



Using Shared VR and immersive tech as a centerpiece of a new Digital Scholarship Lab

Michigan State University finds countless, multi-disciplinary uses for Shared VR and immersive reality in sparking innovation and integrating digital scholarship



Highlights

Back in 2018, Michigan State University launched a Digital Scholarship Lab as an inclusive, interdisciplinary space for technology and collaboration.

Located in the University's main library, the new 10,000-square-foot space was to provide students and

faculty from across campus with access to high-end technology and a hub for workshops, seminars and cross-collaboration. As a centrepiece, the Digital Scholarship Lab features a 7-metre diameter Igloo Shared VR cylinder with 360° immersive projection and surround sound.

Among its many benefits, the Igloo has been used for:

- Producing immersive 3D experiences and art installations
- Visualising data, plans and design concepts on a 360° screen so participants can walk around and hold discussions
- Remote learning using the Igloo to video conference and present together
- Interfacing and displaying Unity and Unreal game engine content in a fully immersive environment

Michigan State University has reported:

<p>Innovation</p> <p>Faculty and students have used the facility in new, ingenious and unexpected ways.</p>	<p>Collaboration</p> <p>Faculty and students have been able to work together in a way that would not have been possible with VR headsets alone.</p>	<p>Discovery</p> <p>Faculty and students have learnt to use a technology they would not otherwise have been available to them.</p>	<p>Ingenuity</p> <p>Faculty and students gravitated towards the space, using it for classes, projects, exhibitions, events and more.</p>
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About Michigan State University

The United States' pioneer land-grant university, **Michigan State University** (MSU), has been advancing the common good with uncommon will for more than 160 years.

One of the top research universities in the world, MSU pushes the boundaries of discovery and forges enduring partnerships to solve the most pressing global challenges while providing life-changing opportunities to a diverse

and inclusive academic community. It is the first university in the United States to have an Igloo Vision Shared VR cylinder.

The University's **College of Arts and Letters** (CAL) educates actors, artists, designers, filmmakers, linguists, philosophers, poets, teachers, translators, writers and more in a creative, learning, and nurturing environment.

Students who come to CAL with experience in their chosen field find the additional knowledge and personal space to further learn their craft and hone their skills. Those who have yet to identify their future life's work are met with diverse opportunities for creative reflection to explore the world and find their passion.

The situation

The need to give students across campus a new hub for digital scholarship + high- spec technology

Although MSU always had a variety of high-quality digital and technology facilities, they weren't always easily accessible to all students or faculty. They tended to be scattered across

campus. Some were limited to specific departments. Others would have strict opening hours that wouldn't always reflect the realities of student life. Students and faculty had enormous interest in digital scholarship, immersive visualisation and virtual reality, but nowhere to follow through. The proposed solution was a Digital

Scholarship Lab. This would be a central hub for Digital Humanities that would provide workstations, technology and virtual reality all available in one space. Furthermore, it would be available to all students and faculty, regardless of discipline or department.



“ We are excited to be able to create a space that will encourage research and teaching around these cutting-edge concepts. This space will be an idea incubator for faculty and students from all over the University who are interested in exploring and integrating digital scholarship into their research and teaching.”

Terri Miller, Assistant Director for Public Services at MSU Libraries



The solution



Building a state-of-the-art Digital Scholarship Lab - including committing to Shared VR

MSU Libraries researched what services other universities offered. It found that a lot of universities had small rooms or spaces for meeting or dropping in, but didn't offer much more beyond that. What it wanted to do was go one step further. MSU wanted a classroom environment where lecturers could teach. A flexible space where students, faculty and staff could also collaborate openly. And a data visualisation area so users could share that information together.

As much as offering workstations and technology, MSU's vision was to create a place where these groups across campus could learn together. Together,

they could build a digital scholarship community.

With this in mind, MSU Libraries and the College of Arts & Letters partnered for the building of a 10,000-square-foot Digital Scholarship Lab. This would be a dynamic and innovative space to elevate MSU's widely recognised strengths in the digital arts and humanities. This laboratory would include:

- Workstations throughout the lab with high-speed computers and software to support sophisticated design and data analysis. This would also facilitate cross-disciplinary collaboration.
- Instruction space, meetings rooms and offices. These would promote

research endeavours through consultation, advising, workshops and instruction sessions.

- A dedicated room for digitization projects.
- A Virtual Reality room equipped with four VR headsets - two Oculus Rifts and two HTC Vives.
- Extended hours including nights and weekends to accommodate the realities of student life.

As part of the DSL, MSU Libraries also envisioned the use of an immersive display. It would be a showpiece technology to attract students and faculty. This took the form of a 360° Igloo Shared VR cylinder.

Why MSU was attracted to Shared VR

Taking the benefits of VR + sharing it with classes + including an immersive display

Students and faculty had registered a keen interest in VR. As part of the Digital Scholarship Lab plans, MSU Libraries decided to include a VR room equipped with four VR headsets. But knowing some departments already had access to headsets, it wanted to go one step further.

MSU Libraries wanted to encourage people across campus to make use of the DSL. To help with that, it wanted to also include a showpiece technology that people wouldn't ordinarily have access to. The sort they didn't even know they wanted yet. It started looking at immersive displays.

It found that an Igloo Shared VR system looked an ideal solution:

Promoting innovation - MSU wanted students and faculty across disciplines to be able to unleash their imagination in making the most of this new technology. They found interest in Shared VR and immersive displays to be high across campus. Many students and Departments had different ideas of what it could do.

Sharing the experience - MSU wanted more than the benefits of headset VR, an immersive experience for one individual. What it wanted was VR to integrate into classes, seminars and workshops. Shared VR allows this. Groups of people can make use of this technology together. They can interact with the immersive experience and have group discussions.

Bringing designs to life - Shared VR in an immersive chamber allows for the ability to bring a design to life in real space. It can be manipulated, walked around, and displayed to multiple people.

Facilitating sessions for large numbers of participants - MSU wanted to cater for a group size of up to 15 people. It was able to specify a 7-metre diameter Shared VR cylinder with 360° projection and surround sound.

Future applications - MSU had registered interest in Shared VR before the project already from various departments: Medicine, History, Engineering, Gaming. But it realised the use of an Igloo would have countless more applications across disciplines and students. Once the space was operational, more students and faculty poured in with new ideas.



“ We didn't know that they were going to need this space, but they knew as soon as they found out [what it could do] that they were going to use it.”

Terence O'Neill, Head of Digital Scholarship and Makerspace Services, MSU Libraries

“ VR is often an individual experience, where then you go and talk to your friends and socialise about what you felt or did. These [experiences in Shared VR] are communal.”

Steven Rachman, Associate Professor of English, MSU

How Shared VR is being utilised by the University faculty and students

MSU has found countless research and teaching applications of the Igloo Shared VR cylinder. Some basic uses have included:

- History classes can use Google Street View to explore architecture from around the world.
- Art history classes can engage in the process of an archaeological dig from the lab.
- Interior designers and landscape architecture students can bring their designs to life.
- Game developers can develop and display their video games in a fully immersive environment (the Igloo is able to run both the Unity and Unreal game engines).

MSU's faculty and students have found that incorporating Shared VR

into classes, projects and seminars and creating content are far easier than they might have thought. Google Slides, for example, can create presentations to fit the vast screen.

They also found many uses for the Igloo's ability to display any web-based content in a 360° format, including Google Street View.

“ Igloo Web is fantastic, because it opens up the entire web to the immersive environment. Anything that's out there that is 360° or panoramic, I can pull it in, and stretch it, skew it, and make it fit within the environment, so that I can basically present any material, any content.”

Paul Cooper, Transformative Technologies Coordinator, MSU Libraries



Mini case studies

Since the installation of an Igloo Shared VR Cylinder, MSU staff and students have found countless uses for it, including:



A 360° immersive visualisation exhibit

The first use of MSU's Igloo Shared VR cylinder was to create a hybrid exhibit/360° film. This was part of an event to commemorate the 25-year anniversary of the Rwandan genocide.

The exhibit explored the history of the genocide through a virtual tour using 360° cameras, featuring several prominent memorial sites in Rwanda and testimonial interviews with survivors.

"The film can be paused at any time, so the student has the opportunity to interrogate that space on their own terms. It's really exciting that you can be in a site, stop it, and take a good look at what you can see around you. That's quite different from a film, where you just see what's in front of you. The immersive experience is a game changer."

Erik Ponder, African Studies Librarian and Director of the Exhibit.

The exhibit was further showcased beyond the event. It became featured in several courses in the following semesters as a learning tool. Furthermore, classes of high school students also visited the DSL to see the exhibit.

"I've heard from our students that they felt they were actually there in Rwanda, and that's what immersive experiences are all about."

Erik Ponder, African Studies Librarian and Director of the Exhibit.

The director of the exhibit/film found it so immersive for audiences he produced a second art installation for Martin Luther King Day. The exhibition was so successful the Library intends on holding a new 360° exhibition for Martin Luther King Day every year.

Remote learning

Michigan State University has been intrigued by the possibilities the Igloo Shared VR cylinder creates for remote connection.

As a preliminary test, it was able to hold a joint session at MSU and in Japan using the Igloo.

Using a mix of Zoom, the Gaming Server, and Igloo Capture, the Professor of Japanese Studies held a seminar in the Igloo. This allowed him to present materials and provide instruction to students and a colleague in Japan, while also holding a session at MSU.

This represents many exciting opportunities for remote learning in the future.



"By bringing together a variety of content and data visualisations while simultaneously facilitating communication with large groups, we can extend this transformative technology to create engaging communication and decision-making environments with audiences and partners off campus and across the world."

Terence O'Neill, Head of Digital Scholarship and Makerspace Services, MSU Libraries

Immersive storytelling

As part of an English class where MSU students were studying a graphic novel, they were asked to recreate a scene from that graphic novel as an immersive experience.

Even though students did not necessarily have any advanced technical skills with shooting 360° video, they were able to create presentations in Google Slides that were of a format that wrapped around the entire screen. Students found they could also integrate music and animations into their presentations.

"We created a very special experience. I know it was a special one for the students -- they were thrilled, moved, kind of beyond their expectations and everyone who was in the room seeing what was going on there sensed something powerful and new was happening with this immersive technology."

Stephen Rachman, Associate Professor of English



Students were able to let their imaginations go wild using the Igloo Shared VR cylinder. They could advance slides in 360° along with music. They could test various effects and see what would take someone in, or out, of the immersive experience.

Just as an Igloo could help with teaching, it could also demonstrate a student's learning and comprehension.

Interior design simulation for classroom safety

The Igloo Shared VR cylinder has been used in focus groups. The applications of Shared VR with interior design were quickly apparent. Simple but high quality panoramic photos of existing classroom configurations could be blown up in 360°.

Groups of about ten people were able to view eight configurations in a very short period of time. This meant they could analyse classrooms for an occupant's ability to respond in an active shooter incident.



"We were able to have multiple voices come together and project eight different classroom configurations, be immersed in them, and really feel like you were there and you could look at the details of a space."

Kristy Kellom - Graduate Student and Instructor, School of Planning, Design & Construction

Evaluating the impact

The Igloo has had significant success and impact. MSU has seen numerous uses of innovation, ingenuity, discovery and collaboration.

Impressions of the Igloo:

“I don’t have a grand sense of what all the potentials of this 360° are, but it’s so interesting to me to be able to explore it. We’re at this place where nobody knows. Our students may find out more than we know about it!”
Stephen Rachman, Associate Professor of English, MSU

“From shooting to getting the content up in the 360°, it really is quite straightforward. It works with a number of file types and software packages that are already the bread-and-butter of these different fields.”
Terence O’Neill, Head of Digital Scholarship and Makerspace Services, MSU Libraries

Success of the Igloo:

“That’s the cool thing - there’s no end to what you can do with the system. It’s just a matter of what if, and what if becomes reality.”
Paul Cooper, Transformative Technologies Coordinator, MSU Libraries

“They really want to build a digital environment that makes you feel like you’re in a physical environment, and that’s what the immersive visualisation possibility of the Igloo 360° is perfect for.”
Terence O’Neill, Head of Digital Scholarship and Makerspace Services, MSU Libraries

“The 360° is an excellent tool to have students immersed on campus and learning on campus in that environment.”
Erik Ponder, African Studies Librarian

“What I enjoyed most about working with the 360° projection system was the level of freedom and creativity that’s actually available to me, and also just unlocking new ways to do things.”
Justin Leggs, Videographer, African Studies Centre

Comparison with traditional facilities:

“We’ve had students from theatre, engineering, design, landscape architecture, all coming together and creating their concepts, where before they had to look at them on a posterboard. Now in our 360° area, we’ve been able to take those ideas and give them life. They can actually walk through and experience they’ve created.”
Paul Cooper, Transformative Technologies Coordinator, MSU Libraries

“The value of viewing this in the space rather than just photographs or posters or even traditional projectors, is being able to be in the space and feel like you’re in it.”
Kristy Kellom, Graduate Student and Instructor, School of Planning, Design & Construction

As for the future, MSU is looking for methods to take remote learning further. It has numerous other plans for integrating immersive experiences into future classes and seminars, and is confident that other universities will adopt this technology too.

“We’re excited that more universities are adopting this because those are potential partners down the line where we can create content, share content, and really tackle some of these complicated big problems that are otherwise very hard to visualise and very hard to understand.”
Aubrey Wigner, Assistant Professor, Eli Broad College of Business



Keys to success

At Igloo we have worked on many deployments of Shared VR and Immersive technology. And we are always keen to advise customers, and also to learn from customers, about the factors that enable an Igloo to become an effective tool.

From our perspective, the Michigan State University deployment has five main keys to success:

- 1 A cadre of internal power users**
From the outset, two senior members of the team at MSU Libraries have been strong advocates of the Igloo. They have demonstrated a ferocious capacity to learn how to use the Igloo and support MSU faculty to use and get involved with the Igloo. **Internal users passionate about the Igloo have encouraged MSU staff and students to use the technology, and secured visibility and attention for it.**
- 2 A prominent location**
By making its Igloo the centrepiece of the brand-new 10,000 square foot Digital Scholarship Lab, MSU has used it as an eye-catching state-of-the-art technology to build student and faculty interest. This has helped lure people from across campus to the DSL, and allowed the creation of immersive, 360° content. **By making the Igloo a centrepiece at MSU Libraries, students are intrigued and inspired to learn about creating content for it.**
- 3 Working with talented content creators**
MSU has not been shy about encouraging its talented students to get involved with the use of the Igloo. Many have been able to use their creativity and the same software they use in classes to create immersive, 360° content. **Creative, talented students are able to use high-end technology to create the immersive content they would not have been able to otherwise.**
- 4 A commitment to multiple use cases**
From the very beginning, MSU was always aware that there would be more uses that it could not yet foresee. **Students and faculty regardless of discipline are supported to use the Igloo in whatever new ways they can think of.**
- 5 A strong commitment to partnership and collaboration**
MSU has built a trusting, two-way relationship with Igloo through regular calls and updates. We are able to share learnings, make recommendations, and keep everyone aware of the Igloo development programme. **A strategic partnership is very different from a more transactional client-supplier relationship, and requires more commitment, but is much more valuable.**

Specifications of the MSU Igloo

Creating a bespoke Shared VR System to service a wide range of needs across various disciplines and departments

MSU had very specific needs for its Igloo to ensure the DSL would be equipped to suit a range of students and faculty, and encourage and inspire them to use the space. Together, we worked on creating a bespoke Shared VR cylinder tailored to the students' needs.

- This became Igloo's first permanent installation using Epson 6000 Lumen 4K enhanced laser projectors with UST periscope lenses.
- Campus facilities and architecture teams worked with Igloo to specify a custom-built 7-metre

screen, designed to sit flush with the existing ceiling. The Igloo itself was given custom exterior branding to match the library aesthetic.

- To help soundproof the space and avoid disruptions to other visitors to MSU Libraries, custom acoustic dampening panels were installed.
- The Igloo featured a concealed underfloor conduit carrying data, signal, and power cables to a custom-designed control station. The station can be lifted from a standing or sitting position,

attach touch screen tablets to an articulating monitor arm, and be moved on wheels that can lock the desk in place.

- The Igloo was equipped with an Igloo gaming system, which means any game available on Windows or Steam can be played on the vast screen.
- Igloo developed a brand new Google Earth solution using a virtual machine environment, enabling it to run Google Earth in 360° from a single Igloo Media Player.

For more information

Igloo Vision is the Shared VR company

From bases in the UK, USA, Canada and Australia, we work with clients worldwide. Our largest, fastest-growing market is education. So far, 25+ universities have installed Igloo Shared VR systems, and many more installations are in the pipeline.

- Michigan State University
- University of Brighton
- Mid-Sweden University
- Cardiff University
- Arkansas State University
- Zhejiang University
- Florida International University
- Khalifa University
- California State University, Long Beach
- Ryerson University
- Deakin University
- University of Loughborough
- University of Essex



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