Interactive Technologies and Indigenous Art: Exploring the Use of Immersive Resources to Increase Audience Engagement with Ceramic Pieces in the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University

Research Thesis

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by

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Abstract

Women of the Canelos Quichua community in Amazonian Ecuador learn ceramic traditions from other master potters and through continuous practice. They use multi-sensory interactions to input knowledge into their piece and specifically, use art to connect the mythic and contemporary worlds by interpreting and materializing shamanic visions. Guided by Andean and Amazonian indigenous approaches to learning and meaning making, my thesis project focuses on the development of a digital interactive resource that attempts to increase audience engagement with Canelos Quichua ceramics housed in the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at Ohio State (AAAC). The program aims to develop understanding and appreciation for these ceramics and the skill of the artists behind them by way of experiential, interactive features. Given the delicate nature of these ceramic pieces, and the tendency of Western museum culture to limit access to collection pieces more broadly, the program attempts to overcome the inability to handle the actual physical artifacts.

My central research question revolves around the extent to which interactive resources developed under a framework of digital humanities are able to increases audience engagement with the ceramic pieces in our collection, thereby increasing knowledge of and appreciation for indigenous forms of expression while providing insight into key Andean and Amazonian concepts and practices.

Preliminary data demonstrates that this digital humanities project successfully incorporates multi-sensory, interactive experiences. Users reported that they gained knowledge about and appreciation for Canelos Quichua traditions and practices, namely ceramic making. The program also increased their understanding of indigenous art as a source of knowledge whose creation and appreciation require interactive processes.

While this program can never fully demonstrate the tradition and associated concepts of Canelos Quichua ceramic making, it might serve as a promising educational tool that helps increase user engagement with collections of indigenous art while incorporating aspects of indigenous ideology into the resource itself.

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Additionally, I would like to express my appreciation for the many students and faculty members across Ohio State who expressed interest in this project, several of whom are mentioned throughout this thesis. Their comments and suggestions in the early stages of the project greatly shaped the design of the digital interactive program that we see today. In particular, I would like to extend my gratitude to the AAAC curator group and my close friends, all of whom gave me invaluable feedback on the resource.

I am also grateful to the Department of Spanish and Portuguese, the Center for Latin American Studies, the Advanced Computer Center for the Arts and Design, University Libraries, and the Global Arts and Humanities Discovery Theme K'acha Willaykuna Andean and Amazonian Indigenous Art and Humanities project for their support of my research.

Finally, I would like to thank my entire family. Your hard work and sacrifices inspire each word I write and everything I do. I cannot thank you enough.

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Glossary

Allyu: A Quechua term referring to an extended kin group.

Assembly-line instruction: The learning model that is most common in Western society. Sources such as teachers, or textbooks share present information to a recipient in a linear and unidirectional way.

Aswa: The Quechua term for chicha, a mildly fermented drink made from manioc tubers that is central to the Canelos Quichua ceramic making process.

Aya rumi: A Quechua term referring to the female soul stone. It is used to polish ceramic artwork and is one of the several ways that master potters form a personal connection with their pieces.

Blackware: A type of ceramic pottery with a black interior and a black or brown exterior that is made from heavy-grade clay and fired twice, the second time being under oxygen-reduced conditions. These pieces are used to cook or serve food because they can withstand high temperatures. Examples include *callanas* and *yanuna mangas*.

Callana: A type of blackware piece that is used to serve cooked food.

Chumbi: A woven article of clothing that functions similarly to a belt. Even though they contain colorful patterns, they are worn under a layer of clothing, out of sight.

Downwards contextualization: The integration of an artifact into a museum collection at low levels of activity, such as customization or operation. This provides information about the function, physical structure, and/or the actions associated with a piece.

Experiential learning theory: A theory that views learning as the continuous creation, transformation, and re-creation of knowledge. Supporters place an emphasis on new information, its future application, and reflections about one's experiences.

Glass-case paradigm: A term that refers to the idea that museum exhibits rarely allow visitors to interact with the artifacts on display.

Huihuishcu: An oval-shaped gourd fragment that master potters use to smooth the clay coils of their ceramic pieces.

Instrumental value: The importance to social or economic development.

Interactive technology: Technology that allows for communication or the exchange of information in a reciprocal manner as a result of interactions between a user and technology or between two users with the use of technology.

Intrinsic value: The significance to an individual or source community.

Khipu: Knotted string devices that were used by the Incan people to record and communicate both quantitative and qualitative data.

Learning by observing and pitching in (LOPI): An approach to learning that is common in indigenous communities across the Americas, including the Canelos Quichua community. Children learn skills and strengthen their abilities by watching others around them and imitating what they see.

Mama churana: The first and thickest line that is painted on a polychrome vessel. It determines the overall design of the motif and is eventually surrounded by thinner lines.

Meaning making: The continuous process of active interpretation through the development of personalized significance. It incorporates the values, beliefs, feelings, and goals of the individual.

Mucawa: A type of polychrome piece that is used to drink *aswa*.

Object-based learning: An approach to learning that involves closely interacting with an object, either physically or digitally.

Polychrome ware: A type of ceramic pottery that is characterized by vibrant colors and painted patterns. These pieces are fired only once, and most are related to the production or consumption of *aswa*. Examples include *tinajas*, *mucawas*, *puras*, and other ceramic figurines.

Ptyalin: An enzyme in saliva that acts as a fermentative agent. During the process of making *aswa*, starch is converted into dextrin and maltose.

Pura: A type of polychrome piece that is used to serve *aswa* during festivals. These artifacts often convey culturally significant animals, mythic figures, and more.

Re-contextualization: the integration of a museum artifact that already has a specific function into the context of a person's own activity.

Reflection: Conscious thought that involves evaluations, criticality, and problem solving as a result of lived experiences. It can lead to insight, increased awareness, and/or new understanding, however, should be distinguished from routine decision making.

Sicuanga manga: A type of polychrome piece that is also referred to as a toucan jar. It is the only polychrome vessel that is not used to serve or store *aswa* and is instead used to store feathers, beads, and other personal items.

Tinaja: A type of polychrome piece that is used to store *aswa* as it ferments.

Upward contextualization: The integration of an artifact into higher levels of audience activity, with connections being made to the interests, values, and motives of the individual. Visitors think deeply about the artifacts they are interacting with and reflect about the larger concepts associated with that piece.

Yanuna manga: A type of blackware piece that is used to cook food and is often involved in the production of *aswa*.

Background Information about The Ohio State University's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection (AAAC)

The Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University (AAAC) was established by the Center for Latin American Studies (CLAS) in fall of 2015. It is primarily organized and maintained by faculty curator Dr. Michelle Wibbelsman who has been assisted by previous undergraduate student curators including Diego Arellano, Elaine Louden, Jenna Mayeres, and Frances Dillon. Along with myself, current graduate and undergraduate student curators include Tamryn McDermott, Micah Unzueta, Emily Brokamp, Hallie Fried, and Kelly Tobin. The artifacts in the collection were acquired with the support of Title VI Federal Funding, private funding, or through donations. Specifically, several pieces were purchased from the Sacha Runa Research Foundation or donated by the organization's director, Dr. Norman E. Whitten Jr., who also serves as curator of the Spurlock Museum of World Cultures at University of Illinois in Urbana-Champaign. The Collection resides in room 225 of Hagerty Hall, which serves as the Department of Spanish and Portuguese conference room.

As an educational resource, the collection complements curricula pertaining to the Andes and Amazonia, such as the Quechua Language Program and the Andean and Amazonian Studies Interdisciplinary Minor, as well as other courses. The collection promotes experiential, applied methods of learning and attempts to engage practices emergent from Andean and Amazonian communities themselves.

The collection itself is comprised of a selective array of artifacts from the Andes and Amazonia. These include etched story gourds, woven textile pieces, "Slice of Life" Tigua paintings, festival masks, feathered headdresses, ritual objects, musical instruments, hunting

implements, children's toys, cooking implements, and finally the focus of this thesis, Canelos Quichua ceramic pieces. Together, all of the items in the collection stress the importance of artistic production, storytelling, and other non-written approaches as means of wisdom sharing and meaning making. They emphasize the value of cultural practices and processes, individual experiences, and personal knowledge.

Several QR codes that accompany the physical artifacts can be found throughout the collection room, and when scanned with the cameras on their phones or tablets, visitors can quickly access digital resources that are associated with our exhibits. Each code makes accessible a different digital learning tool, many of which were created with the help of former undergraduate student curator Diego Arellano. For example, one interactive tool is a digital story map that situates several artifacts in the location where they were created. It contains additional resources pertaining to indigenous art such as videos that demonstrate the process of Canelos Quichua ceramic making, hyperlinks to cultural and historical information, additional readings, and the websites of similar collections. Other resources that are accessible by QR code include the 3D digital models of collection pieces that can be virtually manipulated by the user.

In conjunction with the physical collection of artifacts is a traveling pop-up exhibit titled *The Hidden Life of Things: Andean and Amazonian Cultural Artifacts and the Stories They Tell*. The exhibit contains 20 seven-foot-tall retractable banners centered on the ways that material culture can be used to share indigenous narrative, as well as on the broader meaning-making practices of the Andes and Amazonia. Specifically, it attempts to communicate the ways in which tangible objects and performance traditions are used to document and record narratives and histories. Each panel contains limited amounts of text, thereby placing a larger emphasis on images of the art and interactive resources that are accessible via QR codes. To date, this exhibit

has traveled to institutions such as University of Wisconsin and University of Illinois at Urbana-Champaign and has been presented at several events at The Ohio State University.

Preface:

An Overview of My Undergraduate Student Career and Curatorial Experiences Working with The Ohio State University's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection

In this section, I detail my involvement with the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University, describing not only the projects and presentations that I was a part of, but also how my work contributed to my undergraduate academic experience and has made a lasting impression on me as a person.

As an undergraduate student studying Spanish language and Latin American cultures, I was first introduced to Ohio State's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection in the fall of 2018 during my sophomore year. I enrolled in Dr. Michelle Wibbelsman's Andean Art, Culture, and Society (Span 4515) course as an elective for my Spanish degree and our class met in the Department of Spanish and Portuguese conference room (Hagerty 255) – the same space that permanently exhibits the collection. Dr. Wibbelsman took full advantage of where our class was held and frequently passed around artifacts that were related to our discussions. In doing so, my classmates and I learned through active engagement with the cultural artifacts themselves. We used analytical approaches that required critical thinking to discuss many topics such as the history of artistic expression and production that utilize a wide variety of mediums, the ways in which artistic practices and larger socio-cultural processes influence each other, and how societal issues continue to manifest themselves in art. The course served as an excellent introduction to Latin American epistemologies – the ways in which knowledge is created, shared and understood. In particular, we focused on the

epistemologies that belonged to the indigenous communities of the Andes and Amazonia, and were primarily related to art.

Toward the end of the semester, former undergraduate student curator, Diego Arellano, prepared to graduate and Dr. Wibbelsman announced to the class that those interested in continuing to work closely with the collection should reach out to her. I seized the invitation as an excellent opportunity to conduct humanities-based research and further investigate the specific themes that interested me. Along with two other classmates, Elaine Louden and Jenna Mayers, I began to work as an undergraduate curator in December of 2018.

In January of 2019, I began the second semester of my sophomore year and enrolled in one credit hour of independent research (Span 4998) with Dr. Wibbelsman. As a curator group, our first priority for the semester was the reorganization of the artifacts in the collection. This included the addition of our Sungui, Moon Man, and Lumucha ceramic figurines, a regular shaman's bench, and several feather pieces that were donated by Dr. Christine Ballengee Morris, Professor of Arts Administration, Education and Policy. Additionally, with private donation funds provided by Dr. Norman E. Whitten Jr., curator of the Spurlock Museum at the University of Illinois at Urbana-Champaign, new display cabinets were installed in the conference room. We began our work by removing each artifact from the case it was previously held in, and after we reflected thoroughly about the approaches that we could take to group pieces together, reorganized the collection on the basis of similar cultural concepts such as miniaturization, the presentation of non-linear narratives, depictions of daily life, gendered pairings, strong personal connections between artifacts and their users, and the importance of festivals among other general themes and concepts. In accordance with our view that the artifacts are alternative forms of literacy, we paired books alongside the pieces in the glass cases. It is very important to clarify

that our curator group does not have any formal education in the field of museology. Instead, our approaches to thinking about and organizing the AAAC derive from our respective fields, including anthropology, Latin American studies, Andean and Amazonian studies, and arts administration, education, and policy. In this sense, we primarily draw on our background information about the cultures we attempt to present and our own experiences as museumgoers, as opposed to coursework or previous work experiences related to curatorial practices. Given that we had little curatorial background between us when we first started, we gained an introduction into some of the logistical considerations related to curating an exhibit including the positioning and proximity of our artifacts to the cabinet lights, exposure of some of our items to natural sunlight, or the maximum weight the glass shelving could hold. We received an introduction to these elements by consulting with The Ohio State University Libraries Exhibit Program Coordinator Ken Aschliman and Senior Exhibitions Preparator Justin Luna who met with our team. In addition to working together to arrange the newly added pieces, each of us chose one subset of the collection to focus on. I selected the Canelos Quichua ceramics, which included both the functional vessels as well as the figurines representing forest spirits and beings.

My main focus during that semester was writing exhibit tags for two of the forest spirit figurines in our collection. The first piece was of Sungui, the androgenous Amazonian spirit of the hydrosphere, with the depiction being of her fish-woman form. In Andean mythology, Sungui has the power to cause destructive weather events such as erosion, floods, and or drought and is also credited as being the source of shamanic power. This specific piece incorporates the corporeal representation of Sungui, Yacu Mama, as a black anaconda draped around her neck, as well as zig-zag patterns on her nose and skirt that also allude to the cultural importance of the anaconda. The second piece I focused on describes the myth of Moon Man. According to the

myth, Moon Man would descend from the night sky to visit his lover, Jilucu, a nocturnal potoo bird. However, after painting Moon Man's face, Jilucu realized that he was her brother and her tears, along with those of her sisters, resulted in torrential rain, floods, earthquakes, and volcanoes. Eventually, these conditions woke up Inti, the sun, who emerged from his cave on earth, ascended into the sky, and ultimately created the first humans (Whitten Jr. 2015:87). The piece in our collection is unique in that it depicts Moon Man and his round, painted face on one side, and the open mouth of Jilucu on the other.

I primarily gathered information for these two exhibit tags from the book *From Myth to Creation*, written by Dr. Dorothea S. Whitten and Dr. Norman E. Whitten Jr., which includes pictures of Canelos Quichua ceramic pieces and discusses their social, cultural, and historical contexts. I condensed this large amount of textual information into exhibit tags of fewer than 125 words that accurately described both the physical appearance of the piece and its cultural significance in a concise and digestible format. I wrote each card to be understood by those unfamiliar with the piece and the depicted spirit while simultaneously offering new information to those with prior knowledge of Andean and Amazonian mythology. Through a series of email exchanges, I received feedback on my exhibit tags from Dr. Norman Whitten, Jr. himself. This interaction was especially impactful in that I had the opportunity to have my work reviewed by one of the world's leading experts on the Canelos Quichua ceramics. By engaging with Dr. Whitten, I learned how even minor changes in diction can drastically alter the meaning of a paragraph, it's loyalty to accurate ethnographic representation, and the subsequent interpretation of the reader.

Elaine, Jenna, and I presented our collection's traveling pop-up exhibit, a series of 20 seven-foot panels titled *The Hidden Life of Things: Andean and Amazonian Cultural Artifacts*

and the Stories They Tell to more than 760 attendees of Ohio State's 2019 Innovate Conference (May 16, 2019). We used iPads to access the QR codes for the interactive features created by Diego Arellano and paired these additional resources with the textual information on the panels. Additionally, we supported the Andean and Amazonian Virtual Reality Project Collaboration with ACCAD (Advanced Computer Center for the Arts and Design) at the Innovate Conference which allowed users to virtually immerse themselves within the Amazonian region and explore several cultural concepts with the use of multiple senses. In preparing for this conference and familiarizing myself with these programs well enough to present them to others, I gained a lot of insight into the potential uses of digital interactive resources. Observing audience interactions with the resources we already had largely motivated and inspired me to continue to increase the access to our collection through digital interactive technologies.

It was during a meeting held in preparation for this conference that I first mentioned my idea for a digital interactive program to Dr. Wibbelsman. As we all sat around Hagerty 255, surrounded by the glass cases that contained our collection, we discussed the technologies that we would be presenting and how they attempted to metaphorically break even our most fragile pieces out of the vitrines that separated them from our visitors. Over that summer, I began to formulate ideas for the digital interactive program and looked into the technology that would make such a resource possible.

That following fall, we had the opportunity early on to present our pop-up panels twice more. The first was at the Indigenous Peoples' Day celebration organized by the Global Arts and Humanities Migration, Mobility and Immobility project on October 14, 2019, at Sullivant Hall for more than 130 people. We then presented a month later at the National Quichua Alliance

Meeting on November 11, 2019, at the Ohio Union, which brought more than 80 Quichua language speakers and learners from across the country to Ohio State.

In addition to the opportunities to share our collection with the public, our group of undergraduate student curators also had the opportunity to host the welcome discussion on November 18, 2020, with Sebastián Calfuqueo Aliste, a Mapuche artist from Chile who was invited to OSU as an artist in residence through the Global Arts and Humanities Discovery Theme (GAHDT) K'acha Willaykuna Andean and Amazonian Indigenous Arts and Humanities Collaboration. Our conversation was held in Spanish and was facilitated almost entirely by the undergraduate student curators. We focused our discussion on Calfuqueo Aliste's ceramic, installation, and performance art in relation to our collection, but also on larger socio-cultural and political contexts. This recorded event welcomed over twenty Ohio State faculty members and graduate students from various departments across campus, as well as community members from the greater Central Ohio area who shared an interest in indigenous art and culture.

Through this event and those held in the following days, I had the opportunity to engage in dialogue with this indigenous artist himself to learn more about the current political climate of Latin America and how a wide variety of artistic expressions continue to be used to reflect the sentiments of a community or entire culture. Additionally, I shared my project idea with Sebastián Calfuqueo Aliste and he offered his own thoughts and experiences regarding the accessibility of art in permanent collections and the importance of personal interactions with the pieces. He also provided me with notes on how to best maintain the cultural integrity of the digital interactive program while also ensuring that my message would be clearly presented to the user.

With the reorganization of our collection complete, my fellow undergraduate student curators and I each had the opportunity to pursue our own projects for the semester and I chose to begin my thesis work with the ceramic vessels. As I started to draft sketches of how I envisioned the digital program, Dr. Wibbelsman looked into potential partners on campus that would be able to assist me with the technological aspects of the project. On September 18, 2019, I pitched my idea to a diverse group of graduate and undergraduate students including Lakshika Udakandage and Leigh Loomis from ACCAD, Jessica Pissini and Anna Freeman from Arts Administration Education and Policy, and Bryse Wagner, a second-year undergraduate student with computer coding experience interested in working with the collection. Additionally, that autumn, after hosting a tour of our collection, I pitched my project idea to Dr. David Staley, Director of the Humanities Institute, as well as Dr. Rick Livingston, Assistant Director of the Humanities Institute.

These meetings served as an opportunity to not only formalize my ideas but receive feedback about concerns that I had not yet considered. For example, one suggestion that I received was to think carefully about my intended audience. This advice helped me shape many aspects of the digital resource such as the level of detail of the textual information, the complexity of the reflection prompts, and even the digital platform of the program. Collaborators came from departments all over campus and as a result, each person shared their own perspective about the project based on their unique backgrounds and areas of expertise. These interdisciplinary exchanges made addressing potential challenges and subsequently identifying effective solutions very efficient. In addition to input and suggestions, the fact that I surrounded myself with a diverse team granted me access to knowledge about the technological aspects of the project as well as the resources that were needed to bring my ideas to fruition. I

certainly learned a lot from my collaborators and had the chance to share knowledge about the cultural concepts, processes, and practices associated with ceramic making in the Andes and Amazonia.

These meetings also allowed for interaction between people at all stages in their academic careers. Not only was I able to learn about the cutting-edge projects being created by the graduate students, but in addition, they offered themselves as additional resources if I decided to study art and design or art education later on in my academic career. In addition, I also formed many relationships with academics already established in their respective fields. These were particularly meaningful to me in that they were organically formed outside of the classroom on the basis of mutual interest in each other's work.

Over the next few weeks, additional meetings served to refine my ideas concerning the final product as well as brainstorm about the specific cultural components that should be included. It was during one of these meetings that the idea for a supplemental coloring book was developed. As the semester drew to close tremendous progress had been made with respect to conceptual design of the digital interactive program.

During the second semester of my junior year, I enrolled in Dr. Wibbelsman's Latin American indigenous literatures and cultures class (Span 4565H). While the course I had previously taken with Dr. Wibbelsman focused mainly on the cultural themes found in indigenous art, this course dove deeper into the indigenous cultures in relation to the historical, geographical, social, cultural and political contexts of Latin America through the analysis of texts written by knowledgeable academics or indigenous writers. I was able to establish a technical vision of the final program over the course of the last semester and this class taught me more about the cultural concepts I was attempting to convey in my project. I also benefited

greatly from the essays I wrote in this course in that I began to think critically about which aspects of indigenous ideology I wanted to include and incorporate into the final product.

Unfortunately, due to the outbreak of the COVID-19 virus in early March, my time in-person with Dr. Wibbelsman was cut short as classes were shifted to an online format. Nonetheless, my final project for the course consisted of a rough outline of the digital interactive program as well as its associated coloring book. Through this final assignment I not only presented a holistic summary of the project in Spanish to my classmates who had little background knowledge about the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection, but in addition, I produced the first preliminary sketched for a coloring book that could complement the digital interactive program.

I reached out to Professor Jeremy Patterson at ACCAD in early May and requested his input about how my vision for the program could be created. Professor Patterson expressed interest in the project and made me aware of considerations such as the platform of the final program and how aspects of a digital interactive resource or coloring book might differ based on my target audience. Megan Hasting, Assistant Director for the Center for Latin American Studies at Ohio State, also offered advice on how to craft educational resources specifically for younger users.

As I now reflect on the hard work of the last two years, I cannot emphasize enough how grateful I am to have worked on such an incredible project. Since the earliest pitches, I have had nothing but a wealth of supporters from all over campus, and even other institutions, who not only took the time to hear my ideas, but also offered suggestions that shaped the way I approached this project. The final version of the digital interactive program would not have been possible without the insight and dedication of Professor Patterson, whose close guidance allowed

me to bring to fruition what began as a series of rough sketches. Most importantly, I am extremely fortunate to have such a knowledgeable, nurturing, and invested mentor in Dr. Wibbelsman. It was her patience and encouragement that fortified my passion for this project and constantly motivated me.

Because I am also majoring in biology and evolution & ecology, the vast majority of my coursework has consisted of classes associated with the life sciences. The time I have spent working with this collection is especially meaningful in that it offered me the opportunity to further study topics related to my Spanish language education, even after my required courses were completed. Furthermore, my role as an undergraduate student curator served as a creative outlet and allowed me to pursue new passions related to the arts, an area of study that, admittedly, I had not considered exploring prior to my sophomore year.

Though I had once primarily associated research with subjects such as biology, chemistry, or physics, my curatorial experiences have since redefined what the term means to me, proving that academic inquiry can encompass any field and often involves more than one at once. Additionally, the value of the knowledge and many abilities I have gained over the last two and half years is unmeasurable. From establishing a clear and concise idea, to communicating my work in an effective manner, improving my skills during each step of the process has solidified my desire to incorporate research into my career, no matter what it may be, and has prepared me well to meet my investigative goals.

Finally, the nature of work itself will certainly go a long way towards preparing me for the future. I have slowly come to understand, and in many cases, adopt, the ideologies of the indigenous communities I have been working with. Specifically, my ability to think and problem solve from multiple perspectives has already helped me as a student and will continue to define

how I approach the next steps in my educational and professional careers. Finally, I thoroughly enjoyed being able to get to know and work closely with mentors and peers from a wide array of backgrounds. This opportunity to experience the collaborative nature of interdisciplinary academia will continue to motivate me to seek out opportunities through which I can merge multiple interests into work I feel passionately about. I am very grateful for the experiences that my role as an undergraduate student curator has afforded me and I am excited to see how it will shape my future.

Chapter 1: Introduction

Over the last few decades, experiential learning, defined as learning through immersive experiences followed by reflection about newly acquired skills, processes, attitudes, or ways of thinking, has become increasingly popular (Lewis and Williams 1994:5). In recent years, advances in technology have produced more opportunities for experiential learning with the use of digital interactive resources for learning such as computer games, e-texts, and more (Hwang and Wu 2012:E9). These developments in interactive technologies such as 3D printing, augmented reality experiences, and other digital features have revolutionized possibilities in museum settings across the world and become especially important in relation to items held in traditional exhibit display cases. My research is focused on increasing the accessibility of and appreciation for indigenous artifacts from the Andes and Amazonia through the use of digital interactive technologies and resources designed to allow experiential learning and increased audience engagement with pieces in Ohio State's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection. Attention to decolonial ideologies and practices as they relate to decentering Western approaches to art is also central to my project.

As an undergraduate student curator of The Ohio State's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection (AAAC), I spent countless hours in the process of designing, creating, and evaluating digital interactive resources. I was particularly interested in their application to experiential learning and visitor engagement with indigenous artifacts, specifically, ceramic pieces made by members of the Canelos Quichua community, which are particularly fragile and cannot be easily handled outside of a display case. Furthermore, I considered the ways in which the indigenous perspectives, concepts, and practices that we attempted to educate our audiences about could be incorporated into the educational experiences

and resources themselves. I was interested in the extent to which interactive digital tools can be designed to facilitate engagement with Andean and Amazonian indigenous art as epistemology. Could this increase appreciation for indigenous forms of expression and provide new insight into key Andean and Amazonian cultural concepts and practices?

The central goals for this project were to:

- Increase the accessibility and use of the Canelos Quichua ceramic pieces housed in Ohio State's Andean and Amazonian Indigenous Art and Cultural Artifacts Collection and broaden the reach of our collection beyond The Ohio State University by way of sharable digital resources.
- Utilize activities-based, interactive features and exercises to catalyze personal connections between exhibit users and collection pieces they create digitally in order to foster engagement with and experiential understanding and appreciation of Andean and Amazonian concepts, aesthetics, processes, and customs.
- Beyond appreciation of the ceramic pieces themselves as cultural products, increase appreciation for the underlying knowledge and processes associated with the making of Andean and Amazonian ceramic vessels
- Effectively communicate knowledge about and promote dialogue between users and Andean and Amazonian indigenous cultures in ways that incorporate the ideology and practices of the cultures themselves

As someone exploring the opportunities and challenges of our collection from outside the field of collections and museums studies, the approach I took to conducting this research was heavily influenced by my personal work with the collection as well as my background in Latin American Studies and driven by my interest in digital humanities. The numerous opportunities

granted to me by this position allowed for me first-hand observation of visitor interactions with the artifacts in our collection room, our traveling pop-up exhibit at various events and conferences, and the already existing interactive digital resources created by past student curators that are freely available on our collection website (https://u.osu.edu/aaac/). During my studies, I observed and took note of the duration of time users spent viewing the artifacts, the type and number of questions asked, the levels of engagement with textual information, self-guided exploration of currently available digital interactive resources, and more. Furthermore, my course work as a Spanish major, along with supplementary readings, provided me with additional information about the processes associated with indigenous ceramic making and the cultural concepts that I attempted to incorporate into the digital interactive resources. I used these experiences to experiment with addressing challenges specific to our collection and work toward improving resources.

Another purpose of this project was to honor indigenous learning approaches that incorporate multiple senses and hands-on interactions. By metaphorically breaking our pieces out of their glass cases, we sought to increase the level of access to some of our more delicate pieces. Additionally, we sought to overcome the fixed nature of our collection by creating interactive features that could accompany our traveling pop-up panel exhibit and be accessed via our website or scannable QR codes.

On a larger scale, we created these digital interactive resources to encourage deeper understanding of cultures whose traditions are often underrepresented and underappreciated by Western society. We also urged engagement with the non-conventional, yet equally important, sources of knowledge that they produce. Finally, we aim to reveal and explore the complexity of indigenous vessel making as a form of knowledge production.

I attempted to accomplish these project objectives by designing and evaluating a digital interactive resource that allows users to design a personalized ceramic vessel based on authentic Canelos Quichua pottery housed in our collection. Users are able to learn about the traditions, processes, and concepts associated with indigenous art by not only interacting with their piece, but also by reading small amounts of textual information and reflecting about their experience. To create the digital resources, I conducted background research on the Canelos Quichua ceramic making process and digitally created the various combinations of vessel shapes, colors, and painted patterns that users can choose from.

After completing these digital assets, I gauged the basic effectiveness of the digital interactive resource in its ability to facilitate interaction between audience members and our cultural artifacts through the use of a follow-up survey that collected both quantitative and qualitative data. Recorded observations, in-person observations, screen recordings, and interpersonal discussions provided additional feedback about the successes, pitfalls, and potential directions of the digital interactive program.

The data that I have analyzed thus far suggests that users experienced more interactions with museum collections after using this resource, compared to the number of interactions that typically had with similar exhibits. Specifically, they successfully used multiple senses. Users also reported increases in knowledge about and appreciation for Canelos Quichua traditions and practices, in particular, the master potters' ceramic making process. The program also increased their understanding of indigenous art as a source of knowledge, and they recognized that both artistic creation and appreciation are characterized by interactive processes. Although some reported that they did not necessarily establish a strong personal connection with their digital

piece, many expressed interest in engaging with Canelos Quichua concepts and practices as well as our collection and resources in the future.

This digital humanities project is valuable in that it produced a digital interactive resource that is specifically tailored to the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University. Increasing one's knowledge of and appreciation for indigenous art, cultures, and schools of thought by way of this resource is important in that learners gain insight into ways of thinking that may be unfamiliar. Additionally, this body of work adds to ongoing conversations about best museum practices in the digital age, specifically those related to curation of indigenous art exhibits.

Subsequent chapters of this thesis include a literature review of published research relevant to our project, a section on methodology relating to the creation of our interactive resources along with discussion of notable features of the digital interactive program that allowed indigenous cultural concepts to be experienced during the process and incorporated into the final products of the user, a chapter describing our approach to answering our guiding questions along with sections on the quantitative and qualitative analysis of data we collected, and finally, by way of conclusion, a discussion of the implications of our findings and the future of the project.

Chapter 2: Literature Review

This chapter examines published literature related to the intersection of museum accessibility, interactive technologies, and experiential learning in relation to ceramic artifacts made by the Canelos Quichua community. The first section provides background information about Canelos Quichua pottery. I then discuss the respective perspectives of art held by indigenous communities and those held by the majority of the Western world. I provide a brief history of art observation in the museum setting. Next, I describe some of the barriers that stand between visitors and artifacts, as well as the benefits of interactions between the two. I discuss how interactive technologies can be used to work around these barriers before offering a brief overview of experiential learning. Finally, in the last section, I write about how this approach to learning can be specifically seen in indigenous communities from the Andes and Amazonia.

Section I: Canelos Quichua Pottery

An overview of proper understanding of Canelos Quichua ceramics, the artifacts that are the primary focus of this thesis, is necessary before I delve into the specifics of this project and how I carried it out. To the Canelos Quichua people, the central importance of pottery to cultural transmission cannot be overemphasized, an idea held by Norman Whitten Jr. (2008:15), as well as many other ethnographers. In other words, ceramic artwork is commonly used to share practices, concepts, and knowledge from generation to generation. Wibbelsman (2017:78) notes that in particular, these ceramic pieces have great significance in terms of the history, ecology, mythology, cosmology, and daily life of the communities that produce them.

The Canelos Quichua people live around the eastern slopes of the Andes Mountains in the Pastaza province of Ecuador, around the city of Puyo (Whitten 1982). Pottery making has

been a staple of the Amazonian Quichua region for thousands of years. Archeological evidence suggests that the practice has existed in the area for more than 7500 years, which is more than 1500 years before it emerged elsewhere in the hemisphere, as noted by Kramer (2017:59). In these communities, ceramic making is a process that is completed exclusively by women and is characterized by traditional hand coiling, decorating, and firing techniques (D. Whitten 1982). Young girls learn these skills from their mother or other maternal figure through observation and imitation (Mezzenzana 2020:288), and they continuously change as the potters progress through life. This idea reminded me a lot about how a parent might teach their child how to cook a culturally significant dish, with the child later adding their own personal touches to the recipe before passing it down to their children. In order to understand and appreciate Canelos Quichua pottery, it is important to emphasize the difficulty associated with making traditional ceramic pieces and the skill required to complete each step of the process.

The collective production of *aswa*, the Quichua word for *chicha*, which is a mildly fermented drink made from cooked manioc tubers, is central to the ceramic making process. This drink is made exclusively by women, just like pottery, and manioc, also referred to as yuca, cassava, and tapioca, is a source of power, autonomy, and knowledge. Kramer (2017:60) clarifies this idea when he states that in this sense, making *aswa* helps women establish a prominent role in Canelos society.

The process of making *aswa* begins with the growing of the manioc tuber during which time women tend to their crops with great care. Swanson (2009:37) describes this process to be similar to that of raising children: by singing to them and nurturing them. I think that *aswa* production is also similar to the ceramic making processes in that women partake in every step of the process, not to mention the fact that, as Guzmán Gallegos (1997:61) points out, this practice

is very important for young girls in particular. After having been peeled, cooked and mashed, the manioc is masticated for a minute or two and then spit into a vat where it is allowed to ferment for two to three days (Nuckolls 2010:13). Specifically, the enzyme ptyalin serves as the fermentative agent in the saliva and is used to convert starch into dextrin and maltose (Shields et al. 2015:19 cited in Lancaster et al. 1982:25 and Kramer 2017:58). The manioc is mixed with hot water to make the *aswa* after the fermentation period. It is made in large quantities (between 40-60 gallons) that typically last between 7-10 days and is so rich in calories, carbohydrates, and proteins that the Canelos people are able to survive for several days on *asw*a alone (Baruffati 1984:100). I argue that to an extent, the high importance of *aswa* to the daily lives of the Canelos Quichua people lends support to the significance of ceramic pottery as well. In addition to everyday consumption, *aswa* is drunk in large quantities during festivals and even poured on those who cannot drink fast enough (Sirén 2012:37). I originally interpreted this description as a slight exaggeration but was quickly corrected by footage of festivals in the community.

Most Canelos Quichua ceramic pieces can be categorized as one of five types: the cooking pot (*yanuna manga*) which is used to cook manioc for *aswa*, the soup bowl (*callana*) which is used to serve cooked food, the storage jar (*tinaja*) which is used to store *aswa* as it ferments, the drinking bowl (*mucawa*) which is used for the everyday serving of *aswa*, and the festival piece (*pura*), which is used to serve *aswa* during festivals and also to represent culturally significant mythic figures, animals, and more (Kelly and Orr 1976:XI). More specifically, these five types of vessels can be grouped together, with the first two as blackware and the other three as polychrome. Despite the fact that the specific functions of the vessels might differ between indigenous and Western households, a similarity that can be made between both societies is that certain vessels have specific purposes around the house based on their material and shape.

Examples of this include a soup pot, which is specifically designed to be tall enough to hold large amounts of boiling liquid, as well as the slender design of a flower vase, which is perfectly suited to support a growing stalk.

Blackware and polychrome ware pieces ultimately look different but their vessel making processes are very similar. Firstly, it is important to recognize that in using the word 'traditional' to describe Canelos Quichua pieces, there are four assumptions, as described by N. Whitten, Jr. in the book *Rainforest Visions*. These pieces are constructed from coils of clay, as opposed to a potter's wheel and slips (liquid clay applied over raw claw) used to establish the base colors of a vessel. Also, polychrome decorations are made from natural rocks and clay dyes. Additionally, the firing of the ceramic pieces is done at an average temperature of 1400 degrees Fahrenheit, without the use of a kiln or pit, and finally, a processed tree resin is used to lacquer the final artifact (D. Whitten and N. Whitten, Jr. 1988 cited in Grieder et al. 2002:172). The significance of these techniques might not be immediately apparent to readers with little prior knowledge of ceramic artwork. It is therefore important to reiterate that the entirely handcrafted nature of these pieces makes their creation that much more impressive because of the meticulous manipulation of the clay. Additionally, the temperature of 1400 degrees Fahrenheit achieved without use of a kiln is extraordinary.

The following paragraphs serve to describe the tradition of making Canelos Quichua ceramic vessels, though it should be noted that the making of ceramic figurines is very similar. Hundreds of pounds of clay are mined at a time by the Canelos Quichua people from specific sites with the use of only shovels and machetes at the very beginning of the process (N. Whitten, Jr. 2015:56). The clay that is used to make a ceramic piece is specifically selected depending on a type of piece and is carefully cleansed of unwanted residue if necessary. Mezzenzana

(2015:163) provides examples of this when she explains that master potters use clay containing small stones when making storage jars, smooth grey clay when making drinking bowls, and special black clay when making blackware eating bowls. N. Whitten, Jr. (2015:56) adds that in general, heavy grade clay containing quartz crystals, sand, and tiny pebbles is needed to withstand high temperatures are used for blackware while smooth clay is used for drinking bowls and coarser clay is used for storage vessels. When I closely examined the material composition of the c*allana* and *mucawa* pieces in our collection, I was able to feel a noticeable difference in the texture of each piece. The *callana* contained tiny rock fragments while the *mucawa*, which is intended to be held to one's mouth, was much smoother.

Once the clay has been gathered, it is rolled into coils of uniform size and thickness on boards that are shaped like turtles, analogous to the boards used by shamans to cut tobacco (N. Whitten, Jr. 2016:204). Kelly and Orr (1976:3) write that soon after, these coils are stacked on top of each other, and when the clay has become firmer, the coils are made smooth with a piece of a gourd shaped like an oval (*huihuishcu*). After the shape of the vessel has been formed, the piece is allowed to dry for a duration of time that depends on the vessel (between a few days and 2 weeks). The ethnographers continue by asserting that a piece is finally smoothed with either a river pebble, in the case of storage jars and eating bowl, or a small piece of corn husk, in the case of a drinking bowl (Kelly and Orr 1976:3-18).

The respective steps required to make blackware and polychrome ware begin to diverge at this point. At temperatures of about 1500° Fahrenheit, blackware pieces are fired in what resembles a bamboo crate before being allowed to cool slightly, as described by Whitten and Whitten Jr. (1988:19). Then, the interior of the vessel, and in some cases the exterior as well, is rubbed with taro or sweet-potato leaves which provide an oxygen-reducing substance. The vessel

is then fired once again, this time in an oxygen reduced environment (Whitten Jr. 2015:56). By firing their pieces under these conditions, master potters are able to produce the signature shiny, dark colors of blackware. Given the fact that I come from a STEM background, I found the scientific aspects of these culturally significant processes incredibly interesting. It would also be worth researching the underlying biochemistry of other practices such as the application of tree resin.

Color is not added to blackware vessels, however as the term implies, this is not the case when making polychrome pieces. After a storage jar, drinking bowl, figurine or toucan jar (*sicuanga manga*-- the only polychrome vessel that is not used to store or serve *aswa*, and is instead used to store feathers, beads, and other personal items (Cabrera Suárez 2018:29) has been sufficiently dried, a base color, usually white, is added to the piece using a slip. These slips are produced from black, red, white, and yellow clays and rocks that, as described by Whitten Jr. (2015:56), are actively traded between master potters across the region in an effort to ensure the abundance of these colors. This is only possible through an extended kin group, *ayllu*, that also allows the exchange of varieties of manioc, access to game resources, and marriage partners (Reeve 2014:21). This concept of *ayllu* can be applied to many different cohorts in Western society as well, such as a group of faculty members in the same department, or all of the players, coaches, and staff members affiliated with a sports team. In Span 4565H Latin American Indigenous Literatures and Cultures, our discussions and collaboration, both during and outside of our scheduled lecture time, led us to think of our class as an *ayllu*. The piece dries once more before the vessel is polished with the female soul stone (*aya rumi*) (Whitten Jr. 1976:90). The *aya rumi* can be thought of as one of the several ways in which master potters establish a strong personal relationship with their piece.

After a base color has been added, master potters proceed to paint designs on her piece with a brush made of her own hair. This specification may seem unnecessary to some, however a close examination of the painted motifs reveals why such fine brushes are needed to achieve the precise lines. As noted by Bruhns and Stothert (1999:168), life forces, living beings, mythic spirts, and spirit masters can all be represented in these designs. The *mama churana* is the first line that is painted, and being the thickest, determines the overall design of the piece (López García and Miguélez 2001:133). It should be noted that visualization of the final product is vital to the ceramicist, as erasing the *mama churana* is nearly impossible, as explained by Mezzenzana (2015:193). I found that this approach taken by the Canelos Quichua ceramicists differs from some modern Western art styles that rely on unpredictability or spontaneity, such as splatter painting. After making the *mama churana*, thin, parallel lines are painted on either side to form geometric shapes that eventually become the overall motif of the piece.

Once completed, the vessel is fired at temperatures that range between 1300° and 1700° Fahrenheit. While master potters fire blackware twice, the second time being in the oxygen reduced environment, N. Whitten, Jr. (2015:60) distinguishes these two categorizes of pottery by writing that this is not true of polychrome ware, which is fired only once and for a shorter period of time.

Finally, after removing the polychrome ware from the fire, but before it is fully cooled, *shilquilla* tree resins are applied to the exterior of storage jars and to both the interior and exterior of drinking bowls. N. Whitten, Jr. (1976:90) maintains that in doing so, master potters reveal the true characteristics of the piece. According to the ethnographic work of Francesca Mezzenzana (2015:171), the powerful fragrance released during the application of the resin to the hot pottery largely determines the quality of *aswa* stored or served in those pieces. It is

therefore this smell that is critical to the experience of consuming the drink. In other words, the smell of the vessel itself has a large impact on the taste of the *aswa*, a fact that serves as another example of the multi-sensory aspects of Canelos Quichua traditions. I saw this pattern repeated often so I made sure to design the digital interactive program in a way that not only allows senses to accompany each other but complement each other as well. Finally, the fact that the *mucawa* itself contributed to the taste of the *aswa* reminded me of other cooking utensils like caste iron skillets, clay pots, woks, and *molcajetes* whose "seasoning" processes not only help to preserve the vessels but impact the flavors of the foods they cook.

The cultural significance of the motifs that are painted onto the polychrome pottery should be elaborated on. Not only are these designs painted on ceramics, but they can be seen on the faces of people, including foreign tourists, in the city of Puyo, the capital of the Pastaza province. I thought that this was worth mentioning for two reasons. First, the fact that patterns are painted on the faces of people signifies that the motifs are not limited to ceramic artifacts and speaks to the level of importance that the plants, animals, myths, etc. represented by these patterns have in the Canelos Quichua culture. Additionally, I argue that including non-community members in local traditions is related to the notion that ceramic artwork is not meant to be localized within only one group of people. Specifically, the patterns painted on polychrome vessels are included by an artist so that they can be appreciated not only by a master potter's immediate community, but a wider audience as well. Just like the other facets of the ceramic making process, basic designs associated with the rain forest and the river are learned through observation and imitation.

Briefly, this approach to learning is characterized by a lack of direct instruction, an emphasis on intrinsic motivation, and the utilization of multiple senses. The three most common

motifs that master potters incorporate into their polychrome ware pieces are the anaconda and water turtle, the land tortoise and iguana, and the coral snake ("Whitten Collection of Amazonian Ecuador Cultural Artifacts"). A pattern might be inspired by and named after an animal however the design is not a representation of that particular creature and is instead a depiction of the virtues of that animal, as asserted by Mezzenzana (2015:197). In other words, when a master potter paints an anaconda motif with parallel zig-zags, she may not have been trying to paint a snake on her piece, but instead, might have been motivated to capture its serpentine movement.

Citing N. Whitten, Jr. (2015:60), Wibbelsman (2017:778) remarks that the most skilled master potters are able to "play" with symmetry and asymmetry within the same piece, showcasing their profound knowledge and skills. This ability is one that is gradually developed over time and is a testament to the knowledge that an artist has come to process through many years of perfecting her craft, as well as by observing and interacting with the world around her. I found that the idea of developing the skills to "play" with symmetry and asymmetry was similar to process of jazz musicians who master canonical pieces and then go on to improvise on them with virtuosity.

Mucawas are one type of Canelos Quichua artwork that exhibit the creative abilities of master potters very well. While all polychrome pieces have patterns on the exterior of the piece, *mucawas* are unique in that motifs appear on the interior as well. As *aswa* is consumed, more of these inner motifs are slowly revealed, an occurrence that is observed by Mezzenzana (2015:197). According to N. Whitten, Jr. (1976:91) in his book *Sacha Runa*, women strive to communicate aspects of themselves, their households and their broader communities. While a person who has close connections to a master potter, such as a family member, would likely have a more accurate interpretation of her pieces than somebody who does not know her as well,

ultimately, the master potter herself is the only person who fully understands the meaning of the piece. In other words, while a piece may reference an animal that is common to that region or a myth that is well known within the community, an artist may also incorporate other personal elements, such as memories, experiences, or dreams that would be unrecognized by anybody except for her. This speaks not only to the varying degrees of appreciation and understanding that are possible, but also to the great personal significance that *mucawas* have to their creators.

Ultimately, it is through the painted designs that are found on all polychrome artifacts that Canelos Quichua women are able to pass knowledge among themselves in a way that is similar to that of male shamans, reinforcing the complementary nature of these roles in the Canelos Quichua community (Hornborg and Hill 2011:325). As defined by Michael J. Harner is his book *Hallucinogens and Shamanism*, the word 'shaman' refers to somebody with a direct contact with the spirit world (Harner 1973:XI). In this sense, the roles of master potters are connected to those of the shamans in that the women use their artwork and the processes involved in their creation to interpret shamanic visions, thereby connecting mythic and contemporary world events (D. Whitten and N. Whitten, Jr. 1988 cited in Wibbelsman 2017:76). In his article titled "Ecological Imagery and Cultural Adaptability: The Canelos Quichua of Eastern Ecuador," N. Whitten, Jr. (1978:845) notes that the basis of vision is dreams and that in the early hours of the morning, men and women will discuss their dreams with each other seeking "dynamic, shared, perceived relationships among dream content, personal and social situation, graphic design, and mythic event." Additionally, according to D. Whitten and N. Whitten, "A powerful image-making woman "clarifies" a shaman's visions while he is in seance, and a shaman himself, while chanting, may bring to consciousness symbolism deeply embedded in his wife's or sister's ceramic art. What binds these distinct yet merged male/female domains is

an ancient, enduring cosmology" (D. Whitten and N. Whitten, Jr. 1988:15-6 cited in Stothert 2003: 398-9). It should be noted that while the knowledge of a shaman is only available to them and often facilitated by the use of a hallucinogen, master potters not only see shamanic imagery, but bring them to light as well (Mezzenzana 2015:208). In other words, the designs that are painted on polychrome vessels are made to be seen by members of the community so that the knowledge of the artist can be shared and understood by others.

Ceramic making has been, and continues to be, a very important cultural practice to the Canelos Quichua people. The skills required to make these pieces, both blackware and polychrome ware, are acquired by women throughout their lifetime and the vessels themselves are characterized as being traditional, distinguishing themselves from ceramic techniques that are commonly used by Western artists. Lastly, these pieces, as well as their processes, are closely related to the sharing of knowledge. This not only takes place between a master potter and members of the community when she incorporates references to culturally significant plants, animals, and myths, but also between an artist and her work as she exchanges information about the world around her with her piece as she interacts with it.

Section II: Indigenous and Western Perspectives of Art

When considering these Canelos Quichua ceramics, it is important to do so through the lens of the indigenous peoples of the Andean and Amazonian region. In this section, I highlight three interrelated facets that are central to indigenous views of art held by communities in the Andes and Amazonia:

- Indigenous art and artifacts commonly have functional uses
- Art can often serve as a source of knowledge

- Transmission of knowledge between a person and art requires interaction between the two in both directions

The Functional Uses of Indigenous Art

Most people who visit our collection of indigenous art are likely to gravitate toward "viewing the artifacts" and focusing on their aesthetic qualities. This approach to art appreciation, as well as the notion that art is created to be admired and commented on but rarely handled or used with a specific objective in mind, is often exacerbated by the locked vitrines that contain the majority of our pieces. On the other hand, one notion that is central to the indigenous communities we have been discussing is that art is not meant to be merely looked at, but rather used with purpose. In this sense, art can be found in every artifact, and inversely, in every piece of art lies some variation of an artifact or tool (Paternosto 1996 [1989]:6). I believe that this is certainly true of the artifacts housed in our collection. For example, our *chumbis*, which are used by indigenous women and function similarly to a belt, contain colorful patterns that are beautifully woven, yet are typically worn under a layer of clothing. This is certainly true of Canelos Quichua pottery as well, whose artistic value is recognized across the region, but as Baruffati (1984:100) intentionally points out, their functional value is highly regarded as well. The ceramic pieces produced by master potters have a wide variety of functions that differ based on the type of piece. In this sense, we can see the relatedness between the physical structure or appearance of a piece and what it is used for.

This ideology of functional art has persisted since pre-Columbian times, as even then, the purely aesthetic was unknown (Paternosto 1996 [1989]:6). Today, the Quichua language does not have a designated word for "artist" or "technician." Any separation between the artifact's "artistic" and "technical" sides is absent, signaling the importance of curating indigenous items

based on the intentions of their makers and the cultural concepts that inform them. I argue that because these artifacts were often created with a specific function and meant to be interacted with, they should be appreciated in such a way as well.

Knowledge Transmission Through Art

Even though each type of artifact or individual piece has different purposes, one function that is generally seen across Andean and Amazonian art is that it serves as a source of knowledge. Firstly, it is important to recognize the flexible definition of knowledge in indigenous cultures from the Andes and Amazonia. According to Hendricks (1988:220), "Knowledge is associated with the heart and thinking, and refers to knowing, feeling, experiencing, and truth." The term itself is difficult to define, however, knowledge creation can be thought of as using multiple senses to form a person's body and subjectivity through the exchange of substances, as well as the reproduction and appropriation of the movements of others (Mezzenzana 2015:36, McCallum 1996:347, Santos-Granero 2012:199). Based on this collective definition, it is my interpretation that the formation of new knowledge is closely related to the manipulation and incorporation of existing knowledge. Specifically, this existing information can come from the actions of an individual, the actions of others, or the surrounding environment. Additional ideas relating to this definition of knowledge and how it differs from that of Western society will be touched on in the following sections.

Art can be used to document and share information about important figures, memorable events, or culturally significant processes, and perspectives of the community. Because Quichua cultures rely primarily on oral traditions, art serves the important function of documenting community experiences without the use of written words. On the other hand, written cultures document their experiences through text which leads art to be thought of more in terms of

aesthetics than documentation. Paternosto (1996 [1989]:12) goes so far as to claim, "in the absence of written language, the visual metaphors of the Andean arts are pregnant with meaning in a manner that is foreign to our literate civilization." I had not previously considered the ways in which written language could limit how people perceive art, but I think that this quote supports the idea that art is different yet equally valid means of documentation.

Other forms of indigenous art function in this similar way of documenting knowledge and experience. In particular, artifacts are often used to document the local experiences of an artist or others in their community. One example is the "slice of life" Tigua paintings which not only beautifully portray rural life in the highlands of Ecuador but also provide information about the daily happenings of the people from that area (Colvin 2004:5). One piece in our collection made by Nelson Toaquiza from Cotopaxi Province uses vibrant colors to depict community members as they wear masks, play music, and drink what appears to be *aswa* during a festival celebration.

It is not, however, just the alternative narratives that are important but the *way* these stories are documented and told. Indigenous art presents an alternative approach or *form* of narrative through the artifacts themselves that invites multi-sensory, intertextual, multimodal interaction. Such is the case with khipus, which are knotted string devices that record and communicate quantitative and qualitative information (Urton and Brezine 2005:1065 and Urton 1998:410) about traditions, law, history, and more (Conklin 1997:119). Khipus are "read" using the sense of touch as well as sight. The direction of the knot, the materials used, the composition of the knot and the directions of the twists all contain knowledge. Similarly, "reading" of Andean story gourds relies on visual, tactile, and sonorous elements. This art form, moreover, presents

non-linear narratives in stark contrast to Western storytelling (Wibbelsman 2017:70-1) in the sense that one can turn the gourds in either direction to appreciate a circular narrative.

As we consider these examples, what becomes apparent is that ceramic artwork shares many properties with Tigua paintings, khipus, story gourds, and other forms of Andean and Amazonian expression. Similar aspects included the careful exchange of information between artists and their art, the close association with nature, the inclusion of mythological references, the presentation of culturally significant symbolism, and the multi-sensory, interactive nature of Indigenous expression.

In the case of master potters, visions and knowledge are exhibited as tangible pottery. Additionally, it is important to note the importance that music plays in knowledge exchange, specifically its ability to make connections between temporal, and in some cases, spatial realms (Sullivan 1984:47). In an article titled "Sacred Music and Sacred Time," Sullivan introduces the idea that scared music is often derived from experiences other than its performance. When I read this line, I thought about how in some ways, the songs that young girls sing when they learn how to make pottery might be thought of as another way by which master potters share the skills they have developed over time with their daughters.

Music also assists in knowledge exchange in that it helps build relationships between humans and non-humans (Sempértegui 2020:122). In addition to pottery making, I previously recognized that music strengthened this relationship during other processes such as growing crops and weaving, both of which are mentioned by Sempértegui as well. I was loosely familiar with the idea that shamanic practices incorporate music, however, the specific significance was unknown to me. I found that an article written by Seitz provided clarification. She writes that music is one of the ways in which shamans achieve their vision, and that because it has the

ability to cross the barrier between the physical and spiritual domains, it can mediate communication with the spirit and soul forces of the universe. Seitz (1981:226-34) submits the idea that when a woman sings, either out loud or silently, she is able to pour information into her piece. This speaks to the multi-sensory nature of ceramic making in that a sonorous element complements the visual observations and tactile actions of the artists. Beyond this, it underscores dialogue with nonhuman participants in the process of meaning making.

As noted by Bowser (2000:228), information about mythology, plants, animals, and cosmology can be conveyed through the represented features that a master potter includes in her piece. Painted motifs are one way in which knowledge can be shared. Citing an article by Lagrou (2012:258-63) and a paper by Arnold and Yapita (2006:275), Wibbelsman (2017:78) draws attention to the significance of line patterns in a variety of other Amazonian cultures such as the Cashinahua communities. She points out their importance as "pathways of knowledge," perceptual transformation and memory formation. In her discussion, Wibbelsman notes that these pathways have the potential to bridge different realms of experience, a point that I found to be similar to Sullivan's ideas about the functionality of sacred music. Even though I had limited prior knowledge about the indigenous ceramic traditions of the Canelos Quichua community, I found it interesting that many other communities share similar practices. The tradition of painting patterns has persisted over time as a means by which to share knowledge and also maintain powerful connections between human and nonhuman realms of existence.

Furthermore, the overall structural appearance of the piece can contain and convey knowledge. For example, figurines such as Apacha Vargas's depiction of a coatimundi provide insight into the flora and fauna that is all around these indigenous communities and the close relationship that people have with nature. As described by Bartra (2003:88), Dorothea S. Whitten

noted that Vargas's works are so accurate that her depictions of insects could be identified by entomologists from the Smithsonian Institute working in her area. Additionally, the piece depicting Sungui, the androgynous master spirit of the hydrosphere, that was created by Rosa Dagua is an example of an artist's materialization of Amazonian mythology and symbolism. The black anaconda that is draped around the neck of the spirit informs the viewer of the close relationship that s/he has with the animal.

Knowledge Exchange Through Interaction

Master potters are involved in every step of the creation process, from the collection of the materials to the final firings. The interactions that master potters have with their pieces is very intimate, and in the process, ceramists are able to imbue their piece with knowledge. This is not only accomplished through tactile interactions such as the physical manipulation of the clay, but also sonorously through the songs that women incorporate into their work. It is only through this process that both the ceramicist and their piece are transformed (Whitten Jr. 1976:65). In other words, the Canelos Quichua ceramic process is a bidirectional exchange of knowledge facilitated through interactions with art and that as information emerges in the process of creating a piece, a master potter acquires more knowledge as well.

The appreciation and complete understanding of the information contained in ceramic pieces necessitates close attention, for instance, to the type of clay an artist uses depending on the type of piece she is trying to make. Blackware, for instance, requires heavy grade clay and polychrome ware uses smoother clay. Visually, with the exception of differences in color, these types of pieces may appear similar. However, it is through the sense of touch that differences in their composition can be identified, thereby providing information about how master potters

made these pieces and what their uses are. Furthermore, the functionality of ceramic pieces and their close association with *aswa* involve the senses of taste and smell.

Indigenous perspectives of art held in the Andes and Amazonia are characterized by a level of interaction with artistic pieces beyond just visual appreciation. In this sense, Andean and Amazonian approaches emphasize manipulation during creation, as well as interaction with it once it is completed. These interactions and the incorporation of multiple senses allow indigenous art to serve as sources of cultural knowledge. Barriers to interaction within our collection of Andean and Amazonian Indigenous art warrant discussion about potential changes to our curatorial practices so that these pieces are properly organized, presented and appreciated.

Section III: A Brief Introduction to Observation in the Museum

We have established some central aspects of Andean and Amazonian Indigenous perspectives on art. However, many collections, including our own, struggle to organize their exhibits in a way that reflects these approaches. This section provides an introductory exploration of past and present approaches to observation and appreciation in museums that shape the experiences of museumgoers. Additionally, I discuss the influential role that these institutions can play in society. It is important to note that while I recognize differences between art museums and those that contain collections of cultural artifacts, they are both relevant to this thesis since our Andean and Amazonian Indigenous Art and Cultural Artifacts Collection contains elements of both.

Despite our active efforts to work around barriers that stand in the way of audience interaction, our collection of Indigenous art is still encumbered by glass display cases that separate artifacts from our audience. As a museumgoer myself, I have experienced an emphasis

on visual appreciation and the predominant use of sight many times during my own experiences in art museums. Constance Classen and David Howes (2006:200) point out that the dominance of visual culture in some museums limits display to the most visually attractive pieces while those that are not as eye-catching are often confined to storage rooms. They explicitly state that regardless of other sensory factors a piece evokes, outward appearance is often the primary criteria that determines if a piece will be exhibited or not. While it is worth mentioning that historical relevance, value and rarity also play a role depending on the nature of an exhibit, I wonder if the conventional orientation toward visual aspects influences museum curators to appeal to what their audiences will see? This is an approach that I think our collection actively tries to avoid. We attempt to do this by emphasizing that multi-sensory interactions are necessary for truly appreciating a piece and by organizing our collection based on common functions or themes, as opposed to strictly how they look.

Although overreliance on visual observation continues to characterize the experience of many museumgoers, including the AAAC to some extent, my literature review reveals that prior to the middle of the 19th century, museum visitors often had permission to touch and interact with collection pieces. In their chapter in the book *Sensible Objects, Colonialism, Museums, and Material Culture*, Classen and Howes (2006:200) include the personal accounts of wealthy European travelers who were encouraged to handle museum contents prior to the mid 1800s. This permission to interact with collection pieces in some contexts granted visitors access to information that was not readily available by sight alone, such as the weight of an object, which may have indicated the materials it was made of, its value, and even the amount of effort that an artist put into their piece (Classen 2007:901). I experienced this idea for myself during the process of creating the digital interactive program. I wanted the texture of the digital models to

be as accurate as possible, so I carefully used my hands to interact with the vessels in our collection. By doing so, I was able to identify minute imperfections on each piece and gain insight into an artifact's material compositions, information that is not evident through observation alone.

Even though touching items in museum collections was once more common, it is important to remember that up until that point, many museums were private, created by the elite for the elite. Organizers commonly extended the courtesy of handling items to visitors, and if anything, only offered a gentle reminder such as, in the case of 17th century collector Cardinal Mazerin, "these pieces break if they fall" (Classen 2007:899). It was not until the middle of the 19th century that museums began to open to wider audiences as museum scholars advocated for museums to serve to educate the public (Williams 2017:12). Proper handling of artifacts and the possibility of damage were, of course, concerns for many museum curators. With more viewers, this became a concern that could no longer be ignored (Classen 2007:907).

Although the additional information that the sense of touch could provide was valued in the 1700s, a period during which scientific inquiry greatly increased, many museum organizers in the 19th century realized that the potential cost of damaging an artifact outweighed the benefits of visitor interactions. Additionally, concerns of theft may have contributed to limited tactile interaction. As some curators and museum organizers became fearful that the arrival of the general public would result in their artifacts being stolen, physical barriers such as glass cases or ropes were put in place to deter felonious behavior. Finally, perhaps in the aftermath of events such as the 1780 Gordon Riots in London, during which troops were stationed inside of the British Museum to protect the building from vengeful mobs, even the possibility of revolts or

revolutions could have contributed to the shift in museum practices and led to changes in how audiences appreciated collection pieces in some museums (Bennett 1995:69-70).

Changes in Western thought during this same time period, in particular those regarding how people viewed the senses of sight and touch, may have also shaped early modern museum culture and the reliance on traditional case displays. The Western world saw the emergence of social Darwinism around the time that this shift in museum culture was taking place. Some biologists during this time, such as Lorenz Oken, argued that Europeans were the most advanced race and as a result, had the most refined vision. Oken also associated Asians with hearing, Native Americans with the sense of smell, Australian Aboriginals with taste, and Africans with the sense of touch (Gould 1985:394). For Oken, the sense of sight was associated with higher civility. Beliefs like these arose during the industrial revolution and had a profound effect on museum culture. As Classen and Howes (2006:200) note, during this time there was a large emphasis in museums on the visual display which not only served as an advertisement, but also as a sign of material ownership during this time period. I mention these details as my sense is that collecting, organizing, presenting, and appreciating cultural artifacts can only be understood in a wider context that takes into considering not only local, national, and global events, but shifts in thought that accompany them as well.

Today, museums still struggle with organizing, displaying and describing indigenous artifacts and art. When curators present artifacts through traditional case displays they may limit engagement with collection pieces to only sight and largely restrict how collection pieces can be interpreted. Responsible curatorship may involve at its core organizing and presenting cultural artifacts in accordance with the intentions of the artists or originating culture.

Museums can shape how their audiences perceive an indigenous artifact. In this sense, they can serve as civilizing institutions that reinforce specific means of learning and appreciation (Hooper-Greenhill 1994:249). In his book *The Birth of the Museum: History, Theory, and Politics*, Bennet (1995:24) builds on Hooper-Greenhill's argument when he points out that specific behaviors could be learned in museums and later diffuse through society. This speaks to the extensive influence that museums have, as museumgoers can continue to spread the ideologies of the institution even after they go home. In this sense, it bears asking in what ways museums may have helped to reinforce a hierarchy of senses that is devaluing the sense of touch and emphasizing the importance of sight.

The colonial past of museums can present challenges to the curatorial practice of indigenous artifacts in traditional displays. The first aspect of this lies in the fact that many Western museums acquired cultural artifacts through questionable or unethical means (Leventhal and Daniels 2013:339). Not only are artifacts often taken from their original homes, but they are subsequently showcased for monetary gain. Furthermore, such a heavy reliance on sight exotifies these pieces, as museum attendees can only make brief and superficial observations. It is important to note that museums have historically felt justified in their presentation of non-Western cultures. Many museums justified their existence based on the argument that they were doing a service for the cultures whose artifacts they collected and, moreover, that their collection or exhibit could do a better job of preserving these pieces than the original communities themselves.

The second aspect is related to the imposition of Western values and schools of thought vis-à-vis cultural art pieces. As Marstine (2006:14) puts it, limiting audiences to strictly visual interactions with artifacts molds often non-Western pieces into the Western hierarchies or

perspectives on art. In this sense, the intended means of appreciation and interpretation of the indigenous culture are ignored or unavailable to the museumgoer. Much like the colonizers when they first saw indigenous art hundreds of years ago, museums continue to omit non-Western perspectives in their understanding and interpreting of these items. Because some museums continue to struggle with their colonial pasts, active design and mediation are needed to appropriately contextualize indigenous artifacts for Western audiences.

Another example of conforming non-Western art to Western ways of thinking is exemplified in the terms and layouts used to categorize and describe Indigenous artifacts and art. For example, large art museums might group pieces together and labels them with terms such as "fine art", "low art," "high art," "folk art," etc. In some instances, museums specialize in one of these subjective categories, only housing pieces that fit their definitions. I found that Novitz (1996:155-6) summarizes this idea nicely. He notes that classifications are based on a person's experiences of the world and that they can be mistaken due to erroneous beliefs, lack of evidence, or misinterpretation of evidence. Descriptions used for indigenous artifacts may not take into account how these items are described by the indigenous artists themselves or their communities. Current debates in this area are actively exploring terminology used in collaboration with and by indigenous communities. Additionally, Carolyn Dean (2006:25-31) draws attention to an interesting point when she describes the longstanding debates about the use of terms such as primitive art, traditional art, exotic art, non-Western art and even indigenous art, ultimately raising the question of whether the term "art" is itself an appropriate term.

A third way in which museums have omitted indigenous concepts when curating non-Western art can be seen in some institutions' reliance on chronological order to display and describe individual collection items or the manner in which museums organize and present

multiple collections. In other words, as museumgoers progress through a museum exhibit, a visitor might first be presented with art that is 200 years old, followed by art that was created 100 years ago, before finally reaching pieces made in the last decade. Because many indigenous cultures from the Andes and Amazonia think of time as being non-linear, organizing pieces based on when the artists made them does not make much sense.

Moreover, this guided sequence through time implies a sort of evolutionary timeline moving from a "primitive" past to a "modern" contemporary expression. In a article titled *Aspects of Design of Exhibitions and Museums*, Bayer (1961:284) provides the example of ramps being used to guide museumgoers through an exhibit in chronological order. Although this publication is now 50 years old, some museums continue to use this approach. In Bayer's example, Western perspectives of time are reinforced in the structural design of the museum itself.

To summarize, the formation of modern museum culture and reliance on traditional display and description have often failed to include indigenous perspectives and concepts. While this reliance on traditional display may reflect valid concerns held by curators, such as damage or theft, this way of display may limit understanding of indigenous artifacts. I argue that modern museum culture and the curatorial practices that perpetuate it are inappropriate for a collection of Canelos Quichua ceramics and must therefore be decolonized to better reflect the indigenous culture it attempts to represent. In other words, we must intentionally work to decenter the Western perspective and strive to include indigenous concepts, supplemental materials, and artists' perspectives when we curate and present exhibits of indigenous art.

Section IV: Barriers in the Museum and the Benefits of Interaction

This section attempts to describe the limitations that are associated with artifact appreciation in our collection of indigenous art as a result of physical barriers such as glass cases. Additionally, it serves to describe the benefits of overcoming these barriers and allowing increased interaction between viewers and art.

In some museums, barriers are placed between a visitor and an exhibit to stop people from getting too close to an object on display. In the field of museology, this phenomenon is referred to as the glass-case paradigm, as defined by Wilson et al. (2017:456) citing Dudley (2012) and Kreps (2015). Bacci and Pavani (2014:17) take notice of the fact that significant amounts of money are poured into maintaining this separation in visible ways, such as the use of vitrines or stanchions, as well as in ways that are more subtle, such as the presence of sensors or by changing the level of the floors. I have observed all of these practices during my own visits to museums. I have also been aware that some institutions purposefully positioned pieces at a height that is too high for visitors to reach and that even the mere presence of a security guard in other institutions is enough to deter museumgoers from attempting to touch an exhibit. Some museums consider these efforts to be "necessary evils" to protect collections (Pilegaard 2017:87) in response to concerns of damage and theft. Realistically, this logic helps to explain why we continue to present most of our artifacts from behind glass, even though this practice contradicts indigenous approaches to appreciating art.

Additionally, some cultural museums view themselves as having a responsibility to preserve the pieces in their collections so that they can be enjoyed and learned from in the future. However, Pelowski (2017:255) cites Cupchik (2006:218) to explain that these barriers isolate artwork in a space that is not shared by the visitor, and that in turn, this leads to a hyper-fixation

on the formal properties of a piece along with an overall detached approach to appreciation. I found that these ideas are supported by my own observations as an undergraduate student curator with the AAAC, as well as a frequent museumgoer. When visitors of our collection look at the Canelos Quichua ceramics, they often comment on the colors or motifs of the piece. However, because of the glass that separates them from the object, other physical aspects of the piece, such as the texture or weight are difficult to appreciate, not to mention the processes that are associated with making the piece.

Meyer (2020:93) warns us that the reliance on visual observation prohibits other modes of appreciation that would also provide insight into an object's meaning and its significance in the past. The work of Black (2005:204) can be used to elaborate on this idea as he suggests that there are strict limits to what the eyes alone can reveal, and what's more, in cases where textual information attempts to compensate for a lack of interaction, museum audiences tend to be selective in what they actually read. I have seen this concern present itself while giving tours of our collection, and even prior to reading his book titled *The Engaging Museum*, I was careful not to over-rely on textual information when curating our collection of Canelos Quichua pottery. It would have certainly been easier to explain every detail of a piece, but Black neatly summarizes a consideration that I was mindful of when I wrote exhibit tags for the collection. I took the same approach when deciding on the textual information that would be included in the digital interactive resource.

Arellano (2018:17) refers to the work of Price (1986:580) pointing out another potential pitfall of a glass case causing the decontextualization of cultural artifacts when museumgoers are unable to interact with them. Using the sense of sight alone offers a visitor very little information about the functional uses of an artifact or how it was made. I found that Arellano's perceptions of

these barriers within the AAAC were similar to those of Hogsden and Poulter (2012:268) who propose that the separation between a visitor and an object that is created through a barrier such as a glass vitrine rarely allows an embodied connection between the two.

Hooper-Greehill (1992:7) offers additional insight that has since changed the way I view my own curatorial practices when she states that barriers limit the interactions between a viewer and the objects on display. The significance of entire collections is thereby restricted to the private sphere of the individuals who handle the collection, in other words, our small curator group. Because we are the only people authorized to handle fragile artifacts, are we then the privileged few who fully understand the significance our artifacts have in relation to their respective communities and cultures? Unless museumgoers are granted a similar level of access, their appreciation of indigenous works continues to be impeded by vitrines. I think that it is worth adding that because of this, we largely control the information that is available to audiences and therefore should be responsible for maximizing their depth of understanding.

Currently, there is a lot of published research describing potential benefits that could result from removing barriers in our collection and the restrictions they imply. Papadimitriou et al. (2016:42) assert that this can be accomplished by incorporating multiple senses but also caution that this approach is meant to be analytical rather than descriptive. This distinction was initially unclear to me but was eventually clarified by the researchers when they cite the work of Classen and Howes (2006:42), explaining that an emphasis placed on the body and the senses allows for communication and the acquisition of knowledge. This is largely due to the fact that multiple senses are able to collectively contribute to our perception of an object, in this case, a cultural artifact.

Parallels can be made between these ideas and the traditions of the Canelos Quichua community in that master potters visualize their creation and often either sing or talk while they use their hands to make their ceramic pieces. In this manner, one sensory modality can provide information that is used in another. Levent and Pascual (2014:XVI) illustrate this concept with the example that a person could know a shape by the way it feels and later identify it correctly with their eyes. Hetherington (2002:199 cited in Christidou 2019:96-7) provides a unique analogy when he submits that the heightened ability of tactile observation serves almost as an "optical prosthesis." In spite of the fact that I agree with Hetherington's idea that the sense of touch can augment the sense of sight, I caution against the use of the word "prosthesis" because tactile observation should not be thought of as a substitute for visual observation.

The strong connection between the sense of touch and narrative, according to Levent and McRainey (2014:62-3), allows for physical and cognitive access to cultural artifacts and engagement with history. Tactile information can also supplement other senses. According to Chatterjee et al. (2009 cited in Christidou 2019:98), our interpretation of an object is often framed by the ways in which real touch differs from what is seen, such as expected texture, composition, temperature, shape, and size. Hogsden and Poulter (2012:266) would later add that the incorporation of touch creates room for new understanding and previously held ideas are often revealed or challenged. These ideas, however, draw attention to the challenges that arise when interaction within museums is limited. In the absence of the use of touch, information that visitors to our collection acquire visually has the potential to be incomplete or even incorrect.

I found that the ideas of these scholars were similar to Kaptelinin's (2011:1,2) concept of 'meaning making', a phrase that he uses to refer to active interpretation through the development of personalized meaning that incorporates of the values, beliefs, feelings, and goals of the

individual. When we consider the transformation of the learner, we realize that learning is not just the transmission of knowledge to a recipient from sources such as a teacher or textbook. Blud (1990:44) reinforces this notion by implying that if exhibits such as ours were to allow more physical engagement with our artifacts, our collection might be more effective in promoting learning than if it were to remain static. What's more, tactile interactions between museumgoers and our objects could appeal to a wider audience, specifically those who exhibit types of intelligence that are undervalued in a traditional classroom. For example, touch allows for visitors with high 'bodily-kinesthetic intelligence' to learn about cultures that are typically taught in a way that favors 'logical-mathematical' intelligence (Candlin 2006:138). We can similarly speculate that auditory and empathetic intelligences (by which I mean attention to soundscapes and inter-relational, affective connections) also provide unique perspectives into cultures. These were not benefits that I had considered when I first began this projected, but I have since identified them as having the potential to further increase the accessibility of our collection.

In addition, the cognitive and emotional engagement with an artifact described by Kaptelinin allows for the re-contextualization of an artifact, which refers to the integration of a museum artifact that already has a specific function into the context of a visitor's own activity. To better understand this concept, the researcher cites the work of Engeström (1990 cited in Kaptelinin 2011:4), who breaks this term down into two distinct types of contextualization: downwards contextualization and upwards contextualization.

Downwards contextualization is involved with the integration of an artifact at lower levels of activity. In these cases, an artifact may be customized or operated. For example, the downward contextualization of the Canelos Quichua ceramics in this project would involve

learning about the function of the vessels (storage and serving *aswa*), the physical structure of the pieces (the various shapes as well as the motifs they contain), and the actions associated with the piece (the ceramic making process).

On the other hand, upwards contextualization is involved with higher levels of activity in conjunction with the interests, values, and motives of a person. When accomplished, visitors contemplate deeply about the artifact they interact with. Once again using the Canelos Quichua ceramics as an example, the reflections of a visitor might include, but is not limited to, the gender roles of master potters in Andean and Amazonian societies, the importance of multi-sensory exchanges between the artists and their pieces, or the functionality commonly associated with indigenous art. It should be noted that for this first version of the digital interactive program, successful upwards contextualization, if at all possible, will likely rely heavily on the textual information that is presented to the user. In truth, there is no substitute for the physical process that is practiced by master potters as a means by which the cultural concepts of the community can be learned. I am in no way claiming that the digital program will ever be able to fully demonstrate this tradition, however, it is my hope that continuous improvements to the resource will help increase engagement with, appreciation for, and understanding of Canelos Quichua pottery.

Currently, there is certainly a wealth of published literature supporting the idea that direct interactions between museum audiences and museum displays can not only lead to enjoyable museum experiences, but furthermore, that these experiences will be memorable and long lasting (Baker 2015, Bell 2016, Dudley 2015, and Schorch 2014 cited in Wilson et al. 2017:44). However, it is also important to consider a larger scale, in particular, the benefits that are felt by the communities whose cultures are represented by the pieces on display. As Pye (2017:23)

suggests when she cites the work of Peers (1999), engagement with artifacts can provide source communities with the opportunity to learn about the materials, processes, and concepts that are associated with the traditions of their culture. She adds that in some ways, the handling of objects, as well as other collaborations, can initiate a healing process in terms of the relationships between museums and communities. I agree with her viewpoint and think that increasing the involvement of the Canelos Quichua community through approaches such as allowing for more interaction with artifacts as well as engagement with master potters, could lead to the improvement of our collection as well as the experiences of our visitors.

After reading more about the concerns held by some curators and collection organizers, as well as reflecting on the approach that our group of curators has taken to organize the AAAC, I believe that they are valid, but only to certain extent. They can certainly be used as effective means of protection and preservation, however, the limiting effects that barriers in our collection, namely our glass vitrines, have on proper artifact observation are persistently evident. Overall, a visual emphasis is simply insufficient for artifacts such as our ceramic pieces to be fully contextualized. If these barriers were to be overcome and engagement could be increased, this would produce countless benefits related to appreciation and understanding, not only for our visitors, but for the communities associated with the objects on display.

Section V: Interactive Technology in the Museum

Many museums have recognized the benefits of increasing interaction with their collections and have made attempts to implement multi-sensory features into their exhibits in recent years. This development can be seen, for example, in the fact that the number of interactive children's museums in the United States increased from 38 in 1975, 118 in 1990,

about 218 in 2001, and has since continued to grow exponentially (ACM 2001 cited in Mayfield 2005:180). One way in which this is accomplished is by embracing the use of interactive technology, and as noted by Gammon (2003 cited in Haywood and Cairns 2005:2), these changes have been met with great success in regard to learning and engagement. In this section, I touch on a few of the most common types of interactive technologies and discuss their effectiveness in art museums.

The term interactive technology has many applications and can therefore be interpreted differently depending on the field or context. As defined by Bucy and Tao (2007:647), interactive technology is that which allows for communication or the exchange of information in a reciprocal manner as a result of interactions between a user and technology or between two users with the use of technology. In the past, I had only ever considered interactions between an individual and the tool that they are using but have since realized that the benefits of the technology as a facilitator of interpersonal interactions are equally important. The term tends to imply the use of an electronic device or resource. However, non-digital technologies are interactive as well, so long as either of the other criteria are met. Whether digital or not, for a feature to be considered interactive, the visitor should have the opportunity to ask 'what if' questions such as, "what would happen if I changed this or that" (Feher 1990:36). In other words, interactive technologies go beyond simply reiterating existing information in a new format. Instead, the knowledge of the user is complimented and built upon by engaging with technology and through the novel experiences that it brings about. In collections around the world, these features can take on a variety of forms and their success is supported by qualitative and quantitative data, as well as observational data and positive user feedback.

Some interactive technologies can involve the physical movement or manipulation by a person. For example, as the technology has become increasingly popular, many art museums containing fragile artifacts have created 3D-printed replicas of their pieces that can be handled by their visitors (Olson et al. 2014:162). These 3D models allow curators and museum organizers to work around barriers related to artifact damage. A study conducted at the Oxford University Museum of Natural History by Wilson et al. (2017:451) evaluated the reception of 3D printed artifact replicas by visitors.at the Oxford University Museum of Natural History (OUMNH).by visitors. Of the 76 surveyed participants in their study, 93% expressed that 3D replicas could enhance their museum experience and 80% reported that they would like to see 3D printed replicas in more museums. I found that Anastasiadou and Vettese (2019:435) came to a similar conclusion about visitors' reception of interactive technologies. For example, when museumgoers were given the opportunity to 3D print a souvenir, one researcher observed that:

> Some people felt that even the process of being engaged in the design of the product, even if they had not designed the product themselves still made the product feel personal. So if they could pick the design, colour, material they would feel instrumental in the development of the product and this was a meaningful experience to them (Researcher 2, observations).

Based on these findings, I feel optimistic that my digital interactive program will receive similar feedback.

Other interactive technologies can be primarily digital as well and, in some cases, for instance touchscreen displays, have been incorporated into museums for decades (Shneidemnan 1991:93). These have been found to not only promote museums as social and educational institutions, but Li and Liew (2015:208) mention that they can also "boost the value of cultural heritage." This idea is not explicitly defined in the paper, however, Dümcke and Gnedovsky (2013:6-7, 139-41) make an interesting distinction between the intrinsic and instrumental value,

defining the instrumental value as being the importance to social or economic development and intrinsic value as being meaning to the source community. Even though I was familiar with the idea that interactive technologies could assist museums in promoting intercultural dialogues, teaching about the traditions of a community, and explaining culturally significant concepts, I believe that other social benefits that are noted in the paper, such as social cohesion and creating atmospheres of tolerance, are possible as well.

Furthermore, Clini et al. (2018:251) proposes that interactive digital technologies allow museumgoers to deviate from their traditional roles as passive spectators. With about 3.5 billion smartphone users in the world (Turner 2018), many institutions are filling in the gaps between their collections and their audiences by taking advantage of personal devices, as stated by Li and Liew (2015:209). I found that Chivarov et al. (2013:122) raises the excellent point that quick response (QR) codes, for example, provide rapid access to resources or information such as images, videos, audio files, and more. I think it is worth adding that downloadable mobile applications could serve similar functions as well.

One interactive resource that is commonly associated with art collections, is a 3D model that can be digitally manipulated by a user. Instead of physically recreating an artifact, pieces might be scanned or digitally reconstructed so that they can be accessed on computers, tablets, or phones. Diego Arellano, for example, found that visitors of the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University spent an average of 58 seconds looking at artifacts. I noticed that his observations were similar to the studies cited by Valorie Beer (1987:208) which found that visitors even spent as little as 30 (Boggs, 1977), 20 (Clowes and Wolff, 1980), or 10 seconds (Coleman 1936) at an entire display. The sources she referred to certainly support the results of Arellano. However, the novel findings of her study

were even more eye opening. When they were asked to estimate the amount of time that visitors would spend at each display, only one of the twelve staff members made an underestimation with others believing durations might be multiple minutes long, suggesting a disconnect between organizer perceptions and visitor experiences. In any case, Arellano tested the use of 3D models to increase the duration of time and amount of interaction audiences have with artifacts and found that the previously observed visitors spent an average of 4.07 minutes interacting with the digital 3D models designed for the collection. Additionally, in her dissertation, Younan reports that after using digital 3D models users made statements such as, "I feel like I can hold them (the museum objects) and play with them, and that's never happened before, they have always been behind glass" (Younan 2015:201). The testimonies produced by Younan's investigation suggest that even museumgoers themselves are able to identify the benefits of using interactive technologies in museum settings.

Another interactive resource that has been adopted by art museums across the world, including the AAAC at OSU, is virtual reality. Virtual reality technology has been around for nearly 30 years and, as underscored by Hirose (2006:31), is especially useful in museums because it allows people to look at objects that are difficult to understand more intuitively. Roussou (1999 cited in Roussou 2001) puts it nicely when he writes that in using this technology, users can travel through space and time without ever having to leave the physical structure of the museum. Not only do displays and resources utilizing virtual reality require little to no space, but Subramanien et al. (2017:550) asserts that in some cases, they allow access to museum collections from geographically distant locations, making them excellent for traveling exhibits. Further benefits are illustrated in a study conducted by Shiaw, Jacob, and Crane, in which one group of participants (group V) navigated through a VR Vase Museum while another

group, (group P) explored a catalog of vases. In both of these tasks, individuals were asked a series of 10 questions pertaining to the vases that they saw. Not only did group V score significantly better ($p<0.0074$) by averaging a score of 7.2 compared to group P's 5.4, but they completed the task faster as well ($p<0.00011$) by averaging a time of 13.69 minutes compared to an average time of 37.03 minutes for group P (Shiaw et al. 2004:132).

When I first read about this experiment, I immediately thought that it fully supported my argument that interactive technologies are beneficial to museumgoers. However, Dr. Wibbelsman brought up a good point when she questioned whether achieving the fastest possible progression through a VR environment or museum exhibit should actually be considered a success. Because the objective of our interactive resources is to increase visitor engagement with our collection, I share her opinion that the immersive natures of VR technology allows for deeper levels of observation and exploration, processes that should not necessarily be rushed. I hold the opinion that the findings of Shiaw et al. speak to the potential of VR technology in the museum setting, yet their data should be interpreted and cited with one's goals for their technology in mind.

Interactive technologies come in many forms, both physical and digital. Three of the most common resources include 3D replicas of artifacts that can be physically handled, digital objects that can be manipulated, and simulations or programs that use virtual reality technology. When successfully implemented in museums, these offer some successful options for working around the barriers that exist between visitors and traditional collections. The benefits of including these innovative technologies include improvements to audiences' engagement with exhibits (both the level of interaction, as well as duration) and overall increases in understanding, appreciation, and enjoyment.

Section VI: Experiential Learning

No matter the type of resource or the platform that they use, interactive technologies have been effective in museums because they promote experiential learning. This section defines experiential learning, describes its conceptual basis, and discusses the approach both generally and specifically in relation to this project.

According to David Kolb, experiential learning theory (ELT) defines learning as being "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (D. Kolb 1984:41 cited in A. Kolb and D. Kolb 2005:194). Parallels between ELT and the Canelos Quichua ceramic making processes support the idea that similar schools of thought can exist in Western and indigenous societies, even if they are not always explicitly named or defined by the latter. In the 2005 article that she published with him, Alice Kolb includes six propositions that build the foundation of ELT and are based on the work of 20th century scholars such as Carl Jung, Jean Piaget, John Dewey, Pablo Freire, and others (Kolb 2005:194). She states:

1. Learning should be considered not in terms of its outcomes, but rather as a continuous process.
2. All learning is relearning and that it is best accomplished when preexisting beliefs and notions are examined, tested, and integrated when novel ideas are introduced.
3. Conflict, differences, and disagreement propel the learning process.
4. Learning can be thought of as the holistic process of adapting to one's surroundings and therefore involves the cooperative processes of thinking, feeling, behaving, and perceiving.

5. Learning is achieved through synergistic exchanges between a person and their environment.
6. Learning is the process of creating and recreating knowledge. In this sense, ELT differs from the unidirectional transmission from teachers or textbooks to students.

Just as the implementation of experiential learning has increased over the last few decades in Western institutions, previously accepted ideas about learning in which the teacher is a provider of knowledge and the learner is a receiver of knowledge are continuously being reconsidered (Hannen et al. 2013:159). Throughout my own undergraduate education, I believe that I have witnessed these changes in real time. Each semester, I found that more and more of my teachers deviated from conventional lecture-based structure that characterized my first college classes. Not only did I experience this shift from the perspective of a student, but I also helped implement them as a teaching assistant this past semester. Lewis and Williams (1994:5) submit that slowly, these unidirectional approaches are being replaced by learning models such as ELT which stress the importance of meaning formation, demonstrating that this restructuring has been a work in progress for at least 25 years. Clem et al. (2014:491) points out that proponents of ELT believe that learners are more engaged and motivated to learn when learning is self-directed and rote memorization is not prioritized.

In an article titled *An Interpretation of Dewey's Experiential Learning Theory*, Roberts (2003:8) defends the idea that simply acquiring information does not imply that learners will be able to apply it in the future and that the ability to apply gained knowledge in new situations takes on a central role in experiential learning. I agree with Roberts's claims, yet believe that they warrant some clarification. I argue that the process of acquiring information and the act of applying new knowledge should not be thought of as being sequential phases or even as having a

set order of occurrence. That is to say that knowledge can be applied while information is still being acquired, and that the learning that takes place through application is valuable as well. I do believe, however, that Roberts is correct in stating that application of new knowledge cannot happen until said knowledge is actually acquired.

Additionally, reflecting about one's experiences is a principal element of experiential learning, though, as Anderson notes, the practice of reflection is hard to define. In a recently published article, he attempts to synthesize various definitions and states:

> Reflection is conscious, experientially informed thought, at times involving aspects of evaluation, criticality, and problem-solving, and leading to insight, increased awareness, and/or new understanding. As such, reflection can be contrasted with 'impulsive' or 'routine' decision making that reinforces and embeds current perceptions or practices (Dewey 1933:17 cited in Anderson 2020:480).

During processes such as making Canelos Quichua pottery, a master potter might, for example, reflect about her relationship with nature while she manipulates her clay or paints motifs onto her piece. I uphold Anderson's notion that reflection is a result of an experience and therefore cannot precede it. When the second line of this definition is added, Anderson makes the important distinction between naturally occurring thought and reflective thought, essentially writing that a conscious decision must be made to reflect, as opposed to simply thinking about completing an action while doing it. Guthrie and Jones (2012:54) add that when mediated by reflection, learning involves careful observation before making judgements. I found that their ideas accurately explain that the exploration and consideration of multiple perspectives results in a stronger understanding of the relationships between the meaning of things.

With regard to this project, the specific type of experiential learning that I attempt to encourage is object-based learning (OBL). Implied by the name, this type of learning involves the hands-on approach of learning by closely interacting with an object. Even though OBL is

traditionally associated with physical objects, advances in technology have opened doors that allow virtual artifacts to be "handled" as well (Davies and Nicholl 2017:155 and "Object-Based Learning | Academic Technologies" 2020). Therefore, referring back to previous sections, the use of 3D printed replicas, as well as digital 3D models, and in many cases, VR simulations, can all facilitate OBL. Many people associate object-based learning with younger audiences, however, Hanen et al. (2013:159) discusses the fact that students of all levels and across subjects have been found to benefit from this approach.

In addition to data provided in the previous section, there are many published studies that describe the positive outcomes of OBL. For example, in her case study involving the Daggett Collection at the Stanford University Archaeology Collections, Hodge (2018:152) noted contextualization by a student when interacting with a maple bark skirt when the student commented "I wonder if the color variation might be from just the original natural coloring of the tree its material comes from or could it be from the sun or water exposure?". Schultz (2018:283-4) argues that with specific respect to organized collections, object-based learning in the museum can work against the self-claimed authority of the museum regarding the processes of collecting, interpreting and representing of indigenous cultures. With OBL, cultural understanding is increased as students are empowered to construct personal connections between the artifacts and their lives, all the while engaging in a dialog with the communities that are represented instead of having someone speak for them.

In conclusion, the shift towards experiential approaches to learning in a variety of settings is undeniable, as are the many benefits of acquiring knowledge through actions, reflections, and future applications. Recent research has shown not only the popularity of object-based learning in museum settings, but that the manipulation of objects is an effective way for museumgoers to

share knowledge about cultural pieces and foster meaningful inquiry around them. I believe that the potential benefits of implementing this approach to learning in a digital manner will help address and work against some of the challenges that our collection faces, specifically those related to limited artifact understanding and appreciation resulting from the lack of physical interaction our audiences have with our collection artifacts.

Section VII: Learning in the Andes and Amazonia

Experiential learning is a growing area of interest in museums and this approach has characterized the lives of indigenous peoples from the Andes and Amazonia for hundreds of years. Utilization of resources that facilitate experiential learning with our collection of indigenous artifacts is not only advantageous from a curatorial standpoint, but also fitting given the similarities between ELT and the ways in which the members of the Canelos Quichua community learn and grow.

Just like the distinctions that were made between the indigenous and Western perspectives of art, there exists a clear difference in the approaches to learning as well. In spite of the fact that the culture of education is slowly shifting, the traditional model of learning seen in Western countries involves the transmission of information from a source such as a teacher, textbook, etc., to the recipient, the learner. In articles such as Rogoff et al. (2003:183), this is described as assembly-line instruction. Directly contrasting this, however, are the indigenous cultures across the Americas (both North and South) that utilize a model of learning by observing and pitching in (LOPI) (Urrieta Jr. 2015:359). For example, young Canelos Quichua girls learn pottery skills by observing and imitating their mothers. Broadly, assembly-line instruction is characterized by unilateral transmissions of knowledge and learning often takes

place out of larger contexts. This approach is not collaborative and instead, learners are motivated by extrinsic rewards, punishments, or rankings. On the other hand, learning by observing and pitching in incorporates learners into larger communities of individuals and the primary goals are to participate and contribute. Learners are eager to find a sense of belonging and demonstrate responsibility as they acquire knowledge and develop skills (Rogoff 2014:73,6).

In addition to the documented practice of LOPI in other indigenous communities in South America including the Mapuche people of Chile (Murray et al. 2015) and the Piaroa community of Venezuela (Overing 2003), the ethnographic work of Mezzenzana is the most relevant to this project in that it focuses on the Runa people of Ecuador. In an article she published in 2018, she noted that the learning paradigm of the Runa people differs from that of Western cultures and that knowledge among Runa people is not thought about only in terms of acquisition and transmission (Mezzenzana 2018b:289). What I mean by this is that instead of directly acquiring knowledge from a written source or by consulting an expert, the Runa people learn through their actions and experiences. In her recently published ethnographic work titled *Between Will and Thought: Individualism and Social Responsiveness in Amazonian Child Rearing* she provides detailed insight into the learning perspectives of indigenous communities in Ecuador. An example of this is when she writes about the hands-off approach that Runa parents taken when their children learn how to walk. I found similarities between the approaches to learning of the Runa people and those held by proponents of ELT. When she asked a friend about the differences between Runa and non-Runa approaches to raising children, he provides an accurate description of the Runa's perspective and is quoted as saying, "Ahuallacta [mestizo] children are weak. Their parents tell them: 'Don't do this, don't take the knife, don't climb the tree, it is

dangerous.' But then how can they learn if they don't have experience?" (Mezzenzana 2020:543).

Additionally, one of the largest ideas that is expressed by this anthropologist is that from a very young age, children are self-sufficient and that instead of requiring the explicit instruction of an adult, they are motivated by personal interests and able to learn naturally on their own (Mezzenzana 2020:541,543). After I read about their freedom to learn, I quickly recognized a stark difference in the amount of instruction and rigid structure that I received during my childhood when compared to the experiences of the Runa children. I think that the Western perspective is reinforced by the explicit directions provided by teachers and the reliance on grades as motivation to learn, something that has persisted well into college. The indigenous approach, on the other hand, is very much related to the second facet of the LOPI model found above that is concerned with innate willingness and eagerness to learn. Specifically, tasks that are completed by children as young as five or six include taking care of infants, cooking, fishing, washing clothes, skinning animals, and lighting fires.

In contrast to assembly-line instruction, the learning by observation and pitching in model characteristic of approaches in many indigenous communities across the Americas emphasizes key elements such as integration into a community, an ongoing process of transformation, internal motivation, and self-guidance. Designing a resource that incorporates ELT and OBL within this broader framework not only allows us to share knowledge about the Canelos Quichua community but actually incorporate the community's methods of teaching, learning and meaning making.

Chapter 3: Project Design, Description and Methodology

There are two interactive resources that are associated with this thesis project: a digital interactive program and a physical coloring book. The coloring book is still a work in progress but can be thought of as a side product that resulted from the process of designing the digital interactive program. As a result, these two outputs are very similar in their functions and intended goals and convey the same themes and ideas in two different formats. Together, these resources attempt to broaden the AAAC's potential audience and allow for increased accessibility.

These interactive resources are in no way intended to simplify the indigenous ceramic making process or suggest that the skills required to create such works can be easily learned. Rather, we hope that users of our program will be able to 1) recognize interactive engagement and experiential learning as valid methods of increasing cultural understanding and appreciation while 2) gaining an increased appreciation for the knowledge and processes related to the making of Andean and Amazonian ceramic vessels, made possible by the personal connections and dialogues they share with their created pieces. Furthermore, we hope they will 3) be able to identify and reflect on aspects of the indigenous concepts associated with the vessel making process and indigenous art in general and simultaneously 4) notice similarities and differences between Western and indigenous ideologies. This section focuses on the digital interactive program and describes both the resource and its development in detail.

Section I: Describing the Digital Interactive Program

The digital interactive program comes in the form of a computer program that is accessible via a URL or QR code. Compatible with desktops / laptops, tablets, and cell phones,

the resource provides users with the opportunity to create ceramic vessels that are similar to those made by indigenous communities in the Andes and Amazonia and incorporates the aesthetics and concepts of their cultures. Specifically, this program focuses on the Canelos Quichua community.

When the digital interactive program is first loaded, users are presented with a brief welcome message and are then invited to select the type of vessel that they would like to make. In this first version of the program, users can elect to create an eating bowl (*callana),* a drinking bowl (*mucawa)*, or a toucan storage jar (*sicuanga manga)*.

Immediately after making their selection, the program loads a new page, and an interactive window is shown on the center of the screen. This window initially contains a blank 3D model of the piece that they will be personalizing. Users can use their cursor or fingers to rotate and zoom in on their creation in order to examine the fine details of the vessel. Located above this window, the specific function of the type of vessel that they selected is described by a small amount of written text. Users can also learn more about the cultural concepts of the Canelos Quichua community by reading brief textual information that is located beneath the interactive window.

At the top of the page, next to the name of the vessel, an embedded SoundCloud audio player is used to play songs sung by indigenous women as they make ceramic artwork. The recording consists of eight individual songs that originally come from the CD belonging to the book *Cantos de mujeres en el Amazonas* by Luz María Lepe Lira (2005) and the total duration is about thirteen and a half minutes.

To the right of the interactive window, there are four tabs titled "artifact," "creation," "reflections," and "references." The default tab that is always loaded first is the "artifact" tab

which contains a picture of the vessel from our collection that I used to design the models that users can personalize. Information about the woman who made that authentic piece, as well as where the piece originates from, is located under the image. Along with the authentic piece, an example of a completed digital vessel is shown to the users as well.

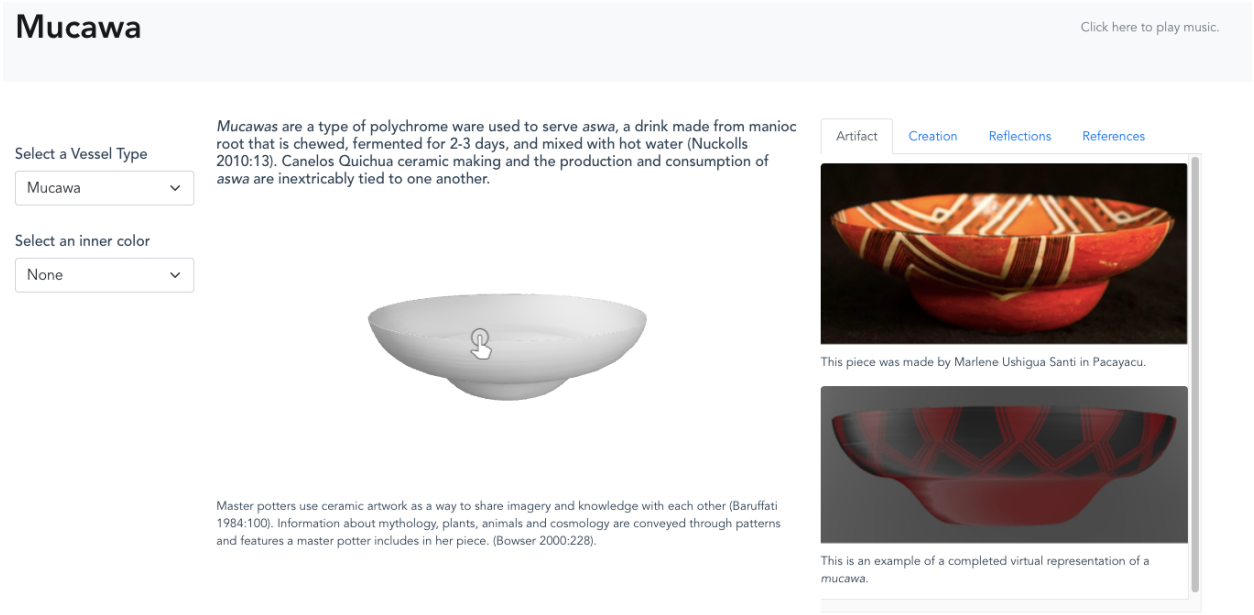


Image 3.1: Screenshot from the digital interactive program

After users select the vessel that they would like to make, they are then able to use the next two drop-down menus to select the base colors of their piece. Specifically, they are first asked to make a decision about the color of the interior of the vessel and then about the exterior of the vessel. By using these drop-down menus, users can quickly compare various color combinations to each other before moving on to the next steps.

At this point, if users chose to make a *callana,* their piece would be complete. For those that chose to make one of the polychrome vessels, the next two drop-down menus that become available ask users to decide on the painted patterns of their piece. Just like the colors, users first choose the design that they would like to include on the inside of their piece before adding

another pattern to the outside. The various color and pattern options for each type of vessel can be seen in the appendix.

During the process of creating their personal piece, users are able to engage with their artwork with the help of the interactive window. For example, when first deciding which vessel they would like to personalize, users can manipulate the 3D model to see the structure of the artifact from every angle and closely examine the fine textural details. Similarly, they can rotate their piece when they select their base colors to see how the appearance changes depending on the lighting. Finally, users can magnify to gain insight into the thinness of the painted lines and the overall symmetry of the motifs.

As users make decisions about the colors and patterns of their piece, they can explore the other tabs to the right of the interactive window. In the "creation" tab, they can find short bits of textual information that provide insight into the process of Canelos Quichua ceramic making. For example, users that choose to make *callana* can learn more about the clay used by master potters when they read the bullet point that says, "heavy grade clay containing quartz crystals, sand, and tiny pebbles is needed to withstand high temperatures and is used for blackware pieces such as *callanas* (N. Whitten, Jr. 2015:56)." To break up the bullet points short video clips are embedded into the tab and each depicts a different aspect of the tradition, such as the coiling of the clay, or the application of the slip.

Once their vessel is complete, users have the option to switch to the reflection tab and see prompts that encourage deeper thought about their experience with the digital program. Specifically, the guiding questions differ for each type of artifact and are loosely related to the cultural context users read about when they first choose a vessel. After reading a few lines about how master potters learn how to make ceramic artwork by observing and imitating their mothers,

for example, prompts such as "if you had used a textbook to learn about Canelos Quichua pottery, would your understanding be different? How?" and "which skills or abilities in your own life that have been acquired through experiential learning?" are used to connect knowledge or appreciation they might have gained to their own lives. Finally, the "references" tab contains the bibliography for the digital interactive program and can serve as a starting point for users who are interested in reading more about the Canelos Quichua community or indigenous ceramic traditions.

It is worth noting that unlike the decisions they make to create their personalized vessel, users are free to transition back and forth between the four tabs to the right of the interactive window. In this sense, users, for example, have the option to preview the reflection prompts before they complete their piece so that they can connect larger cultural concepts with the appearance of their artwork and the various techniques associated with the tradition.

Section II: Creating the Digital Interactive Program

Prior to beginning the process of designing the digital interactive program, I spent time thinking about and researching the vessel shapes, colors, and designs that I wanted to include. To do this, I combed through books and published journal articles about Canelos Quichua pottery and browsed organized collections of indigenous ceramics from the Andes and Amazonia, such as the Whitten Collection of Amazonian Ecuador Cultural Artifacts at the Spurlock Museum of World Cultures at the University of Illinois and the Andean and Amazonian Indigenous Art and Cultural Artifacts Collection at The Ohio State University. I ultimately chose to base the vessel shapes on a blackware eating bowl (*callana),* a drinking bowl (*mucawa),* and a toucan jar

(*sicuanga manga*) found in our collection. I selected the patterns based on a variety of authentic pieces whose pictures are included in the books *Rainforest Visions* and *From Myth to Creation*.

During this time, many considerations, some logistical and others conceptual, were taken into account. Logistically, I had to be mindful of the project timeline. This project required me to create the digital interactive program before I could write the majority of this manuscript and as a result, I chose to include three vessels and a total of four different motifs in the digital program, numbers that I confidently felt I could complete in a timely manner. I also took into account the specific shapes of these vessels and the intricacy of the painted patterns. I also understood that I would eventually have to recreate these pieces digitally so I selected vessel shapes that lacked complex curvatures or additional appendages and designs that appeared more symmetrical than asymmetrical. I was also mindful of the technological limitations of the creative programs I used. I found that the narrow range of tools in Blender and Substance Painter, coupled with my lack of prior experience making digital art, placed restrictions on the textures I was able to add to a piece while the thinness of available paintbrushes reduced the number of motifs I could include to a select few.

Conceptually, I thought about the overall purpose of this project when selecting the shapes and designs for the interactive resources. One of our goals was to increase the accessibility of our artifacts so I elected to include vessel shapes that were based on pieces in our own collection, each of which is different in appearance and function. I also recognized the importance of including a variety of designs that conveyed the cultural concepts we were attempting to relay to the user. Therefore, the painted patterns that were added serve as a diverse sample of the culturally significant designs that are commonly seen in pottery from the region. I believe that the careful selection of vessel shapes and patterns that were chosen for the digital

interactive program speaks to the uniqueness of each piece, but at the same time, fit well within the context of this project.

The first task in creating the digital interactive program was the formation of the 3D vessel structure. To do this, I made hand-drawn outlines of the *callana*, *mucawa*, and *sicuanga manga* that users would eventually be able to make. These sketches were based on pictures of our collection pieces and were drawn so that if they were to be rotated in a circle, the 3D vessel would be formed. I used Adobe illustrator to digitally recreate these sketches and I paid close attention to the curvature of both the exterior and interior. Once finalized, I saved the outlines for each of the three vessels as scalable vector graphics (.svg files).

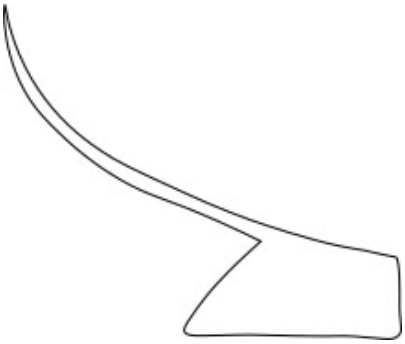


Image 3.2: Outline of the *callana* 3D model

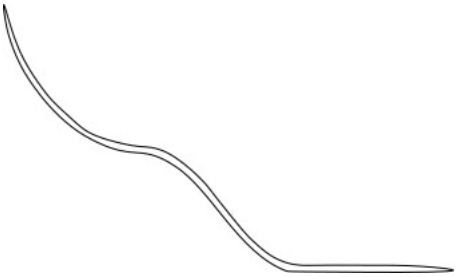


Image 3.3: Outline of the *mucawa* 3D model

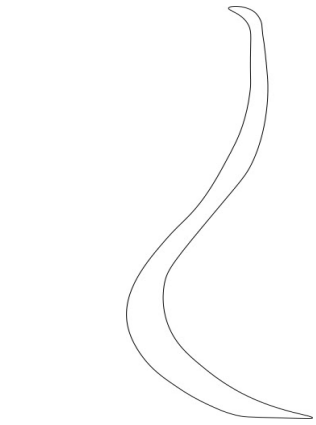


Image 3.4: Outline of the *sicuanaga manga* 3D model

Next, I uploaded these .svg files to Blender in order to create a smooth, unblemished 3D model whose texture was then coarsely altered so that the piece appeared more realistic. Once I

was content with each piece's shape the blender files were saved and exported as a Wavefront OBJ file (.obj).

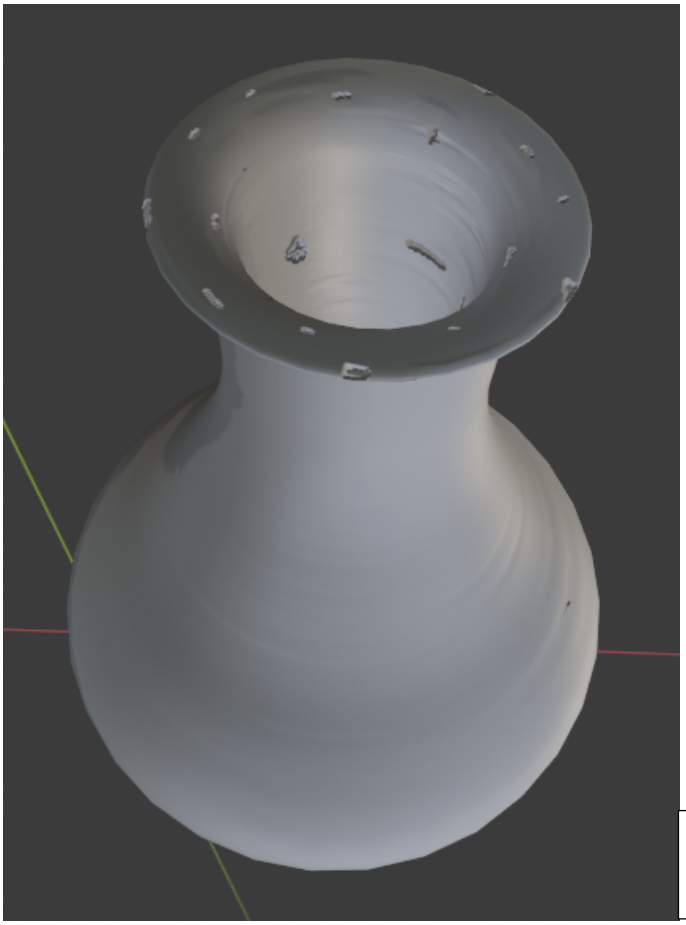


Image 3.5: 3D *sicuanga manga* model in Blender

I then used Substance Painter to add additional textural details to each piece and create layers for each color and pattern option that could be superimposed onto the shape of the vessel. Next, I selected / deselected the visibility of the different layers depending on which ones I wanted to appear on the vessel and saved every possible combination that users could make in the program as Substance Painter (.spp) files.

Finally, I reuploaded these files to Blender, made a few minor adjustments, and exported each combination as a GLB file. These files were passed along to Professor Patterson who incorporated them into the digital interactive program.

Chapter 4: Notable Features of the Digital Interactive Program

This section explains the connections between some of the program's features and the goals of this project, both those relating specifically to the appreciation and understanding of indigenous ideologies, concepts, and practices, as well as broader goals related to proper curation and accessibility. Specifically, we hoped that people who use our program would:

- Be able to recognize interactive engagement and experiential learning as valid methods of increasing cultural understanding and appreciation;
- Be able to identify and reflect on aspects of the indigenous concepts associated with the vessel-making process and indigenous art in general;
- Gain an increased appreciation for the knowledge and processes related to the making of Canelos Quichua ceramic vessels, made possible by the personal connections and dialogues they share with their created pieces;
- Be able to notice similarities and differences between Western and indigenous ideologies.

Section I: Using URL and QR Codes for Greater Accessibility

Because one of the largest goals of this project was to increase the accessibility of our Canelos Quichua ceramic pieces as well as our collection in general, we made sure that the digital interactive program would be available on a website that could be accessed by both a URL and a QR code. As opposed to platforms such as an app that would have been designed for a specific device, such as a phone or a tablet, using a website allows users to access our resources on any device with internet connectivity, such as smart phones and tablets, but also laptops or desktops. The online format of this program permits visitors to continue to access the ceramic

artifacts once they have left the physical collection room or a conference presentation. In this sense, accessibility is maximized in that the number of people who can access the technological features is as high as possible. Both of these modes of access can be easily shared with and utilized by other collections, institutions, or individual learners around the world. This enables us to extend the reach of our artifacts beyond students and faculty at The Ohio State University and as an educational tool with a global application.

Use of a QR code makes the program readily available to visitors in a matter of seconds. Users simply open their smart phone or tablet camera and scan the code. The ease of access diminishes the possibility of users being deterred from attempting to use the resource because of the manual task of typing in a URL. The code itself can be printed on any printer and could easily be posted in our collection room, included on our traveling pop up panels, posted on our collection website, or attached to other resources circulated on campus. Also, an important point to make is that QR codes can be shared with other institutions and indigenous communities themselves, giving them free and immediate access to the program provided they have internet connectivity.

Section II: Utilizing Touch Screen Technology

This digital interactive program was specifically designed to be compatible with devices such as smartphones and tablets. This was done to give users the option to engage with the vessel that they are making in a tactile manner, as opposed to making decisions about and manipulating their piece using only a computer mouse or laptop trackpad. Through this tactile engagement, an additional sense is made available to the user, thus contributing to the multi-sensory nature of the resource. We of course acknowledge that a digital program such as this will never be able to

fully emulate the ceramic making process of the Canelos Quichua people. Instead using a touch screen allows users to closely examine the fine details of their piece, as opposed to simulating the tactile experience of working with clay and paints. It is our hope that this digital interactive program assists in facilitating increased engagement between users and indigenous art, specifically through the use of their hands.

Because users are able to digitally engage with their piece with their hands during each step of the vessel making process, this digital interactive program is intended to be used as an educational tool that promotes object-based learning. What's more, this "hands-on" approach, as opposed to presenting stagnant images that update as users make decisions about their piece, closely aligns with the approach to learning that is commonly found in indigenous communities of the Andes and Amazonia. Because of the various steps that master potters take when preparing to make pottery, from mining the clay, to cleansing the clay, to rolling coils of clay, we emphasize the importance for users of our program to digitally interact with their piece as much as possible. Even though the physical ceramic vessels in our collection might be restricted to their vitrines, the use of touchscreen technology allows for increased interaction with the indigenous art in our collection that otherwise would not be possible. Simultaneously, it alludes to the approaches to learning that are characteristic of the indigenous cultures of the Andes and Amazonia. Of course, touching and viewing an object from all angles, especially when done digitally, is insufficient for fully understanding the intricate processes involved in the tradition of Canelos Quichua ceramic making. Utilization of touchscreen technology serves as a partial, yet still important, first step for increasing audience engagement with our collection if it can be used to complement other approaches in the future.

Section III: Presenting Images of Authentic Artwork

Within the digital interactive program, all of the vessel shapes, colors, and designs are based on real pieces found in our collection, other collections around the country, or published in literature. Rather than allowing users to freely create a piece without limitations of the physical form of the vessel, the colors that were used to paint it, or the patterns, we decided to limit available options to those that reflected authentic features. Ceramic artwork has such as high importance to the culture of the Canelos Quichua community so as a result, we wanted to maintain a level of cultural integrity among the pieces that our users made. In other words, while we wanted users to feel they had some options in designing their digital piece, our objective remains one of fostering cultural connection and understanding.

The digital interactive program presents a picture of an authentic piece that each selected vessel type was based on to users before they begin making decisions about the color and designs of their piece. This is one of the several ways in which we attempted to contextualize the vessel that users will be designing. As opposed to simply stating the name of the piece (which is likely to be unfamiliar to the majority of our visitors and program users) or providing a verbal description of the vessel, users are able to see the artifact that they will be making before they begin the process. Additionally, they can see the ways in which colors and motifs appear on that particular type of piece.

Moreover, including an image of an authentic piece encourages imitation, much like the approaches to learning in indigenous communities in the Andes and Amazonia. The example of what their final vessel aspires to look like serves as a starting point for the users' creative process.

Section IV: Including Artist Information

In addition to the image of the model piece, textual information is offered before users begin to create their own vessel as well. First, the program presents information about the model piece's origin, such as when it was made, the specific location in which it was made, and the artist who made the artifact. Just like the image, all of these pieces of information attempt to contextualize the ceramic pieces so that it can be better understood and appreciated. In many ways, the purpose of this information is similar to that of the exhibit tags that accompany our physical collection.

The geographic origin of the model piece informs users of where exactly in the world this type of artwork is from. Even though the physical distance between users in Columbus, Ohio and a master potter living in Pastaza, Ecuador might be large, it is our hope that localizing Canelos Quichua ceramics educates them about Andean and Amazonian geography and leads to an increased appreciation for and understanding of the significance of the art style to the community. After completing the creation process, users are able to link their own piece, as well as the knowledge that they have gained, to a specific location in another part of the world.

Additionally, we thought that including information about when the example artifact was made was important in that it adds temporal context to an object and in general, an art style, that may have been previously unknown. In spite of the fact that some may think of "indigenous" and "ancient" as being synonymous, including information about contemporary art pieces helps to break this stereotype and to inform users that indigenous art continues to be made in these communities using traditional approaches. The specific years in which these first three vessels were made was unfortunately unknown, however as additional vessels become available in the program, this facet of the program will become more applicable.

Finally, the inclusion of information about the specific artist who made this piece attaches a face and a name not only to the specific piece, but also to Canelos Quichua pottery making and the local community as a whole. By doing so, we are making sure to give credit to the artist whose piece is serving as inspiration for those that users make. This goes a long way to interrupt ideas that traditional art is somehow anonymous and that only high art is recognized by artist. Additionally, including information about the artist attempts to close the separation that can exist between an artist and their art when it is presented in a museum or museum-like setting. This is especially necessary in the case of Canelos Quichua pottery because of the deep personal connections that ceramicists have with their artwork and the knowledge that is put into each piece through close interactions. For these reasons, we emphasize the idea that the artists themselves are central to the information that their pieces, and therefore the digital interactive program, offer.

Section V: Including Information about Cultural Significance

Along with information about when, where, and by whom each model piece was created, the digital interactive program also provides information about the cultural significance of the type of vessel that users select. This information further contextualizes a user's personalized piece in connection to the daily lives of the Canelos Quichua people and is an example of downward contextualization. Coupled with the user's customization of a piece, this information restores context that is commonly stripped by barriers in the museum setting that impose distance between a viewer and a cultural artifact. Finally, because each vessel type serves a different purpose, offering information about the variety of functions these ceramic vessels serve also speaks to the diversity that exists within this one style of art. In a way, this aspect of the digital

program supports the indigenous perspective of art in an indirect manner. Descriptions of a piece's practicality are shown alongside their beautiful physical appearances so that just like the indigenous peoples of the Andes and Amazonia, users can acknowledge both the aesthetics and functionality of these ceramic vessels.

Section VI: Introducing Indigenous Cultural Concepts

The last type of information presented to users before they begin designing their piece is related to the indigenous cultural concepts of the Canelos Quichua community, specifically those that are exhibited during or incorporated into the practice of ceramic making. Just like all of the other types of information, the introduction of important cultural concepts adds context to the experience of the user. The information relating to the origin or functions of ceramics allows for downward contextualization of Canelos Quichua pottery, however, this information serves as a starting point for facilitating upward contextualization in which the ceramic vessels are understood on a conceptual level. Even though the program relies on textual information, as opposed to the preferable use of users' actions, it attempts to reinforce the aspect of the indigenous perspective of art that breaks away from the Western idea of making art for art's sake. It is our hope that users gain insight into how art embodies the ideologies of the community. Specifically, the three cultural concepts that we attempt to convey are:

1. The importance of experiential learning in the Canelos Quichua community
2. Art serves as a source of knowledge in the Canelos Quichua community
3. Canelos Quichua ceramic making, as well as its complete understanding and appreciation requires multi-sensory interactions between a person and the artifact

Section VII: Omitting Explicit Instructions

In regard to the actual process of ceramic making that is facilitated by the digital interactive program, one characteristic that is worth mentioning is the intentional omission of explicit instructions. In other words, we decided against providing explicit guidelines that explain what users need to do in order to produce a completed artifact. Despite the program itself being relatively straightforward and easy to use, the lack of written instructions attempts to reflect the approach to learning that is characteristic of the indigenous communities of the Andes and Amazonia. Namely, that people learn by doing. Recall from Chapter 2 that adults do not provide their children with instructions for daily tasks. Instead, kids learn through doing. We kept this in mind and implemented a similar hands-off approach because we wanted to encourage self-motivated learning. Specifically, we attempted to do this by inviting users to explore the digital program and the ceramic making process without any overly didactic interference. It is our hope that users therefore apply knowledge gained in previous steps towards decisions or actions that they make further down the line.

Section VIII: Including Textual Information

One of the ideas that our undergraduate student curator group considers to be important to the discussion of indigenous art from the Andes and Amazonia is that art itself is a source of knowledge. We purposefully include other informational resources such as books, DVDs and CDs alongside our artifacts in their vitrines to communicate that all of these forms of expression are equally valid sources of knowledge exchange. In a similar manner for the digital interactive program, we limited the amount of text presented so that the art can also speak for itself and underscore the multiple ways in which users can increase their appreciation for and

understanding of Canelos Quichua ceramics. Specifically, the textual information that is presented to users while they design their piece is related to the vessel making process itself or to the specific colors and patterns that they can choose from. For example, I provide information about the firing temperature of a *callana* and the significance of the colors on a *sicuanga manga*.

Section IX: Including Music

While users make their digital vessels, the program plays Canelos Quichua music. The decision to include music during this interactive experience was based on the fact that master potters often sing, either out loud or silently to themselves, while they are making their ceramic pieces. By including music, we hoped to simulate the conditions similar to those of the indigenous ceramicists as they worked. Just like the physical action of manipulating the materials, in this case digitally, interaction between the artifact and the user is facilitated through song. Inclusion of a sonorous element to the digital program, moreover, adds another layer to the multi-sensory experience. Not only is information presented in a textual manner and acquired through doing, but additional context related to the Canelos Quichua culture is exchanged through the music. Finally, it should be emphasized that the music played by this program is authentic to the region that we are attempting to educate our users about. Specifically, it is from the CD that accompanied the book *Cantos de Mujeres en el Amazonas* by Lira (2005). Together, these characteristics bring us closer to simulating the traditional ceramic-making experience.

Section X: Making Personal Choices

The fact that users are able to make personal decisions about the final appearance of their artifact is in itself noteworthy. Customization is one of the ways in which downward

contextualization can be achieved. This is especially effective when sharing knowledge about indigenous artwork because users are able to learn about both the aesthetics and function of each piece. Additionally, customization is another way in which we attempted to emulate the authentic process of ceramic making in the Andes and Amazonia. The fact that ceramic making is a deeply personal experience for master potters cannot be understated. In this sense, we attempted to emulate the close relationships that women have with the pieces they create. Finally, we considered that it is possible that by making an artifact that has personal significance to them, the knowledge or appreciation that users gain through this experience might remain with them for a longer period of time than if they only read about the practice of Canelos Quichua pottery or simply created an exact replica of an authentic vessel. Because we had concerns about the potential cultural appropriation, we felt that allowing users to customize their pieces might effectively circumvent issues of cultural tokenizing or reification. In other words, we understood that ceramic making is a very personal tradition to the Canelos Quichua women and did not want to disrespect such a culturally significant process by offering users the complete freedom to paint their piece or design their patterns. We felt that including a limited range of options to choose from was a healthy middle ground between exact replication and endless possibilities. We fully acknowledge that our program will never be able to share the knowledge but hoped that making personal decisions would help users understand and appreciate Canelos Quichua pottery on a more profound level.

Section XI: Reflecting after the Experience

The last aspect of the digital interactive program I discuss in this thesis is the set of reflection prompts that the resource presents to users after they complete the vessel-making

process and produce a finished virtual artifact. Our program fosters experiential learning and as a result, it would be incomplete without encouraging users to think critically about their experience with the program and the knowledge and appreciation that they might have gained along the way. Therefore, short, open ended questions are presented. Questions focus on application of cultural concepts from the Canelos Quichua community throughout the users' experience and potentially in relation to their own lives. In other words, questions incorporate practices or ideologies from the Andes and Amazonia and attempt to relate them to Western perspectives. In true Andean fashion, prior knowledge is recalled, incorporated, and transformed into new knowledge. Additionally, this approach aligns with the aspects of ELT that emphasize the application of acquired knowledge in newfound contexts or applications. Furthermore, the prompts are related to the information that is presented before users begin the process of creating their vessel. In this way, users are reminded of the previously introduced cultural concepts and connections can be made between all steps of the program. It is my hope that these reflection prompts help users hold onto any knowledge or appreciation they gained for a longer duration of time and that they encourage ongoing learning.

Chapter 5: Project Evaluation and Assessment Tool Design

To answer our guiding question about the extent to which interactive tools facilitate immersed interaction with Andean and Amazonian indigenous art as epistemology, it was necessary to evaluate our digital interactive program. Specifically, I sought to gather information about potential increases in appreciation for indigenous art or insight into culturally significant concepts and traditions that might have resulted from using this resource. This section describes the approaches I took to evaluating this first version of our digital interactive program.

Section I: Sharing the Digital Program

I made the first version of the resource available to the public by way of URL and QR codes primarily distributed to members of the Ohio State community and via the AAAC website and Professor Patterson's personal website. Additionally, I requested that former professors of mine who are affiliated with the Center for Latin American Studies or the Department of Spanish and Portuguese distribute it to their respective students and Professor Patterson circulated it among his colleagues at ACCAD. The initial release of the program also included those associated with the K'acha Willaykuna Andean and Amazonian Indigenous Art and Humanities Collaboration, several new members of our group of undergraduate student curators, and a few close friends and family members. Through these means of distribution, I was able to form a diverse cohort of users who would be the first to test the interactive resource. The program was of interest to those in the fields of arts and design, arts education and policy, Latin American cultures, and museum studies, so as a result, users had varying amounts of prior knowledge about indigenous cultures and art, respectively.

The initial evaluation of the digital interactive program collected data over the course of about six weeks, from the middle of February through the end of March. In total, I gathered feedback about the experiences of 26 users. Since those initial data collection efforts, this digital interactive resource has been shared with many more people, many of which continue to share information about their experiences as users.

Section II: Evaluating the Resource

Along with mentors and other collaborators we gauged the successes and pitfalls of the digital interactive program. We thought holistically about which format would be most suitable for an educational resource such as this, as well as the amount and types of data that could be gathered through different approaches. Then, we took into account other specific factors that helped shape our means of evaluation.

Ultimately, I decided that it would be best to present an online survey to users after they created their personalized vessel and had a chance to reflect on their experience. The final version of the survey can be found in the appendix section. This approach allowed me to ask a wide variety of questions and collect data that was both qualitative and quantitative. Additionally, using a survey, particularly one that was digital, allowed me to easily organize and analyze my data after I collected it.

In addition to the feedback that users provided by way of the survey, I was able to collect a small amount of observational data. Specifically, I observed my three roommates during their first experiences using the program. When he was evaluating the interactive resources that he made for his thesis project in 2018, Diego was able to gather observational data from users that visited the physical collection in Hagerty. Originally, Dr. Wibbelsman and I hoped to host a

small gathering in the collection room as a way to unveil the digital interactive program alongside the authentic ceramic pieces, as intended, and to see the first impressions of people as they used the product. Unfortunately, the ongoing COVID-19 pandemic prohibited me from gathering such a large amount of observational data.

Section III: Survey Design

Number of Surveys

Originally, I had planned to present two surveys to those who used the program: one prior to creating their vessel and the second following their self-reflections. I intended to compare the background knowledge and preconceptions of each individual with the new information and/or appreciation that they might have gained after using the digital interactive program. However, I ultimately decided against this approach because I did not want the survey to resemble a formal assessment such as a test or quiz. We recognized that our program is not able to fully convey every step or concept related to the pottery making process and therefore thought that assessing our resource based on how well respondents were able to recall minor details would not be the best approach. On the other hand, it would not have been realistic to present questions about every detail and users might have had takeaways that the follow-up survey did not specifically ask about.

Anonymity

Another aspect of the survey that I took into consideration when it was created was the level of anonymity that should be extended to the user. I wanted to prioritize accurate feedback and therefore decided to make the survey completely anonymous so that respondents had the opportunity to provide their honest opinions without the worry of being identified.

General Survey Characteristics

The final version of the survey I presented to users consisted of a total of 23 questions, the first two of which simply asked them to state their age and an estimate of how long they spent using the resource. While there were many aspects of the program that I wanted to evaluate, I made sure to limit the questions I asked to only those that helped us accurately answer our central question. Additionally, I did not want to overwhelm users or discourage them from answering each question by focusing on quantity over quality. I also held the succinctness of the survey in high importance because I recognized that many new ideas were introduced while using the digital program. In this sense, I did not want the survey to distract from any new knowledge or appreciation that might have been gained.

I paid special attention to the style in which questions were written during the process of creating the survey. As noted by Fowler Jr. and Fowler (1995:73), the way in which a question is worded can have large effects on how people answer it. My own experiences as a respondent led me to make sure that I phrased each question neutrally so that users could express their opinions through their answers. For example, I avoided using words such as "increased" or "decreased" in the question because they could have influenced a user to feel either positively or negatively about the program. This, in turn, would have led to an inaccurate evaluation of the interactive resource.

Additionally, I was mindful of the length of each question. Citing Payne (1980), Dolnicar (2013:560) states that longer questions are more difficult for respondents to understand and that the use of "marathon" questions should be avoided. Following his advice, I made sure that all of my questions were less than 20 words.

Section IV: Types of Survey Questions:

Multiple Choice Questions

Of the 23 total questions in the final version of the survey, seven can be characterized as being multiple choice. Specifically, these multiple-choice questions ask users to quantify aspects of their experience, for example, potential changes in their understanding of a certain concept or appreciation of a certain process. I wrote each answer choice to be easily understood by the respondent (e.g., "a lot more" or "decreased a little") and paired it with a numerical value that ranged from 1 to +3. In this sense, both qualitative and qualitative data are combined. I would not only be able to count the number of users that chose each answer, but also calculate the average success with respect to each aspect of our central goal.

Check-All-That-Apply

In the two check-all-that-apply (CATA) questions, I offered several answer choices to the respondents and they had the option to select multiple responses. The possible answers to the multiple-choice questions were essentially mutually exclusive, however the CATA questions offered users more freedom regarding the feedback they could provide. This was also beneficial in that it greatly reduced the total number of questions that needed to be asked.

Open-Ended

In the final version of the survey, there were a total of three open-ended questions (not including the elaboration questions). Despite the fact that offering only open-ended questions has been found to result in missing or incomplete data, as noted by Reja et al. (2003:174), and on their own provide insufficient data for a uniform evaluation, I thought that they would be able to supplement the previously asked questions with personalized data. In addition, I hoped that this type of question in particular could help increase the depth of engagement that users have with

the program, similar to the reflection questions that are presented after users create their personalized vessels.

Chapter 6: Survey Results

Based on the survey responses of 26 individuals, I used the feedback to evaluate the extent to which we were able to meet the central goals of this project. Specifically, this section reports the quantitative data and written comments as ways of gauging the successes and pitfalls of the digital interactive program.

When respondents were asked to estimate the amount of time they spent exploring the interactive features, responses from 18 individuals indicated that users engaged with our collection by way of this program for a much longer time than they spent engaging with our physical exhibit or other museum collections.

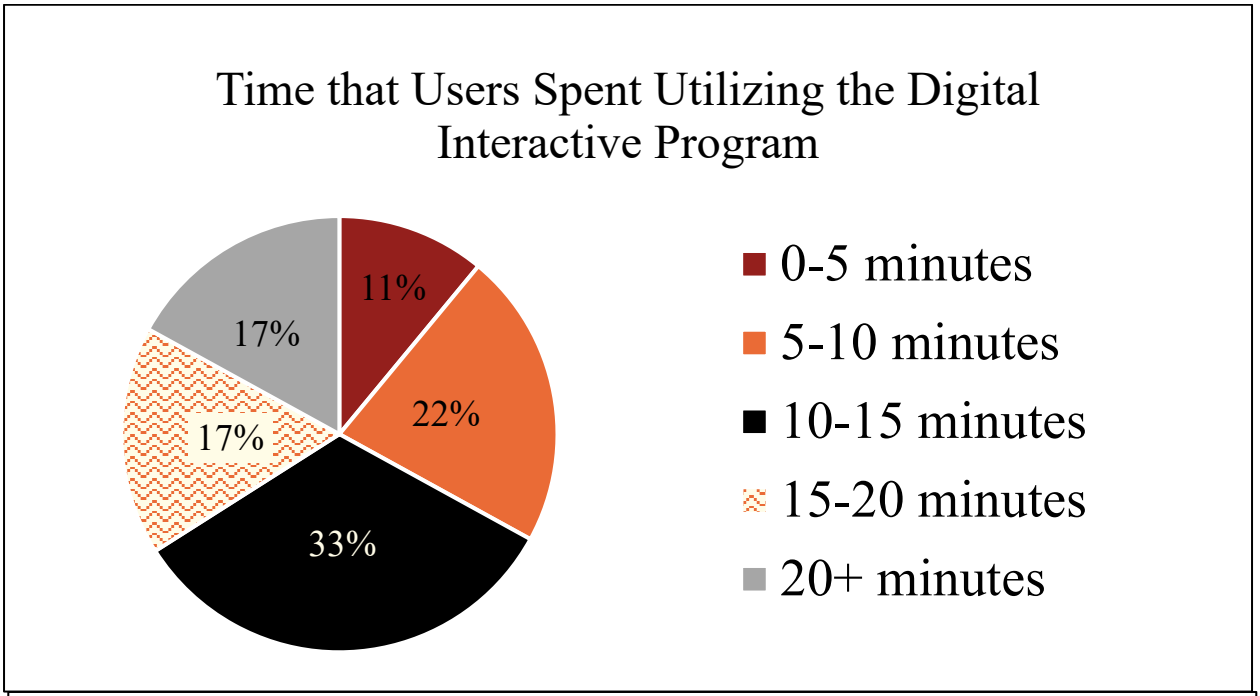


Figure 6.1: A breakdown of program-use duration. 89% of users spent more than 5 minutes while 67% of users spent more than 10 minutes.

According to the results of the survey, users stated that the program allowed for more interactions with a collection of art compared to most museums. Only 11.5% of people claimed

that they did not notice a change in interaction and based on the numerical values that were associated with each answer choice, I calculated a weighted mean of about 2.3. This signified that on average, respondents reported having many more interactions.

Users reported using three senses during their vessel designing process: sight, touch, and hearing. Specifically, all users reported using sight while the second most common sense was hearing (69.2%) followed by touch (38.5%). I calculated the average number of senses that were used to be about 2.1, which supports the claim that this resource allows for multi-sensory interactions.

Overall, the results of this survey support the idea that this program helped increase the recognition of art as a source of knowledge. 84.6% reported that they walked away with a better understanding of this idea while only 15.4% of people noted that their grasp of this concept neither increased nor decreased. When calculated, the weighted average for this question was found to be about 2.3. Some respondents recognized that art allows a person to gain a better understanding of the thoughts and feelings of a community while others stated that the process of designing their vessel encouraged them to read the included textual information.

Results of the survey suggested that the digital interactive program was successful in sharing information about indigenous art as well. Of the 26 respondents to question 4A, 100% expressed that they increased their knowledge of and appreciation for these artifacts, with 61.5% answering that they gained a lot more and 38.5% answering that they gained a little more. One user noted that although they had a little prior knowledge, the digital program served as a good synopsis and added to their understanding. Another respondent elaborated on their multiple-choice answer and wrote that they appreciated the accompanying text and videos as useful material that did not come across as overwhelming.

Similarly, 57.7% of people answered that their understanding and appreciation of indigenous art making as an interactive process "greatly increased," 34.6% of people answered that it "slightly increased," and only 7.7% of people answered that it "did not change." I calculated that on average, understanding increased across all 26 respondents, with a mean numerical value of 2.5. One user followed up on their answer and wrote that interacting with the piece allowed them to get to know the piece better than if they had used a textbook. It should also be noted that the user who reported that their understanding did not change explained that they had existing beliefs that art should be interacted with yet recognized the program's ability to communicate this idea to users who used it without prior knowledge.

I also concluded from the survey that the digital interactive program was successful with respect to the Canelos Quichua community. 69.2% of respondents stated that their knowledge of and appreciation for Canelos Quichua traditions and practices "increased very much" while the remaining 30.8% answered with "increased a little." One user explained that because they had background knowledge about other indigenous communities, the program allowed them to compare the customs of other groups with those of the new culture they were learning about.

When users were asked about the Canelos Quichua ceramic making in particular, they answered similarly, with 69.2% responding that the digital interactive program greatly increased their knowledge of and appreciation for the process and the remaining selecting the answer that corresponded with the numerical value of 2. Users commented that they appreciated the opportunity to view changes to their piece as they made decisions. Additionally, users elaborated on their multiple-choice answer by stating that they found the 3D model useful for visualizing the process, and that overall, the interactive features made learning not only easier, but also more fun.

Despite the fact that the digital interactive program increased the knowledge of and appreciation for Canelos Quichua culture, only about 66.7% of users felt as though the piece they made had personal significance to them and overall, there was a lot of variability in the explanations of their answers. For example, one respondent stated that while they enjoyed the process, their piece would have been more meaningful if they had made it in person, while somebody else expressed that they wished they could have added their own designs or learned more about the few motifs that were offered. One survey taker added that they only recognized the significance of their piece after reading the accompanying textual information.

At the end of the survey, I asked users about the broader impacts that the digital interactive program might have had on them. Responses were overwhelmingly positive, and users stated that they planned to integrate non-traditional ways of thinking into their daily lives and look further into the concepts and processes that they were introduced to. One respondent left a comment explaining that although they actively try to learn more about indigenous art and non-traditional forms of knowledge, it is unlikely that they would have further researched the Canelos Quichua community in particular without having used the program, even going so far as to write that they have used the resource multiple times since designing their first piece. Another user pointed out that the program prompted many questions for them and that they felt motivated to conduct further inquiry about unfamiliar concepts.

In general, the responses to the survey suggest that this first version of the digital interactive program met almost all of our main objectives and that it will serve as a useful educational resource when paired with physical collections of Canelos Quichua ceramics, as well as our traveling pop-up exhibit. Specifically, users increased their knowledge and appreciation at multiple levels, including art in general, indigenous artifacts, and Canelos Quichua pottery.

Although future versions of the program will certainly aim to increase the personal significance that users' pieces have, the overall results of this initial evaluation lead me to believe that this program can be used to facilitate increased interaction with the AAAC in more ways than one.

Chapter 7: Interpretations of Observational and Verbal Feedback

The survey that users took after designing their personalized vessels produced a wealth of quantitative data that sufficiently evaluated the extent to which we met the goals of this program. Furthermore, the comments that respondents left within the survey, along with the recorded observations, screen recordings, and casual dialogue, provided deeper insight into aspects of the program that I did not explicitly ask about. This section discusses the interpretations of all of the collected data with respect to the successes, pitfalls, and future directions of the digital interactive program.

Section I: Variation in the Users Time Spent Using the Program

In general, I noticed that there was a lot of variability with respect to how long users spent interacting with the digital program. When I watched the recorded observational data, it appeared as though some users finished designing their vessel within a couple of minutes. This observation was supported by the screen-recording data that I collected. I think that this can be interpreted in two ways. It is possible that users immediately recognized which shape, colors, and designs they wanted their piece to have. However, based on previous observations of audiences that visited our physical collection or pop-up panel exhibits, it might be more likely that not all users took the time to read the textual information, utilize the embedded media, and reflect on their experience. On the other hand, other users appeared to take their time when designing their vessel, exploring every shape, color, and motif combination. User variability should definitely be taken into consideration when museums or similar institutions create educational tools that attempt to engage wider audiences. I argue that the best way to work around this unpredictability is to find the middle ground between resource designs that align with

each approach that a user might take. Even though I was selective with the amount of textual information that I included in the program, and also attempted to break it up with images and video clips, these observations might warrant additional edits regarding the amount of text that I actually present.

Section II: Quality of the Digital Technology

I had the opportunity to have a discussion with one user who is very impressed with the quality of the models that were used in the digital interactive program. Not only did they acknowledge the detail that each model contained, signaling an appreciation for and awareness of research attention to ethnographic detail, but they specifically pointed out that the models responded very well to touch. Even though there were certainly some limitations regarding the degree to which I was able to present the various steps involved with the ceramic making process, I think that the touch screen technology in this digital interactive program successfully incorporated the idea that master potters manipulate their pieces while they work. This user feedback supports the idea that interactive technologies can certainly be helpful when attempting to illustrate hands-on processes, although it is clear that they cannot convey the same information or teach skills that only actual handling of the pieces can provide.

Section III: Different Definitions of the Senses

One of the largest successes that the survey responses demonstrated was the multi-sensory aspect of the digital interactive program. However, I think that the responses to that question require additional explanation about why specific users answered the way that they did. The program was very successful in the fact that all respondents used the sense of sight, however

the other senses that I had hoped they would use, touch and hearing, we're not reported as often as I had predicted. With respect to the sense of touch, some users acknowledge the fact that they could use the interactive window to manipulate their peace as they made decisions about the features of their piece, however, did not feel as though that was sufficient for being considered using the sense of touch. In the future I hope that the sense of touch can be better facilitated by the digital interactive program by allowing users to broadly mimic master potters' movements as they create their ceramic artwork. I also think that providing a little more context about the uses of tactile technologies in museum settings might be helpful for allowing users to better understand the ideas that I am trying to indirectly communicate. I think that the users' responses bring up the question of whether there should be a distinction between the sense of touch and the action of touching. Users may not have perceived the use of touch as being a part of the digital interactive program because sensory information is not possible with the use of touch screen in the same way that interacting with the physical ceramic pieces provided me with insight about the texture of the vessels. As Kaerlein (2012) describes throughout his publication titled *Aporias of the Touchscreen*, discussions are ongoing about the extent to which factors such as tactility, reliance on other senses, responsiveness, and more should be considered in regard to digital touch.

I reflected deeply on how each individual interpreted this sensory modality differently after I reviewed the feedback. I think that the fact that users interacted with the digital models yet did not necessarily recognize that they were using the sense of touch, illustrates how museum visitors may interpret interactive resources that are presented alongside our collection of indigenous art, in other art exhibits, or museums in general. I also think that it is worth considering how technological advancements have actually changed the way that we think about

our senses. A touch screen might have been easily recognized as being able to elicit tactile engagement two decades ago. However, the increased accessibility of technology, in particular, smartphones, has raised the bar for what increased engagement actually looks like. I think that this brings up interesting questions about what the future of museum culture will look like. In other words, will incorporating digital interactive resources be standard practice? Although I believe that there are many benefits to pairing such resources with physical artifacts, I fear that there will soon be an over-reliance on digital technologies. Despite the successes of this digital interactive program, I encourage other institutions to be mindful of the balance between innovative resources and the original artifacts. Only the engagement with authentic artifacts will actually allow museumgoers to fully understand the processes, concepts, and contained knowledge of that piece.

I think that the number of users that reported using the sense of hearing was also lower than expected, firstly, because many did not recognize all of the program's features that were included to facilitate its use. In particular, many initially thought that the embedded SoundCloud player that was located at the top of the screen was actually an advertisement. Since receiving this feedback, we have modified the program so that users are explicitly invited to listen to the songs of the Canelos Quichua women as they design their own personal vessels. Even with this change, however, a second explanation for lower-than-expected use of the sense of hearing is not addressed. Based on the recorded and in-person observational data that I collected, the majority of users appeared hesitant to fully explore the sonorous elements of the digital interactive program. One stated that they acknowledged the fact that the program contained various videos when they elaborated on their answer in the follow-up survey, but that they were reluctant to play these videos out loud because they were surrounded by other people. I observed users

express similar feelings when I was in the same room as them while they created their vessels. When the songs of the Canelos Quichua women started to play automatically from one user's device, their immediate reaction was to panic and mute the audio on their laptop. This observation showed me that users viewed the audio associated with the program as distracting to others, as opposed to a feature that was meant to enrich the experiences of everybody. I think that this insight, when considered together, speaks to just how much modern museum culture is ingrained into each and every one of us. Additionally, this investigation provided clearly documented examples of how we as museumgoers often uphold and reinforce these practices and ways of thinking. I think that in the future, initially explaining the importance of music to the ceramic making process might be beneficial for encouraging users to utilize as many senses as possible. It is my hope that eventually, such explicit instructions will be unnecessary, not only because institutions have taken steps to increase audience engagement with their collections as more and more curators recognize its value, but also because museumgoers recognize the importance of multi-sensory interactions to their own experience and therefore, take advantage of opportunities when it is possible.

Section IV: Difficulties Forming Meaningful Personal Connections

Users offered another piece of valuable feedback in the survey when they said that they would have appreciated being able to create their own patterns for their vessel. This was originally a possibility that I considered, however ultimately, we wanted to include authentic motifs because of the cultural significance that these pieces have to the Canelos Quichua community. We wanted to make sure that we were not being disrespectful to the culture we were trying to present and therefore, eliminated the possibility of users making inappropriate patterns

all together. However, in doing so, we had to sacrifice the amount of personalization that was possible, and our decision did not go unnoticed by the user. Perhaps the largest pitfall of this prototype version of the digital interactive program was that users did not feel that their piece was personally significant to them, at least to the extent that I had hoped for. As we continue to improve upon this first version, I plan to think more about how users might be able to form a stronger connection with their piece. While I am still reluctant to allow complete freedom with respect to the patterns that users can put on their vessel, increased personalization might be achieved by offering additional motif options and allowing users to better mimic the movements of master potters while they shape their vessel structure, add slips, and paint their patterns.

Overall, the feedback that I received with respect to this balance between accessibility and appropriation made me think deeply about the role of a curator, especially one who specifically organizes indigenous art. This project has made it clear that even the smallest decisions that I make as a curator regarding the physical ceramic artifacts or aspects of the digital interactive program can have very large implications about how visitors or users think about and engage with indigenous art. Although I do not currently have a solution for which approach might be best, I think that one step in the right direction will be to increase the involvement of indigenous artists in our curation processes.

Chapter 8: Discussion and Conclusions

The feedback that users provided after they used the digital interactive program demonstrated several strengths of the resource regarding its potential uses in our collection, however, they should be celebrated cautiously and to an appropriate extent. No matter what they report, results such as these can only be interpreted in the context of the interactions people have with the artifacts that the program presents. Originally, these interactions are between an object and the artist, in this case, between the women of the Canelos Quichua community and their artistic traditions and products. However, when these artifacts are moved to other spaces such as museums, markets, or digital platforms, the dialogues shift to include museumgoers, buyers and sellers, and users, respectively. In doing so, knowledge of and appreciation for the significance or processes related to an artifact can be easily lost. Increasing the dialogue between artifacts and other groups of people should be encouraged and, in many ways, doing so was one of the largest objectives of this project. However, curators of all levels, including students such as myself, should be mindful not to sacrifice the original interactions in exchange for those that prioritize audiences or users.

New advances in technology continuously increase the appeal of using digital resources in museum spaces as catalysts for incorporating visitors in these dialogues. The emergence of these new capabilities, however, raises questions about the limits of technology and also how use of technology potentially shifts the focus of importance and even the objectives of the research project if we are not vigilant about the dynamics at play.

At some point during the project, I felt I was losing sight of what was really important as my focus had become fixated on the interactions between the user and the digital program instead of understanding the interactions between artifacts and their makers. In a similar way, I

think that it is possible that collections such as the AAAC can unintentionally shift their focus toward how audiences interact with the technology behind digital interactive features itself and away from appreciating the artifacts and the cultures that produce them in more complex ways. This led me back to a critical evaluation of using technology for technology's sake or simply because we can and toward a more nuanced appreciation for weighing the benefits of using technology. Simply put, the "why" aspect of the decision to integrate digital elements into a museum collection should prevail over the novelty of digital modes of representation and the temptation to include them as exciting forms of interaction or representation in and of themselves.

The potential benefits of increasing digital resources can eventually level off. This is especially true when attempting to communicate information about the Canelos Quichua ceramic tradition because the various multi-sensory interactions are so important to the appreciation of these artifacts as well as their creation in the first place. For example, the walls of these vessels are very unique. Although engaging with 3D models might allow users to visualize how thin these walls are, related features of these pieces, such as their relatively light weight, cannot be conveyed. Traits such as weight and texture, as well as those that require senses other than touch, such as the smell of the vessels, would require major advancements in technology. These might include specialized gloves, the incorporation of fragrance diffusers, or other tools that may not exist yet. Better simulating the processes of creating these pieces is likely to be just as hard, if not more difficult. For example, painting motifs on digital models with the same accuracy as master potters might require extremely accurate styluses, while other aspects of the ceramic-making process, such as the firing of the pieces, would be nearly impossible to replicate. In speculating about the future direction of this program, as well as others that attempt to help

communicate indigenous practices and traditions, we must ask ourselves, to what extent are these technological advancements worth the time and money required to create them? Even more importantly, in what ways can they help to convey the processes as intended and what are their limitations?

They can potentially also have adverse effects. Shehade and Stylianou-Lambert (2020:15) mention dangerous or damaging outcomes in relation to virtual reality, for example. The authors note that in excess, technology has the potential to overload a user or remove the user from the experience of the museum visit. In other words, the opposite of the intended outcome of including digital interactive features in a museum setting. In regard to this digital humanities project, it is possible that including additional or increasingly intricate vessel shapes, colors, and patterns might cause users to focus on the many combinations that they could make as opposed to gaining deeper cultural understandings and cultural appreciation.

The purpose of creating and implementing this digital interactive resource was to increase the levels of engagement that visitors of our collection have with our pieces. Nonetheless, I acknowledge that the program runs the risk of focusing engagement between the user and the resource, instead of the user and the artwork. Without conscious moderation, digital interactive resources in the museum can quickly pose as the very same barriers that they were intended to overcome.

Despite the promise that this prototype version of the digital interactive resource demonstrates, it is important to keep in mind that technology is not a fix-all solution and that a single resource should not be used as a crutch for presenting an artifact, exhibit, or culture by itself. Any given resource should complement other features and activities. There is, moreover, no question that hands-on approaches are ideal and that a combination of interactive approaches

and opportunities is optimal. Finally, it bears underscoring that the most important challenge and goal for our collection is increasing the involvement of indigenous artists themselves. We intend to begin that process by sharing the digital interactive resource with indigenous artists themselves and inviting their reactions and feedback as a next step beyond completion of my thesis and this project. Ideally this dialogue as well as other initiatives centered on engaging with indigenous artists and communities can contribute to creating pathways for indigenous involvement and presence at our institutions.

Increased discussions with indigenous artists would go a long way toward affirming the dialogue between artists and their piece as well as informing an appreciation of indigenous art and our curatorial processes. Other collections on campus such as the ONLO collection directed by Dr. Elena Foulis, have demonstrated this sensitivity. Similarly, the K'acha Willaykuna Andean and Amazonian Indigenous Arts and Humanities Collaboration brought Mapuche artist Sebastián Calfuqueo Aliste to our campus for a series of performances, talks and dialogues. Incorporating the voices of these artists helps us navigate the problematic issue of owning indigenous art pieces and improve the ways in which we share them with our audiences.

Reflective Postscript

Throughout this entire journey, I feel as though I have grown tremendously as a student and researcher, but also more importantly as a person. This is by far the largest project that I worked on during my undergraduate career and as a result, I learned skills that other experiences, even those that involved independent research, did not fully teach me. For example, I learned how to efficiently conduct a large-scale literature review and how to pitch my ideas to others with the intention of drawing their interest. These, of course, are in addition to the various artistic programs that I became familiar with and still continue to explore. Perhaps the largest growth, however, is with respect to my writing style. Throughout the process of writing this manuscript, I have come to understand not only the knowhow, but also the value of writing in a clear and concise manner that favors the active voice. Similarly, in my analysis, I learned to rein in literary interpretation in favor of attention to ethnographic detail. I saw noticeable changes in my confidence as a writer and I am excited to carry this knowledge with me for the rest of my career as a researcher.

My understanding of Canelos Quichua ceramic pieces in our collection has increased immensely since I began working on this project. I immediately gravitated towards the ceramics when I first took on the position as an undergraduate student curator, and although I have been working with them for over two years now, I am still noticing new details and raising new questions about the pieces each time I see and handle them. For example, this past March, about two and half years after I was first introduced to these pieces, I noticed small holes at the base of two ceramic figures. I had always thought that members of the Canelos Quichua community would have served *aswa* from these pieces, especially because one piece has an appendage that looks like a spout, however, taking note of the small holes brought up a lot of questions about

what functions the artifacts might have actually served. These ceramics are almost always locked in their vitrines, certainly when we have had audiences visit our collection, but even when we rearranged other artifacts in the AAAC. This project gave me the opportunity to practice the level of interaction that I have been preaching by engaging with each piece at a deeper level. Even though I had always accepted the idea that these pieces can contain knowledge beyond what is visually apparent, working with the *callanas*, *mucawas*, and *sicuanga manga* vessels in such an intimate way granted me access to information contained in the smallest of details.

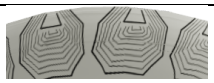
One of the largest topics that I learned more about was the actual process of making ceramic vessels. Although I did a lot of reading on the subject, personally, I think it is one thing to read about the various steps that master potters complete when they make their art and another to attempt to engage the processes of art making even in some small way. For example, as we were talking about the control master potters demonstrate when painting detailed motifs on three dimensional surfaces, Dr. Wibbelsman suggested that I try to paint parallel lines on just a two-dimensional surface using a few strands of my own hair to emulate what the Canelos Quichua women do. I was woefully unsuccessful. However, this simple activity exponentially increased my own understanding and appreciation for the skills of master potters. This reminded me a lot of the final project I completed for my Spanish 4515 Andean Art, Culture and Society class. I carved my own story gourd and through the process of actually creating a piece of my own, I came to truly appreciate the craftsmanship and cultural significance that indigenous artists pour into each piece.

I believe that the year-long process of designing and creating the digital interactive program was very similar to both of these tasks. Additionally, I find it easy to identify similarities between the steps I took and those that make up the master potters' process of

ceramic making. I applied experiential approaches to learning throughout this project even though at first I was not as knowledgeable about how prevalent this is in Canelos Quichua culture. It was not until I had already spent a few months working on the 3D models for the digital program that I noticed that the steps I was taking in some ways paralleled those of the indigenous women. I did not have any previous experience working with the software I used throughout this project and therefore relied heavily on instructional videos and trial and error approaches to figure out tfhe best ways to create the models. I began by observing and imitating Professor Patterson's techniques and, by the end of the project, had developed my own methodologies. I think that this approach was very similar to how young girls learn from their mothers through processes of observation, imitation and repetition. Master potters continuously improve upon their ceramic making skills throughout the course of their lives and in a similar sense, I could see my own technological abilities grow over the course of the last year. Processes such as digitally sketching the silhouettes of the vessels, adding textural details, and meticulously using my computer mouse to draw the motifs, initially took me 10 times longer when I first started compared to how fast I can complete them now. I am very glad that I decided to try my hand at every step that went into the final product of the digital interactive program. This was very similar to the fact that master potters participate in every individual step of their pieces' creation as well, from the mining of the clay, to the firing of the artifacts. I think this approach gave me a stronger personal connection not only with the individual digital vessels that I created, but to the interactive resource as a whole. It was both challenging and thrilling to create something with the intention that others can learn from it, similar to how master potters use their artwork to share knowledge.

I am very fortunate to have worked on such a special project over the last few years. This opportunity was especially meaningful to me in that it connected me with such a wide array of collaborators from across the country and even other institutions. I am very excited to apply everything I have gained through this experience as I continue to incorporate interdisciplinary research into my future career.

Appendix A: Digital Interactive Program Decisions and Options

Decision	Option 1	Option 2	Option 3	Option 4	Option 4
Callana Interior Color	Black				
Callana Exterior Color	Black	Brown	Light Brown	Dark Brown	White
Mucawa Interior Color	Red	Rust	White		
Mucawa Exterior Color	Red	Rust	White		
Mucawa Interior Motif	 Anaconda	 Turtle			
Mucawa Exterior Motif	 Anaconda	 Turtle			
Sicuanga Manga Interior Color	Black				
Sicuanga Manga Exterior Color	Black	Red	White		
Sicuanga Manga Exterior Motif	 Anaconda 1	 Anaconda 2	 Turtle 1	 Turtle 2	

Appendix B: Follow-up Survey

Canelos Quichua Ceramics Digital Interactive Program Survey

Thank you very much for using our digital interactive program about Canelos Quichua pottery. Please feel free to complete this survey to share about your experience and provide feedback about the resource.

1. i) How old are you?

_____

2. ii) About how many minutes did you spend using the digital interactive program?

_____

3. 1A) This program allowed me to have _____ interactions with a collection of art compared to most museums.

   Mark only one oval.

   - ◯ many more (3)
   - ◯ a few more (2)
   - ◯ the same number of (1)

4. 1B) Feel free to explain your previous answer.

_____

_____

_____

_____

_____

5. 2A) What senses did you use during your experience?

Check all that apply.

- [ ] Sight
- [ ] Smell
- [ ] Touch
- [ ] Taste
- [ ] Hearing

6. 2B) Feel free to explain your previous answer.

7. 3A) The piece I made has _____ personal significance to me.

Mark only one oval.

- ◯ a lot (3)
- ◯ a moderate amount (2)
- ◯ almost no (1)

8. 3B) Feel free to explain your previous answer.

9. 4A) After using this program, I gained _____ knowledge about and appreciation for indigenous art.

Mark only one oval.

- ◯ a lot more (3)
- ◯ a little more (2)
- ◯ no additional (1)

10. 4B) Feel free to explain your previous answer.

11. 5A) My knowledge of and appreciation for the traditions and practices of the Canelos Quichua community _____ after using this resource.

Mark only one oval.

- ◯ increased very much (3)
- ◯ increased a little (2)
- ◯ did not increase (1)

12. 5B) Feel free to explain your previous answer.

13. 6A) This interactive technology _____ my knowledge and appreciation for the Canelos Quichua ceramic making process.

Mark only one oval.

- ◯ greatly increased (3)
- ◯ slightly increased (2)
- ◯ neither increased or decreased (1)

14. 6B) Feel free to explain your previous answer.

15. 7A) After using this digital program, I have _____ understanding of how art can be used as a source of knowledge.

Mark only one oval.

- ◯ a much better (3)
- ◯ a somewhat better (2)
- ◯ neither increased or decreased my (1)

16. 7B) Feel free to explain your previous answer.

17. 8A) This resource _____ my understanding that making and appreciating indigenous art are interactive processes.

Mark only one oval.

- ◯ greatly increased (3)
- ◯ slightly increased (2)
- ◯ did not change (1)

18. 8B) Feel free to explain your previous answer.

_____

_____

_____

_____

_____

19. 9A) After using this program, I am likely to _____.

Check all that apply.

- ☐ try to learn more about indigenous art
- ☐ try to learn more about the Canelso Quichua community
- ☐ integrate non-traditional ways of thinking and learning into my own life
- ☐ use this program again
- ☐ use other resources offered by the AAAC

Other: ☐ _____

20. 9B) Feel free to explain your previous answer.

21. 10) Describe your experience. What did you enjoy? What did you find challenging?

22. 11) Has your perception of indigenous cultures and/or indigenous art changed? If so, how?

23. 12) How did this program compare to traditional museum experiences?

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