The Virtual Workplace

Is Higher Education Ready For Virtual Hybrid Working?

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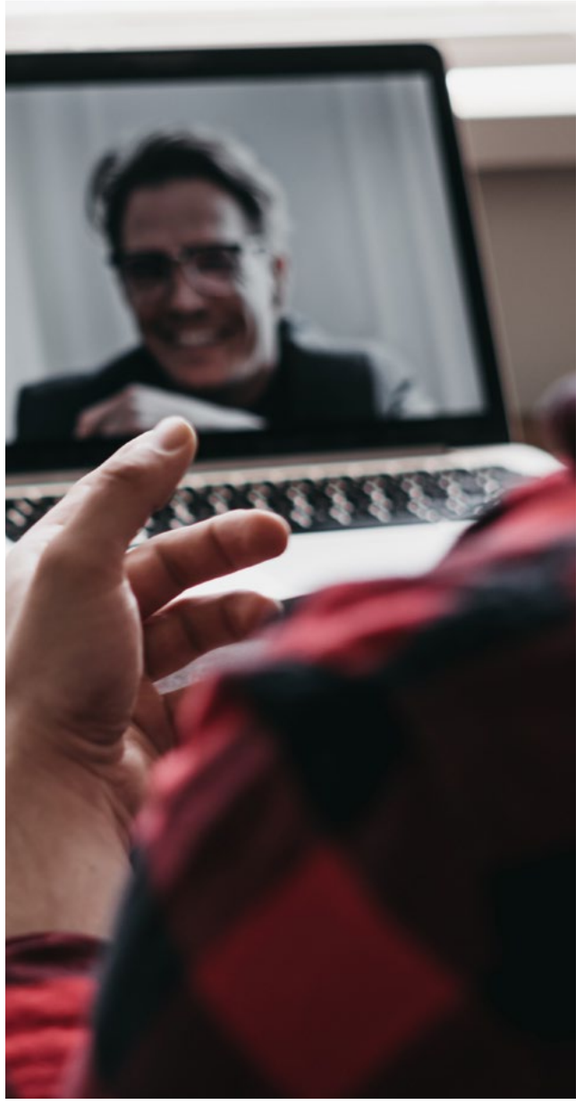

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Introduction

Spring / Summer 2022

Series of tests carried out in the spring / summer of 2022

100+

LDS Staff members

Spatial

Virtual platform used as an alternative to Microsoft Teams

Is Higher Education ready for hybrid, virtual working?

This report answers the question of whether virtual environments can support effective, collaborative hybrid working by providing detail and explanation of the Digital Working Environment Exploratory Project (DWEEP) carried out within the Learner and Discovery Services Unit at The Open University in the spring / summer of 2022. Over one hundred members of staff took part in the project, using a virtual platform (Spatial) as an alternative to the usual video conferencing tool of choice (Microsoft Teams) to undertake a series of team events, with mostly positive outcomes. The users utilised a range of hardware to interact in the platform and many users enjoyed the collaborative and spontaneous nature of the platform. However, throughout the testing we identified a number of challenges, particularly around the implementation and use of virtual technologies within a University environment, that would need to be addressed before such technologies could be rolled out more widely across the Higher Education sector, all of which are explained in detail in both this summary report and the accompanying research paper.

Background / context

The Digital Working Environment Exploratory Project (DWEEP) is part of a larger programme of work, the Supporting Digital Transformation in Wales project, which is funded by The Open University in Wales (OUW) and the Higher Education Funding Council for Wales (HEFCW). The wider project aims to enable the OU in Wales to adopt more sustainable, accessible, and healthier working methods, particularly when looking at future hybrid working practices. A series of bilingual resources will be produced, aimed at staff and students, to help improve wellbeing for both. These resources are to be made available to education providers across Wales as part of planning for future digital provision

The DWEEP project itself has been led by the Learning Innovation team (LI) (LDS, OU) as a sub-project within which a series of virtual events have been run and observed by colleagues in the Learning Design team (also LDS, OU) to gather data and evidence to help provide an assessment on whether virtual environments can support remote collaborative working. One of the main project aims is to evaluate whether this type of event is, or could be, more effective and efficient than Teams, Zoom, and other remote working conference tools for remote collaboration, and could therefore help support sustainable hybrid working in the future.

Why is DWEEP important?

Since the beginning of the COVID pandemic in early 2020 organisations across every sector have faced significant challenges to normal working practices, with many institutions relying on the ability of their workforces to work remotely, usually from home, due to enforced closures of offices and physical spaces. This seismic change to the daily routines of most companies has happened at an accelerated pace, meaning new working methods are necessarily being implemented at scale, but with very little prior experience or knowledge of such practices.

In the search for solutions, hybrid working has been identified as the most likely form of long-term replacement for many organisations. However, what hybrid means is something that is yet to be defined. A prolonged period or trial and error has been taking place within many institutions to establish this and will no doubt continue for some time to come, as organisations look to establish what it is they need, or even what they can afford.

This period of enforced learning has led to the need to experiment with and trial new technologies in search of solutions. For the most part, those that have been implemented are simple digital replacements for mechanisms that would have taken place in person, on site, yet there are still gaps looking to be filled. Virtual, collaborative environments could be classed as the next logical step in this.

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In recent years there have been major advances in various digital technologies, especially in collaborative, social platforms, which have become widely adopted for virtual meetings. Applications such as Microsoft Teams, Zoom, and other video calling systems are leading the way in this area, regularly improving their offering with additional features, updating the quality of the user experience, and improving reliability. They are, however, relatively simple in their setup, primarily delivering one to one calls, one to many presentations, or semi-organised small group conversations. They offer a fairly structured experience, this being a requirement due to the nature of the platform, which is based upon organised, timed meetings, and the webcam interaction offering little room for manoeuvre for participants.

Virtual reality is quite different with respect to the collaborative, social platforms that it can offer as an alternative. These environments are less structured, offering spaces that are available 24/7, whenever a user wishes to use them. The environments also provide opportunities for spontaneous interaction, with the ability to host multiple groups working simultaneously in the same space without interrupting each other, but with the ability for the groups to mix and reorganise at will, unlike the breakout rooms in systems such as Teams or Zoom.

With the huge advances in immersive technologies comes similarly big developments in the methods that users can take advantage of to interact within them. While VR headsets are developing at rapid speed, it is the use of laptops, desktops, and mobiles where the virtual environments are opening up possibilities at an increasing rate. It is on these devices where the greatest opportunity perhaps lies, as these devices are almost ubiquitous within society and almost every worker within an organisation will use a laptop or desktop for their daily work, whereas VR headsets are very much still a niche technology and fairly rare. Given that these virtual environments can run in a simple web browser, on standard specifications, and require no download before use, they could easily be rolled out to users within a very short space of time, just like a link to a Teams meeting.

Outside of the technical advances in the field of VR, it is also a huge growth area and therefore an important area to keep track of. There has been incredible investment by the major technological corporations in recent years. Interest in the ‘metaverse’ and the uptake of virtual, social environments by users has even led to Facebook forming a parent company and naming it Meta. There are billions of dollars currently being invested by Meta, Apple, Microsoft, and Google in environments specifically designed for workplace interaction, so it is vital to be aware of these ahead of any potential release.

It is for these reasons that it is important that we carried out this project, working with colleagues across the Learner and Discovery Services unit in The Open University to test and research the user experience, consider the technical challenges, and to look at the possible operational implications of implementing such technologies at scale.

What is contained within this report and who is it useful for?

This report outlines the key information about the project, its objectives, provides a summary of the project findings, and includes a conclusion about the possible implications for the OU in Wales and the HE sector with regard to the adoption, development, and possible implementation of virtual environments within a HE institution. It should be viewed as a summary document, highlighting the key benefits and challenges relating to virtual environments within the workplace.

This summary report is also accompanied by a detailed research paper which outlines the full findings of the Learning Design team, who were responsible for the evidence gathering and analysis throughout the project.

Together, these two documents will help to inform anyone looking for information on the possible implementation of virtual environments across a number of roles and disciplines, including, but not limited to:

- Key stakeholders at institutions looking to implement post-pandemic hybrid working
- Management / senior management considering the benefits, risks, and potential challenges of rolling out such technologies
- Users within organisations currently trialling or rolling out virtual collaborative environments
- Colleagues and peers across the HE sector with an interest in virtual technologies
- Researchers looking for information on the user experience with such technologies

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Key project questions

What is immersive technology?

There are many types of technology which can come under the banner of immersive. These include:

- Virtual reality: a wholly simulated experience, which can resemble the real world, or not
- Augmented reality: takes place in the physical world, with elements overlaid on it virtually
- Mixed reality: a hybrid of both virtual and augmented realities, where there is interaction between the real and virtual elements

Each of these technologies could also come under the banner of extended reality (XR), an all-encompassing term for any simulation using elements of each of the above mediums.

For the purposes of DWEEP we concentrated solely on virtual experiences, although it should be noted that this was not solely via a virtual reality, immersive headset, but rather also through the use of laptop, desktop, and mobile devices and internet browsers that can run virtual experiences.

The ability to use alternative devices to VR headsets was crucial in this project as VR headsets are not yet commonplace, nor affordable to institutions to purchase at scale, and as such could not feasibly be envisaged to be a solution in the short term. Therefore, any technology we could trial needed to be extensible across multiple platforms with cross-platform and cross-device support.

What questions did we want to answer?

Is the technology ready?

With regard to the technical platforms we wished to experiment with, there were questions to be answered over the reliability and performance of the software across the range of devices we wished to test on. These virtual platforms are still in their infancy and rapidly developing, so the stability of the platforms was a key concern.

We also had technical concerns around the capability of the hardware that our users are provided (primarily laptop and desktop) and its ability to run the virtual environments. This could potentially be a blocker to the use of the platforms if the devices were not of a sufficient specification.

An additional complication which needed further research was the possibility of using such platforms on the University's existing network infrastructure. The standard security protocols employed within most organisations generally blocks such systems from working, due to the nature of the network ports that they utilise being classed as a threat. While we have specialist networks on which we could test, if we were to correctly gauge the compatibility with University systems, and therefore the feasibility of mainstream adoption, we would need to test on the core networks.

Are users ready?

One of the key questions that was necessary to evaluate was the feasibility of possible future adoption within the University at scale, primarily for staff, but with an eye to the future for student interaction. User engagement was a critical question to be answered, most importantly whether users would be willing to trial the technology and engage with it to interact with their peers. In relation to this potential issues of digital capability and literacy were also elements that we would need to evaluate to ascertain if this hampered adoption.

There were also questions around accessibility, especially important for equality and inclusivity, given the lack of common features with virtual technologies that are usually found within other technologies. With further regard to the user experience, the potential issue of motion sickness that VR could induce was a concern that we wanted to evaluate via the use of headsets, but also something we wished to compare with the desktop experience, to see if there was any difference in the effect.

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What are the use cases?

After considering whether users are ready, one of the other areas for evaluation was the level of interaction between various groups of staff. We wished to assess whether the environments would work better for particular groups of users more so than others. For example, would it work better for graphic designers than it would for project managers. We could use this as a way of assessing if the system worked better for certain types of interaction over others, such as simple discussions compared to more complex workshops.

In assessing this, it would be useful to consider whether there are different types of use cases for these technologies. For example:

- Team meetings
- Information sharing / networking
- Collaboration and creativity
- Wellbeing
- Specific use cases for the participating teams (re: team objectives)

The project also provided an opportunity within the Learner and Discovery Services unit at The OU to test some of these new ways of working with regard to our ongoing preparations for post-pandemic working, where many of the above use cases are also trialled with hybrid technologies.

How does it compare to alternative approaches?

An important area for evaluation was comparing the virtual environments to the more established, implemented systems within organisations, as well as more modern alternative systems, such as:

- Video conferencing tools: Teams, Zoom, Skype, etc.
- Whiteboarding tools: Miro, Mural, etc.
- Presentation systems: PowerPoint, Prezi, Google Slides, etc.

Throughout the course of the project we would also look to identify other use cases and to determine if the virtual environments could offer viable alternatives to these.

Who carried out this report?

The project was carried out by the Learning Innovation (LI) team at The Open University. The team is experienced with immersive simulations, having developed multiple experiences and applications for courses as part of the OU curriculum, in addition to several other VR applications with internal and external partners. The LI team works with a diverse range of teams across the University, on site, remotely, and in a hybrid manner depending on the nature of the project.

For the LI team this project was an opportunity to test virtual technology with a wider and more representative audience than they would usually have the ability to work with on pilot applications. The usual audience tend to be early adopters and are therefore more engaged with such technologies, so working with colleagues across the University with little experience or knowledge of such technology would provide a good insight into the ability and capacity to adopt such technology.

There was also support for the project from the Learning Design (LD) team who conducted the observations of the events held as part of the project and provided an evaluation and assessment of the various data. Members of that team attended the various events held throughout the project and sent out a series of surveys to gather feedback and evidence from users. The LD team compiled the research paper that provides a full analysis of the project as a whole and which is attached as an appendix to this summary report.

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Project setup

There were a few important factors to organise before the project could get under way, such as the choice of a technical platform to use as part of the testing, as well as the methods for observing, recording, and evaluating the evidence.

Platform evaluation and adoption

Choosing a platform

As part of the choice of technical platform to use for the project for testing, we needed to assess various features of each virtual environment to find the most suitable system for our purposes. These systems included Mozilla Hubs, Spatial, Microsoft's AltSpace, amongst a variety of other platforms on the market, as well as considering whether we could develop our own platform in the time available.

We have included the features assessed, below, as a checklist, against which we assessed the variety of systems.

- **Cross platform support:** does the system work on Windows, Mac OS, Android, and iOS, whether that be a native application or a browser-based system. It also had to support Meta Quest headset usage
- **Technical support:** the system had to work on University supplied laptops (which are low in RAM, have low-end graphic processors (if any) and sometimes cannot install unsigned apps)
- **Network support:** ideally would work on University networks, but must work on home networks of a relatively low broadband speed / bandwidth
- **Usability:** is the platform easy to use, with a clear user interface
- **User requirements:** for example, accessibility, audio device support, etc.
- **Cost:** preferably the platform would be free to use, or at least low in cost
- **Design / setup time of environments:** ideally these would be used 'off the shelf' without any requirement for adaptation, but the chosen platform would need to have a simple and easily understandable interface, particularly when it came to adapting the environments, with simple UI options for moving objects and resizing them
- **Privacy:** a public system would be problematic, so the option for private rooms to keep users safe and secure while trialling was essential
- **User numbers:** due to the size of team events the platform needed to support up to 50 simultaneous users, per environment
- **Avatar usage:** how easy was it to set up avatars and how distracting were they
- **Integration with Office documents:** is it possible to upload assets into the system, such as PDFs, images, slide decks, as users would do within Teams?
- **Audio:** did the system feature spatial audio, i.e. does the system mimic lifelike scenarios where sound is directional and utilises multiple speakers to aid immersion?
- **Other functionality / features:** for example, were sticky notes available in the system, or did it have moderation tools, or a chat system to aid support

After assessing the variety of platforms available, using the checklist above, we narrowed the choice down to just two systems, Mozilla Hubs and Spatial which offered the greatest level of compatibility with our selection criteria.

We opted for Spatial mainly due to a few factors, particularly the ease of use of setting up a profile and avatar and getting started, the better choice of off the shelf environments, and the ability to amend the environments. The platform had to be easy to access for all users, as levels of experience with these types of platforms were extremely low to non-existent, so Spatial ticked more boxes after assessment of all of the features above.

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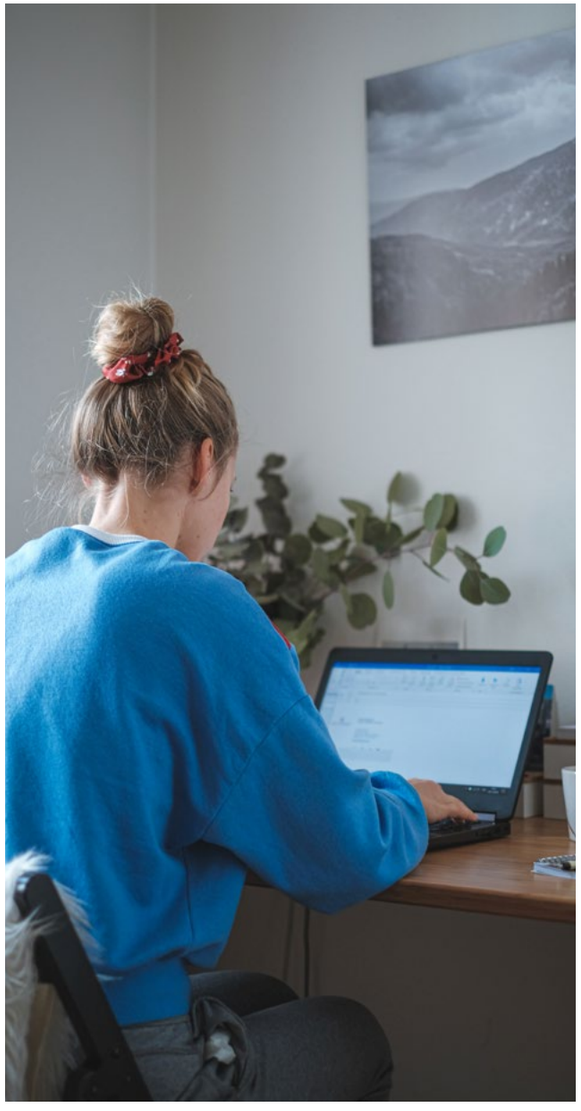
Platform concerns

Even after selecting Spatial as our chosen platform for testing, there were still some remaining concerns that we hoped to be able to iron out once the project started. These were concerns that were present across all platforms, and while Spatial supported these better than the other systems, not one supported these as fully as we would have liked. These factors included:

- Motion and video setting changes: so that those on low speed connections / low quality machines could amend settings in the virtual space for an optimal experience
- Sharing of spaces: the method of sharing a link to a room with other users (e.g. users would expect to be sent a simple link to click on to access the environment, like for a Teams call, but how integrated these are with our existing technologies or not was variable)
- 3D asset support: so that we could utilise 3D models and animations where required



Observations and evidence gathering

A major part of the project was gathering evidence and data from users and by making observations at the various team events. This excluded observing the orientation events, where we decided not to observe users while they were getting comfortable with a new technology and where the explicit purpose was to allow them to make mistakes and to trial navigation methods, etc. Observations during the orientation could have caused issues with users' willingness to take part in later events and therefore those events were just run as standalone, training events. However, for each of the subsequent team events it was agreed that the Learning Design team would make observations through attending the events (except for their own events, where the Learning Innovation team would instead provide the observations.)

Observers were to simply attend the events virtually and stay in the background. They would play no active part in events or any technical support, so as to remain impartial and not affect the outcomes of events. For each event, observers completed a survey form after the event, detailing their findings and these were later compiled as part of the overall evidence gathering for analysis.

All other attendees were classified as participants or facilitators and additional surveys were sent out after each event to each user according to their role. These surveys consisted of a range of Likert scale questions, along with free text responses to provide respondents with the opportunity to provide more information.

This information was collected and then assessed by the Learning Design team. These findings have been subsequently compiled into a detailed paper, attached to the end of this report as an appendix.

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Events summary

Orientation

There was a significant difference between the facilitation of the orientation sessions and the team events themselves. For the orientation sessions, it was necessary for the LI team to run these as guided tutorials, where we closely instructed users on what they needed to do to achieve:

- An understanding of the basic navigation
- Adjustments to settings to best suit their device (e.g. render settings, A/V setup)
- Knowledge of the various features in the platform and how to interact with elements
- Fix any technical issues

One environment for the orientation sessions was created and used for each event. The space was fairly simple in design, a series of numbered zones which the facilitator led users through one by one. In each zone the facilitator helped users either understand a feature of the environment, such as navigation, or worked with them to optimise a setting in the platform, such as render quality. The desired result was to have users reach the final zone and be comfortable in the basic features and have an optimised setup before attending their first team event.

To achieve this meant providing what was almost one-on-one assistance for users in each session, which was resource intensive for the LI team. There were also concerns that due to the lack of available time in people's diaries, users may not attend the orientation events. For these reasons, and to help as many people as possible to attend an orientation event, it meant increasing the number of orientation sessions massively from our original intention (from 6 to 26 events). However, ultimately orientation attendance was still fairly low, with around half of all users attending a session.

Team events

The team events were run over the course of two months, with some teams holding their three events at a rate of one event each week, whereas others spaced them out throughout the period.

Which teams took part?

For the team events, four teams were chosen, primarily based on their availability, interest, and possible future potential to utilise virtual technologies within the University:

- Graphic Designers
- Editors and production staff
- Project Managers and Commissioners
- Learning Designers

What types of event were held?

The variation in these teams meant that we were able to test several types of activity and could experiment with the various features, pushing the Spatial platform quite hard to ascertain what was or wasn't possible. The event types (and teams that utilised ran such an event) were as follows:

- Informal team discussions (Engagement and Partnerships and Editorial)
- Formal team discussions (Engagement and Partnerships and LD)
- Team show-and-tells (GMD)
- Collaborative workshop (LD)
- Auditorium presentation and discussion (Editorial and LD)

This variation in the event types meant we needed differing levels of technical support, with just one person required for some teams, but two people for others.

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Each session lasted 60 minutes, with 30 minutes of that time being spent in the virtual environment. Half an hour has been widely identified in the industry as an optimal amount of time to spend in a VR headset, especially for new users, and from the LI team's own research this length of time has proven to be about right, giving enough time to test the platforms, but not so much that users become too hot, disorientated, or start to feel uncomfortable. The sessions also started in Teams in order to provide a brief introduction to the session and they also ended in Teams in order to record feedback and to give a chance for questions.

In total, 10 separate team events were held, with all teams running three sessions, except for the much larger Editorial team, that ran a single, longer session (45 minutes) that was divided into two parts – the first a presentation in the amphitheatre, the second part an informal meeting in a gallery type environment.

10

Separate team events were held

60mins

Each session length

30mins

Time spent in the virtual environment for each session

Which types of virtual environment were used?

The environments that were used were all off-the-shelf options in the Spatial system, which can be categorised simply, as follows:

- Small, medium, and large galleries
- A 50 seater amphitheatre

Most events used a large gallery environment, as it permitted users to spread out across the space and to have multiple, simultaneous conversations without interrupting each other, as the spatial audio was turned on and any speech would drop off in volume as users moved away from the group, picking up again as they neared another conversation.

A couple of teams used the small gallery for their first event, but quickly found that the crossover of sound was an issue and as a consequence they decided to use a larger gallery subsequently.

The amphitheatre was used by two teams in slightly different ways – one to host a straightforward, traditional presentation, the other to have a discussion-based event where users would speak to facilitators at the front of the space.

The virtual space setup work for each event was handled by the LI team who added any necessary content and did some design and modelling work. However, this mainly consisted of adding signage and user assets, such as images and slide decks. The requirements were kept very simple by teams, who didn't want to complicate the experience too much for users.

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Key Findings and Challenges

Induction / platform adoption

The orientation sessions that were held did appear to have the required impact. Users regularly fed back that they appreciated the opportunity to get more comfortable with the technology before interacting with peers in their respective teams. There were multiple anecdotal comments from users referencing the desire to ‘not look stupid’ when using the technology with colleagues they worked with on a regular basis, something seen previously in the roll out of other technologies in the University, such as Teams. This also supports evidence from other VR projects run by the LI team, where similar comments have been made by pilot users.

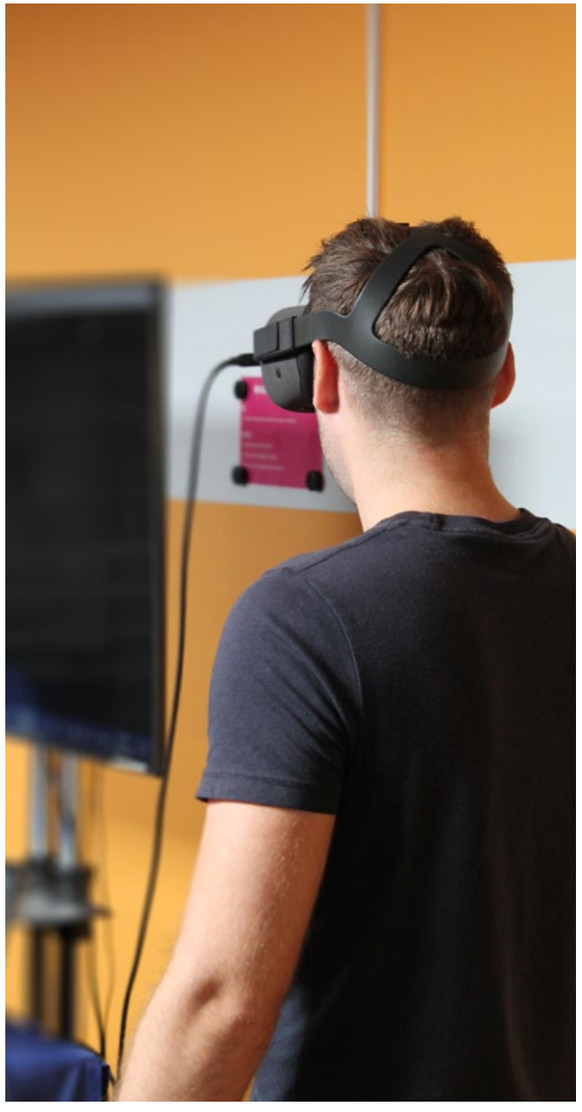
The increase in the number of orientation events held did help to improve the number of users attending an orientation event prior to attending their first team event. The smaller numbers in each orientation event also seemed to assist users in getting comfortable quickly, without worrying about how they may look to other colleagues. The spaces were also open 24/7 for users to go in on their own in their spare time, if they wished, to run through the zones again and to practice.

However, despite this, only around half of all total users that were invited did attend an orientation. This led to quite a difference in the experiences of users at their first team events. User feedback suggests that the orientation events made a significant difference in user comfort and helped to ensure good attendance at each of the subsequent team events, whereas those that didn’t attend an orientation fed back more negatively after their first team event and also experienced multiple issues and many did not create personalised avatars, also hampering their experience.

The evidence from the orientation sessions suggests that an extended period of orientation events would certainly be necessary if any roll out of immersive environments is to take place within an organisation. There is also perhaps a case to make these mandatory to ensure user’s attend – given only half of users came to the sessions in a project where they would be expected to be more engaged, it could be assumed that the percentage would be lower if they were optional when rolled out more widely to users that were less engaged.

Throughout the orientation events it also became clear just how varied people’s abilities were, ranging from not being able to grasp the nature of the 3D environment, to needing no help whatsoever and going off alone to complete the orientation activities. This highlighted the level of support that was required and gave us an insight into which of our colleagues would be able to present in the team events and which would be able to participate only.

Fortunately, by the end of each of the orientation sessions every participant could at least navigate and interact as required, achieving the base level requirement ahead of moving on to the team events.



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Team events findings – headlines

The research paper (Appendix I) authored by the Learning Design team explicitly details their findings with respect to each of the individual team's experiences, so the following is just a quick summary of the top level headlines from the research and observations, as drawn out by the Learning Innovation team. For each of the teams the LD team also looked to answer the key research question 'Can virtual environments support effective collaborative hybrid working?', so we have included their complete answers to that question in each section below.

Graphic Designers

The group strongly agreed overall that the virtual environment offered benefits in terms of collaborative working and hosting events. This was most likely due to the events aligning closely with the design of the virtual environment by Spatial for the purpose of the event, which is to allow people to display their artwork and move around the event.

The group respondents had some very positive opinions of the environment:

- 84% of respondents agreed that 'The virtual environment supported the event more effectively than MS Teams' (agree and above)
- 70% strongly agreed 'the virtual environment could support sustainable hybrid work in the future'
- 100% of respondents agreed 'the virtual event achieved the objectives outlined by the facilitators'

84%

of respondents agreed that 'The virtual environment supported the event more effectively than MS Teams'

70%

strongly agreed 'the virtual environment could support sustainable hybrid work in the future'

100%

of respondents agreed 'the virtual event achieved the objectives outlined by the facilitators'

There were some negative issues reported, primarily down to the Spatial platform, with concerns around audio (especially a delay / lag in the audio) and some connectivity issues resulting in people being ejected from the platform. These seemed connected to the power of the device used by the user, in this case laptops, instead of the usual iMacs the team would use.

However, the group consistently reported back about how they enjoyed using the platform. The head of the team specifically reported back that:

> **… the designers who took part in these sessions, thoroughly enjoyed the opportunity to try something immersive and different. They found presenting and viewing their gallery / artwork spatially was more intuitive and far more fun; something we often overlook at the OU.**

The nature of the environment, specifically the relaxed nature and freedom of movement, were cited as important positive factors.

Can virtual environments support effective collaborative hybrid working?

'In the use case demonstrated by the Graphic Media Developer team, the answer is yes. Virtual spaces such as Spatial allow presenters to display their artwork and collaborate with others in a more natural, free, informal manner than other ways, such as screensharing via MS Teams. They also enable multiple participants to view multiple artworks at their own pace, again unlike video conferencing platforms such as MS Teams where the presenter controls the slides and pacing.

Virtual environments also allow for participants to interact with various people within the space and not be restricted as they are in MS Teams where the groups are more fixed once set up. They can leave and join different groups in the virtual space at their own will and start conversations and collaborate. For the reasons described, virtual spaces certainly offer an effective alternative way for work colleagues to engage with others in a hybrid work context in terms of displaying artwork and collaborating.'

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Editors and production staff

Much of the feedback from this group specifically referenced the lack of familiarity with the environment and the technology used, perhaps unsurprising as only a single team event was held, meaning users had less chance to become familiar with the technology before providing feedback.

A representative comment from a user stated:

> **I think this group needs a few more goes and to try a different type of activity to see if that improved engagement.**

66%

of respondents disagreed that 'The virtual environment supported the event more effectively than MS Teams'

50%

thought that the 'virtual environment supported collaborative working'

This, unsurprisingly, was also reflected in the statistical feedback from the surveys:

- 66% of respondents disagreed that 'The virtual environment supported the event more effectively than MS Teams'
- Only 50% thought that the 'virtual environment supported collaborative working'

It should be noted that users in this group also seemed to have more technical issues than other groups, including:

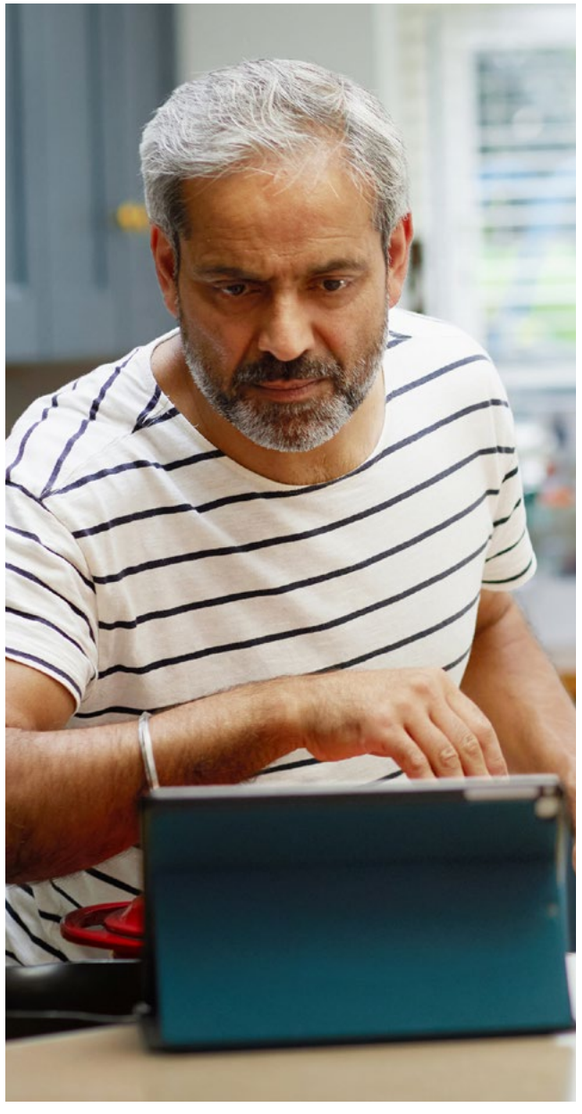
- low audio and video quality
- laptops struggling to cope with the demands of the virtual environment
- not being able to see presentation slides clearly

On the whole, the Editorial group appears to have had the least successful of the experiences.

Can virtual environments support effective collaborative hybrid working?

There has been a mixed response from the Editorial team regarding collaborative working in the virtual space. 3 participants (50%) agreed that Spatial supported a collaborative experience, whereas the rest of participants, as well as facilitators, neither agreed nor disagreed. However, there is a consensus that the virtual environment can support future hybrid working: with only one facilitator neither agreeing nor disagreeing. This points to the potential of the space and suggests that test experiences have led to a positive review. Certainly, it can be concluded that there is an openness to virtual spaces housing some work activities, such as the sharing of resources and meeting with colleagues. However, limited knowledge of the virtual space as well as technological issues need to be addressed.

For those observing the event, the virtual space created barriers through unnecessary technology but also a freer space for colleagues to interact. This mix of opinion is reflected in responses to the research question, where there is both agreement and disagreement that the virtual space supported collaborative working. This is also reflected in opinions on the virtual environment supporting future hybrid working: with one agreement and one neither agree nor disagree.



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Project Managers and Commissioners

This group of users appears to have had a more mixed experience than the previous groups, demonstrated in their responses to the survey:

- 60% of respondents disagreed that 'The virtual environment supported the event more effectively than MS Teams'
- 30% thought that the 'virtual environment supported collaborative working', whereas 25% did not, with 45% neither agreeing or disagreeing
- 40% agreed 'the virtual environment could support sustainable hybrid work in the future', whereas only 10% disagreed

60%

of respondents disagreed that 'The virtual environment supported the event more effectively than MS Teams'

30%

thought that the 'virtual environment supported collaborative working'

40%

agreed 'the virtual environment could support sustainable hybrid work in the future'

The mixed responses can be somewhat explained by the development of the responses from the first event until the last event. There was a clear increase in positive responses after each event, so much so that after the last event not one respondent disagreed that 'The virtual environment supported the event more effectively than MS Teams', compared to 66% disagreeing after the first event.

This change in response was evident in the changes in the responses to the surveys, and the Learning Design team have pointed out in their paper that:

> **Between Events 1 and 3, how participants behaved in the space changed as a shared understanding of etiquette developed. While participants were finding their feet with the first event, behaviour could be erratic, exploratory and playful as opposed to professional, with participants exploring the controls, the dancing, avatars and capabilities within the space. As the novelty value subsided, in the third event, participants started to behave more 'professionally' within the space, not engaging in disruptive action (dancing, running through others) and instead facing one another while chatting, with a respectful amount of interpersonal space.**

Once again, there have been references to technical issues faced by users that are very similar to the previous groups, with the addition of the group struggling with the spatial audio in the first event in particular, where the virtual space was too small for the number of participants, and was subsequently changed for the next events. However, there was a noted improvement from the first event to the last event as people got to grips with the technology, which is also a possible reason for the improved participant responses to the surveys.

Can virtual environments support effective collaborative hybrid working?

In the activity tested by the Engagement and Partnerships team the answer is that they can to some extent, but that it will introduce more technical and usability hurdles (reducing effectiveness) than existing hybrid working tools, like MS Teams. Compared with traditional tools, the chief benefits this type of activity presents in virtual environments are the sense of space, virtual colocation, and an ability to move freely between discussions.

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Learning Designers

Perhaps the most divided of responses from team members came from the Learning Design team themselves, where the range of responses to the various questions was spread out almost evenly across the range of options. For example:

- 20% of respondents strongly disagreed that 'The virtual environment supported the event more effectively than MS Teams', with 20% disagreeing, 20% neither agreeing or disagreeing, 20% agreeing, and 20% strongly agreeing
- 40% agreed 'the virtual environment could support sustainable hybrid work in the future', with 40% disagreeing, and 20% strongly agreeing
- 20% of respondents strongly agreed 'the virtual event achieved the objectives outlined by the facilitators', whereas 20% disagreed

20%

of respondents strongly disagreed that 'The virtual environment supported the event more effectively than MS Teams'

20%

of respondents strongly agreed 'the virtual event achieved the objectives outlined by the facilitators'

40%

agreed 'the virtual environment could support sustainable hybrid work in the future'

These responses are interesting as they conflict somewhat with the responses of the facilitators of the event, which are almost uniformly positive. This disparity between the experience of the participants and the facilitators is the most stark across all of the groups, where facilitators usually aligned fairly well with the participant feedback in the other groups. However, the level of the event complexity within the LD sessions was far higher than other groups and this could perhaps explain this disparity somewhat, with facilitators perhaps finding it harder to ascertain how things were going in complex activities compared to the more simple activities within other groups.

Again, there were some technical issues that users faced, which were quite similar to other groups, such as issues of connections causing dropouts, issues with the audio and the spatial audio function. There were also issues with the use of avatars which other groups also experienced.

> **VR spaces are very different - everyone is moving about and your avatar viewpoint often shifts. This is the nature of VR so people need to become conformable with it and establish an etiquette when in such spaces or it can become a stressful experience.**

Can virtual environments support effective collaborative hybrid working?

The Learning Design team test events suggest that, yes, virtual environments can indeed support collaborative hybrid working. This does however come with the caveats:

- Improving the experience with the specific tool (Spatial, or other technology) to ensure a consistent, frustration free experience
- Developing mitigations to accessibility challenges, and ensuring spaces offer inclusive means of interaction
- Engaging in activities suitable for virtual spaces, where the interactions, communication and collaborations are enhanced by the capabilities of the virtual space.

Overall Themes

When evaluating the feedback and responses to staff surveys, we are able to draw some key findings from the data, including:

- Participants had a generally positive reaction overall to the virtual spaces
- The closer spaces aligned to the purpose of the events, the more positive the reaction
- Facilitators and participants liked the sense of space, togetherness and presence (use of an avatar gave users a sense of projected agency)
- Users liked the informal atmosphere
- User confidence and capability within the environments improved across the sessions
- Technical challenges and a lack of accessibility options excluded some users
- Collaboration is the key benefit in virtual spaces, cited by participants and observers alike
- Guidance, facilitation and support are critical to building positive experiences with VR
- The use of the virtual spaces felt like a starting point: many participants, facilitators and observers saw the DWEEP events not as a fixed study, but as the beginning of a broader exploration of the tools that they would like to continue with

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Technical Issues

On the whole, the events ran fairly smoothly, but as with any new technology, when things go wrong technically, they can be fairly obvious and sometimes difficult to resolve. Throughout the course of all of the events held we ran into issues with the following on multiple occasions:

- **Internet speed and bandwidth issues:** the variation in the speed of home internet and the available bandwidth for services such as Spatial can cause issues with the reliability of the service, leading to dropouts and trouble connecting to the service. Many users experienced these from time to time, some more frequently than others (particularly those in more rural areas with low broadband speeds)
- **Laptops having too little RAM:** to run the virtual spaces, devices need sufficient memory, as without it the system can stall or crash, causing dropouts in the platform. Some users on low end University laptops had repeated issues trying to run Spatial, these user also having previously had problems with other applications requiring similar RAM commitment, such as Teams
- **A/V permission issues:** mostly this was where users did not permit the browser / website to access the microphone or webcam, despite prompts at the start of their session for this, and therefore could not get the mic and / or webcam to work. A fairly straightforward issue, but one that is difficult to rectify for users working remotely where digital literacy is an issue
- **Issues with audio lag / latency:** some users reported delays in the audio when interacting. This is difficult to diagnose and not something that the LI team has been able to replicate. It could be down to the individual audio setups of each user, or it could well be an intermittent problem with the platform, but due to the difficulty in establishing where the problem lies further research is required as it has a significant impact on the ability to interact within the virtual environments
- **Problems with spatial audio:** this was a particular issue with the crossover of speech / conversations, hearing audio from one area when standing in another area having a different conversation. This mainly occurred in the smaller virtual spaces and was mainly corrected by moving to larger spaces for later events, although some users still did not get the hang of moving further away from users to start a conversation. With time, this would likely resolve itself as users became more familiar with the technology. However, a spatial audio radius tool in the platform would be a welcome addition from developers, which would allow users to adjust the drop-off rate themselves
- **Problems with navigating around the environment:** again, an issue that mostly affected users in the earlier sessions, and resolved itself as users became more confident in the virtual spaces. However, for some users, they could not get past this and consistently struggled to manoeuvre around the spaces. It is difficult to know if this would resolve itself if the users had more time, although it might require additional one on one training to help users having these issues.
- **Text resolution and sizing:** this appeared to be an issue for those with small screens or with low resolution displays, where the user could not determine the name or read the text on certain signage / assets. This could occasionally be remedied by changing rendering settings, but mostly it was unresolvable for those with the problem. It is possible for Spatial to fix, but it would require a change in approach and as they are more concerned with graphical fidelity, it is unlikely they will make such a change. For users with high resolution displays or with larger screens, the problem is unlikely to have occurred.

There are some general themes that link several of the problems outlined above. These are issues across the HE sector, primarily due to the following:

- A lack of digital skills / literacy capabilities in general across the sector, including greatly varying levels of digital literacy even within a single team, but especially from one team to the next
- Remote working is generally poorly supported (and underfunded), so users either self-fund fast connections or accept low speed / dropouts and the issue persists until an intervention is deemed necessary by one party or the other
- Allocated machines are low-end and not up to the task of utilising more modern software applications, such as VR

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Platform updates

However, during the course of the project, Spatial made various updates to their platform which made it less reliable and more like Mozilla Hubs. For example, they updated their avatars to the same system as used within Mozilla Hubs (a system called Ready Player Me, which is a cross-platform avatar tool). This made the process of setting avatars up much more complicated than it had previously been and introduced many customisation options, which only gave users more options and caused more confusion and distraction when creating or updating their avatars. This change was also introduced right in the middle of the orientation events, just before the start of an event, causing significant disruption and introducing more confusion for users that were new to VR.

Most frustratingly, further updates to the platform came without warning or notice and this caused some issues with some events. The updates tended to cause technical glitches we would only discover in the live events and caused some problems for users that we were unable to resolve until after the event. While such changes are commonplace across all of these platforms, due to the continual progression and development of their offering, what they demonstrated was a significant issue for an organisation that is looking to introduce a new tool, where stability and confidence in the operation of the tool is paramount. It also demonstrated just how difficult the ever-changing nature of these systems could be for users, who are trying to learn a new system which is changing before they are even comfortable with it.

Spatial's strategic move towards capitalising on the growing non-fungible token trend (NFTs are a record on a blockchain associated with a digital or physical asset, the ownership of which can be transferred by the owner, allowing them to be sold and traded) and away from its core collaborative, social platform, also meant that some of the technical glitches that were introduced did not get fixed during the course of the project, despite new NFT features being added in that time, and the overall platform experience became more unstable over time.

Of much interest, just before the end of the project, Microsoft released a huge update to AltSpace, overhauling the visual look and feel, the user interface, and introducing a variety of new features, including an environment builder tool. These changes improved the nature of that platform to the extent that had those updates have been released in April, it might have swayed our overall platform selection. It also further highlighted that these systems, and VR in general, is still developing at a very fast rate and it is difficult to predict exactly what will be coming next, demonstrating the difficulty (or perhaps even the futility) of making long term choices today.

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Implications, recommendations, and next step

Implications for The Open University in Wales and the Higher Education sector

While this report is written using the data from testing and research carried out within the Learner and Discovery Services unit in The Open University, there are clear and obvious connotations for our colleagues at The Open University in Wales and across the Higher Education sector in general, due to the extremely similar nature of our organisations.

Many of the themes and outcomes detailed throughout this report will be similar at a wide variety of educational institutions across Wales and more widely across the United Kingdom, possibly even continentally and globally. These key implications are explored further, below.

Technical challenges

Perhaps the most obvious of the implications are the technical issues involved in utilising and rolling out any such technologies. These can be broken down, as follows:

Device compatibility

It will be rare for most educational institutions to possess the technology to make use of VR via headsets. In fact, the majority of organisations will have little to no VR facilities and the speed of the changes in the field of virtual reality means that it would be hard for many to invest and then keep up with the technological advances before equipment becomes obsolete. This almost rules out VR via a headset for most organisations due to the cost of investment in the hardware. It is, in fact, one of the key reasons why we chose a platform that could be used via a desktop / laptop device and a mobile phone for testing.

However, there are still some issues when utilising the virtual platforms via a desktop / laptop device. As per our findings, there can be issues with the graphical aspect of these platforms, which require a large degree of computational power to run the virtual space. As our testing proves, for some machines this simply isn't possible and the user cannot maintain a stable connection, due to the PC device they are allocated having too little RAM, or a low end CPU and / or GPU. While for some users this is never an issue (for example, those with a modern MacBook / iMac or a high-end Windows Ultrabook / notebook / desktop), for the majority we would expect this to be a challenge. The Open University is perhaps typical in terms of the type of machine that staff are provided with and we would not expect a high degree of variation across the sector from our own. If we are correct in this assumption, then there would inevitably be problems for many users. This is certainly an area where additional research across the sector is required to ascertain a base level of device for an average user.

Current compatibility with IT security policies

We were fortunate in a way that we carried out this project while the majority of staff are working from home. That is because the use of these types of platforms is currently blocked on Open University sites. That is primarily because these platforms use specific ports to support peer to peer networking, similar to the technology used in multiplayer gaming. For most IT departments, the use of these ports is seen as a security risk and it would be quite likely that similar blocks are in place across other institutions. Spatial (and indeed each of the other virtual platforms that we reviewed) are currently blocked across the entirety of the Open University physical spaces, except for in specific exemption areas, such as the Learning Innovation project room, where teams are permitted to test such technologies with security clearance.

In order to recommend the adoption and rollout of these virtual platforms today, we would need to be confident that IT departments would be willing to immediately whitelist such services to allow them to be used on a general basis. However, we do not believe this is feasible in the short term and will require investigation work in cooperation with IT security teams in the longer term, so therefore we cannot currently make such a recommendation.

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Development and technical support requirements

While the platforms we assessed, and indeed the one we chose to use for testing (Spatial), are freely available to users, they are basic in their default offerings. While users can certainly interact within the environments, the types of activities that teams will want to carry out will inevitably require some additional setup work. This was true within our testing, where every team needed at least some level of environment setup to be completed by the Learning Innovation team (who have developer experience and knowledge) and also technical support when running their events.

For the vast majority of institutions, such technical support resource is simply not available, let alone specific development resource, especially not without charge, as is the case within LDS at the Open University. Therefore, it would require specific staff to be employed to handle such work, or the work to be contracted out, both of which will incur significant costs that are likely infeasible in the current economic climate. Even if an institution has such resource, or the funding to employ said resource, there is still a requirement for collaboration between the teams needing the environments to be set up and the people fulfilling that requirement which will mean additional people hours are required. This is a significant economic challenge to deploying these technologies in small teams, let alone at scale.

Platform evolution and unannounced changes

Another challenging aspect is the nature of the various virtual platforms and the constant evolution and changes made by their developers in pursuit of market traction and dominance. While using Spatial for our testing they significantly changed key elements of the platform, including the avatar setup and usage, as well as the types of asset that you can use, in their pursuit of the current NFT craze. This pivot from organisational and business support to that of going after a share of the NFT market could not have been predicted and was not announced.

These types of platforms are in their infancy and there are no contracts with organisations for long term support. This means they cannot be counted on for long term fulfilment of an organisation's virtual collaboration needs and need to be viewed as a risk, and rather as a short term solution for short term projects or team collaboration, at best. This may change in the future, as Microsoft and Meta are both going after the business market with their respective platforms, but Microsoft's currently doesn't feature any of their Office type elements and Meta's system is not even available outside of their organisation as yet.

In light of this, we cannot currently recommend pursuing these platforms at scale and while they are still changing so rapidly and substantially on a weekly basis.

Logistical challenges

The challenged we faced here will likely be typical across the sector. We had a number of operational issues to get around before we could even get under way. With just four months to complete the project, and just a few weeks' notice before we needed to start, we had to procure all of the equipment and fast. This proved difficult to do within an organisation that has strict procurement procedures and which is not used to the implementation of these technologies, even for small scale testing. The standard process for the purchase, delivery, and processing meant that the VR headsets did not arrive in time for us to use as part of the orientation events, scuppering an element of the platform induction we had planned for and meaning we had to adjust our plans for the subsequent team events somewhat.

This may seem like a trivial issue to include within a report such as this. However, these issues are typical across the HE sector and will be common to other institutions where the purchase of specialist, virtual technologies is not something that there will be a process for, or even understanding of among those colleagues ordering and processing the equipment. This lack of knowledge and experience is something that hampers the sector's ability to move quickly to adjust to any new technology and will continue to be a factor in the coming years, as it is unlikely significant changes will be possible due to funding and budget allocation within educational organisations.

Within the University, the project was also scheduled for a difficult time of the year for our users – April to July – right in the peak point of production of our courses before the September course start dates / student intake. The summer months are also when many of our colleagues tend to go on annual leave, reducing the number of potential pilot users that we could work with for testing purposes. Both of these concerns will be the same for the majority of HE sector institutions.

We needed around 100-150 users to complete the testing, each of whom would need to give up around one to two days of their time during this busy period, which is not an insignificant ask. The project requirements would also mean taking over regular team meetings for pilot teams for around two months within which we would run the events, aiming to cause the least amount of disruption. On top of the ask of users, we also needed to find time within a small team to run the events, and also for our colleagues in the Learning Design team to observe the events and run analysis and evaluations after each to record findings and collect data for the final report. There were also concerns around rising levels of COVID affecting user availability, something that is ongoing even now and will likely remain an ongoing issue.

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Cultural

This is a much harder area to predict and every institution will be different in terms of their organisational approach to and desire for technological change. However, it should be noted that there are some cultural challenges in the adoption of virtual technologies, some of which we have seen have a positive influence on adoption, others less so.

On the whole, throughout our testing, user interaction was positive and we experienced a good number of those invited taking part in a constructive and positive manner. There were, however, challenges for many, and this led to some reluctance to engage. Not everyone came to an orientation session and in the Editorial team there were significant operational issues that led to this being more of a challenge for that team than others.

There are certainly concerns around digital literacy and digital skills levels that would need to be explored. The Open University is perhaps a little more exposed to digital tools and services than some other institutions, but even within the LDS unit, where multiple digital tools are used by the majority of staff daily, there were still some problems where users struggled to understand and interact with the devices and technologies. This would likely be a bigger issue when extrapolated across the whole of the University and certainly more so across the sector. VR is still in its infancy, however, so this could perhaps lessen over time.

Financial

Quite an obvious challenge perhaps, and one which is covered briefly in the other challenges outlined here, but one which should not be underestimated. In people time alone the project used hundreds of hours of work to set up, run, and evaluate the sessions. There would inevitably be a time resource attached to any rollout within an institution and this would need funding. There is also the obvious outlay in terms of the devices required and the potential cost of setup of the virtual environments. The platforms currently permit free use of the virtual spaces, but this should also be kept under review, because at some point the owners will want to monetise these in order to recuperate investment costs.

Accessibility

This is an area, unfortunately, where there are multiple issues for virtual environments. Even if you take out VR headsets from this equation (as there are situations where headsets are almost completely inaccessible for certain users), the platforms simply do not work with the majority of common accessible technologies. This ranges from a complete lack of support for the major screen reader technologies (such as Dragon and JAWS), to a lack of compatibility with various accessible hardware, as we experienced when trying to support users throughout the project. There are also key accessibility features that simply don't exist within the platforms, such as ALT text, close captions, audio descriptions, colourblind support, etc. This lack of support is perhaps surprising, given VR's close affiliation with gaming, where companies like Microsoft and Sony are ploughing millions into accessible support for gamers.

Until the various platforms start supporting common accessible software and hardware options that are used by large numbers of colleagues across the sector, these types of platforms can only ever be seen as useful for piloting and testing, as opposed to be being rolled out at scale for general usage by staff and students.

Recommendations

We have some suggestions (with more to come) for any institution looking to implement a virtual collaboration space in the near future:

- Create user buy-in: work co-operatively, don't force VR
- Communicate both the potential and limitations of VR
- Give users time to develop their virtual identity (with extra sessions): it can take time to feel comfortable in VR
- Training is essential: the provision of a series of facilitated orientation events is critical in allowing users to experiment with the functionality and for them to become familiar with the environment and how to navigate around it
- Provide support to facilitators to create suitable virtual spaces
- Share best practise and templates where possible
- Don't force virtual environments on users if alternatives are better; e.g. Zoom, Miro
- Play to the positives: begin with spaces that are social, interactive, fun, and designed with users for their needs
- Ensure there are alternate resources for users who cannot use the virtual environments.

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Next steps

In light of our testing and research, we would recommend that the following steps are taken with regard to moving forwards:

1. **Carry out additional research in this area:**
   From the feedback provided by the people that took part in this project, there are a variety of additional pieces of research that may be useful to carry out:

   a. Run some test events that use solely VR headsets, due to the extended positive nature of the experience that those that used them reported

   b. Hold informal meetings in the virtual spaces over an extended period of time to evaluate their impact on hybrid working

   c. Conduct specific research into how virtual spaces could be suitable for use from and EDI perspective

   d. Additional testing and research into the cognitive overload caused by virtual spaces

   e. Test alternative platforms to establish if there is better support for communication within them (e.g. chat) that could support users that are struggling to use Spatial

2. **Continued monitoring and assessment of virtual reality collaborative environments:**
   These environments are changing so rapidly, as seen during the course of this project, where substantial changes were made not just to Spatial, but to the other platforms that we had considered at the start of the project. It is extremely likely this development will continue, especially given the considerable investment being made in this area by some of the world's largest technology companies (Meta, Microsoft, Apple, Sony, etc.) We anticipate that many of the new collaborative environments being developed, particularly Meta's Horizon Workrooms, might be made available soon for use by the general public and this would significantly shift the landscape and possibilities for the Higher Education sector in general.

3. **A sector-wise review of current compatibility with IT security policies with respect to the use of these technologies**
   Educational institutions are currently ill-equipped to adopt these technologies at scale for multiple reasons, but IT security protocols can be a significant blocker to the trial, adoption, and roll-out of such platforms. Technically the platforms could be easily made available if deemed safe. However, the level of risk and appetite needs to be assessed and the legitimate concerns of IT departments need to be reviewed together with operational teams wishing to use such technologies to address these concerns. It would be beneficial to do this as a sector-wise exercise so that multiple institutions can contribute to a more informed and reasoned debate, sharing that knowledge and speeding up any potential adoption process.

4. **Review a case for investment in core hardware devices and technologies**
   During the course of this project we identified that a lack of computational power was hampering many users' ability to interact with these technologies. This is unlikely to different at other institutions in the sector and such challenges will hamper any potential adoption of these virtual platforms. Now, while the VR sector is still in its infancy and yet to release the key platforms, would be a good time for a sector-wide review of the capability of institutions to support such platforms going forwards, if only to establish what kind of case would need to be made to upgrade the core technologies available to users in the sector.

5. **Continued small-scale trial and testing**
   Separately to the specific research outlined, continued small-scale and limited testing with small numbers of users within a specifically operational context would be useful to conduct within institutions that can support this. While specific research is necessary, agile and short term testing in an operational environment will quickly highlight where the technologies are at and if conducted at regular intervals it will enable organisations to adapt quickly once the technologies mature. The LI team at The Open University will be doing exactly this within the Learner and Discovery Services unit and if such testing was carried out at multiple institutions and the information shared, the sector could manage the risk more easily and be quicker to adapt when the time comes.

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Summary

This report outlines some of the key challenges which are faced when trying to take advantage of these new virtual environments.

As explained, the platforms are developing at speed and therefore we would recommend that they are monitored and developments tested and piloted in small scale projects, where possible. The Learning Innovation team at The Open University will continue to test these platforms moving forwards and at least three of the four teams that took part in testing for this project are keen to continue working with us and piloting the technologies in regular events over the coming twelve months. This in itself could be regarded as a recommendation and is certainly an indication that this type of technology might offer something that users want that is not being delivered by other platforms.

Can virtual environments support remote collaborative working?

If we wish to draw conclusions from the project, we can look to review the research question posed: 'Can virtual environments support remote collaborative working?' From our findings, we summarise the response to this by answering our research questions, below.

Is the technology ready?

Yes, if the intended use is relatively straightforward and users have the correct hardware to run the environments. We found varying levels of issues across our testing, meaning that for some users these environments worked very well (e.g. for exhibition type events for Graphic Designers, who have a good specification of hardware), whereas for others they did not work well at all (e.g. for users with accessibility concerns or with low-powered laptops).

There are certainly multiple accessibility problems with the technologies at the moment, which would mean the technology could not be rolled out across an organisation to all users. However, for discrete groups where this is not a concern, and where there are no technical problems with delivering the environment, the technology works well and is well received.

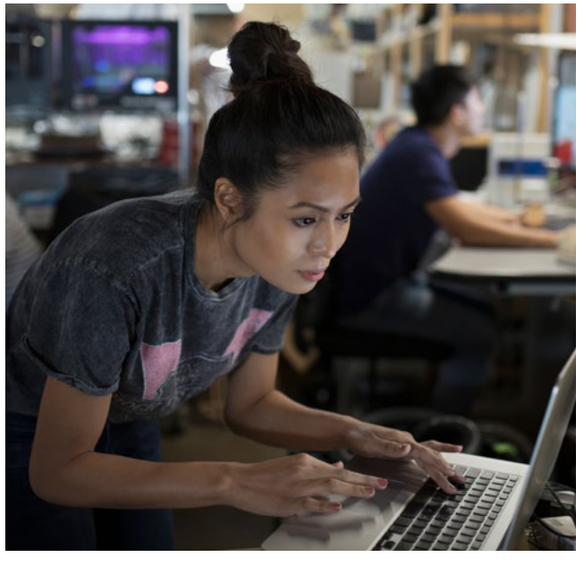
In many ways, this feels similar to when video conferencing tools were being developed and made available for commercial usage. For some users they worked well instantly, whereas for many others the technology took a few years to provide all of the features that are necessary for delivery and usage at scale. If we look at the speed of development and progress in this area and the desire of development companies to capitalise on the market, it is possible to assume that it may not take too long before the necessary support features are in place.

Are users ready?

This is a much more difficult question to answer outright. It is essentially yes and no, simultaneously. This is primarily down to the fact that some users are able to adapt to and adopt the technology almost instantly and with very little support or guidance, whereas others consistently struggle even after continued exposure to the platforms, even with support and facilitation. However, the experience of those that adapt quickly is so positive that the advantages appear to outweigh the disadvantages for many.

If institutions believe the technology is ready to use and are looking to implement it with their staff and / or students, then it would be advisable to look for pilot teams and to test with small groups to establish where best it can be utilised with the least amount of disruption and the highest degree of success. A widespread rollout of the technology would almost certainly fail, and whichever route is taken, users will need support and guidance from technical staff, even if they appear to be confident in the use of the platforms.

The changing state of the platforms will also mean that institutions will need to stay on top of developments and adapt to changes as they arise. From what we have seen in just a few months of testing, this is an ongoing and frequent process.



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What are the use cases?

This is difficult to answer with complete certainty, but from our testing and research we have seen that the technology works well in the following scenarios:

- **Small to medium collaborative groupwork**
- **Spontaneous and unstructured conversations in small groups**
- **Exhibition / gallery events**
- **Focused workshops with multiple small groups**

There are likely to be additional uses that we did not cover, but for each of the events we held throughout testing where these types of activities were run, the platform did a good job of allowing users to interact in ways that were significantly different to other platforms, such as Teams and Zoom.

However, we also found that some activities do not currently work as well, such as:

- **Presentations to large groups**
- **Unstructured / unfacilitated large group conversations**
- **Complex activities involving multiple, complex assets**

In the events where such activities took place, we regularly saw too much crossover of audio between groups, making it hard for people to hear what was being said clearly. In the presentation space a large groups is difficult to accommodate due to the low resolution of the text on many users machines. The usage of multiple 3D models and high resolution assets could also cause the web app on users' machines to fail, meaning they dropped out and had to re-enter the space, which quickly became tiresome.

In order to run a successful activity, the use case needs to be well thought out and tested within the environment before run in anger with users. When this is done, and any activity adapted to meet the requirements, then many events can be successfully run and meet, and even exceed, the needs of users, as seen in the Graphic Design and Learning Design team events.

How does it compare to alternative approaches?

On the whole, and in light of the responses to the questions above, virtual environments can offer a useful and clear benefit to users in comparison to what can be achieved in other platforms. There are obvious benefits to the collaborative and spontaneous nature of virtual spaces in comparison to the more rigid and structured approach of tools like Teams and Zoom, particularly when planning and delivering workshops and collaborative events. The virtual rooms also offer benefits for those looking to run sessions on wellbeing and where teams wish to have a sense of connection and belonging, such as induction events for new members of a team or for social events. They also allow users to have spaces that run all day, every day, so that users can go into the space when they are able, instead of at set times, such as on video calls. All of these are clear advantages.

There are some areas where tools such as Teams will still provide a better experience in the near future, such as providing presentations to large groups of users and the use of slide decks. Support for office type assets and slide decks is still a little basic within the virtual platforms, although that support is improving all the time. The biggest advantage other platforms have currently is in support for accessibility tools and software, as the virtual spaces have almost non-existent support in this regard. That may again change, but there is a lot of work to do on this front before virtual tools could be rolled out universally across an organisation.

Final conclusion

In short, as described in each of the previous points, the decision on whether to use a virtual space instead of a more traditional tool or physical meeting will all come down to meeting the needs of users and whether the benefit of using a virtual platform outweighs the disadvantages.

This is, as previously mentioned, no different to the use of any other technology. Across the HE sector there has recently been widescale adoption of multiple technologies that had previously been regard as for edge case use at best. However, tools like Teams and Zoom are not seen as basic standards, as users working patterns and habits have changed significantly.

The adoption of virtual platforms for remote working is perhaps, inevitable. In this moment in time, there are still some significant challenges that will need to be overcome before any universal, widespread rollout could be achieved. However, there are clear, obvious, and immediate benefits for specific users and groups of staff which virtual platforms could provide, not least around hybrid and sustainable working. There will need to be continued and additional testing of these tools, not least because they are still developing and changing at breakneck speed, but that should be seen as a positive, as they certainly have something to offer and are likely to be worthy of a place in a user's digital toolkit in the new, post-pandemic workplace.

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