

ʔeləw̓kʷ – Belongings: Tangible Interactions with Intangible Heritage

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ABSTRACT

ʔeləw̓kʷ – Belongings is an interactive tabletop using a tangible user interface to explore intangible cultural heritage. The table was designed for the *čəsnaʔəm*, the city before the city exhibition. This exhibition is a partnership of three major institutions in Vancouver, BC, examining the significant ancient village site on which part of Vancouver was built, as well as Musqueam culture and community today. The tabletop uses replicas of Musqueam belongings excavated from *čəsnaʔəm*, as well as contemporary objects that are a part of everyday Musqueam life to access information about the long history of salmon fishing and the continuity of related knowledge at *čəsnaʔəm*. The design of ʔeləw̓kʷ – Belongings highlights the tensions between fragmentation and continuity that are central to discussions of access and preservation of intangible cultural heritage in the digital age. In this paper we discuss the tangible tabletop interface as a response to the desire to reconnect fragmented collections and physical belongings from *čəsnaʔəm* with Musqueam intangible cultural knowledge.

KEYWORDS

Tangible interaction; intangible cultural heritage; digital heritage; Museum of Anthropology; Musqueam Indian Band; *čəsnaʔəm*.

1 | INTRODUCTION

ʔeləw̓kʷ – Belongings is an interactive tangible tabletop on display at the Museum of Anthropology (MOA) at the University of British Columbia in Vancouver, Canada and was developed for the *čəsnaʔəm*, the city before the city exhibition. Using replicas of ancient belongings excavated from *čəsnaʔəm* and everyday objects in contemporary Musqueam lives, the table shares stories of the Musqueam community's past and how their culture and traditional knowledge continues today. Susan Rowley, Jordan Wilson, and Lisa Uyeda at MOA worked with Kate Hennessy, Alissa Antle, Rachael Eckersley, Perry Tan, Brendan Matkin, and Reese Muntean at Simon Fraser University's School of Interactive Arts and Technology to develop the tabletop application.

čəsnaʔəm, the city before the city is a partnership among the Musqueam Indian Band, the Museum of Vancouver, and the Museum of Anthropology at UBC (MOA), along with the University of Waterloo. In three unique but related exhibitions, the institutions introduce visitors to *čəsnaʔəm*, an ancient Musqueam village and cemetery on which part of modern day Vancouver was built. The exhibition at the Musqueam Cultural Education Resource Centre & Gallery highlights the sophistication of Musqueam's



Figure 1 | Testing ring and belonging prototypes for ʔeləw̓kʷ – Belongings. Courtesy Reese Muntean.

technology and culture both past and present. The Museum of Vancouver showcases ancient Musqueam belongings and ties them to the more modern histories of colonialism, heritage politics, and cultural resilience. The MOA exhibition, which includes the ʔeləw̓kʷ – Belongings tabletop, shares Musqueam values and worldview using media-rich installations and told from the point of view of named Musqueam community members' voices. The exhibition at MOA runs from January 2015 to January 2016.

Archaeologists generally refer to the material culture they excavate as “artifacts” or “objects”. Our Musqueam collaborators understand these items to have been created by, and to continue to belong to, their ancestors. For this reason we refer to them as ʔeləw̓kʷ, a hən̓q̓əmi̓h̓əm̓ term meaning belongings. By reframing Musqueam’s material culture using this term, we emphasize the continuity of intangible forms of knowledge that are intrinsically connected to belongings. The belongings from ɕəsnaʔəm connect contemporary Musqueam people to their ancestors and their snəw̓eyəʔ (teachings received since childhood).

2 | CONTEXT: ɕəsnaʔəm, THE CITY BEFORE THE CITY

ɕəsnaʔəm was one of Musqueam’s largest village sites approximately two thousand years ago. Archaeological evidence suggests people lived there for over three thousand years, and according to Musqueam oral history, their ancestors have lived at the mouth of the Fraser River from time immemorial (Roy, 2010). The ɕəsnaʔəm village site and burial ground has had a number of names over the years as it shifted from burial site to archaeological site during British Columbia’s colonial project. In archaeological circles it has been known as the Great Fraser Midden, DhRs-1, and Marpole Midden. Many in Metro Vancouver today would not even realize that the area around the railroad tracks, roads, and bridges on the way to the airport has an historic significance.

Between the late 1800s and today, professional archaeologists, amateur archaeologists, the general public and looters have removed thousands of belongings from the ground at ɕəsnaʔəm. From living rooms to museums, belongings from ɕəsnaʔəm are literally scattered across the world. In Vancouver, there are large collections at the Laboratory of Archaeology at UBC and at the Museum of



Figure 2 | Blanket pin and slate blade. Courtesy Reciprocal Research Network.

Vancouver. While a number of ornate, intact belongings were excavated, preserved, and disseminated through exhibits and publications – for example, a zoomorphic blanket pin – the vast majority of the belongings removed from *čəsnaʔəm* are fragments of stone or bone, and are often seen as less exotic or mysterious to a common viewer (see Figure 2). While these belongings may appear less significant than more aesthetically intriguing belongings, they represent complex histories, deep ancestral knowledge and are of continuing value for the contemporary Musqueam community. Additionally, these belongings, which in many ways represent technologies used for daily activities, speak to the wealth, resourcefulness, and detailed knowledge of the Musqueam ancestors at *čəsnaʔəm*.

The tangible interface developed for the *ʔeləw̓kʷ* – **Belongings** takes inspiration from the tensions between fragmentation and continuity that underscore all three exhibitions. As both metaphor and physical process, fragmentation includes the colonial appropriation and division of Musqueam territories and resources, the removal of belongings and ancestors from *čəsnaʔəm*, and the natural and inflicted degradation of the belongings themselves. Fragmentation is also represented in the vast collections of Northwest Coast First Nations belongings in museums around the world, the majority of which were acquired during a period (following the implementation of the Indian Act (1884)) in which the Indigenous populations were at their lowest ebb (Phillips & Johnson, 2003). Such collecting practices were justified by a ‘salvage’ paradigm, based on assumptions on the part of the colonizers that Indigenous peoples were doomed to vanish.

Today, museums are challenged to build new relationships with contemporary indigenous peoples, including the repatriation of belongings and ancestral

remains. At the same time, museums are struggling to find ways to bring representations of intangible cultural heritage into the museum space (Kurin, 2004). Continuity of intangible forms of knowledge, languages, and traditions is in tension with their historical fragmentation, just as the prioritization of objects as the focus of museum collections has contributed to the fragmentation of tangible and intangible heritage.

Explorations in digital fabrication and tangible interactions have highlighted possibilities for digital tools to support both the reconnection of intangible and tangible cultural heritage, and real interactions with physical belongings. For example, the National Museum of Natural History’s Tlingit Killer Whale Hat project used 3D scanning and fabrication technology to appropriately display the replica of a crest object that had been repatriated in a culturally appropriate manner (Hollinger et al., 2013). The University of Southern California’s Interactive Art Museum took advantage of the PHANTOM haptic device to enable visitors to handle 3D digital models so that objects that were too fragile, or even delicate in a cultural sense, could be made available for fuller appreciation and understanding (Brewster, 2005). The Mejlby Stone at Aarhus University animates an ancient rune stone by projecting the story and the translation of the stone’s inscription back onto itself (Basballe & Halskov, 2010).

Developments in interactive media and the creation of new digital museum networks are providing curators, software developers, and First Nations communities with new tools for the reconnection of fragmented collections with intangible forms of cultural knowledge, and their representation in museum exhibitions. One such digital museum network, the Reciprocal Research Network, greatly contributed to the development of *ʔeləw̓kʷ* – **Belongings** and is discussed in the next section.

3 | NEW RELATIONSHIPS, NEW NETWORKS

The development of the *ʔeləw̓kʷ* – **Belongings** tabletop exhibit has roots in a paradigm shift in North American museology focused on building new relationships with First Peoples. In 1992 the Assembly of First Nations and the Canadian Museums Association joined together to develop the Task Force

Report on Museums and First Peoples in order to work towards repairing the fractured relationships between Canadian institutions and First Peoples and to move towards open partnerships. The Task Force described the need for the inclusion of First Peoples in the interpretation of their cultures by Canadian institutions, calling for a change in the power relations between museums and First Peoples. The Task Force further pushed museums to increase access to collections by First Peoples and to create policies on repatriation of cultural heritage and ancestral remains. Similar mandates were underway in the United States with the 1990 passage of the Native American Graves Protection and Repatriation Act (NAGPRA) (Council of Canadian Academies 2015).

As museum anthropologist Ruth Phillips (2011) has noted, in the early 1990s, digital imaging, database, and search technologies were rapidly advancing at the same time that Canadian museums were looking for new ways to implement models of partnership and collaboration mandated in the Task Force Report. Phillips asserts that new technologies provide unprecedented new tools for both reassembling and creating new forms of access to dispersed collections of Indigenous cultural objects.

Recognizing in 2001 that museums did not yet have the infrastructure to support such a collaborative museum model, the Musqueam Indian Band, the Stó:lō Nation, the U'mista Cultural Society, and MOA applied for a grant as research partners to develop a digital infrastructure for museums, researchers, and community members. The outcome, the Reciprocal Research Network (RRN), creates an online research forum enabling community members, researchers, and institutions to access collections and information housed in different geographic locations (Rowley, 2013).

The RRN aims to support different cultural systems of knowing. Along with maintaining and sharing museum data about Northwest Coast collections, community partners are able to contribute their own knowledge about belongings. By creating a virtual space to share and foster discussions around the collections, the RRN community can contribute to a greater understanding of belongings than is present in the original museum records (Rowley et al., 2010). The RRN was used by curators at all three of the

čəsnaʔəm, the city before the city exhibits to share digital records of belongings from their institutions, to collaboratively develop curatorial texts, and to connect intangible knowledge to tangible belongings.

With the established relationship between the Musqueam Indian Band and MOA, and the collaborative research infrastructure of the RRN well in place, our team therefore had a solid foundation from which to design a tangible interface that could make at least a fragment of the large collection of belongings from čəsnaʔəm accessible to the public and connect those belongings to the intangible stories of Musqueam culture through contemporary voices.

4 | CURATING CONTINUITY

New museological discourse in the late 1970s included the ideas that knowledge is social, that knowledge is shared, and that objects themselves embody knowledge. Indeed, “a necessary condition for the generation of knowledge is engagement with objects” (Srinivasan et al., 2009).

It can be difficult for museums to interest visitors in the seemingly unimportant fragments from the past, and usually only a carefully curated, well-preserved selection of ‘treasures’ are exhibited. MOA curators Susan Rowley and Jordan Wilson discussed the challenges and opportunities afforded by exhibiting a fraction of the collection held in trust for Musqueam at the UBC Laboratory of Archaeology (LOA), all the collection, or none of the collection. After debate, and discussions with Musqueam exhibit advisory committee members, they determined the MOA exhibition would not feature any ancient belongings.

A number of factors influenced the decision. Displaying all of the thousands of belongings removed from čəsnaʔəm and housed at LOA would be a logistical challenge. Displaying a few would force the curatorial team to select and interpret belongings in the way they were trying to avoid. Certainly displaying belongings associated with burials and ceremonial use would be inappropriate culturally, but given the history of excavation process at čəsnaʔəm it would be nearly impossible to determine the exact provenance of particular belongings and thus how appropriate it would be to display. Wilson, a co-curator as well as a member of the Musqueam Indian

Band, furthermore noted that from the community's perspective, *čəsnaʔəm* is not viewed as an archaeological site, rather, it is commonly referred to a former village and cemetery, an important part of Musqueam's extensive history. In fact, the excavations and removal of ancestors, and many other forms of Western research, have been viewed as contravention of cultural values and protocol, and have resulted in long-term negative impacts on the community (Roy, 2010).

Rowley and Wilson were also attempting to challenge the meaning of an archaeology exhibit. As MOA is known for collecting, displaying, and interpreting material culture, visitors would be expecting to see ancient objects supplemented by academic experts' scientific views. The curators wanted to convey that material culture is not equivalent to culture; there is much more to Indigenous communities than art and artifacts. Displaying only the historic runs the risk of falsely implying that Musqueam are a people of the past or that their practices, values, and traditions have diminished over time. Rather than focusing on the tangibles, MOA highlighted the intangible values, worldviews, and teachings of Musqueam culture.

While *ʔeləw̓kʷ* – **Belongings** was designed with MOA's curatorial philosophies in mind, the table's development team saw the tabletop exhibit as an opportunity for incorporating tangible technology within the museum space to tell the greater stories of Musqueam history. It could show how the importance of ancient belongings is not about their form and function but rather their connection to the ancestors and the teachings (*snəw̓eyəʔ*) that were handed down through them. These *snəw̓eyəʔ* are part of everyday life, in the past as well as in the present. By using replicas of ancient belongings that would have been common in the past to visualize the story of Musqueam's history of knowledge and culture from long ago, we could similarly show the culture and practices of today through contemporary everyday items.

5 | *ʔeləw̓kʷ* – BELONGINGS

ʔeləw̓kʷ – **Belongings** is a tabletop application for the Samsung SUR40. The SUR40 is a horizontal HD display with legs. Using Microsoft PixelSense, which utilizes infrared sensors to detect objects on the



Figure 3 | The twelve contemporary and ancient belongings. Courtesy Reese Muntean.

screen, the table can detect blobs, fiducial tags, and up to 50 touch inputs. The ability to detect blobs and tags extends the table's possibilities beyond a simple touchscreen and offers the ability to support tangible interactions. By utilizing the touch and tag reading functions of the table, we have the opportunity to combine physical replicas of cultural belongings to additional media such as text, images, audio clips, and videos.

The tangible interface of the system comprises six replicas of ancient belongings excavated from *čəsnaʔəm* (net weight, celt, slate blade, harpoon, a decorated fragment, as well as a piece of cedar bark to represent everything that is not preserved), six contemporary everyday items of Musqueam life (ice cube, keys, status card, tide chart, quarters, and a Coke can), and two activator rings (see Figure 3). The replicas, cast from molds and hand painted by members of our design team to resemble the originals, sit together with the contemporary belongings on a collections cart. Juxtaposed with ordinary items like keys and a crumpled tide chart, visitors are invited to pick up the ancient belongings to discover their importance. Conversely, seeing a Coke can on display encourages them to question how mundane modern objects are relevant to Musqueam culture.

Three monitors are situated on the walls surrounding the table and belongings cart (See Figure 4); two of these are associated with the activator rings while the third displays photographs of the process of cleaning and filleting a salmon. The table itself shows a top down view of a fish-cutting table. On the table are a salmon, salmon fillets, a knife and sharpener, and an iPhone. Around the table are related supplies for fishing and fish preservation: fishing nets, firewood, an axe, a gas can, an oilcan, and a tote of fish.

When a visitor places a belonging in one of the rings on the table, basic information about the belonging and its use appears on the table. Additional images of similar belongings from the LOA collections database appears on the ring's monitor so visitors can see other examples of this type of belonging.

Visitors can connect the belonging to its related area of the fish-cutting image. When the correct section of the image is located, information about the belonging's use and place in Musqueam culture appears. An assortment of images, quotes, documents, and text will tell the story of how the belonging functions in Musqueam life (long ago or today) and why it is important. Some of the connections made between the belongings and the underlying image are more expected than others, but they work together to show the complexities of their interrelated histories.

The value of the two quarters, for instance, is symbolic. Two quarters are used in ceremonial contexts to thank people who have contributed in particular roles. The quarters match to the iPhone in the image, because while recognizing that we live in a time where information is literally at our fingertips, Musqueam people keep their spiritual and ceremonial lives private from those outside of the community.

As *mə́neʔt* – Johnny Louis explains in a quote that appears on the table when a visitor connects the physical quarters to the iPhone on the digital tabletop,

It's just a part of us, part of our life and traditions, and then one of the very few things we have left. So we have to protect it, so it doesn't get carried away.

Visitors can further explore the belongings by connecting an ancient belonging to its contemporary match to learn about the continuity of Musqueam culture from the past to present day, learning what has changed and what has remained. When visitors connect two seemingly unrelated belongings from the past and present day, again, a series of texts, contemporary images, historical documents, and quotes from community members appear on the table.

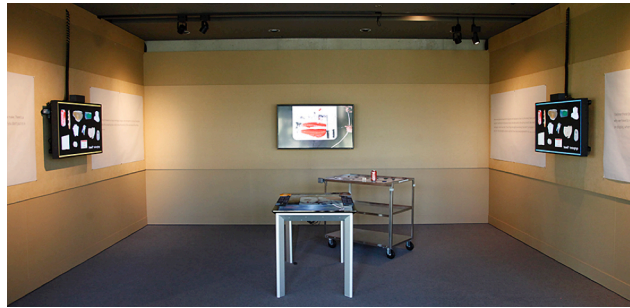


Figure 4 | The installation at the Museum of Anthropology. Courtesy Reese Muntean.

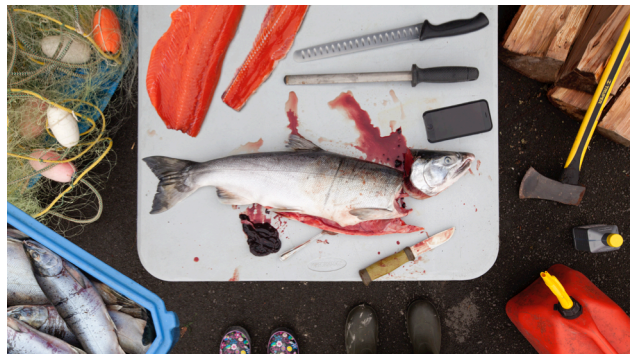


Figure 5 | The fish-cutting table top view. Courtesy Reese Muntean.



Figure 6 | The quarters connect to the iPhone. Courtesy Reese Muntean.



Figure 7 | The slate blade pairs with the ice cube. Courtesy Reese Muntean.

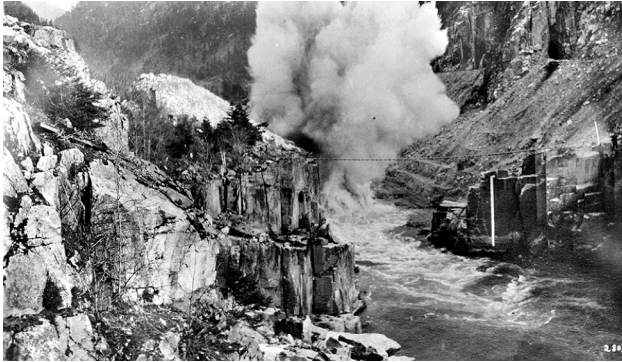


Figure 8 | Detail of historical image from the table, “Clearing Hell’s Gate Rockslide, Fraser River ca. 1916,” Courtesy Vancouver Public Library.

The slate blade and ice cube are two such belongings that match up to tell a larger story about their importance in fish preparation and preservation (see Figure 7). In the past the slate blade was used to process fish for drying, smoking, and cooking, while today fish are often preserved through freezing, in addition to traditional methods. The fragments of information that appear on the table when a visitor discovers this match tie the concepts of everyday fish preservation into the greater issue of fish conservation and sustainability. The quotes, images, and historical documents describe how overharvesting by commercial interests and environmental changes have had a dramatic impact on the salmon, sturgeon, eulachon, shellfish, and other culturally significant species.

In one quote that appears when a visitor connects the slate blade to the ice cube, community member **secelenəx**^w - Morgan Guerin explains salmon fishing and issues in the region.

The sockeye salmon run is species-specific and year-specific for every one of the four-year cycles. There are four cycles of them and two cycles being off and two cycles being on. Two years of abundance and two bad years. They used to historically of course be all good years except when the rockslide triggered during the railroad construction at Hell’s Gate in 1914 collapsed one whole run.

The information is quite specific, but it also conveys a larger message about Musqueam life today. Musqueam’s traditional ways have been fragmented by colonialism, yet in the case of their traditional ways of fishing, they are actively working to increase the salmon stock, collaborating closely with other Indian

Bands as well as Canada’s Department of Fisheries and Oceans.

Once a visitor has fully explored a belonging through these interactions and activities, they gain access to a short video of a Musqueam community member sharing their own lived experiences, often relating important moments of learning about history and teachings.

6 | EVALUATION

Curatorial goals and Musqueam values led the design process of **ʔeləw̓k**^w – **Belongings**. In our early development and design meetings, we outlined what we hoped to achieve in the tabletop exhibit. We wanted visitors to understand the role that ancient belongings played in the lives of Musqueam ancestors, but also how the teachings about the belongings and the embodied practices are still important today. Key design decisions were made to convey these ideas. The inclusion of both ancient and modern belongings, the fish-cutting image, and the multiple categories of information for each belonging were designed to speak to the tensions between fragmentation and continuity.

The two sets of belongings, both ancient and modern, help to show the continuity of Musqueam culture. As noted previously, the curators were concerned that by showcasing only the ancient belongings, visitors engaging with the table would associate Musqueam with the past, when the exhibition at MOA was really about the Musqueam people today. With ancient belongings sitting on the table along with modern items such as keys and a Coke can, visitors are encouraged to think about and explore the connections between the past and the present. The fish-cutting image, too, is a modern display of traditional Musqueam practices. By interacting with the belongings and the table, visitors could learn about the evolution and sustainability of Musqueam’s fishing practices and technologies over time.

Another design feature includes the four categories of information that can be accessed for each belonging. Rather than simply telling what each was used for, the table reveals quotes from community members, photographs, and documents. The multiple categories build on one another, giving visitors a greater understanding of how each particular belonging has



Figure 9 | Four categories appear in the digital ring. Courtesy Reese Muntean.

an impact on daily life in the past and present as well as related issues affecting Musqueam life. This wealth of information helps visitors see the belongings as more than historical fragments.

Once **ʔeləw̓k** – **Belongings** was installed, we conducted an interview-based visitor study in the gallery space at MOA during a two-week period to see whether our design decisions helped us achieve our goals for the table and what we hoped visitors would take away from the experience. Twenty-four visitors participated in the study by interacting with the table, completing a questionnaire with demographic information, and sitting down for a 10-20 minute structured interview.

Participants were asked questions relating to our research questions. These focused on a number of our design considerations including these ideas of fragmentation and continuity. We asked participants what they learned about Musqueam culture and how they learned this (e.g. What was something that surprised you about Musqueam culture that you didn't know before?) as well as what the belongings represented, why we used the term belongings, and if they saw any connection among the four categories on information for each belonging (e.g. While using the table, you placed different objects in the ring. What do you think those objects represent?).

The interview sessions were audio-recorded and later transcribed. Three researchers individually reviewed the transcriptions, analyzing them using open coding to find common concepts and themes. These researchers came together to compare findings to ensure the validity of the coding.

While the study included research questions to guide the evaluation of four of our main goals, here we focus on the extent to which the table communicated information that helped visitors to better recognize the continuity of Musqueam culture despite historical and ongoing colonial dynamics of fragmentation.

We found that participants understood the concept of continuity in relationship to Musqueam people and their traditions. 17 participants shared information they learned about Musqueam culture, and 13 discussed cultural continuity in their responses.

There's hardly ever a distinct line between "Oh, this is the culture before, there's the culture now." There can be broad strokes with that. But when you come down to the details, you have that element of stuff... from before, and you have elements that are new, and they do have to co-exist. – P18

The combination of modern and ancient belongings assisted in this understanding of continuity. Even if participants were not able to successfully match an ancient belonging with its contemporary counterpart in the tabletop activity, the inclusion of the contemporary belongings on the museum cart helped convey that idea to visitors.

They're a changing culture. It's sort of something I gleaned just by looking at the objects on the table in the first place. When you approach it and you see a harpoon and a Coke can together, you almost don't need the table. – P22

We also wanted visitors to gain a fuller understanding of the importance of the ancient belongings. Beyond information that might be found on a familiar didactic label, it is important to show not only how belongings were used in the past but also how the culture engaged new technologies and how Musqueam people today continue to use these traditional practices in the contemporary landscape. The fish-

cutting image on the tabletop, the different categories of information for each belonging, and the combination of historic and contemporary content helped us show how much could be learned from what some might overlook as a historic fragment.

One visitor describes how interacting with the belongings on the fish-cutting image broadened their understanding:

It isn't just an object in isolation. It's an object that connects to other objects, like the people, other functions. It has a functional reason for being there. It doesn't exist in isolation. – P06

Along with context from the image, each belonging had four categories of information to explore, and these categories were visible whenever a belonging was inside a ring. One visitor describes these categories as

Different levels of depth to the conversation... so one was just a description of the object or belonging and then an application of it, how it was used, and then how it connected to something else. – P17

Another explained,

It seemed almost like an intricate web. On the onset, it seems like they're four separate things that you kind of click on, and then after while you play around with it a little bit, and you start realizing that no, they're all connected. – P18

Each of these categories told the story of the belonging through fragments of information. Old documents and modern regulations, historic images and smartphone photos from contemporary Musqueam families, and stories from ancestors and well as elders today were interwoven to tell the story of the Musqueam people through their belongings and fishing practices.

7 | CONCLUSION

In our efforts to create a tangible interface for the exploration of intangible cultural heritage, **ʔeləw̓k̓ – Belongings** has taken inspiration from the tensions that exist between historical fragmentation of cultural heritage collections (including colonial collecting

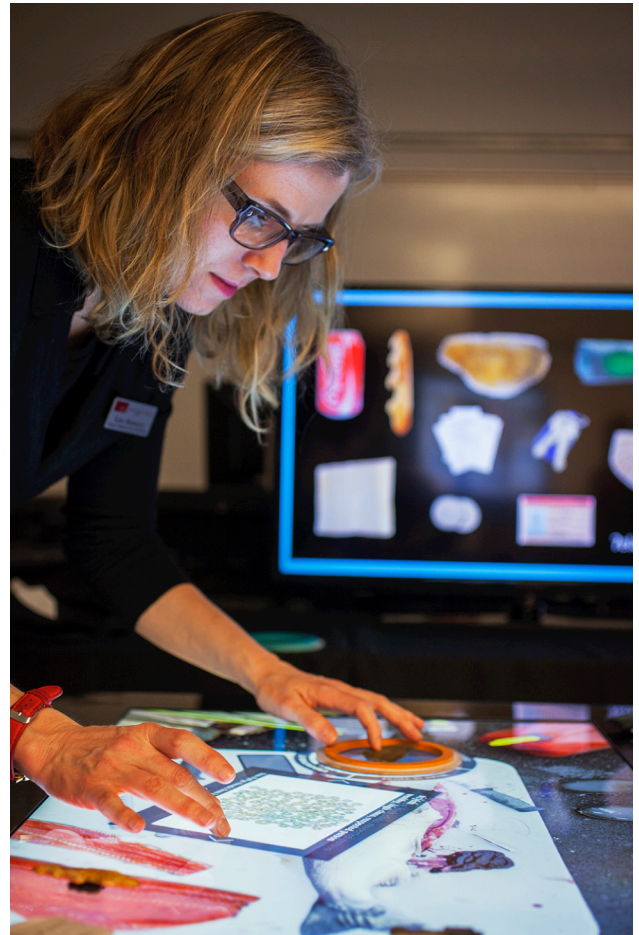


Figure 10 | Demonstrating **ʔeləw̓k̓ – Belongings**. Courtesy Reese Muntean.

practices, looting, geographical dispersal, and removal of belongings from intangible cultural life) and the ongoing role of belongings in the continuity of cultural knowledge. It builds on decades of work in the North American museum community and Native American and Canadian Indigenous communities to build new relationships. This has more recently included the collaborative development of digital museum networks such as the Reciprocal Research Network that facilitate collaborative research, access to digital representations of belongings, and the reconnection of geographically dispersed First Nations belongings. Digital networks like the RRN provide resources for the development of projects like **ʔeləw̓k̓ – Belongings**.

The tangible interface further responds to the challenge of representing the significance of fragments and everyday belongings, and their connections to contemporary Musqueam culture, in the museum space. Replicas of belongings provide the opportunity for museum visitors to spend time with Musqueam belongings from **čəsnaʔəm** and to

interact with them in a way that the exhibition of real belongings would not allow.

ᑲᑲᑲᑲᑲ – **Belongings** encourages interactions between visitors, the sharing of information, and the informal discussion of the intangible knowledge being shared about Musqueam belongings. Significantly, our initial evaluation of the table has shown that visitors enhanced their understanding of the continuity of Musqueam culture and values through their interactions with replicas of belongings and associated intangible forms of knowledge, such as photographs and videos of contemporary Musqueam community members. In doing so, we suggest that such an understanding of the continuity of culture may begin to counter historical processes of fragmentation, which included the separation of tangible and intangible forms of knowledge, and the removal of heritage collections from their communities and territories of origin.

In reframing what archaeologists refer to as “objects” or “artifacts” as Musqueam belongings, we support a growing movement aimed at decolonizing museum practices and creating a collaborative museum model. While engaging with issues of access, preservation, and continuity of culture that are central to discussions of digital heritage, the overarching goal of this project has been to communicate Musqueam cultural values through interaction with belonging replicas and the voices of community members, building a greater understanding of Musqueam’s past and present.

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Reese Muntean is a graduate student at Simon Fraser University's School of Interactive Arts + Technology (SIAT) and holds a Bachelor of Fine Arts in Photography and East Asian Studies from New York University. Her research interests include digital cultural heritage and collaborative development of ethnographic new media projects.

Dr. Kate Hennessy is an Assistant Professor specializing in Media at Simon Fraser University's School of Interactive Arts and Technology. She is a cultural anthropologist with a PhD from the University of British Columbia (Anthropology). Her research explores the role of digital technology in the documentation and safeguarding of cultural heritage, and the mediation of culture, history, objects, and subjects in new forms. Current projects include the collaborative production of virtual museum exhibits with Indigenous communities in Canada; the study of new digital museum networks and their effects; ethnographic research on the implementation of large scale urban screens in public space; and the intersections of anthropology and contemporary art practices.

Dr. Alissa Antle is an Associate Professor in the School of Interactive Arts + Technology at Simon Fraser University, Canada. Her research focuses on embodied human-computer interaction and child-

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Dr. Susan Rowley is an Associate Professor in the Department of Anthropology and a Curator at the Museum of Anthropology (MOA) at the University of British Columbia. She is a member of the Reciprocal Research Network (RRN) Steering Group. Most recently she was a member of the exhibit team for *čəsnaʔəm*, the city before the city and co-curator for the exhibit at MOA. Her personal research interests include public archaeology, material culture studies, representation, repatriation, intellectual property rights and access to information on cultural heritage.

Jordan Wilson is a graduate student and co-curator of the exhibit *čəsnaʔəm*, the city before the city, at the Museum of Anthropology. He's of European and Indigenous ancestry, and a member of the Musqueam First Nation. He is currently in the Masters of Arts program in the Department of Anthropology, University of British Columbia. His research interests include community collaboration and Indigenous-museum relationships, issues of representation, material culture studies, Indigenous art history, community/oral history, and Indigenous/community-based research. Jordan has spent time researching and receiving training at the Smithsonian Institution in Washington DC, the University of Tromsø in Norway, and at the Indian Arts Research Center at the School for Advanced Research in Santa Fe, NM.

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