A. A. Mol/C. E. Ariese-Vandemeulebroucke/K. H. J. Boom/A. Politopoulos (eds.), *The Interactive Past: Archaeology, Heritage & Video Games*, 7–18, Leiden: Sidestone Press.

Politopoulos, A./C. E. Ariese/K. H. J. Boom/A. A. A. Mol, 2019: Romans and Rollercoasters: Scholarship in the Digital Playground, *Journal of Computer Applications in Archaeology* 2 (1), 163–175.

Reinhard, A. D., 2018: *Archaeogaming: An Introduction to Archaeology in and of Video Games*, New York: Berghahn Books.

Online sources

Fleming, N. D., 1995: I'm Different; Not Dumb: Modes of Presentation (V.A.R.K.) in the Tertiary Classroom, in A. Zelmer (ed.), *Research and Development in Higher Education Volume 18: Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia (HERDSA)* (308–313), Hammondville: HERDSA. ▸http://www.

vark- learn. com/ wp- content/ uploads/ 2014/ 08/ different_not_dumb.pdf, accessed on 28/02/2022.

Gutteridge, C., 2016: Minecraft Archaeology Day. *Southampton Web and Data Innovation Team*, 25/07/2016. ▸https://blog.soton.ac.uk/webteam/2016/07/25/minecraft-archaeology-day/, accessed on 28/02/2022.

Miller, J., 2014: British Museum to Be Digitally recreated in Minecraft, *BBC*, 23/09/2014. ▸https://www.bbc.com/news/technology-29281051, accessed on 28/02/2022.

The VoxelBox. 2014. #TateCraft: Bringing Art to Life – ik Prize 2014 Finalist [Video], *YouTube*, 15/01/2014. ▸https://www.youtube.com/watch?v=7B9rfHXJrHo, accessed on 28/02/2022.

VALUE. 2020. VALUE Excavates Çatalhöyük in Minecraft! #ArGaCon2020 [Video], *YouTube*, 31/07/2020. ▸https://www.youtube.com/watch?v=UprhjdkJQH4, accessed on 28/02/2022.

Recreating an Excavation in *Minecraft Education Edition*: Final Thoughts

Anna Silberg Poulsen

The initial article "Recreating an Excavation in Minecraft Education Edition" focused on exploring how the game *Minecraft* has been used in the past to communicate cultural heritage by museums and archaeologists to a wider audience.[1] It also presented a *Minecraft Education Edition* map created by the author which attempted to recreate the archaeological field school experience in the game.[2] Unfortunately, the field school map could not be tested in a classroom due to the circumstances of its creation during the first wave of the COVID-19 pandemic in 2020. This short paper will reflect on the two main challenges raised in the response paper by Dr. Csilla E. Ariese. The first challenge for the *Minecraft Education Edition* map is the simplification of the excavation process, because of the choice of representing something 1:1 scale when the blocks themselves take up 1 m^3. The second challenge for the map is its unclarity of the target audience for the field school map, and how the map would need to be changed to embrace the different audiences.

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▶ *Profile page*

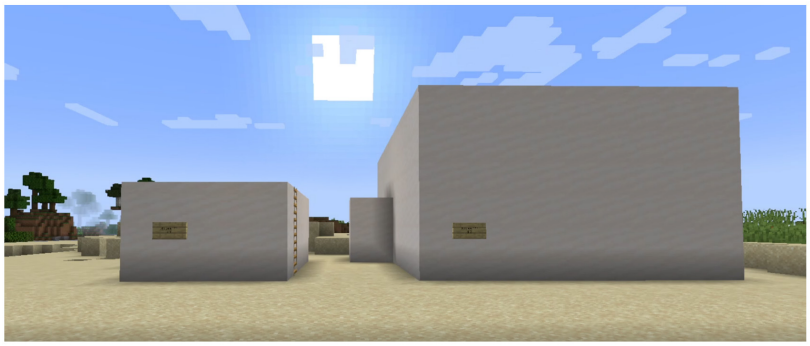
Questions of Scale and Complexity

Minecraft's pixelated look does not accurately represent the real world, and it is not meant to be a hyper realistic recreation of the real world, and that is probably one of the reasons why the game has remained popular since its release in 2009.[3] As pointed out in the response article, the size and shape of *Minecraft* blocks causes issues if one wishes to represent something detailed at a 1:1 scale when compared to real world measurements. A solution to this, as observed in a short comparison video of a reconstruction of building 77 (figure 9), and as suggested by the review article, is to

1 Politopoulos et al. 2019; Langis-Barsetti 2021; Edwards et al., 2021.

2 The map can be acquired by contacting the author. It was created as a part of a master level course at the University of Copenhagen.

3 Langis-Barestti 2021, 63.



a

b

c

Figure 9
Comparison of space in reconstructions of building 77, a) the exterior of the two reconstructions. Left 1:1, and right 1:2; b) Interior of 1:1; c) interior of 1:2. Watch the video for a walkthrough of the two buildings at ▸ https://youtu.be/YnIDxesoalg (created by author).

increase the scale of structure.[4] The altered size made it possible to include more decorations. However, changing the scale of a structure alters the perception of the structure and distorts the proportions. I would argue that increasing the scale of a structure or a feature alters the experience of space, as can be observed in figure 10. The increased dimensions make the structures appear unproportionally large, which can impact the player's experience and understanding of the feature, by making it appear more grandiose than it is in real life. The challenge of scale and how to adapt it to *Minecraft*, is only relevant if the goal of the map is to recreate a real excavation site, and thus have to grapple with the concepts of transferring physical objects into the digital space. The scale is also important when considering how to communicate the aims of the research. I chose to keep the scale at a 1:1 to make the height of the character and the construction fit in with its surroundings (see figure 6). Furthermore, I would argue that *Minecraft* is not suited for learning how to excavate small finds, but rather to explore concepts of simple stratigraphy and interpretations of structures.

It is possible to create a more complex excavation experience in *Minecraft*, either by adding more complexity in the layers above the structures, or by increasing the physical dimensions of the excavation. But even if the spatial boundaries of the excavation are enlarged, it will still be difficult to use them to teach how to excavate small finds, because the blocks without modifications, when broken, leave a void of 1 m^3. In excavations in the real world layers of soil are carefully removed with a trowel, and brushed

4 Youtube video can be found online, ▸https://youtu.be/YnIDxesoalg.

clean for photographs before the next layer is removed. *Minecraft* in its current state is not the best fit for recreating complex experiences of excavating a multi-period site like Çatalhöyük. Nevertheless, I would argue that depending on the intended target audience like the group this *Minecraft* map was developed for, a simple excavation should be sufficient to give an insight into how archaeologists work in the field, and how they generate knowledge. If a project demanded it, I am sure it would be possible to produce a highly complex excavation experience in *Minecraft* by increasing the scale, and by creating custom textures for the world. Ultimately, the scale of an excavation or structures are dependent on the experience one wishes to replicate in *Minecraft*.

The field school map is another way of highlighting the importance of small finds. This is done by interacting with the archaeology NPC's like the Flint specialist, figure 7, who explains how their specialisation contributes to the interpretation of a site. By interacting with the hyperlink, the player is taken to a website which shows an Obsidian mirror found at Çatalhöyük.[5] Further fictional complexities were added to the excavation area in the form of changing soil types (figure 4), and features like pits and burials. In hindsight, I should have added at least one of the later levels of occupation from the real excavation area, but at the time, I was afraid that doing so might prevent a player, who is less familiar with archaeological methods, to dig beyond the first level of features, without prompting from a teacher or an NPC.

Summing up, I do not think that *Minecraft* in its current state, 1.18.2 (Java edition) and 1.18.12 (Bedrock edition), is suitable for teaching how to excavate a delicate context or how to extract small finds. Those skills are a vital part of most excavations as the response by Dr. Csilla E. Ariese rightly points out.

It is possible that *Minecraft* might add features which makes it possible to excavate certain blocks more delicately, but even then, I doubt the experience will be comparable to the real-world experience.[6] For now, the best way to implement similar excavation techniques is to modify the base game, with mods like *Fossils and Archaeology Revival* which adds palaeontology and archaeology to the game.[7] It would be interesting to see how the concepts presented in the field school map could be explored in a modded version of Java version.

5 Çatalhöyük Research Project, 2021.

6 ▶https://www.youtube.com/watch?v=DBvZ2Iqmm3M&t=2185s.

7 The mod can be downloaded through Curse forge, ▶https://www.curseforge.com/minecraft/mc-mods/fossils/files, see the Wikipedia for more information on the features in the mod, ▶https://fossils-archeology.fandom.com/wiki/F/A_Miod_Revival_Wiki.

Single target audience?

The map in its current form can be used in different scenarios, and for different age groups. As the response article points out, the age groups who would gain the most archaeological knowledge from the map are the archaeologists and archaeology students playing and exploring the map. However, I would argue that a map like this could be used in primary and secondary schools, as well as high schools, to communicate the general practices of archaeology. *Minecraft* is already present in the classroom and used to teach those age groups about science, mathematics, and history.[8] It would be interesting to present an alternative to the current history lessons, which primarily consists of reconstructing or exploring a historical site.[9] A map like the field school map presented in the research article could add a more scientifically based explanation of archaeological practices, which people in my experience are generally interested to learn more about. The map could also explain how archaeology contributes to the general understanding of human history.

I think a concept like the field school map with a more complex stratigraphy, perhaps constructed at a larger scale, could be a valuable tool to introduce university students, as well as high school students to how archaeologists work in the field. The map could also be altered to fit the communication needs of a museum, like the projects made by Crafting the Past and TateCraft, and with the assistance of staff or teachers, be used to communicate a simplified version of excavation techniques as they are presented in the map.[10] Having a teacher or professor in the room to answer questions students might have about archaeology, would be instrumental to highlight how *Minecraft* does not depict a realistic excavation experience. The importance of a "real world" guide to help with the map would undoubtedly have become obvious if the map had been tested in a classroom setting. The map comes with two guides, one intended for students, and one intended for the teacher. The guide for students is aimed primarily at high school students, but it could be used in an undergraduate class on introductions to archaeological methods. The guide intended for the teacher goes more in-depth with where to find more references on different archaeological methods, but it also explains the drawbacks of using Minecraft to represent the complexities of a real-world excavation.

8 Sáez-López et al 2015; Macgregor 2019. Lessons can be found on ▶ https://education.minecraft.net/en-us/resources/explore-lessons.

9 Mojang Studios 2022.

10 Dig It!/Immersive Minds 2022; Tate 2014.

Conclusion

The Education Edition field school map can be seen as a development of other archaeogaming *Minecraft* projects like VALUE foundations *Romeincraft* and *Crafting the Past*.[11] Most projects primarily focused on reconstructing the past in *Minecraft* and only two of Crafting the Past's maps, St. Kilda, and Watling Lodge, feature an archaeological excavation.[12] *The Education Edition* map took the seeds planted by the previous projects and created a virtual field school experience which focused on archaeological excavation in *Minecraft*, and added additional elements like landscape survey, similar to Shawn Graham's survey project.[13] The field school is populated by NPCs who provide guidance and archaeological knowledge to the players as they explore the map and begin their excavation.

The field school map was not meant to replace all aspects of the excavation experience, but to explore the possibilities of recreating a simplified version of the experience, while creating awareness of its shortcomings, like the inability to add small finds which makes up most to the archaeological record. It would be interesting to take the concept further and develop different maps for different purposes, a simpler version for schools, and potentially museum outreach, and more complex versions for university level teaching. A more complex version of the map would involve expanding and rethinking the excavation area to better reflect the reality of the overlapping layers of Çatalhöyük more accurately. It could also be interesting to have archaeology students develop their own fictive or real excavations, which would force them to actively reflect and engage with stratigraphy in a different way, and potentially help them understand it better when they are on an excavation.

The blocky design of *Minecraft* creates a different experience than excavating in the real world, but I think a map like this, despite its difficulties with representing small finds, could be used as a teaching tool to get an idea of what an excavation can be like. It could be a way for "people outside the field" to get a taste of what archaeological excavations are like, even if it is less detailed than an excavation in the non-virtual world. The map would be ideal in a focused lesson on archaeology in schools as a supplement to ordinary history lessons, but it can also be elaborated upon and used to introduce archaeology students to basic excavation methods as a part of their training before they go on their first fieldwork.

The map makes it possible to partake in archaeological

11 Politopoulos et al. 2019.

12 Dig It!/Immersive Minds 2022.

13 Graham 2015.

excavations in a risk-free environment, both from the sun and wild animals, which can interfere with the excavation. It provides a safe space to learn the basic principles of archaeological excavation.

Bibliography

Edwards B./B. B. Edwards/S. Griffiths/F. F. Reynolds/A. Standford/M. Woods, 2021: The Bryn Celli Ddu Minecraft Experience: A Workflow and Problem-Solving Case Study in the Creation of an Archaeological Reconstruction in Minecraft for Cultural Heritage Education. Journal of Computing and Cultural heritage, 14(2), article 23.

Langis-Barsetti, D., 2021: Building Kunulua Block by Block, Near Eastern Archaeology, 84(1), 62–70.

Politopoulos A./C. Ariese/K. Boom/A. A. A. Mol, 2019: 'Romans and Rollercoasters: Scholarship in the Digital Playground', Journal of Computer Applications in Archaeology, 2(1), 163–175.

Sáez-López J./J. Miller/E. Vázques-Cano/M. Domíngeuz-Garrido, 2015: Exploring application, attitudes and integration of video games: Minecraft EDU in Middle School, Educational Technology and Society, 18(3), 114–128.

Online Sources

Çatalhöyük Research project, 2021: Research Portal, ▸ http://www.catalhoyuk.com/research, accessed on 24/05/2021.

Dig It!/Immersive Minds, 2022: St Kilda, ▸ http://www.craftingthepast.co.uk/st-kilda, accessed on 08/01/2022.

Graham S. 2015: Somewhere in the desert… a temple, ▸ https://electricarchaeology.ca/2015/03/24/somewhere-in-the-desert-a-temple/, accessed 10/08/2021.

Macgregor, J. 2019: How teachers are using Minecraft in the classroom, PC Gamer, ▸ https://www.pcgamer.com/how-teachers-are-using-minecraft-in-the-classroom, accessed on 31/03 /2022.

Mojang Studios, 2022: Minecraft Education Edition – History and Culture kit, ▸ https://education.minecraft.net/en-us/resources/history-and-culture-subject-kit, accessed on 31/03/2022.

Tate, 2014: IK Price 2014 Shortlist: Tatecraft, ▸ https://www.youtube.com/watch?v=aXC8JUmb12U, accessed on 31/03/2022.