

# Minecraft Education Magma Challenge – Bridging the Online Induction Gap

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## Abstract:

The Covid-19 pandemic posed many challenges for Higher Education, not least how to induct students into the University environment remotely while ensuring they had the opportunity to meet peers, University staff and connect to their campus environment. With these aims in mind, the Teesside University Minecraft Education (ME) Working Group developed an online team building induction activity within a ME World. This allowed students to work with their peers to solve a task in the shape of the ME Magma Challenge to allow students to bond with their peers and their learning environment.

Feedback from students indicated that undertaking the ME Magma Challenge helped them become more familiar with the University campus, develop their IT skills in preparation for study and bond with peers and staff on their programme of study. These are all aspects shown to be linked to the effective retention of students suggesting that the ME Magma Challenge is an effective way to support progression and retention of new students.

The ME Working Group reflected that the success of the project was dependent on staff engagement and those staff who immersed themselves more fully into the challenge provided a better student experience than those that did not.

## Keywords:

Minecraft, Minecraft Education, Covid-19, Online induction

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## Introduction

The novel coronavirus disease (Covid-19) pandemic, which began in December 2019, has had far reaching implications within Higher Education with most institutions globally being forced to deliver via an online or hybrid delivery model in order to mitigate exposure to the virus. Vlachopoulos (2020) states that this is considered a unique opportunity for educators to “fill the gap” left by traditional face-to-face teaching methods and this is none truer than when considering student induction.

Induction is a key mechanism in a student’s transition into Higher Education (HE) providing an opportunity for students to be introduced to their studies, institution, tutors and peers. For many students, induction will be the first introduction to the HE environment and the information provided will set the expectation and culture of their study. Yorke and Thomas (2003) suggest that academic underachievement can be enhanced by an ineffective transition to undergraduate study with Stuttard (2007) stating a poor-quality experience leads to decreased retention. Successful retention of students can be enhanced by students forming good friendships or social networks which provide support when they encounter difficulties (Thomas, 2002). It is therefore imperative that a students’ first introduction to a University should be engaging and provide opportunities to bond with other students and staff in order to facilitate forming bonds with their peers and increase the likelihood of successful retention.

In essence, allowing the student to foster a sense of belonging within the institution aids the transition into HE. Meehan and Howells (2019) found that friendship was a key aspect of creating a sense of belonging, but the Covid-19 pandemic hindered this in a manner not seen within HE before. Since 2020, there has been a myriad of research looking at the effects of Covid-19 on our University populations with all agreeing that students faced social, economic and personal struggles during this time [Bartolic et al (2022), Bonsaksen et al (2022), Phillips et al (2022)]. This potentially affected new students greater who had no established friendship groups and no traditional onsite transition pathway into HE. Where you have an online or hybrid model of delivery, the prospect of achieving an induction where students can form friendships and a bond to the institution is more challenging than ever.

There has been little research into online student inductions and how to engage students in order to enhance transition and retention. Where research has been carried out this is focussed on students who are completing their studies as distance learning students and not those who will also be interacting with an actual physical campus setting. Current research suggests it is deemed important that students develop their technological skills within induction to ensure they are at a sufficient level to cope any online aspects of their course and several researchers have concentrated on developing inductions that reflect this [Warren et al (2015), Njorogei and Nzuki (2017)]. Forrester et al (2005) stress the importance of the distance learning student gaining an identity within the wider University framework with a sense of belonging including developing peer support networks to counteract the feelings of isolation. An approach that encourages group tasks online as well as encouraging asynchronous and synchronous dialogue can help with students feeling part of a wider community (Cain et al, 2003). With this in mind, online induction activities and orientation need to

be carefully devised to assist students rather than hinder (Motteram and Forrester, 2005).

An alternative approach to induction was developed at Teesside University which focussed on creating a peer bonding experience alongside introducing the students to the institution and developing key IT skills. The researchers developed a virtual group task which took place within Minecraft Education (ME). ME has been successfully used as a teaching aid within HE [Peters et al (2021), Edwards et al, (2021), Carbonell-Carrera et al, (2021)] but not as a means to create a group peer bonding experience which have been stressed by Forrester et al (2005) as important within the student journey.

ME is an adapted version of the Minecraft game currently owned and licensed by Microsoft and is available through an Office 365 Education license. Minecraft is classified as a sandbox game allowing the user complete creative freedom over the content/context of the game. The 'base' game within Minecraft is to mine blocks which can be used to achieve a goal, it is the user that defines this goal. As a result, Minecraft is often described as a digital 'Lego' due to its usage and that everything is in cube form. However, there are multiple forms for a user to interact with in that game. Placing blocks is the simplest form but there are three programming languages that can be used to perform a host of tasks; Python, Java script and Minecraft's own executable language. There are two ways in which each can be implemented; Python and Java can be used in either raw code form, or paired with a proprietary GUI (graphical user interface), allowing the user to select actions and place them together like a jigsaw. As for Minecraft executable language, users can either type a command directly into a console within the chat function of the game and have it executed, or they can use a block called a command block. Command blocks can have the same in chat commands placed inside them and then triggers can be used to run the command. It is obvious that this level of detail is beyond most new undergraduate students, but these functions allow the educator freedom of creativity in designing for the classroom.

A unique attribute with Minecraft is it facilitates the ability to create mini games within itself. Minecraft is a 3-dimensional, multilayer user-controlled experience which can also be fully customised by the end user. The student controls a character which can be uniquely 'dressed' by the student, so they are able to fully represent themselves with their character. They can then join a World and interact with other students in real time interactions and discussions.

Unlike other software packages, the barrier to entry with ME is very small, the software is free with an Office 365 Education account and can be run on most off the shelf computers and laptops: including iPads and tablets. In addition, the controls used within ME are synonymous within the PC computer gaming industry making it somewhat intuitive for the user to move within the game. Using WASD on the keyboard for movement and mouse left and right buttons for different interactions is commonplace and as such most users will need little time to reach a basic standard of competency within Minecraft.

The ease of availability and use made ME the obvious choice for creating an online virtual induction experience. The current generation of new students has grown up

with Minecraft as a gaming option. In addition, some schools have used Minecraft within their teaching for a number of years [Short (2012), Overby and Jones (2015), Craft (2016), Ellison and Evans (2016), Abrams and Rowsell (2017), Hobbs et al (2019), de Andrade (2020), Edwards et al (2021)].

When creating the induction activity within ME, the team worked towards three aims:

- Do the students have a better understanding of the layout of the campus allowing them to navigate with more confidence when onsite?
- Did the students enhance their IT skills and become more familiar with the packages to be used in the undertaking of their studies (namely Microsoft Teams and Microsoft OneNote)?
- Did the students build a connection with other students and staff on their course?

These aims were chosen to reflect aspects that prior researchers have stressed to be of importance with engaging and retaining students in an online environment.

## **Methodology**

Using ME, a map was initially created through GeoBoxers, a Danish company who specialise in creating Minecraft maps using geospatial datasets sourced directly from Google maps. Once provided with a set of coordinates they create a ME world using their proprietary software; a difficulty with world creation in ME is that the blocks are not simply just a set of X, Y, and Z coordinates. Each block also has a set of metadata behind it which tells the game block characteristics and player data. After creation of the ME map it was necessary to adapt it to reflect the actual look and feel of the campus and meet the needs of the game.

The created map provides a good likeness but is unable to bring detail from buildings and assign colours and as such the map needed detail adding to buildings and landscaping. This was achieved by the Teesside University ME Working Group manually changing the buildings and landscape to reflect the campus more accurately. It was imperative that this customisation was carried out to ensure the campus produced in ME would have the greatest likeness to the actual Teesside University campus as possible and thus aid in the orientation of new students to the campus environment.

In addition, and coupled with signs placed in the world itself, an extensive guide on how to use ME was created using Microsoft OneNote which formed the basis of student guidance for the activity.

## **Staff Training**

An essential aspect of this project was that teaching staff would be leading the activity so that their new students had a chance to interact with them in a relaxed and meaningful manner. Research demonstrates that providing an opportunity for

students to meet staff in a friendly environment helps alleviate feelings of homesickness or isolation [Stuttard (2007), Cooper and Usama (2008)].

For this to be effective, staff needed to be trained to a basic level of competency in using ME. As mentioned previously, ME has a very low barrier to entry and training to a basic user standard can be achieved in 30 to 60 minutes. Training sessions were delivered via Microsoft Teams and delivered by the Teesside University ME Working Group, each member of the group is well versed in using ME and troubleshooting technical issues.

The training involved a tutor lead session where staff undertook the tasks the students would be undertaking and the basic commands to run the game. In addition, staff could download the created Worlds to practice in alongside asking the ME Working Group any questions or queries. Lastly, staff had access to support material produced in Microsoft OneNote. An overview of this process is shown in Figure 1.

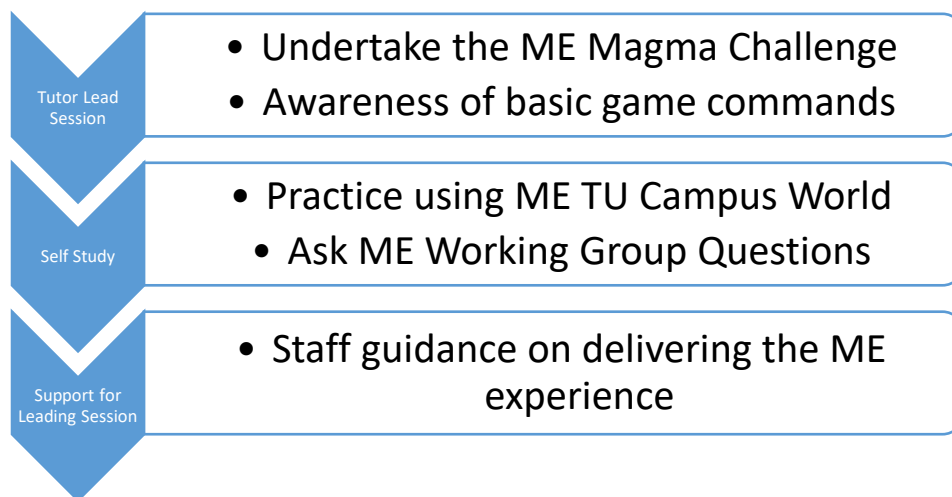


Figure 1. Flowchart showing staff training for the Teesside University ME Magma Challenge

### **Student Induction Activity – the Magma Challenge**

The Induction activity was focussed on getting the students to work in groups within the confines of the virtual Teesside University campus to facilitate them getting to know each other and the campus itself. With this in mind, the ME Working Group developed a group-based activity that was not subject related and was able to take place on the virtual campus.

The activity itself was focussed on the challenge of building a rail track over a pit of Magma, each student group had the exact number of resources needed to achieve this task meaning that effective communication within each group was required.

The activity focused on Team Building and allowing students to meet their peers while being remote from the physical University environment. Students were placed into

teams of up to 6 students within their discipline area. By using Microsoft Teams, each group was able to meet with their peers and the staff lead at the start of the activity. The staff lead would then explain the challenge and ask students to introduce themselves to one another – at this stage there were no expectations as to whether students were required to have their cameras on in order to promote an inclusive and relaxed atmosphere.

The use of Microsoft Teams as a separate communication channel for the Magma Challenge allowed for ease of communication within that set of students, students were able to speak to each other without the distraction of hearing other group communications.

Each group in a session was assigned a colour, and this would correspond to a chest within the ME Magma Challenge World, this chest contained the resources necessary to complete the challenge. The World also had several boards which outlined the task and game rules. The rules focused mainly on student behaviour to stop any one person completing the task and ignoring their team.

The Magma Challenge looked to the participant as a complete open canvas, however, deny blocks were used to block some spaces in the areas where the bridge across the Magma pit was to be built. These would be invisible to the student, but they would be unable to lay their bridge in these blocked spaces. This was designed into the game to trigger discussion within the team to work together in finding locations the blocks could be placed.

Students would first need to create a path over the magma with blocks of concrete, rails could then be placed on the concrete and the activity was only complete when all members of the team had crossed the magma in a Minecraft cart. Once this had taken place the student could set off a firework to signify task completion.

Once the task was completed, the staff member brought the students together away from the game in their Microsoft Teams space and proactively asked the students how they found the experience and facilitate final communication within the group.

Prior to undertaking the Group activity, students were able to individually go into a Teesside University ME Campus World to practice their Minecraft skills and also become more familiar with the campus.

## **Evaluation**

On completion of the activity, students were invited to complete a questionnaire on their experiences undertaking the Teesside University ME Magma Challenge. This was designed to evaluate three key outcomes:

- Did the students have a better understanding of the layout of the campus allowing them to navigate with more confidence when onsite?
- Did the students enhance their IT skills and become more familiar with the packages to be used in the undertaking of their studies (namely Microsoft Teams and Microsoft OneNote)?

- Did the students build a connection with other students and staff on their course?

All three of these outcomes were linked to potential barriers a student may face within their student journey that might inhibit progression within their course.

A Microsoft Forms questionnaire was circulated to students on completion of the activity, the questions can be found in Appendix 1:

It is important to note that researchers did not have access to any personal information such as names or students' numbers and ethical clearance was obtained prior to distribution of the survey.

## Results and Discussion

Participants of the 2020 induction activity Magma Challenge were invited to participate in a survey with the results shown in Table 1. The abbreviated set of questions is shown below, for a full list see appendix 1. Questions which were comment based are not represented in Table 1 as these are open to interpretation.

Table 1. Questionnaire responses from the Teesside University ME Magma Challenge

Question	Positive Response (%)	Negative Response (%)
Do you have a better understanding of where the buildings are on campus?	92	8
Has the Magma Challenge reflecting campus made you feel more comfortable about coming onto campus?	93	7
Did getting to know the campus via the Challenge make you feel more confident that you will be able to find the buildings you need in your study?	93	7
Did you enjoy the Magma Challenge?	96	4
Do you feel more confident with Microsoft software?	100	0
Can you remember the name of someone on your course following this activity?	96	4
Can you remember the name of the staff member?	96	4

The ME Magma Challenge took place multiple courses in the induction programme at Teesside University. The courses included were:

- Dental Hygiene and Therapy
- Animal Science and Welfare
- Biological Sciences
- Business Management
- Airline and Airport Management
- Sport and Exercise Science
- Environmental Science

This was approximately 100 students with approximately a third of them completing the survey.

Evaluation of the effectiveness of the induction session focussed on whether the students felt the sessions met the three aims of the ME working group.

### **Do the students have a better understanding of the layout of the campus allowing them to navigate with more confidence when onsite ?**

The ME Magma Challenge was designed to ensure students had the opportunity to become aware of the campus layout and familiar with how the University Buildings appear –to both increase a sense of belonging and reduce students’ anxiety when locating buildings on campus. This was especially important during the Covid-19 pandemic where one-way systems and restricted access existed on campus.

The students were asked to evaluate whether they felt this had been achieved in Questions 1 – 4 of the evaluation and, in general, this was very positive with 96% of students indicating that it allowed them to become more familiar with the campus layout (Question 1), 93% indicating it made them feel more comfortable about coming onto Campus (Question 3) and 93% stating it has helped them in being able to find the buildings they need for their studies on campus (Question 4).

Question 2 allowed the participants to add comments regarding whether having the activity set on campus made them feel more familiar with it, these comments were also positive in nature reinforcing the notion that by allowing students to interact with the campus in the virtual World helped them to feel connected and familiar with the campus in the physical World. Comments included:

*“I think the Magma Challenge was a fun and creative way to get new students familiar to the layout of the campus”*

*“I liked the idea of it being set on campus and it gave me some knowledge of the place”*

Student connection and feeling valued is important for new starters and has an impact on their resilience to academic pressures. Traditionally within Higher Education, this connection is often thought of in terms of connection to a student’s peers or the academic staff but a connection to the campus is just as important (Hajrasouliha, 2017). Throughout remote learning, enabling students to form a connection with their University environment has become much harder, feedback from the participants



suggests the campus setting of the ME Magma Challenge resonated with the new starters and made them feel more connected and part of Teesside University. As one student commented:

*“..... it makes it feel more like a university based activity.”*

### **Did the students enhance their IT skills and become more familiar with the packages to be used in the undertaking of their studies (namely Microsoft Teams and Microsoft OneNote)?**

Question 7 on the survey addressed the question of whether students gained confidence in Microsoft Teams and Microsoft OneNote with a resounding 100% of students agreeing it made them feel more comfortable using both packages.

In a year where most academic delivery was online, it was of paramount importance to act proactively in getting students to use the institutional digital packages as early in their academic lifecycle as possible. As Stafford and Stinton (2016) discuss, navigating virtual learning environments can be a barrier for students with Hara and Kling (2000) stating students can experience anxiety, frustration and confusion when using IT in their studies with joint research from Microsoft and Goldsmith's University (2020) showed that only 28% of UK business leaders believe that the education system offers adequate digital training for employment. It is hoped by providing students with an experience of Microsoft Teams and Microsoft OneNote early in their academic journey, will equip them with the confidence needed to use these packages successfully in the future, a must when lectures have the potential to be delivered by digital means.

### **Did the students build a connection with other students and staff on their course?**

The 2020 induction posed several challenges in that Universities were tasked with enabling students get to know their peers, tutors, and University environment in a restrictive online environment. One objective of this project was simply to just get students talking to one another, transitioning to University can be isolating and ultimately detrimentally to a person's mental health. Such an unfamiliar and uncomfortable situation to face when potentially isolated from friends and family could make a student's environment feel more like a prison with very real implications for their mental health. As Usher et al (2020) and Perrin et al (2009) outline, the psychological harm associated with isolation can affect all humans but the most vulnerable are children and adolescents.

Questions 5, 6, 8 and 9 addressed how the students felt about the activity in respect of getting to know people on their courses as well as the staff who will be teaching them. Question 5 looked at if they enjoyed the challenge with 96% of respondents indicating that they did. Questions 8 and 9 addressed whether they felt they made a connection with another student or staff member asking students if they remembered

the names of the students undertaking the challenge with them (Question 8) or the staff member (Question 9). Both questions had a positive response of 96% indicating that the interaction was meaningful in allowing students to interact with other students and staff on their programme of study.

Question 6 provides the greatest insight into how students felt about the activity and whether they felt it had helped them make connections with other people in their area of study. Students were asked to comment on the experience with responses demonstrating the positive nature of the interactions:

*“It was relevant to us and it gave us a chance to talk properly to some people as we were in smaller groups”*

*“I found it great and funny talking and working together with the group to do the task”*

*“I enjoyed being able to talk to team members while playing and working together. It broke the ice”*

*“The challenge was very good and I thoroughly enjoyed getting to know people in my team”*

*“The magma challenge was very good and something that I have not done before and I really enjoyed it”*

During the challenge there were moments where students were not significantly involved in the Magma Challenge but were prominent in the team through talking to their fellow students. For example, in one instance a group of Animal Science students debated their favourite animal after prompting by the academic lead. This group included a student who was previously on their second year of a different course and had transferred allowing the group to also benefit from this student’s experience of University life. Forming these initial networks can be helpful in students negotiating their first few weeks in the University environment.

One of the aims of this project was to create an environment that allowed students to get to know one another and begin building relationships that would help with the transition into University life. At a time when the impact of isolation on a student’s mental health and wellbeing are a real possibility [Cellini et al (2020), Kalkan, et al (2021)], an activity that is fun but allows for conversation and interaction is imperative. A member of the ME Working Group works within the Sport and Wellbeing team which allowed the team to use their experience in running face-to-face ice-breaker sessions and have confidence that the initial embarrassment or tentative nature of students at the beginning of an ice-breaker session is usually short-lived and disappears as they become consumed by the task they are undertaking. The virtual ME Magma Challenge sought to replicate those same feelings and values, the notion that hesitancy is soon forgotten within the Challenge. Student comments hint that this was indeed achieved:

*“I enjoyed it as everyone mucked in and it helped with getting to put names to faces”*

*“It was a fun and creative way to get to know the campus, also a good team building exercise. Good ice breaker, especially in the current situation (CV19)”*

One student, who had not used ME before, appreciated the opportunity to try new things within the campus setting:

*“I had never used minecraft before, therefore it was a great opportunity to try something new with the added benefit of being able to view the campus”*

Student comments demonstrate how a relatively simple activity can positively impact on a student's transition into Higher Education. They allude to some hesitation or a tentative feeling about progression into Higher Education and their need to better understand their University physical environment, which in many cases, is also their new home. In addition, they demonstrate appreciation of exposure to new skills and experiences.

Student connection and belonging is of significant importance for new starters (Rayle & Chung, 2007) with belonging or a student feeling valued having an impact on a student's resilience to academic pressures. Throughout remote learning, mattering can become increasingly difficult to provide, however, these comments suggest the activity resonated with the new starters.

### **Teesside University ME Working Group Reflections.**

The running of the ME Magma Challenge relied heavily on staff members being trained in using ME to a level that would allow them to deliver the sessions to the students. Once trained, staff were then tasked with running the interactive part of the Challenge with their own students. Unfortunately, this left the project very susceptible to the attitude of the staff leading the session, in one instance a staff member presented the challenge to their students by saying they were *“not really sure what the point is and I don't get it”*. This attitude was then replicated in the student feedback, with student comments of *“wasn't very well suited to us”* and *“I don't think Minecraft was very age appropriate”*.

This only happened in one session and therefore definite conclusions cannot be drawn, but ensuring staff support during the Challenge is an important aspect of the deployment of this type of activity as in a new environment students may be more influenced by a staff's comments. Students are vulnerable as they transition into a new home, especially during a pandemic when there are many unanswered questions. The attitude of a teacher therefore has both positive and negative impacts on students (Ulug et al, 2011).

Additionally, resistance or a lack of acceptance because of the perception of peers, needs to be carefully managed when considering using ME in the Higher Education teaching environment. For some there is a perception that it is a simple game played by children which then may impact using this technique effectively in Higher Education. Care needs to be taken when approaching a session using a novel idea in order to avoid leading the students to a negative mindset.

It was observed that at start of sessions students were often reluctant to put their cameras on or engage proactively in conversation but as sessions progressed conversational flow increased and often conversations between participants became non-academic in nature. An excellent example of this is a session run with a Biological Sciences student group. The group would not put on their cameras at the start of their session and would only engage in conversation when addressed by the academic staff member. As the session progressed, students chose to turn on their cameras and their engagement in conversation increased dramatically. By the end of the session they were enthusiastically discussing their favourite Netflix shows and recommending shows to one another. Discussions such as these are often the building blocks to future friendships, and this is demonstrated in student comments:

*“I found it great and funny talking and working together with the group to do the task.”*

*“I enjoyed talking with the people on the course and getting to know them better”*

*“I got to know people a lot more”.*

This demonstrates how the ME Magma Challenge can be used to facilitate peer bonding and connection between students. These connections help to build stronger relationships thus helping retention within the University. Universities who wish to improve the transition experience into Higher Education should look towards creating ways which facilitate the creation of meaningful social connection (Maunder, 2017) such as seen in this challenge. This project also demonstrated that ME can be used across multiple degree programmes to create such opportunities.

## **Conclusion**

The project provided an induction activity for students entering the University at a very uncertain time. ME was used to perform an ice breaker style induction activity to increase exposure of students to one another and a member of staff. This was formulated in the guise of a Magma Challenge where students worked in teams to negotiate a Magma pit on Teesside University’s Virtual Campus.

Feedback from staff and students was highly positive. The low entry barrier to using ME as an academic teaching tool helped students to be able to effectively engage. The challenge itself saw students actively getting to know their peers and teaching staff while gaining an understanding of the campus layout.

These meaningful interactions the students experienced as a result of the ME Magma Challenge helped students to feel more comfortable and connected to the University campus as well as other students on their course of study.

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## **Appendix 1. List of questions comprising the student questionnaire.**

1. The challenge was set on campus to allow you to become more familiar with our campus layout, do you feel you have a better understanding of where the buildings are on campus?
2. With regards to the Magma Challenge being set on Campus, have you any comments regarding this?
3. Has the fact that the Magma Challenge was on campus made you feel more comfortable about coming onto campus?
4. Did getting to know the campus via the Challenge make you feel more confident that you will be able to find the buildings you need in your study?
5. Did you enjoy the Magma Challenge?
6. Why did you enjoy/not enjoy the challenge?
7. Do you feel more confident with Microsoft Teams and OneNote following this activity? These are both packages you might encounter in your studies
8. Can you remember the name of someone on your course following this activity?
9. Can you remember the name of the staff member who led the activity in your Teams site?
10. Please add any further comments on the activity that you have
11. What course are you studying?