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Joseph Levitan, Jessica Perez, Andrea Velasquez, Sulem Bello, Juan Loayza, Rosa Espinoza, Daniel Zuñiga, Gerson Candela, Juan Huertas, Cesar Cáceres, Carlos Torres and Kayla M. Johnson

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Article abstract

During the COVID-19 pandemic, more than 300,000 students in Peru dropped out of the school system. Most of the students were rural Indigenous students. A lack of infrastructure and connectivity, as well as a lack of contextualized and appropriate educational resources, made it virtually impossible for rural students to engage in formal learning. The pandemic has made clear the need and viability for distributed e-learning in rural communities. However, creating e-learning content that is contextualized to support vulnerable students' learning has been a challenge. Little to no research has discussed how to contextualize e-learning to address both its promises and challenges. In this research note, we discuss an initiative to bring together advances in contextualized learning and e-learning to address problems with access to quality materials and curriculum in rural Peruvian schools. We highlight how interdisciplinary collaborations can support innovations and improve educational access for low-income students from remote regions through distributed learning. While research have found significant promise in contextualized education, the processes of engaging in contextualized digital learning and in low-income communities have proven difficult to implement. We discuss the concepts, research base, processes, and technology required to address these needs, as well as the curricular and pedagogical approach we take in this initiative.

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Contextualizing E-Learning Experiences With Indigenous Communities: A Practical, Research-Based Approach

Joseph Levitan[1], Jessica Perez[1], Andrea Velasquez[2], Sulem Bello[3], Juan Loayza[4], Rosa Espinoza[4], Daniel Zuñiga[5], Gerson Cadena[5], Juan Huertas[5], Cesar Cáceres[5], Carlos Torres[5], and Kayla M. Johnson[6]
[1]McGill University; [2]University of Glasgow; [3]Teacher, Cusco, Peru; [4]Quechua Speaking Elder, Cusco, Peru; [5]Collaboraccion, Lima, Peru; [6]University of Kentucky

Abstract

During the COVID-19 pandemic, more than 300,000 students in Peru dropped out of the school system. Most of the students were rural Indigenous students. A lack of infrastructure and connectivity, as well as a lack of contextualized and appropriate educational resources, made it virtually impossible for rural students to engage in formal learning. The pandemic has made clear the need and viability for distributed e-learning in rural communities. However, creating e-learning content that is contextualized to support vulnerable students' learning has been a challenge. Little to no research has discussed how to contextualize e-learning to address both its promises and challenges. In this research note, we discuss an initiative to bring together advances in contextualized learning and e-learning to address problems with access to quality materials and curriculum in rural Peruvian schools. We highlight how interdisciplinary collaborations can support innovations and improve educational access for low-income students from remote regions through distributed learning. While research have found significant promise in contextualized education, the processes of engaging in contextualized digital learning and in low-income communities have proven difficult to implement. We discuss the concepts, research base, processes, and technology required to address these needs, as well as the curricular and pedagogical approach we take in this initiative.

Keywords: digital learning, contextualized learning, e-learning, Indigenous education

Introduction

While distributed e-learning offers many benefits for increasing access to quality education, one of the challenges of this approach is that those who are developing the technology and content are often from cultural backgrounds different from the students engaging with it. This means that the content created for digital learning platforms usually carries cultural assumptions and material very different from the realities and cultures of students from marginalized backgrounds—especially those from Indigenous communities (Castagno & Brayboy, 2008; Levitan, 2018). Educational material based on different realities and/or different epistemologies from those of the students negatively affects their learning, identity development, and well-being (Castagno & Brayboy, 2008; García, 2003, 2005; Ladson-Billings, 1995; Levitan, 2018; Sumida Huaman, 2013). Therefore, content in distributed e-learning that does not respond to students' contexts is problematic. At minimum, it will be limited in its effectiveness.

Educators within the communities themselves are often the best prepared to create contextualized knowledge (Levitan & Johnson, 2020; Sumida Huaman, 2020). Nevertheless, there are limited financial resources, structural supports, and designated times to develop digital content in rural areas. Working to increase access to quality education for students from historically marginalized communities, therefore, requires developing processes between sectors to create spaces so that those from the community can collaboratively develop contextualized e-learning.

In response to this challenge, the authors developed a process to create contextualized, culturally grounded e-learning that includes a variety of participants, such as teachers, students, community members/Elders, digital content developers, and educational specialists. We have implemented this approach with three large rural school districts in Peru—two districts that are home to a majority of Quechua-speaking community members, and one district on the northern coast that has a majority Mestizo population, though a significant minority of students and teachers have a strong pre-Hispanic heritage. In this context, there are also non-Indigenous traditions that are a core component of the culture from various immigrant communities. Because of the diversity of identities within these projects, we define contextualized e-learning as a collaborative process-based approach that weaves together technological solutions and culturally grounded curriculum development (Johnson & Levitan, 2021; Levitan & Johnson, 2020) to support schools with limited resources to co-create contextualized digital learning content.

In this paper we define contextualized education as learning that begins with students' identities, cultures, environment, and realities as the foundation to build knowledge (Tamur et al., 2020). Through content and activities tailored to students' environments and learning goals, students can build competencies and acquire knowledge in most subject areas faster and deeper than with other educational approaches (Haerazi et al., 2019; Suryawati et al., 2010). Contextualized learning also supports the development of students' healthy sense of self and identity, as well as their well-being (Berns & Erickson, 2001). Contextualized e-learning, like its namesake, shares the same orientation but is focused on digital resources that can be distributed. However, there is very little research on how to go about contextualizing e-learning. This paper describes the theoretical basis, process-based knowledge, practical considerations, policy background, and the technological requirements to engage in this promising approach.

Context and Background

Peru remains in the lowest quintile of the OECD PISA education test rankings (2023). Findings from the most recent iteration of PISA have demonstrated that COVID-19 widened the learning gap between students from middle- to high-income families and those from middle- to low-income families (OECD, 2023). One of the reasons for this gap is that students from rural communities had less access to the Internet, educational content, and teachers during COVID-19 lockdowns, so they were essentially left on their own (Johnson & Levitan, 2021). According to Meza (2023), with the outbreak of the COVID-19 pandemic, the enormous digital gap in Peru became even more evident. When virtual education was implemented due to the mass closure of schools to prevent the spread of the virus, only 5.9% of households in rural areas had Internet access by the end of the first quarter of 2020. Because of this and other factors, roughly 300,000 students dropped out of the education system in 2020 (Meza, 2023). While a portion of the students have returned to schools since the end of the stay-at-home measures, only about 1/3 of the students have reenrolled (Rodriguez Paredes et al., 2023).[i] As rural communities in Peru (especially in the Andes and Amazon) have majority Indigenous community populations, this issue disproportionately affected Indigenous students (Johnson & Levitan, 2021; Johnson & Levitan, 2022).[ii]

As part of the transition to virtual learning, the Ministry of Education (MINEDU) developed the Aprendo en Casa e-learning program to provide distance education services during the pandemic (2021). Though an innovative and thoughtful response to an unprecedented emergency situation, it did not yield satisfactory results. On the pedagogical side, there were issues because the content developers were necessarily based in Lima, due to a national travel ban. Lima is the capital and a large international city where MINEDU is based. Because of these travel restrictions, only small crews of workers were able to gather to create materials. So, the content developers were overwhelmingly from upper-middle class urban areas, and the content they created, though well designed, was implicitly created for students in urban realities with cultural assumptions from those areas, even when content creators were trying to create intercultural and bilingual materials (Zavala, 2014). In many ways, there was never a real possibility for ministry content creators in Lima to be able to respond to the wide diversity of contexts, cultures, and languages in Peru during the COVID-19 lockdowns, since there were already so many systemic educational issues that the pandemic exacerbated. Nonetheless, the result was that content did not reflect the realities of students in rural areas, nor did it recognize their cultural knowledge(s) (Johnson & Levitan, 2021). Because there were limited options, this content was sent to students throughout the country, even though two thirds of the population live outside of Lima and over 60% live in rural areas.

On the technical side, approximately 72% of students reported Internet service failures that prevented access to their classes in 2020 (MINEDU, 2021). Many rural students had to walk up mountains to access cell-phone service to receive materials via WhatsApp on their phones (Johnson & Levitan, 2021). Because they could not travel to schools, teachers would send learning materials as PDF documents that were difficult to read on a cell phone. The worksheets teachers sent were difficult if not impossible to fill out (Johnson & Levitan, 2021). This meant that rural students, even when accessing education and staying enrolled in school, had limited opportunities to engage in meaningful e-learning, unlike their more urban peers.

In response to the technical challenges, in 2021, the Ministry of Transportation and Communications approved the Todos Conectados plan, which invested heavily in digital and distance education infrastructures. The program installed satellite Internet in isolated Amazon areas and provided free WiFi in rural Andean areas. The ministry also provided tablets to all students enrolled in schools, as well as laptop computers for all teachers. This was a major infrastructure upgrade, and the intention and investment were well received, though the implementation had major challenges. For example, the delivery of the tablets did not happen concurrently with the Aprendo en Casa program, so the national government spent millions of dollars on developing digital learning infrastructure that failed to arrive in rural communities until classes were moved back to in-person. Furthermore, these solutions were only a partial response to the deeper pedagogical challenges—for example content that was not aligned with students' realities.

At the same time, the investment in digital and distance learning infrastructure also created an opportunity to improve access to novel, culturally grounded learning materials and learning technologies for post-pandemic schooling. The Ministry of Education has publicly supported and has had policy for diversifying and contextualizing materials to be responsive to the cultures and identities of students in every region since 2021, which was achieved after significant scholarship and advocacy from Indigenous community members and allies (MINEDU, 2021). Yet, work to improve education in rural Peru still requires educational authorities to address the major *contextual knowledge content gap*—which we refer to as the gap between the knowledge of content creators from outside of the community and community knowledge that would better support students' learning—for students in rural and Indigenous communities, in particular. This challenge has not yet been tackled, but with the policy window and support from the ministry, collaborative approaches between people from different sectors, school systems can begin to close this gap (Espinal-Meza, 2024).

One of the most promising responses to the enabling constraints of the current educational situation in Peru is contextualized e-learning. Research studies demonstrate contextualized education supports faster and deeper learning and promotes the development of students' identities and well-being (Berns & Erickson, 2001; Haerazi et al., 2019; Levitan & Johnson, 2020; Suryawati et al., 2010; Tamur et al., 2020). Contextualized education draws on students' identities, cultures, values, environment, and realities as the foundation to build knowledge. Through educational experiences tailored to students' realities, students can develop transferable competencies in communication, science, math, and other literacies (O'Sullivan, 2006). Contextualization allows for the appreciation of identities, ancestral cultural knowledge, and communities' traditions, contributing to strengthening students' personal identities and well-being. Teachers who engage in contextualized education find it to be aligned with best learning practices that supports a positive dynamic in the classroom (Castagno & Brayboy, 2008; Hynsjö & Damon, 2016; Ladson-Billings, 1995; Sumida Huaman, 2020). However, limited research has been conducted regarding how to do contextualized education via e-learning.

Creating contextualized e-learning requires collaboration between curriculum specialists, local teachers, students, parents, Elders/community leaders, and digital education specialists (Levitan & Johnson, 2020) and also, ideally, students (Brasof & Levitan, 2022). Nevertheless, these communities do not often interact, so intercultural facilitators and cultural knowledge brokers are also needed (Levitan, 2018). In this project, we have brought together contributors from all of these sectors to develop contextualized e-learning for

three large rural school districts in Peru. Before describing the project, the participants, and its process, we discuss a few definitions included in the creation of the collaborative system for contextualized e-learning.

Key Concepts

Contextualized Education

Contextualized education is the adaptation of learning content to the social and environmental contexts of students. Contextualization "is a conception of teaching and learning that helps teachers relate thematic content to real-world situations and motivates students to connect knowledge and its application to their lives as family members, citizens, and workers" (Berns & Erickson, 2001, p. 3). Contextualized education requires that curricular standard policies are competency-based to provide flexibility in the creation of content. Contextualization also operationalizes and responds to calls for culturally relevant/responsive pedagogy (Ladson-Billings, 1995); culturally sustainable education (Paris, 2012); culturally grounded education (Levitan & Johnson, 2020); and Indigenous education (Castano & Brayboy, 2008; Cote-Meek & Moeke-Pickering, 2020; Sumida Huaman, 2020). Contextualized education is a broad term that can be a kind of umbrella for many learning activities. It requires epistemological, axiological, and ontological considerations to carry out adaptation. Contextualization responds to constructivist learning theory (Amineh & Asl, 2015); abductive reasoning and experiential learning theory (Dewey, 1997); as well as social learning theory (Tabibnia & Lieberman, 2007).

In this project, we use the concept of contextualized education, rather than Decolonizing, Indigenous Education, or Culturally Sustaining Education because we do not work only with Indigenous communities in this project, but we see the relevance of this approach as particularly relevant to the struggle for Indigenous communities' self-determination in quality education. The approach has been vetted by Indigenous Elders who are included as authors in this article. Because the focus is on engaging in process-based approaches that are socially just, we do not wish to label the process with particular orientations to the content of learning, but instead to engage in self-determined learning approaches that are also pedagogically and developmentally appropriate. As calls from Indigenous educators and leaders seek to ensure that education is ontologically, epistemologically, axiologically, and teleologically grounded in the community (Sumida Huaman, 2013), operationalizing that necessarily means building procedural knowledge to do so justly (Brasof & Levitan, 2022). Weaving community knowledge with Indigenous knowledge(s) and other knowledge(s) as deemed appropriate by the community through co-construction and community-based participatory action research, can be a way forward.

Researchers have found that contextualized learning fosters a number of positive educational outcomes across subject matters and competencies. For example, a meta-analysis conducted by Tamur et al. (2020) of 21 studies that comprised 1,349 students revealed that contextualized teaching and learning had a significant and positive effect on math learning. Haerazi et al. (2019) found that reading comprehension and learning motivation were significantly improved in a contextualized classroom. Furthermore, Berns and Erickson's (2001) findings revealed that students were more motivated and developed real-life skills in a contextualized classroom. Finally, Suryawati et al. (2010) demonstrated that contextualized teaching has

a positive impact on problem-solving skills. These results underscore the need to follow this approach in more schools, especially those negatively affected by the pandemic.

Contextualization can be done at the local, district, regional, or national level. The research base suggests that local contextualization at the school level is the most effective (e.g., Sumida Huaman, 2020; Levitan & Johnson, 2020). Regional contextualization is also possible, as there is usually more information that can be gathered regionally, but it is less effective. Operationalizing contextualized education requires gathering local and regional knowledge to create educational materials and learning activities, as well as aligning that knowledge to the mandated curricular competencies. In this project, that knowledge is then digitalized as hybrid e-learning educational experiences/units to be shared amongst the teachers and classrooms throughout the district via an online/local server Internet/intranet system.

Competency-Based Curriculum

Like in many countries, Peru's national curriculum is one of the core educational policies for primary and secondary education. The curriculum outlines the competency-based learning outcomes required for all sectors of the public education system. It is the guidebook that MINEDU uses for monitoring learning outcomes, developing teacher preparation, administrative requirements, and educational infrastructure (2016). The national curriculum uses a competency- and capacity-based framework. Competencies, as defined by the ministry, are "the ability of a person to combine a set of capacities to achieve a specific purpose in a given situation, acting appropriately and ethically" (MINEDU, 2016, p. 192, translated and paraphrased by the authors). Capacities are resources for acting competently—they integrate knowledge, skills, and attitudes that students use to face a specific situation. Capacities imply minor operations (e.g., addition, subtraction) to achieve more complex operations (e.g., solving mathematical problems; MINEDU, 2016). Organizing a curriculum based on competencies and capacities provides flexibility of content, as long as students work on competency development.

Distributed E-Learning via Intranet/Internet Servers

The investment in computers and tablets for teachers and students, respectively, has resulted in significant new infrastructure but little actual usage. One of the challenges is that the MINEDU learning platform is Internet-based. Despite the investment in Wi-Fi and satellite service in most schools, the connection speeds are quite slow, and connection is inconsistent. This has led to a considerable lag time, causing students and teachers to shift to traditional methods of education which result in poor learning outcomes (Brasof & Levitan, 2022). As the technological problem is inconsistent Internet, to create distributed e-learning opportunities, this project uses Critical-Links (C3) servers and Raspberry Pi mini-servers to create intranet hubs for classrooms, so that only students in the class can access the content, to keep speeds up, as well as creating a localized digital/hybrid learning management system (LMS). In this project, we use open-source LMSs that employ H5P, Moodle, and Kolibri to create contextualized content.

To receive updates and new contextualized digital content, teachers can take servers to an Internet-connected area. Having an intranet/Internet system in rural schools allows content to be distributed to all teachers, without needing to rely on inconsistent or non-existent Internet connections in the schools. On this platform, teachers can also modify digital content to suit their needs and upload it to the cloud server for others to use. The digital contextualized modules are ready for students as soon as they connect to the

server, and there are fewer possible distractions because students cannot use Internet applications on the same tablet simultaneously. If there are issues with tablets or cell phones, alternative modalities include using a projector, TV, or smartboard to display the lessons and activities. This mobile "digital learning backpack" allows teachers to update servers with new content, as well as to take it home to provide feedback to students' submitted work, which they can receive on their LMS accounts.

Policy Support: Curriculum Diversification Strategy of MINEDU

In Peru, approvals to do contextualized e-learning are supported by a MINEDU policy, which allows for curricular diversification. According to MINEDU (2021), curriculum diversification is the set of processes that respond to the characteristics, needs, and interests of individuals or groups of students in a specific territory, and their sociocultural, linguistic, economic, ethnic, productive, environmental, geographic, and developmental interaction. As part of this policy (and after significant Indigenous community advocacy), MINEDU (2021) recognized Peru's diversity with a myriad of characteristics in each region and locality given the 26 regions that form Peru and their distinct demands, needs, and potentialities. According to the policy, any content (local or otherwise) can be used, as long as the content is aligned with the competency development framework of the ministry, which means that Indigenous lessons and knowledge(s) have a lot of opportunity to be implemented. In practice, however, each annual plan and each class plan needs to be approved by the school and the district school board, so each region will have more or less freedom to develop content and pedagogy depending upon the leadership. The oversight and pedagogical orientation of the leaders varies greatly according to the district. In the Andes, the general zeitgeist is towards Quechua learning, but procedural knowledge about putting Quechua learning into practice by teachers is still generally nascent in regular basic education (*educacion basica regular*) or the district public schools which many, if not the majority of Indigenous students attend. Other districts have more variation.

This diversification policy allows the articulation and adaptation of different programs in schools, as well as other educational proposals as long as they comply with the competencies established in the national curriculum. The objective of curriculum diversification is to provide guidance to ensure its understanding and implementation in a planned and participatory manner, leading to coordinated processes of educational management.

Contextualized E-Learning Project Methodology

In this project we used the Ministry of Education's competency-based curriculum policies, diversification policies, and culturally grounded learning experiences approach to create a strategy towards developing contextualized e-learning collaboratively with teachers and students. To engage in the process, we formed diverse teams that had different tasks. We describe each team and task after we comment on the positionality of the authors.

Positionality Statement

The authors of this article are majority Peruvian Citizens (8), with representation from Indigenous Elders (2), teachers in the region (3), Peruvian International researchers, and collaborators from Canada, Mexico, and the United States. The international collaborators have more than 20 years of collective experience

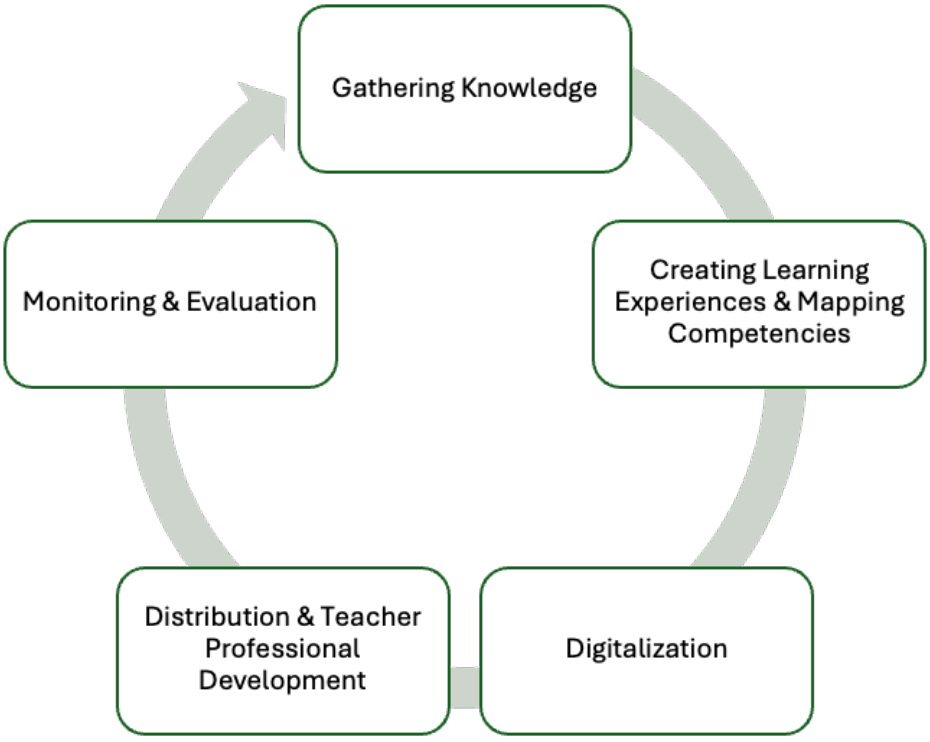
working in Peru with rural and Indigenous populations. The co-authors make up members of the pedagogical team, the digital creation team, and the research team. We have included as many representatives as possible as co-authors because each member of the authorship played an important role in the development of this project. We have not included the more than 400 local teachers who are putting this project into action, nor the various leaders and Elders who are working on their own implementation for two reasons: (a) there are too many people to be feasibly included in the co-authorship of the article; and (b) we focused on the contributors who committed significant time and resources to develop the process in itself, as they are all the co-creators of the process reported here, while other teachers and leaders are implementing the process in their own contexts.

Process

In this process, we created teams of digital experts, local teachers interested in contextualization, and curriculum contextualization experts—including teachers who speak Quechua in the case of the Andes. We also created a validation team that includes Indigenous Elders to ensure that the content, where relevant, aligns with local wisdom. This contextualized e-learning team (CELT), undertakes the general steps shown in Figure 1.

Figure 1

Steps of the Contextualized E-Learning Team



Identifying Local and Regional Realities and Knowledge(s)

To gather local and regional knowledge and understand the specific context and challenges students face, the team engages in a multi-step process. The CELT team identifies local and regional realities by working with local teachers to engage in community-based participatory action research (Brydon-Miller et al., 2020). We have followed traditional approaches, such as *asambleas*, which are decision-making processes implemented in the Quechua community, to understand current realities. This process entails rounds of conversation in a circle in which all community members have a chance to speak and offer ideas, and then a process of consensus is reached. We then engage in an iterative process of community contributions to receive feedback on the information gathered and its interpretations through a process of presenting ideas, collecting contributions, discussing options, and reaching agreements about the knowledge that students require.

Creating Learning Experiences and Mapping Competencies

Using the local knowledge collected, the teachers and curriculum contextualization experts create *learning experiences* (also known as lesson plans) to be digitalized. Part of this process is to identify which competencies students can develop based on local knowledge(s). Learning experiences are a set of activities sequentially developed, in which students solve a complex problem or investigate a complex situation. In a learning experience, activities and competencies from the national curriculum are integrated with local knowledge to create stories, pose problems, and develop learning evaluations. Planning learning activities for a curricular competency area begins with the selection of the competencies. Subsequently, we create the activities considering the validated knowledge identified previously. Afterwards, the purpose of each activity and evaluation criteria are determined, i.e., the capacities, considering the standard of the competency.

Elements of a Learning Experience

The learning experiences within the contextualized competency-based e-learning platform integrate elements that respond to the communities' cultural context. These learning experiences also incorporate the competencies and curricular areas established in the national curriculum. While each element in the learning experience is contextualized, the contextualization will, of course, differ according to the environment, seeking to address its specific characteristics. Nevertheless, contextualization should be intelligible across cultural and epistemological orientations to be usable for teachers, clear for students, and translatable to policy makers. The elements considered for the creation of learning experiences are the following:

- *curricular areas*: established in MINEDU and suggest an organized way to integrate other specific competencies. The curricular areas mostly present in the learning experiences are social-personal development, mathematics, communication, and science and technology.

- *specific competencies*: more specific and attainable goals that, when developed, strengthen a curricular area.

- *learning situation*: constitutes the starting point of a learning experience. It presents a story about students' realities. At the end, this story usually asks a question to explore or reflect upon and/or a problem to solve.

- *challenge*: The question in the learning situation usually leads to a challenge for students to solve throughout the learning experience.

- *purpose*: presents the students expected outcomes after the learning experience is completed and answers the question: What will students learn in this experience?

- *transversal approaches:* are present in the development of competencies in different areas throughout the learning process. They materialize in the student's actions, reflecting values and attitudes outlined in these approaches.

- *product:* constitutes evidence of a student's performance or production, demonstrating the level of development of the competencies achieved.

- *product evaluation criteria:* parameters that measure the level of competencies that students achieve. To define them, each teacher must answer the following: What learning in the curricular area should be evident in the product?

- *competency evaluation criteria:* parameters that measure the level of development of the competencies achieved by the student. These make visible the capacities that make up each competency identified in the learning experience.

- *sequence of activities:* the set of activities that constitute the learning experience, planned in a specific order, allowing the articulation of learning from different curricular areas. It is oriented towards achieving the purpose and developing the final product. This sequence begins with exercises aimed at recalling prior and background knowledge, moving to learning about a specific theme through a text or multimedia. Often, the sequence continues with exercises to verify understanding and moves forward encouraging students with activities to create a product in which the competencies are put into practice.

These elements were developed by the authors, building on content from the Ministry of Education in Peru.

Digitalization

Once the materials have been created in a Word document, the digital experts in the CELT team take the content and make multimedia and interactive learning experiences on the learning platform, with the help of AI software (for example, using Chat GPT to develop images that are contextually relevant), along with H5P, Moodle, and Kolibri to create contextualized learning experiences and interactive digital activities to support student learning.

Once the digitalization process is done, the pedagogical and research teams, including Indigenous Elders, review the materials again. The revision focuses on the coherence of the texts and the accuracy of images

and words, depending on the context. Regarding this, it is essential to mention that even though AI can be a time-saving tool, the team is aware of some concerns related to knowledge homogenization or the provision of incorrect information (Cueto et al., 2023; UNESCO, 2023). In this sense, digitalization processes need to be accompanied by an exhaustive revision that guarantees the quality of the content.

Distribution and Teacher Professional Development

The digitalized learning materials are then uploaded onto servers and distributed to teachers, who then work with the pedagogical team to practice the use of the technology and the pedagogical approaches for the learning experiences. The teachers also work with the pedagogical team to make adjustments to the content for their own classrooms prior to the school year, which they can also share among themselves in the cloud.

Teachers' involvement in the initiative is a crucial aspect of the process. As many other studies have shown (Cueto et al., 2023; Haßler et al., 2016), ed-tech interventions require coming to terms with multiple challenges. Teachers' attitudes and skills are the most important component to achieve education outcomes, so efforts should be put into not only the technology itself, but into how initiatives support teachers during the process of learning and teaching. To succeed in this initiative, teachers need to have the necessary skills and resources to use the contextualized materials in a way that can facilitate students' learning. The main challenge is to have teachers to proactively use these materials, not just as mechanical aids. For this, it is important to seek to improve learning outcomes by providing monitoring programs that can foster collaborative teacher professional development.

When beginning teacher professional development, we ask teachers to select four of their lesson plans—two that they are very excited to teach and two that are very challenging. We then show the different possibilities, programs, lessons, and tools of the content, and ask teachers to think about how to integrate these tools with their lessons. We then show teachers culturally grounded content and ask them to think about how to make their lessons culturally grounded. Teachers then speak with Elders and are asked to speak with their students using a few collaboratively designed questions to engage in student voice information gathering (Brasof & Levitan, 2022). They then re-work their lessons to integrate and re-work their current materials. Once they have done this with four lessons and the Elders and the pedagogical team have approved, teachers work as a team to re-configure their lesson plans for the units of the year, with support from Elders and with other consultations. This is then reviewed by the pedagogical team and the school district.

Continuous Monitoring and Evaluation

The pedagogical team meets regularly with teachers and monitors the use of the e-learning platform. The CELT team is available to answer any questions and ensure that technical problems are addressed. The use of the platform as a LMS allows for easier monitoring and evaluation. Additionally, monthly check-ins with teachers support usage and integration.

Some limitations related to the monitoring and evaluation process are related to teachers' lack of time and resources. The lack of incentives from the regional education directorate and MINEDU undermines efforts to continue developing teachers' skills using e-learning educational experiences. Partnerships and

strategies for teachers' engagement are indispensable to ensure more stable participation of teachers. In this way, the project is in the process of evaluating and improving a specific teacher training program in education contextualization.

For example, in one of the districts, we have regularly checked in with teachers and asked them to self-report their experiences using the new materials. However, roughly 40% of the teachers are not responding, which we assume to mean that they are not engaging in this process. Of the roughly 60% of teachers who are engaging, two thirds are using other teachers' creations, while about one third are active in their creation processes. Fortunately, because of the sharing system, this means that roughly 60% are using more culturally grounded digital materials (which adds up to about 240 teachers in this district).

Limitations and Cautions

There are a number of important limitations to consider when thinking about implementing this process and what this work entails. The first is that while the decades of advocacy from Indigenous scholars and allies successfully brought policy changes to allow for culturally grounded education, this does not mean that racism, machismo, and bias against rural and Indigenous communities is no longer present. Some of the authors continue to work against negative biases against Indigenous knowledge even with some teachers and even with individuals in the collaborating organizations. This project is not an example of harmonious partnership, but instead a constant negotiation and struggle to do work to improve Indigenous students' and other marginalized students' experiences in schools. This point is important to highlight because there is a lot of political work that some of the authors undertook as privileged allies outside of Peru to push levers of power so that Indigenous knowledge would be included. This was part of our work in asambleas to reach a consensus to be able to advocate for the kind of system the community found necessary. Building this procedural knowledge, to ensure community engagement first, is key to actualize the potential for real positive pedagogical and curricular change that can support students. Tensions were also present between the pedagogical team and the digitalization team, as there are disagreements about what knowledge is of most worth and how to operationalize it.

Additionally, while there are many policy spaces where this initiative can work (e.g., most provinces in Canada, some states in the USA, Finland, Mexico, Panama, India, and others), not all policy contexts are going to support this work because they do not use a competency-based curricular framework and they do not have a diversification policy. Continuing advocacy for making changes that allow for this kind of shift are important in different contexts.

Another implementation challenge was due to teachers not necessarily being from the communities where they work. While there were some teachers who had local knowledge, there were many who lacked local knowledge, which made coordinating with Elders essential. But because teachers may not have understood community norms, this work also required cultural liaisons. In addition, the technological learning curve could also be a challenge for teachers, and we have had to design different approaches for adjusting digital content development depending upon teacher capacities.

It is also important to note that while research has shown that contextualized education supports students' learning (Haerazi, et al., 2019), the research team still needs to examine the learning outcomes of this process. Creating contextualized education is part of making the educational system more ethical for Indigenous students (Sumida Huaman, 2020), so it is a worthwhile endeavor in itself, but more research is needed to examine if it supports students' learning based on community and competency-based objectives.

Finally, and perhaps most importantly, there is a possibility for misuse, or at least, not closing the contextual knowledge gap, with this approach. While this work is directed toward a community who has the cultural knowledge, contextual knowledge, values, and history that can support this change, there are ways that this approach can go wrong and lead to ethnocentrism, supremacy, or problematic content if multiple voices are not heard, Elders are not consulted, students are not consulted, and minority voices are not incorporated. Refining and analyzing the different power dynamics to see how this process may get co-opted would be important to ensure that there is not misuse. There needs to be further research on the supports and fine distinctions that could be made to ensure content creation is supportive of local values and bridges understandings.

Processes are only as good as the people who are putting those processes into action. If their inherent axiology is not oriented towards democratic engagement and opening knowledge to be more expansive and inclusive of multiple realities, theories, and epistemologies, then this process will not work. Considering this, one of the main priorities of the research team, based on years of experience in the field, has been to build strong relationships with the communities. Collaborative work, reciprocity, and trust have allowed us to guide each step and engage in decision-making incorporating multiple voices and perspectives, even through conflicts. Further research on these details is needed.

Conclusion and Areas for Further Research

Contextualized e-learning can address current educational challenges for remote and rural communities, especially communities whose knowledge(s) and epistemologies have been marginalized. It also offers significant improvements to digital learning, as it bridges two promising trends in education, contextualization and distributed e-learning via an intranet/Internet system, to increase access and quality materials. To be able to engage in these processes, a few elements are necessary: a policy and curricular environment that allows for flexibility in the creation of content, buy-in from teachers, leaders, and districts, the creation of a facilitation team, and researchers who can work with Elders, students, teachers, and other collaborators to ensure quality content and pedagogical materials. Many school districts already have people who can do this. It is just a matter of bringing this process to them.

Further research about the results and impact of contextualized e-learning is needed, not only in terms of evaluating our initiative, but also to know if and how contextualized e-learning can be a process that allows a more just education experience in rural educative settings. In a country such as Peru, with a long history of racism and violence, advocating for contextualized education can be a way to contribute to forms of reparation and justice, while continuing to support the rights of all Peruvians to engage with materials that

are important to them. Moreover, contextualized e-learning could open new possibilities for promoting local knowledge and contributing to its preservation.

The collaboration between specialists from different areas is key and can be challenging. However, this work is possible with shared goals, values, and openness to unlearn and learn about different epistemological orientations. The processes for engaging in the synthesis of two disparate trends in education also offers considerable strengths, as it allows for greater flexibility and innovation to address ongoing challenges to improving education for rural students. This paper demonstrates the practical approaches to align contextualized digital education with competency-based curriculum standards. We have shown that creating contextualized education through combining e-learning and competency-based education is a feasible approach for using the strengths of both processes to improve education.

Conflict of Interest Statement

Collaboraccion is a consulting firm that facilitates and implements public works projects using a public-private funding mechanism called obras por impuestos (public works for taxes). This mechanism allows private companies to reduce their tax burden by funding public infrastructure and social projects approved by townships or city governments. This funding mechanism is overseen and must be approved by the national government. The authors who are members of Collaboraccion, Daniel Zuñiga, Gerson Cadena, Juan Huertas, Cesar Cáceres, and Carlos Torres receive payment via the obras por impuestos mechanism to implement the project described in this paper, as well as others. The authors who are academics, elders, and teachers do not receive payment for the implementation of the projects and have no financial stake in the project. The Elders and Teacher were independently compensated for their time to consult on the project and for the contributions to the framework and materials.

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[i]Despite governmental initiatives such as the National Strategy for Reinsertion and Educational Continuity and the "Rutas Solidarias Program" that MINEDU launched to facilitate the return of roughly 100,000 students to schools in 2022 (Rodriguez Paredes et al., 2023), the reinsertion has not been successful. We have observed that students from low-income families in particular find schooling not worthwhile once they find a job, and many young people did find jobs in rural areas during and after the pandemic.

[ii]Peru has one of the highest percentages of Indigenous populations in North and South America, with statistics ranging from 24–46% depending upon the "calculation" or "classification" of what "counts" as Indigeneity, which is a hotly contested, complex, and controversial subject. Self-identification is one approach that, while problematic, shows that there are almost six million Indigenous people in Peru, which is about 20% of the population (The Indigenous World, 2024).