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INVESTIGATING CULTURAL LEARNING IN DIGITAL ENVIRONMENTS THROUGH PERUDIGITAL

ABSTRACT

This article examines the PeruDigital project, a digital ethnography project that presents Peruvian festivals and folklore on the Internet through an immersive and interactive environment. This project, like others that employ the Participatory Design model, is an iterative process, one that involves evaluation and garnering feedback into the design loop. In addition to employing Participatory Design principles, the project seeks to bridge current work in digital heritage with the concerns of current anthropological theory. This article focuses on current interdisciplinary research between faculty in Digital Media, Anthropology, and Education to study what and how students learn about cultural heritage from the website. The experience tentatively suggests that the role-playing and immersive potential of digital environments can be used to facilitate cultural learning, but that pathways through those environments need to be carefully structured so that cultural knowledge can be learned.

KEYWORDS

Digital heritage; cultural learning; interactivity; immersion; cultural heritage; Latin America; perspective; role-playing

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INTRODUCTION

This article examines the PeruDigital project (www.perudigital.org), a digital ethnography project that presents Peruvian festivals and folklore on the Internet through an immersive and interactive environment. This project, like others that employ the Participatory Design model, is an iterative process, one that involves evaluation and garnering feedback into the design loop. In addition to employing Participatory Design principles, the project seeks to bridge current work in digital heritage with the concerns of current anthropological theory. This article focuses on current interdisciplinary research between faculty in Digital Media, Anthropology, and Education to study what and how students learn about cultural heritage from the website. The experience tentatively suggests that the role-playing and immersive potential of digital environments can be used to facilitate cultural learning, but that pathways through those environments need to be carefully structured so that cultural knowledge can be learned.

PARTICIPATORY DESIGN AND BRIDGING DIGITAL HUMANITIES WITH CURRENT ANTHROPOLOGICAL THEORY

The PeruDigital project employs ideas from recent work in archive and museum studies that integrate participatory and digital methods into the public presentation of cultural materials, and assembles a diverse group of humanities scholars—cultural anthropology, linguistic anthropology, curatorial studies, and Latin American Studies—along with cultural consultants with expertise in Peruvian, including native Andean (Quechua), folk art, folk dance, and language. The field of participatory digital archives and museums often focuses on the objects as a locus of attention to the relative exclusion of the social situations—and scenarios—in which such objects play a part in real life. The PeruDigital project aims to bring together participatory research methods with digital storytelling and educational game design techniques to convey more abstract aspects of intangible cultural heritage, which includes not just traditional arts and performances, but elements of cultural values and ideas about time, space, and movement (Fennell 2009; Gandhi and Gandhi 2009; Graham 2009; Keller 2009; Ruggles and Sinha 2009; Salomon and Peters 2009).

INTRODUCTION TO THE PERUDIGITAL PROJECT

The PeruDigital project presents and interprets Peruvian festivals and folklore through the medium of the Internet. Based primarily on archive materials from the Pontifical Catholic University of Peru-Lima's (PUCP) Institute of Ethnomusicology (IDE) as well as fieldwork conducted by the PeruDigital team, the project is a collaboration between faculty and students in the fields of Digital Media (including Character Animation), Anthropology, and Modern Languages and Literatures (Spanish).

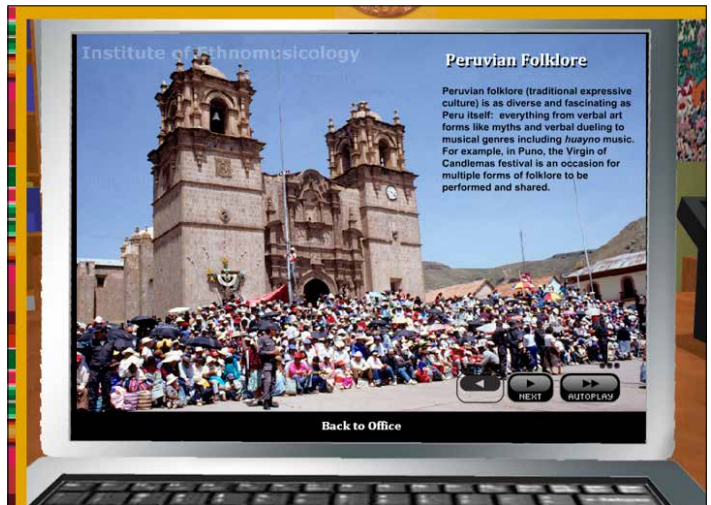
FIGURE 1: PERUDIGITAL WEBSITE HOME PAGE.



The project, supported by internal UCF funding¹, has produced to date numerous publications and conference presentations (see, for example, Underberg-Goode 2015; Underberg-Goode and Adams 2015; Underberg and Zorn 2013 and 2012), and was used as a model in teaching graduate Visual Anthropology coursework in 2012 at the PUCP. The current PeruDigital website introduces users first to a busy Lima, Peru plaza where characters and objects indicate the perspectives to be found within the Website. From there, users can visit the ethnographer’s office and explore orienting information about Peruvian folklore, religion, and regions. These multimedia materials help users better understand and appreciate the interactive festival environment in Afro-Peruvian Piura. There users can interact with festival performers such as a young girl preparing to perform in the *sarahuas* (a dance/drama about the historical conflict between the Christians and Moors in Spain) and objects such as the fieldwork videos integrated into the ethnographer’s virtual mobile player showing festival characters like the *tamalera* (a playful representation of a local tamale-seller) in action. The goal is to introduce via simulation aspects of attending, performing in, and studying a festival.

FIGURE 2: LEARNING ABOUT PERUVIAN FOLKLORE IN THE VIRTUAL DIGITAL ETHNOGRAPHER’S OFFICE.

¹ Internal UCF funding has been received from the following: UCF School of Visual Arts and Design; UCF Department of Anthropology; UCF College of Arts and Humanities; UCF Center for Humanities and Digital Research; UCF Latin American, Caribbean, and Latino Studies Program; UCF Office of International Studies; and UCF CREATE (Center for Research and Education in Arts, Technology, and Entertainment).



The most recent addition to the Website has been a curriculum and quiz based on the Website materials and organized according to three social roles: ethnographer-as-researcher, the artist-as-performer, and the sponsor-as-community builder. The Website features three scenarios that set up the questions, both multiple choice that draw on material contained in the Website, and free-response that ask users to draw upon ideas from the Website to apply those lessons to their own experience and communities.

The curriculum is designed to encourage website users to adopt these points of view as they move through the digital environment:

1) The ethnographic perspective is set up through the following scenario:

Hector is a graduate student studying ethnomusicology (the cultural study of music) at the IDE at the PUCP in Lima, Peru. His family is from Puno, Peru, and he is the first generation in his family to go to college. He is interested in Peruvian traditional culture, but sees it as something that his parents' and grandparents' generation were concerned with, and believes it to be dying out. By learning to ask the questions an ethnographer would ask about the meanings and functions of the festival in Piura, you can help him understand that, far from dying out, Peruvian traditional culture is dynamic, changing and adapting all the time.

Questions include general ones such as, "Why do people all over the world seem to celebrate festivals?" to specific ones such as, "Where has the form of the *cumanana* (a form of verbal dueling) flourished?" Beyond this, users are asked to complete certain tasks that relate to ideas and themes explored in the site to the communities surrounding them, such as "Ask your friends and family if they can think of any other examples of stereotypes in festivals and other celebrations. Why do you think they exist?" To answer these questions requires a certain way of exploring that differs from the choice to experience the festival as a sponsor.

2) In the sponsor perspective, the user adopts the role of Xavier:

Xavier is a middle-aged member of the *hermandad* responsible for organizing the annual Lord of Agony festival in Piura. This is his first experience with sponsoring the festival, and he is replacing his uncle as chief festival organizer—and he hopes he can measure up to his uncle's performance. Xavier is the festival *mayordomo*, meaning that he undertakes the duty of organizing the religious and administrative tasks associated with putting on the festival including caring for the village saint (or Lord), administrative matters, and the festival schedule. He works with a *devoto* (devotee) as well

as an *escribano* (notary public) who is in charge of collecting the money and making the economic arrangements, and a *procurador* (procurator) who makes sure that everything is done adequately and according to tradition. Xavier wants to do a wonderful job in carrying out his *mayordomo* duties and coordinating the members of the *hermandad*, but he has a lot of work to do to make sure it is done correctly. By learning the answers to questions related to organizing the festival, you can help Xavier learn first-hand the value of cooperative labor and the importance of giving in order to receive.

In doing so he needs to understand issues like “What does the *escribano* in a *hermandad* do?,” and complete such tasks that relate to the sponsor role as “Find out what dish(es) are traditionally served [at the celebratory meal after the festivity], and how to make them.”

3) By adopting the performer role users are introduced to Ariana, a nine-year old planning to perform in the *sarahuas* dance/drama in Piura:

Ariana is a nine-year-old girl from Sechura who is performing for the first time as a *sarahua* in the Lord of Agony festival. She is somewhat disassociated from her cultural heritage, and doesn't want to participate in this 'stupid' tradition. She wakes up the morning of the performance as a *sarahua*—not as a character, but in the middle of the drama the *sarahuas* are depicting. She must learn not only about how to play her role in the *sarahuas*, but about other characters' roles in order to return to her everyday existence. When she successfully answers all the questions she needs to know how to perform—and for others to perform in the same festival—you can help her wake up on the day of the festival again, but this time ready to perform her heart out with a new appreciation for the history and heritage expressed in the festival.

To understand the festival performer perspective, the user explores the Website to understand matters like “What is a *compadre*, for which the *serrano* character says he is looking?” and “To what does the term *palla* refer?” To carry out this role, the user completes tasks including to “find out more about the conflict that the *sarahuas* represent in dramatic form.”

INVESTIGATING CULTURAL LEARNING IN INTERACTIVE ENVIRONMENTS

Digital media designers can exploit the role-playing and immersive potential of digital environments to facilitate cultural learning. Erik Champion (2006a, 2006b, 2011, 2015), for example, advocates integrating interactive elements including dynamic place, interactive task-oriented artifacts, avatars, and memento maps to accomplish this.

Dynamic place refers to the provision of paths that either help or block user navigation. Task-oriented artifacts involve the use of interactive elements to encourage users to reach goals through manipulation of objects, and can be employed in such a way that their use demonstrates their cultural significance.

Avatars (actors represented as three-dimensional characters) can represent agents that users can communicate with and from which they can learn, which can help create a sense of presence. Memento maps, meanwhile, can be devices by which users can customize map icons which would help with navigation. These ideas, while not fully realized in the pilot stage, have influenced the design of the PeruDigital Website.

Interactive environment design for cultural learning involves understanding how cultural learning may occur through observation, instruction, or trial and error. The objective is one of simulation, of imitating the procedural knowledge of cultural rituals and symbols, and thus to help outsiders better comprehend a different worldview. This involves provision of contextually appropriate goals, and consideration of the ways that knowledge learned in the virtual environment can be transferred beyond the interactive environment. Champion suggests considering the way in which role-playing figures in the accomplishment of cultural goals and values, and the role of items in social role identification. Designing interactive environments for cultural learning involves having users complete actions such as identifying correct and incorrect behaviors and communicating cultural knowledge (Champion 2006a, 2006b).

Ideas for designing virtual environments to support cultural learning have been adapted for use in the PeruDigital project in several ways. For example, the curriculum free-response tasks ask users to apply knowledge learned from the Website to their own experiences and communities, and to gain practice in using the skills of these social roles. For example, in the ethnographer perspective, we are asked to do the following:

Folklorists and anthropologists talk about an idea called 'religious syncretism,' by which they mean the combination of two or more religious belief systems into a new religious belief system. Find several examples of this 'syncretism' in Peruvian culture through exploring the PeruDigital Website, and by doing additional research as necessary. Can you find any other examples of this 'religious syncretism' in your community, or by asking people you know? What questions would you ask them to find out the answers you are seeking? Make a list of these questions, then ask someone the questions and take notes on what you are told.

In addition, PeruDigital aims to simulate the procedural knowledge of ritual and symbol. For example, by adopting the perspective of the festival sponsor, the user may gain a sense of the Andean cultural idea of cooperative labor as a form of wealth and social influence as indicated by the mobilization of cooperative work.

In this way, too, users are introduced to a different belief system, one which privileges the importance of the cargo system and cooperative labor (Bird n.d., 2010; Guillet 1980; Isbell 1997; De la Piedra 2009).

In addition to understanding the cultural importance of festivals in Peru, users are also given the contextually appropriate goal of gaining an ethnographer's understanding of the festival as a kind of universal human activity, one which provides common functions around the world like providing a "time out of time" in which social values and strains are displayed through ritualized actions and satirical figures, including stereotypes. This is shown by allowing the visitor to visit a street scene set during the Lord of Agony festival including the festival character of the *serrano* (representing an indigenous person from the highlands) and a PUCP student ethnographer holding a mobile video player with fieldwork videos. Within this street scene, the user can hear the *serrano* ask "¿Dónde está mi compadre?" ("Where is my ritual co-father?") and then see the fieldwork video of the *serrano* in the PUCP character's hand and note how he stays in character. Users can then visit the digital ethnographer's office and delve deeper into the history, development, and significance of the *serrano* through looking through fieldwork notes and slide shows either before or after these encounters. One lesson may be a greater understanding of how festival figures may represent regional stereotypes.

To learn more, a visitor might want to look at the Piura (coastal Peru) and Puno (highland Peru) booklets on the bookshelf in the digital ethnographer's office. This understanding is reinforced through completion of the following task questions under the ethnographic perspective: "Find out how the *serrano* represents a stereotypical character, and think of a list of questions to ask a real person who the stereotype represents to learn more about his or her culture. Ask your friends and family if they can think of any other examples of stereotypes in festivals and other celebrations. Why do you think they exist?" Another way is through the multiple choice question within the ethnographic perspective that asks: "Why do people all over the world seem to celebrate festivals?"

In order to better understand how the PeruDigital project does (or does not) enable this "cultural learning," and prepare to more fully integrate this cultural content into the Website, we felt it was important to examine what exactly students who received education based on the curriculum found in the PeruDigital Website actually learned, whether presented through exploring the Website or through receiving the same information via a static PowerPoint presentation.

Evaluating this cultural learning may involve some combination of direct observation, usability and experience questionnaires, and interviews. Observation may involve recording the amount of time taken to explore the environment and complete tasks. Questionnaires are also helpful tools. Pre-questionnaires can be used to gather demographic data and expectations of users.

Usability questionnaires address system effectiveness and user satisfaction. Post-tests can be used at the end to find out what was learned (Champion 2006a, 2006b; Pujol and Champion 2012; Wang and Champion 2011; Roussou, Oliver and Slater 2006). Specifically, Champion (2006b) outlines five categories of questions for evaluation of cultural learning: task performance (locating objects in the environment), cultural understanding (multiple questions on the environment), presence survey (evaluating users' sense of presence, especially cultural presence or the sense of being in the presence of a distinct cultural worldview), environmental recall (testing users' memory recall about the environment), and subjective experience of time passing (in which environment does time seem to pass by quickest). Ideas from the literature on evaluating cultural learning in virtual environments influenced the design of the questionnaires/quizzes for the study under discussion in this article. To this end, Carolyn Hopp, Natalie Underberg-Goode and Maria Eugenia Ulfe applied for and received internal UCF funding (a CAH Seed Funding grant) to study the acquisition of cultural learning in PeruDigital. The objective was to examine differences in learning attainment, motivation, and engagement, and to learn how to best utilize the role-playing and immersive potential of digital environments to facilitate cultural learning. We conducted a quantitative and qualitative research project with two groups of students from universities in different countries. The first class consisted of a graduate class in the UCF School of Education and Leadership taught by Carolyn Hopp. The second group of students came from the PUCP's Visual Anthropology program directed by María Eugenia Ulfe.

As part of this project, students took turns studying the curriculum associated with the PeruDigital project Website, via a static PowerPoint lecture and via an exploration of the Website itself. While the original plan was to randomly assign students to one of the two groups (the control group who would study the PeruDigital curriculum via a static PowerPoint lecture and an experimental group who would study the curriculum via exploration of the PeruDigital Website), during the course of seeking IRB approval we learned that due to student concerns raised during recent years we were now required to offer both interventions to all students during the course of a class.

The PowerPoint lesson included content related to topics including: basic facts about Peru (location, geography, climate, history, population, languages, etc.); introduction to the regions of Puno and Piura (covering the same basic topics, including discussion of the Virgin of Candlemas festival within Puno culture and the Lord of Agony festival within Piura culture); Peruvian religion (including Inca civilization, Catholicism, syncretism, and role of festivals); Peruvian folklore (including festival, verbal art, dance and drama, graphic and plastic arts, and textiles); and festivals in Peru (including the Lord of Agony).

Each student group (one in Peru and one in the U.S.) was then given a pre-test, post-test, and quiz (including both objective and free-response questions).

Our graduate student assistant Hariharan Ramakrishnan set up these instruments in Qualtrics. This, in addition to the focus group discussions, were the sources of data we collected.

Before taking the pre-test, Underberg-Goode gave a brief lecture to explain the project and the research grant activities (in person in Hopp's class and via a narrated PowerPoint to Ulfe's students). Underberg-Goode, Hopp, and Ulfe then created the pre-test, which drew from research on methods of evaluating cultural learning (cited earlier) and multicultural curriculum development and evaluation (Banks 1996; Hopp 2011; Ornstein, Pajak, and Ornstein 2015).

Demographic questions included age, gender, and educational background. Likert scale questions included asking about previous knowledge about Peruvian culture, interest in exploring a foreign cultural heritage, and attitudes toward the use of interactive media for learning. Open-ended questions included asking about background with developing interactive learning experiences, attitudes towards use of storytelling in education, and background knowledge related to ethnography and the functions of a festival.

The quiz was drawn from the Website curriculum, and included questions related to the topics and themes covered in the Website, such as the meaning of the festival figure of the *serrano* and why festivals are found world-wide. The free-response (task) questions were also drawn from the Website, and included such questions as "Find out how the *serrano* represents a stereotypical character, and think of a list of questions to ask a real person who the stereotype represents to learn more about his or her culture. Ask your friends and family if they can think of any other examples of stereotypes and festivals and other celebrations. Why do you think they exist?."

The post-test was also co-designed by Underberg-Goode, Hopp, and Ulfe. Again drawing from the literature on evaluating cultural learning in virtual environments, questions included first asking students to rate which format (Website or PowerPoint) was most challenging, interesting, interactive, and so on. Then Likert scale questions were posed including asking students to rate how they would answer questions regarding their understanding of some key ideas or themes in the Website (such as "I understand how the role of the sponsor differs from that of the artist"), how interesting they found the history behind festivals, and how willing they were to explore a foreign cultural heritage. Questions were also asked regarding their interest in the characters, if they thought completing the free-response "tasks" helped them in understanding the topic, and whether they thought the Website was easy to use. Free response questions asked again some of the questions from the pre-test, including "What do you think an ethnographer does?" and "How does an event like a festival reveal the way that culture and tradition may change over time?"

Video capture software was used to record how students used the curriculum and answered the questions. A considerable amount of time was spent in particular by our graduate research assistant to plan for and troubleshoot this part of the process.

He created a “How-To” guide for proctors and participants to use that explained how to record, render, and export the videos, and we conducted a trail run-through with Ulfe and her research assistant before the recording date via Skype to make sure the recording session with the students would be successful. Due to concerns about file size, computer capacity and Internet speed, the recordings were divided up into several parts, with a period of time in between each recording necessary to render the files. A log of the Camtasia recordings was made by our research assistant, which showed which pages the students visited at which points in the recordings.

In addition, focus group discussions were held to discuss and evaluate the project. The focus group format was somewhat open-ended, but included discussing topics like “What did you think of the curriculum format and structure?” and “Which feature of the Website was most memorable to you?” Due to scheduling difficulties, the focus group discussions were held separately with the students in Peru and in the United States. A student translator was hired to facilitate the discussion since Hopp and our research assistant did not speak Spanish and so the students at the PUCP could express themselves freely in Spanish.

RESULTS FROM RESEARCH

The pre-test results for the UCF students indicated, among other insights, that the majority of students began the project with very little knowledge about Peru in general or North Peru in particular, while just over half indicated strong willingness to learn about a foreign cultural heritage and a belief that interactive media is useful for learning about other cultures. Unfortunately, the students at the PUCP did not complete the pre-test, perhaps due to a misunderstanding on the part of proctors regarding this issue. Because of this, the conclusions presented here are tentative and not conclusive and indicate that more close teamwork is needed in future collaborations.

Students in Hopp’s class answered quiz questions as journal entry assignments within their online course environment, while Ulfe’s students answered the questions using Qualtrics survey software. The open-ended questions are where we may see the difference in areas of motivation and engagement. This allowed us to investigate the question: Is their experience more powerful? In part, this was measured through the reflection pieces, in which we asked students to consider the following: “What did you connect to and why?; What still challenges me?; and “I used to think...but now I think...” The post-test and survey consisted of reactions to curriculum including questions related to interest in cultural learning. The questions are designed to investigate the question: Do we see evidence of differences in areas of motivation and engagement? This can be explored by investigating the question: Is their experience more powerful in one curriculum format versus another?

The quiz results revealed some interesting insights, including that on the quiz for the group that initially saw the Website

curriculum, the PUCP students scored lower on 17 of the 28 questions than the UCF students. One possibility is that the Peruvian students may have taken many things for granted and not paid as much attention due to the subject matter—perhaps if presented with a project on U.S. culture their interest and attention may have been more sustained and thus led to higher scores. Responses to some of the free-response questions showed some interesting differences in what students focused on between the U.S. and Peruvian students. For example, in response to the question that asked students to imagine taking on the responsibility of organizing a festival, the U.S. students' responses were split between one half who noted both the Peruvian-specific roles (the *hermandad* or brotherhood religious organization structure) along with the objects and performers needed, and the other half who primarily focused on the objects and performers needed. In contrast, the Peruvian students all (except for one student who did not answer) noted the Peruvian-specific roles as well as the need for mobilizing a social/family network to complete this undertaking.

The majority of students in both groups rated the Website as more interesting and interactive, while opinions were more split on which format was more challenging. Answers to several of the post-test free response questions in the English-speaking group did reveal a somewhat more thorough or deep understanding of key topics like “What do you think an ethnographer does?” and “How does an event like a festival reveal the way that culture and tradition may change over time?” Student responses to the question: “Complete the following two statements in relation to the lesson on Peruvian religion, folklore, and festivals: I used to think...But now I think...” for the UCF students included some telling statements revealing a more in-depth engagement with the topic and culture, including: “I used to think festivals were just for fun. But now I think there is so much more we can learn...” and “But now I think that Peru is very rich in history and very distinct from all other cultures.” For the PUCP students in response to the same question, several responses focused on the effects of the digital/interactive elements, for example: “I think the digital tools are valuable,” while another attributed his/her change in thinking to the experience of having learned from the Website.

During the focus group discussion, the PUCP students made a number of points about their experience with the curriculum and the Website. Overall, they indicated that they were not intrigued by the curriculum being outside the Website and wanted to see it integrated more so that the pathways through the Website were more structured. Other comments included their desire to see more in-depth information about some of the material on the Website, such as about the musical instruments featured, and indicated that they would find the site more interesting if there were more short videos on the site. Students made it clear that they were not compelled by

the static image-with-text presentation format. The focus group with the U.S. students revealed that in relation to timing, students completed the curriculum in much less time than anticipated. Once they saw the surveys and questions related to the curriculum, regardless of which format they experienced, they commented that they realized they did not pay deep enough attention to the content and realized they needed to go back in some instances and revisit the curriculum. The students indicated that they did enjoy the interactive content more than the static PowerPoint content, but they did suggest adding content that provided more historical perspective and even the location of Peru with respect to other countries and cultures.

CONCLUSION

Drawing on our experience with the CAH seed funding grant, we are currently seeking grant funding to allow us to integrate the curriculum into the Website, which will allow us to take the information we learned and apply it to the creation of a “gamified” Website based on PeruDigital. Gamification refers to integrating game mechanics and design techniques to increase user motivation and engagement (Freitas and Maharg 2011; Ferdig 2012).

Its potential application to the field of cultural heritage has been the subject of discussion in the scholarly literature in recent years. Our interest in exploring the possibilities for “gamification” beyond that of a static online exhibit of archive materials is informed by the fact that the role-playing and immersive potential of digital environments can be used to facilitate cultural learning. The Website and curriculum could also potentially be used in cultural anthropology and Latin American Studies classes to model ways to learn about other cultures by adopting the perspectives of the ethnographer, or to understand through interaction and immersion the importance of wealth as cooperative labor, power through strength of community bonds, and community celebrations as rooted in the social economy of a region by exploring the environment from the point of view of a festival sponsor. Given what we have learned from the study, however, it would be highly desirable to have more videos integrated into the site and offer more opportunities to acquire deeper knowledge about specific traditions featured there. This would require further financial support for the project, which we are currently seeking.

hooks (1994) reminded us that deeper conversations about culture between students and teachers may require a change in teaching style and in content. The capacity to be open to dialogue about curriculum that transcends theory to one that challenges thinking and action requires a paradigm shift. When two university colleagues collaborated to examine a cultural curriculum through the lenses of classroom teachers, the Peru-Digital curriculum project provided an opportunity to not only dialogue, but also to examine a cultural curriculum through different perspectives: interactive and lecture.

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