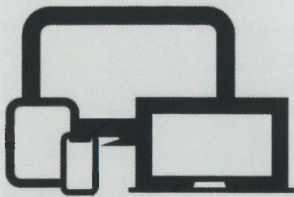
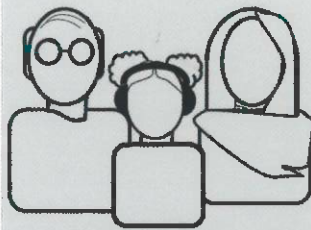


Museums and Interactive Virtual Learning

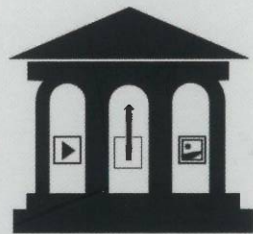
Allyson Mitchell, Tami Moehring,
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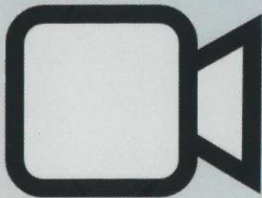
CONNECT



ENGAGE



SHARE



LIVE



Museums and Interactive Virtual Learning

Museums and Interactive Virtual Learning provides informal educators with practical resources that will help them to build dynamic digital engagement experiences within their own cultural organizations.

Presenting vignettes from experienced museum educators and end users, as well as scientific data and practical resources, the book highlights the mutual benefits that Interactive Virtual Learning (IVL) programs offer to the museum and those visiting from a distance. Chapters mirror the step-by-step process of developing reputable IVL programs and emphasize how important it is for cultural organizations to encourage cross-departmental collaboration, if they wish to ensure that their programs align with the overall goals of the organization. Providing a thorough overview of the technologies, budget, marketing and staff requirements, the authors offer a realistic depiction of the work involved in building content for digital engagement. Emphasizing the importance of assessing existing programming, the book shows how institutions can adapt content to fit a virtual format and create inclusive digital engagement opportunities that reach local, national, and international audiences.

Museums and Interactive Virtual Learning is an essential guide for professionals who are tasked with interpreting the content of a cultural organization and building lasting digital engagement opportunities. It will be particularly useful to those looking to reach diverse audiences.

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Museums and Interactive Virtual Learning

**Allyson Mitchell, Tami Moehring,
and Janet Zanetis**

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It was important for authors to create a practical guide that was supported by scholarly and scientific evidence. Thus, they would like to recognize the research and publication of the many authors who are cited within this text and encourage readers to utilize endnotes as well as bibliography as a reference tool to gain an even more robust understanding of the field of Interactive Virtual Learning within museums. Authors are especially appreciative to the Center for Interactive Learning and Collaboration for allowing access to the data collected from their international content providers and virtual members.

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Finally, it is important that authors acknowledge the most important tool in this digitally driven world – technology. We appreciate all the challenges and troubleshooting through the years that brought a deeper understanding of how to use technology as a tool for forging meaningful connections with audiences around the globe.

Introduction

Museums Broadcasting Live

Interactive Virtual Learning (IVL) is a unique form of digital outreach that allows cultural organizations to use videoconferencing technologies to connect with diverse groups and individuals located around the world in real-time. These live broadcasts are conducted by virtual museum educators or presenting experts who actively engage virtual audiences in conversations, collection materials, content knowledge, and activities.¹ While the usage of IVL in the last thirty years has been minimal compared to other technology trends, a new appreciation emerged during the COVID-19 pandemic.² With a new emphasis on IVL, cultural organizations must become familiar with technology-based learning models to build robust digital content that will maintain and elevate their relevance as informal spaces for learning in the 21st-century and beyond.³

This text offers a detailed overview of the long-standing field of synchronous distance learning to offer a comprehensive resource to education professionals in cultural organizations who are responsible for interpreting research, historic sites, and scientific, living, and non-living collections. The COVID-19 pandemic demonstrated the powers of synchronous technologies as an economic and educational tool.⁴ Museums and other cultural organizations had to reimagine their visitor experience, forcing many to scramble to convert on-site programs, research, and expertise to digital offerings to keep their clientele engaged.⁵ While museum workers were introduced to building Interactive Virtual Learning experiences in response to the pandemic, many reported they had little to no experience operating the available technology and felt they lacked the skill set to engage online audiences in live broadcasts.⁶ However, with all audience groups being more tech-savvy than ever before, museum administrators and educators must continue to pivot away from past practices to reconsider how to engage with the public through digital means.

Virtually activating the content of a cultural organization to engage traditional and new audiences requires an institution to reflect on their digital identity.⁷ Prior to the pandemic most cultural organizations invested in generating asynchronous distance learning experiences, which are digital museum content that is disseminated on website or social media channels of an institution for online communities

2 Introduction

to freely engage with at their own pace.⁸ As a result, a great deal of scholarship is focused on the asynchronous experiences produced by museums to digitally engage online audiences.⁹ While investing the resources into developing this user-directed digital content is important in remaining digitally equitable, this is no longer enough in a world familiar and ready to “go live.”¹⁰ This text strives to fill a gap in the scholastic resources available for professionals in cultural organizations by placing the focus on synchronous distance learning and promoting the role of Interactive Virtual Learning as a viable form of museum outreach.

A Step-by-Step Resource

It is imperative that cultural organizations have a practical guide to adapt in-person programs, research, and expertise to a virtual format. This text strives to be just that, an evergreen and dependable resource a museum professional can utilize when developing IVL programs. It offers a framework to identify necessary digital tools and pedagogical approaches to actively engage online communities in one physical space or multiple remote locations.

To provide informal educators with a practical, the book offers an in-depth study of the facilitation methods, audiences, costs, and technologies associated with establishing or growing IVL programs within the parameters of a cultural organization of any size. There are nine main chapters that are organized in the same steps one would follow when developing an IVL program. Each Chapter strives to answer these nine questions:

- 1 When was synchronous distance learning established in the field of education?
- 2 Who typically and newly participates in synchronous distance learning?
- 3 What is required to deliver IVL programming?
- 4 What is needed to adapt or design an Interactive Virtual Learning experience?
- 5 How should staff be trained and scheduled to fill necessary roles?
- 6 With so much digital access, how do you promote IVL to the right audience?
- 7 Where to invest resources to create a sustainable IVL program?
- 8 How can digital engagement open a mutually beneficial portal to diverse, underserved, and global communities?
- 9 What demonstrate the value to the learners at a distance?

Chapter content is broken up using headlines for easy reference. Each section under the headline includes text that is interwoven with data, visuals, templates, and personal vignettes submitted by those experienced in IVL programming. The *Center for Interactive Learning and Collaboration (CILC)*, an organization established to connect museums to learners around the world, provided authors access to data they collected for a thirty-year period to reflect the growth of synchronous distance learning within the field of museum education. While CILC has an

international group of members who receive IVL program, the majority of content providers are from North America. Authors strive to balance this with statistics collected from an international group of museums that measured how cultural organizations utilized distance learning to response to the global pandemic.¹¹

Quick FAQs Before Use

This book is for museum professionals. The *International Council of Museums* states: A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, research, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.¹²

In this text the word museum and cultural organization will be used interchangeably to refer to art, history, natural history, science center, aquarium, zoo, historic site, and botanical gardens.

The informational content and data are balanced with the voices of experienced *content providers*. These are individuals who work in cultural organizations around the globe that design and facilitate IVL programs for online audiences.¹³ Content providers are comprised of individuals with a range of expertise related to the collections of the cultural organizations that work and possess a strong digital skill set. For the purposes of this text, the term content provider will be used interchangeably with *virtual museum educator*.¹⁴ These are two of the many new terms that are used throughout this book to distinguish IVL vernacular. When new terms are first featured within the text they will be placed in *italics* (as shown previously) to indicate they are included in the Glossary found at the end of the book.

The vignettes from experienced content providers were personally submitted for the purpose of this text. They are blended with the scientific data, visuals, and practical templates to highlight the mutual benefit that IVL programs offer the museum professionals and online communities. To ensure these voices of experience standout, each vignette has been placed in a chat bubble to emphasize the shared best practices. To be an effective resource it is necessary to show evidence of the impact IVL programs has had on both the museum as the content provider as well as the virtual visitors who are the consumers. Quotes and vignettes from audiences who have participated in IVL programs are included as support throughout this book. To ensure the perspective of virtual audiences who have participated in IVL programs from museums are regularly highlighted their words are placed in gray boxes and are used in length in Chapter 9 of this book.

Balancing Internal and External Perspectives

Recent reports have identified steps that museums are taking to re-envision their institution.¹⁵ There has been a call to push past practices to create more authentic and inclusive interpretation of museums content.¹⁶ This text discusses the history of distance learning and highlights the access IVL programs have always provided to communities lacking the resources or ability to make physical trips to

a museum. While this text is designed for cultural organizations interested in providing continued access to a museum through IVL programs, there is an extensive focus on the consuming audiences throughout the book.

The various methods of facilitation necessary to deliver IVL programs to audiences in *point-to-point*, *multi-point*, *hybrid*, and *webinar* formats are illustrated through graphics to reflect the physical environment of the far-end audiences. The delivery modes and pedagogical approaches are further dissected to identify the appropriate online teaching methods for diverse audiences. While the global COVID-19 pandemic caused a digital boom, when working with technology it is best to prepare as if virtual visitors have little to no experience operating the digital tools. The text provides a thorough review of hardware and software needed for IVL experiences as well as the techniques to technically assist group organizers prior as well as during a scheduled program.

While the deep dive into external audiences and partnerships is offered, this text is ultimately designed to challenge museums to internally reflect on their role in a digitally driven world. Cultural organizations can forge more socially aware and meaningful connections with global audiences through IVL programs. This text pushes museums to consider how to create IVL programs that engage diverse audiences with content and real-time interactions.

A thorough review of the IVL framework is provided through a close examination of the hardware, software, infrastructure, and staff required to facilitate programming. This book further dissects the development process by focusing heavily on the practicalities of selecting a broadcast environment and of the process of program creation, logistical procedures, marketing, and budgeting to assist museum professionals in planning for the long-term success of IVL initiatives. Each chapter offers diagrams and templates for any museum to use when designing an IVL program to reflect on the mission-based responsibilities and resources available within their own institution. Finally, the IVL framework is reviewed in-depth early in the text then is re-visited to reflect the overarching change that is required in all fields – a lack of bias.¹⁷ A new diagram connected to the IVL framework is presented to encourage a more inclusive program design that aims to elevate the voices of online communities who have found a benefit in engaging with museums through virtual programs.

Notes

- 1 Gaylord-Opalewski and O'Leary, *Defining Interactive Virtual Learning in Museum Education: A Shared Perspective*.
- 2 Houston, *Facilitating Digital Transformation for Museum education in Response to COVID-19*.
- 3 Mitchell, Yoshida, and Linn, *A Tale of Technology and Collaboration: Preparing for 21st-Century Museum Visitors*.
- 4 Houston, *Facilitating Digital Transformation for Museum education in Response to COVID-19*.
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- 7 Visser and Richardson, *Digital Engagement in Culture, Heritage, and the Arts*.
- 8 King and Lord, *Manual of Museum Learning*.
- 9 Kraybill, Anne, "Going the Distance: Online Learning and the Museum," *Journal of Museum Education*, 40:2, (2015): 97–101.
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1 The History and Practice of Interactive Virtual Learning in Museums

When planning for the future, it is often helpful to understand the past. This chapter offers a comprehensive overview of the field of Synchronous Distance Learning in museums by using a series of images and vignettes from pioneers in the field. These unique perspectives are mixed with data that introduces the role of the professional networks that were founded to support the early initiative to use fiber optics and videoconferencing tools to connect cultural organizations with distant audiences around the globe. Technologies are discussed in parallel with the opportunities and challenges faced by cultural organizations that implement IVL programs. To provide a thorough foundation of the field, the evolution in connection method, hardware, and software are presented in chronological order; a timeline concludes the chapter so that readers can move knowledgeably into the digitally driven future.

How knowledge has been transferred from educator to learner reflects the leading technologies of the era – reed to clay, pen to paper, voice to record, floppy disk to computer, hands to keyboards, fingers to tablets. *Distance learning* has long been practiced by formal and informal educational institutions. Technology is ever-evolving, so naturally the field of distance learning has rapidly progressed over the last fifty years to encompass both forms of synchronous and asynchronous digital engagement. *Asynchronous distance learning*¹ does not occur in real-time, rather it is a self-directed, web-based learning experience that allows individuals to set the pace and mode of knowledge collection. *Synchronous distance learning*,² on the other hand, allows for real-time interaction, between two (or more) groups or sites, through videoconferencing hardware or cloud-based applications. To add to the vast research on the use of synchronous digital engagement experiences in the field of museums this text offers a review of *Interactive Virtual Learning (IVL)*³ in museums by examining synchronous distance learning programs that are facilitated by *cultural organizations* and delivered to diverse groups around the globe.

The earliest interactive video calls occurred in the mid-1950s, with the use of expensive and cumbersome equipment; as a result, the earliest users being large

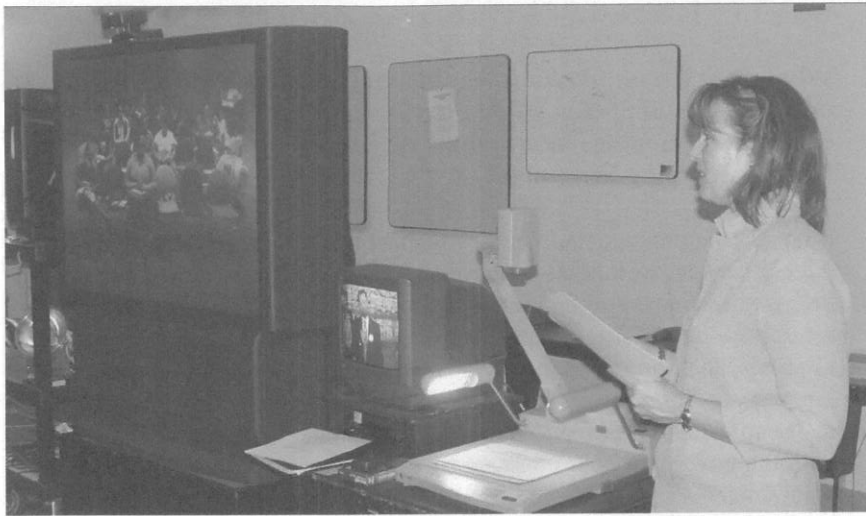


Figure 1.1 Content Provider Facilitating a Live Interactive Virtual Learning Program in the 1990s, Using a Videoconferencing Unit and Available Monitors to Connect With Virtual Visitors Miles Away.

Source: Picture provided by Tonya Carriger, Center for Interactive Learning and Collaboration (CILC).

fiber optic companies and the US Department of Defense. With the development of *video codecs*, a less expensive video calling system that used ISDN (phone) lines to transmit audio and video both ways, higher education institutions were the first able to invest in the new form of two-way video calling as well as employing *bridging technology* to implement delivery of courses for remote students in the 1980s. Before the end of the decade pioneering *museums*, International Correspondence Schools,⁴ along with rural pre-primary, primary, and secondary schools were able to use synchronous distance learning to connect educators in one location and learners spread out across miles.

Around the same time, telecom giants in the US had the idea to connect cultural organizations with primary and secondary schools for museum-focused IVL programs using these synchronous technologies. Grants funded the organization of education networks in several states, which oversaw installation of video codecs and ISDN (phone) lines in the participating schools and museums statewide. By the mid-1990s these established educational networks had personnel regularly connecting participating primary and secondary school-aged learners in their respective area with museums from around the state for IVL programs. One such network was Vision Athena, which was funded to connect primary and secondary schools with museums in the state of Indiana.

BOX 1.1 Interview With Content Provider**What were the motivations, challenges, and success in the establishing educational networks dedicated to connecting learnings to museums through Interactive Virtual Learning programs?**

From the beginning, the Vision Athena project was Ameritech's (now AT&T) need to have their services deregulated. To be deregulated they had to "give back" to the communities they served. In 1994, Vision Athena was set up as a non-profit, independent of Ameritech, serving K-12 schools, hospitals, and libraries in the state of Indiana. Ameritech provided \$5 million per year for six years for the work of Vision Athena. Funds were used to set up distance learning equipment at schools, hospitals, and libraries with the governing board directing us to connect students for classes in math, science, and social studies. We provided the training and connectivity for this to happen while the organizations agreed to pay for their own network costs. While this was well and good, I had learned of a distance learning experience between an Indiana school and the Indianapolis Zoo. This concept resonated with me, and I convinced the board that we needed to include the cultural organizations in our community as content providers to provide tremendous benefits for the schools we served. This was the biggest challenge in the beginning, the switch from using the technology for what had always been done to using the technology in a novel way to engage children with the informal resources from which they could learn tremendously. It often felt that we were building the airplane as we were flying it!

After the initial six years, Ameritech gave us an additional \$15 million and had, in the meantime, pulled fiber optics to all the schools the project served. After this period, Ameritech had achieved its goals with Vision Athena, but the project was far from over. Inquiries from outside the state came in, and non-Indiana museums and cultural organizations were interested in joining us. So, we decided that rather than fold up the project, we would change direction again, and in 2004 we changed our name to the Center for Interactive Learning and Collaboration. We began accepting content providers from beyond Indiana and created a website and a booking platform for teachers to find and reserve interactive videoconference programs. In order to support the educators, we required the content providers to provide national standards to their program descriptions. We placed pins on a world map for every connection we made outside of our state. Soon we were adding pins from

other countries. CILC was on its way to being the international organization it is today with hundreds of content providers serving thousands of schools.

– Interview with Ruth Blankenbaker, former Executive Director of the Center for Interactive Learning and Collaboration

Synchronous technology progressed beyond codecs dependent on the use of expensive telephone lines in the late-1990s with the advent of Internet Protocol (IP) connectivity. The new connectivity protocol operated via the internet, allowing users to transfer audio and video content in real-time through a more manageable and affordable videoconferencing codec, or unit. With more feasible hardware, grants supported the build-up of educational networks around the world like the Vision Athena network in the late-1990s to early 2000s. These early networks could be found in countries like New Zealand, European nations, Canada, Turkey, South Korea, Australia, and some US states like Ohio, Wisconsin, Texas, Washington, Oregon, and Arkansas.⁵ They all strived to connect the higher education institutions, primary and secondary schools, and museums within their respective states or territories but quickly grew beyond their regional and national boundaries.

By 2009 a *Wainhouse Research* report estimated that an overall average of 30% of US primary and secondary schools had videoconference systems

The Center for Puppetry Arts Distance Learning Program was founded in 1998 as a direct request from the executive director. At the time, the state of Georgia was home to largest distance learning and healthcare network in the world (GSAMS). Our executive director saw our participation in the network as an opportunity to offset the cost of traditional outreach (driving around the southeast in vans). I saw it as a way to increase accessibility and extend our reach. I had just stepped into the role of Education Director and was eager to establish the studio and learn about synchronous delivery—innovative at the time, of course!

Opening the studio and developing programs came with its challenges. The biggest was learning the technology and training staff since we were artists with no IT background whatsoever! Another challenge was that we were not allowed to charge for programming to anyone in our state and we had to pay the state to be part of the network. Out of this challenge came our biggest success, however. We began offering programs out-of-state and over the course of the next few years, we had reached nearly all fifty states and six countries with our programming, garnering over twenty industry awards during this time. We were reaching audiences that could never physically visit the Center. For me, this was our biggest success and what I found most gratifying.

Figure 1.2 Vignette From Patty Dees, Former Distance Learning Director, Center for Puppetry Arts, About the Motivations, Challenges, and Success in the Establishing IVL Programs.

Numbers of Schools with Videoconferencing

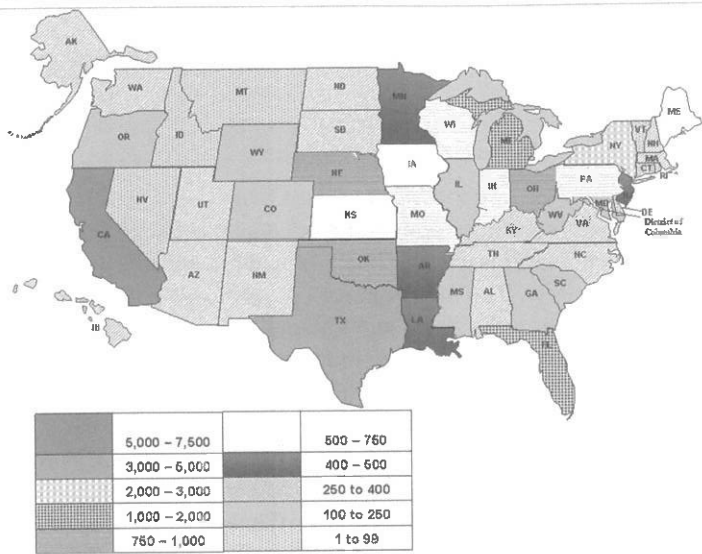


Figure 1.3 Map of the United States That Represents the Number of Primary and Secondary Schools With Videoconferencing Units Installed in 2009.

Source: Image provide by Wainhouse Research, 2009

installed, many of which had made the transition to internet-based protocols.⁶ International networks followed a similar progression as the US; however, each country utilized different technologies based on funding guidelines, international jurisdiction, network availability, hardware, and intention for implementing IVL programs. By 2010, IP-based video calling was the new international norm and became a less incommodious investment to extend access to spaces of learning.

The new millennium brought yet another advancement in synchronous distance learning with the development of desktop (or cloud-based) applications for videoconferencing platforms. This allowed anyone with an internet connection, webcam, and microphone to have the ability to participate in scheduling or joining a video call. Users began to favor web-based and desktop video calling applications rather than the high-end video codecs. This ushered in a plethora of new videoconferencing companies featuring a cloud-based solution. Ultimately, the use of videoconferencing units faded as the cloud-based videoconferencing platforms provided a similar quality of broadcast at a much lower cost.



Figures 1.4 & 1.5 Examples of an At-Home IVL Broadcast Environment Designed With Personal Furniture, Two Monitors, Webcam, Pop-Up Greenscreen, Borrowed Books and Container From Their Child.

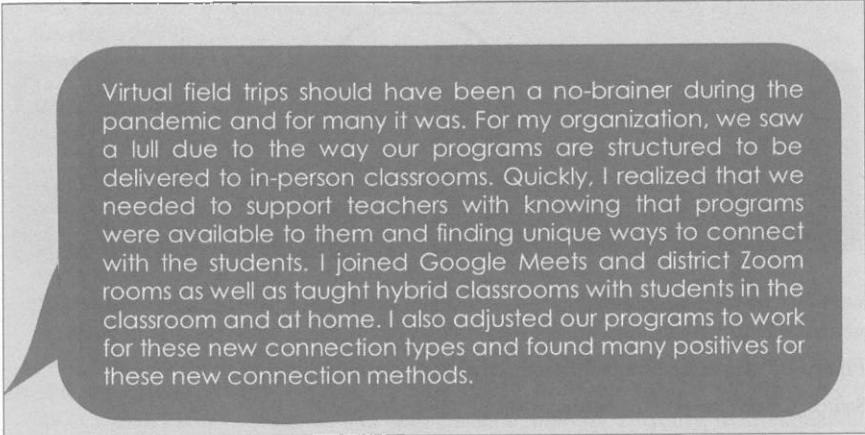
Source: Images taken for publication by author, Allyson Mitchell.

As the need for larger videoconferencing units and bridging technology diminished, so did the educational networks that were initially necessary in coordinating the technology installation and managing connection between institutions. Only two of the original educational networks remain in the US, one currently named *Connect to Texas* and the other the *Center for Interactive Learning and Collaboration*, formerly Vision Athena. Similarly, there are several international educational networks driven by a similar mission such as Connected North based in Canada and Virtual Excursions, based in Australia. Those that remained are part of a global network that now primarily focuses on supporting the production and promotion of live Interactive Virtual Learning programs designed by cultural organizations for online communities of all ages.

It is important to recognize how the progression of these educational networks parallels the evolution in synchronous distance learning hardware and software. While these educational networks have lessened in number, they remained dependable organizations for the small group of *virtual museum educators* using videoconferencing technologies to extend institutional reach to a global audience. With technology progressing so quickly, virtual museum educators were able to gain professional development to learn more about advancements in hardware, software, and online pedagogy. This was especially true in the mid-2010s, when formal and informal spaces of learning that offered IVL programs began investing in cloud-based videoconferencing licenses and dedicated personnel to manage programming from in-house work spaces.

The global pandemic in 2020 exploded the use of cloud-based videoconferencing with the need for remote work and learning. It is fortunate that video calling technology evolved to a cloud-based format to assist in this worldwide digital pivot; one videoconferencing company even reported their 3 million users rose to 300 million users just in 2020. Similar to many other professional fields, video calls allowed cultural organizations to remain in operation internally and externally. Professionals and families with little to no experience with videoconferencing platforms were required to use them to continue learning and working when quarantined at home. Museums and other cultural organizations had to reimagine their visitor experience, forcing many to scramble to convert on-site programs, research, and expertise to digital offerings to keep their clientele engaged. Museums with established IVL programs had the advantage of drawing from their experience in troubleshooting to strategically set-up their hardware and props to facilitate IVL experiences from safe remote locations.

While the usage of videoconferencing hardware and software was minimal in museums compared to other educational technology trends, a new appreciation for IVL emerged during the 2020 pandemic. Most cultural organizations opened a proverbial virtual door for the first time to find that live digital engagement requires the same approach as in-person experiences. Education and interpretation departments hold a unique role in cultural organizations,



Virtual field trips should have been a no-brainer during the pandemic and for many it was. For my organization, we saw a lull due to the way our programs are structured to be delivered to in-person classrooms. Quickly, I realized that we needed to support teachers with knowing that programs were available to them and finding unique ways to connect with the students. I joined Google Meets and district Zoom rooms as well as taught hybrid classrooms with students in the classroom and at home. I also adjusted our programs to work for these new connection types and found many positives for these new connection methods.

Figure 1.6 Vignette From Content Provider Jasmin Poor, Virtual Fieldtrip Teacher/Coordinator, Roper Mountain Science Center, About the Impacts COVID-19 Had on IVL Programming.

as they use their educational expertise to act as the liaison between museum content and visitors. To properly interpret the content of an institution, departments of learning design programs that incorporate active teaching strategies to engage audiences appropriately. This required cultural organizations unfamiliar to IVL programming to use available technology to engage online communities in live educational broadcasts. Even institutions with long-standing IVL programs had to adapt their facilitation methods and planned interactions to fit a variety of new learning environments to serve audience groups of all ages.

As we look to the future after a challenging time in human history, there is one fact that remains evident: synchronous distance learning technologies will continue to advance the ability for humans to connect through space and time. Recall that in the early days, just ten years previous to the first publication of this book, bridging technology was required to connect multiple sites to one video call prior to cloud-based videoconferencing applications. With recent advancements, interactive video platforms now offer streaming technology and webinar platforms, allowing for hundreds or even thousands of sites to participate in one video call hosted from a single internet-connected device. Moreover, sophisticated tools of today's videoconferencing platforms will continue to advance. Break-out rooms, polling, chat, annotation, speech to text, closed captioning, virtual backgrounds, and screenshare allow for intimate interactions with remote visitors that cannot be rivalled in a traditional, face-to-face setting.

With technology posing less of a barrier, developing sustainable and measurable IVL experiences is no longer dependent on investing in new trends or

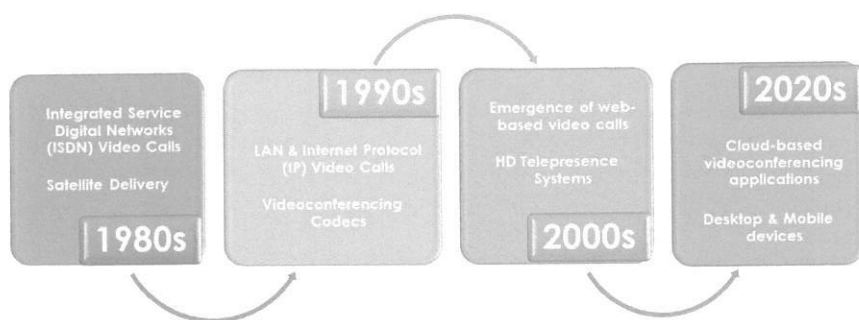


Figure 1.7 Timeline of Synchronous Distance Learning Timeline.

Source: Created for this Publication by Author, Allyson Mitchell.

expensive hardware. Rather, cultural organizations have the opportunity to utilize their available digital tools to elevate the skills of staff as well as the voice of online communities to achieve mission-based and financial goals. Both educators and wider museum staff have a better understanding of the value of Interactive Virtual Learning (IVL) and how it can be used as a tool to engage with global audiences. Every generation has been introduced to a new way of life that normalizes using video calling to connect in personal, professional, and scholastic settings. As audiences become increasingly tech-savvy, cultural organizations must become familiar with technology-based learning models to build robust digital content that will maintain and elevate their relevance as informal spaces for learning in the 21st-century and beyond.⁷

This overview of the field of Interactive Virtual Learning in museums is intended to provide a basic foundation of the progression of synchronous distance learning tools utilized in the past to move into the future well-informed. By blending practical guidelines and voices of experience with a close review of written sources and globally collected data, this text aims to offer a comprehensive and interactive resource to education professionals in cultural organizations who are responsible for interpreting research, historic sites, and scientific, living, and non-living collections through Interactive Virtual Learning programs from any location.

Notes

1 Gaylord-Opalewski and O'Leary, *Defining Interactive Virtual Learning in Museum Education: A Shared Perspective*.

2 Ibid.

3 Ibid.

4 Barbour, *A History of International K-12 Online and Blended Instruction*.

5 Ibid.

- 6 Greenberg, Alan D. *The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom: A National and State by State Analysis*. (Duxbury, MA: Wainhouse Research, 2009).
- 7 Parry, Eikhof, Barnes, and Kispeter, *One by One*.

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