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Higher Education Collaboration for Digital Transformation in Pandemic Panamá

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Abstract

Panama's Ministry of Education unnecessarily complicates its work with non-governmental entities, even when the entities are noted higher education institutions (HEIs). Bureaucratic impediments, lack of transparency and payment terms all present obstacles. During COVID-19, however, the crisis conditions and limited resources available propelled a period of streamlined public-private cooperation, resulting in some unparalleled innovation. This article presents a case study of one such HEI-ministry partnership on a digital transformation mobile literacy project, detailing its components and achievements and providing insights on specific success factors. Situating this discussion within the discourse on collaboration during crisis, the authors conclude that replicating and promoting this type of productive effort beyond periods of crisis will depend on public reform in two areas: (1) streamlining and professionalizing ministry-HEI interactions, and (2) increasing support for research and development, particularly in education. This discussion is relevant for Panama and most of Latin America as well as much of the developing world.

Keywords: digital transformation, higher education, institutional collaboration, Panama, pandemic

Resumen

El Ministerio de Educación de Panamá complica innecesariamente su trabajo con entidades no gubernamentales, incluso cuando las entidades son instituciones de educación superior (IES). Los impedimentos burocráticos, la falta de transparencia y las condiciones de pago son todos obstáculos. Sin embargo, durante la COVID-19, las condiciones de crisis y los recursos limitados disponibles impulsaron un período de cooperación público-privada racionalizada, que dio como resultado algunas innovaciones sin precedentes. Este artículo presenta un estudio de caso de una de esas asociaciones entre IES y un ministerio en un proyecto de alfabetización móvil de transformación digital, detallando sus componentes y logros y brindando información sobre factores de éxito específicos. Situando esta discusión dentro del discurso sobre la colaboración durante la crisis, los autores concluyen que replicar y promover este tipo de esfuerzo productivo más allá de los períodos de crisis dependerá de la reforma pública en dos áreas: (1) racionalizar y

profesionalizar las interacciones entre el ministerio y las IES, y (2) aumentar el apoyo a la investigación y el desarrollo, especialmente en educación. Esta discusión es relevante para Panamá y la mayor parte de América Latina, así como para gran parte del mundo en desarrollo.

Palabras clave: transformación digital, educación superior, colaboración institucional, Panamá, pandemia

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Introduction

Education in Latin America and the Caribbean was hit hard by Covid-19 with various countries in the region topping global charts for time out of class. The crisis also posed a direct threat, globally and regionally, especially to the United Nations Sustainable Development Goal (SDG) 4, Ensuring Quality Education for All. The pandemic compounded previously existing challenges, particularly with regard to targets for universal education and literacy, effective learning environments, and supplies of qualified teachers.

The role of higher education (HE) in these areas is crucial, as numerous experts have emphasized (Chankseliani & McCowan, 2021; EUA, 2018; Goncalves Serafini et al., 2022; Owens, 2017), especially since HE is a vital driver of human training, knowledge production, and innovation (Chankseliani & McCowan, 2021). Hence, HE has an important role to play in mitigating the fallout from the pandemic and in furthering the SDGs, particularly SDG 4. This role goes beyond increasing enrolments and requires higher education institutions (HEIs) to focus on fully developing all three of their educational missions: teaching and learning, scientific research, and community service (Pinheiro et al., 2015). And for HEIs to be true catalysts of innovation, they must work with and be supported by governments and international development actors, above all with regard to research (Owens, 2017). During the pandemic, HEI leadership in areas related to the SDG targets assumed even greater importance; it also faced exceptional challenges.

The Republic of Panama, where all schools at primary, secondary and tertiary levels were closed for the most consecutive days worldwide, suffered even more than most countries. The negative impact on education across grades was unprecedented, taking a disproportionate toll on the most vulnerable and those with less access to remote learning (Svenson, 2021). Ironically, the chaotic conditions of the pandemic also allowed for more innovative and productive collaborations among HE actors dedicated to improving educational equity. Such was the case for a group of Panamanian educators who came together in 2020 to design, implement, research, and document a nationwide pandemic mobile literacy program for teachers and students in public primary schools. The HEI collaboration behind this globally recognized program forms the basis for the case study described in this article.

This case serves as a useful reference in several ways. It demonstrates how crisis can propel innovative HEI collaboration that combines the three HE missions of teaching, research, and community engagement, even within a system that typically offers little incentive for such cooperative efforts. It highlights the importance of and potential for the HE role in advancing universal education through innovations that target teacher training and digital learning. And it describes a HEI-generated model for digital transformation in teacher training and mobile literacy that enabled primary school educators to produce statistically significant reading gains for participating student during the COVID-19 quarantine.

This article details the components and achievements of this unusual pandemic HEI collaboration with the Panamanian Ministry of Education (MEDUCA). It provides insights on the success factors associated with the HE alliance and the project; how HE can push innovative initiatives to propel digital transformation and educational equity; and how such collaboration between the government and diverse HE actors may be promoted and replicated during and beyond periods of crisis.

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Higher Education as a Driver for Equitable Digital Learning

Technology has the power to both widen the educational gap between higher and lower SES households and students or, conversely, bridge it to further educational equity worldwide. The *WhatsApp Remote Reading Recovery* project produced in the collaborative HEI initiative described in this article is an example of the latter. This project is also an example of how HEIs can serve as important drivers of this for propelling equitable digital learning. HEIs are logical proponents in the expansion of equitable digital learning at all levels for several reasons.

Many scholars have described the ways in which HE has been an early adopter of technology for application to learning in multiple areas (Armstrong, 2019; Bennett, 2014; Dale et al., 2021). As an early adopter, HE now has more experience with integrating and experimenting with education oriented technological tools. Covid-19 highlighted and accelerated this HE pioneering of digital learning. The pandemic also demonstrated how HEIs are uniquely positioned to take emergency adoption of online learning and make it more inclusive, working toward broader-based, longer-term visions for digital learning that stress collaboration over profit or individual gain (Laufer et al., 2021). Additionally, HE has been at the forefront of teaching, research and publishing on digital learning and education technology (edtech) for years, especially in the United States and Europe.

Springer Publishing claims to have the first and only scholarly journal in the field of education that focuses entirely on research and development in educational technology, *Educational Technology Research and Development,* which it launched decades ago (Springer, 2022); but there are also now many other academic journals dedicated to the topic of education technology (Lynch, 2018). Moreover, numerous academic journals in the field of education have been publishing increasingly on edtech related themes in recent years. The growth in edtech publishing reflects the growing importance of edtech to HEI schools of education and research centers. Programming from several top universities in the United States and Europe illustrates this point clearly, though many other universities worldwide are also beginning to follow suit with comparable initiatives.

For example, regarding the incorporation of edtech learning into the degree offer, Columbia Teachers College now has an extensive Communication, Media, and Learning Technologies Design program with graduate degree concentrations that include Communication and Education, Design and Development of Digital Games, Instructional Technology and Media, K-12 Educational Technology, and Computing in Education. These courses of study prepare students for leadership in the fields of information and communication technologies within educational systems at different levels (Teachers College, 2022). This trend is mirrored by other US and European university schools of education as well.

With respect to inclusion of edtech themes in universities' research and development centers, Stanford University offers an inspiring example that is directly focused on educational equity. The Technology for Equity in Learning Opportunities (TELOS), an initiative of the Stanford Graduate School of Education begun in 2015, has as its mission the advancement of equity by creating and researching ways that technology can increase learning opportunities for PreK-12 learners, families, and educators. The assumption underlying TELOS is that technology has the potential to increase access to high quality learning opportunities for all levels of society, but that intentional design and study of technologies, learning environments, and policies is necessary for this vision to become a reality. The collective efforts from multiple stakeholders in the TELOS initiative are structured to advance this agenda (Stanford University, 2022).

Similarly, but without the explicit emphasis on equity, the Best Evidence Encyclopedia (BEE), a free and open website created by the Johns Hopkins University School of Education's Center for Research and Reform in Education (CRRE), aims to provide educators and researchers with information about the strength of the evidence supporting a variety of programs available for K-12 students. Much of the material included in the BEE repository now involves edtech (BEE, 2022). At Harvard University, the Berkman Klein Center for Internet & Society, within its mandate to explore and understand cyberspace, has dedicated a significant portion of its programming over the past decade toward researching and evaluating multiple aspects of edtech. This center also actively innovates with an in-house team of developers that works to convert research into practical tools, platforms, and organizations (Harvard University, 2022). At Oxford University, the Oxford X-Reality Hub sponsored by Dell and other tech partners works to harness the power of immersive

technologies, mainly virtual and augmented reality. The Hub dedicates two of its six portfolio areas to teaching and edtech (Oxford University, 2022a). Also, in Europe, Spain's University of Alcala is home to the relatively new Innovation and Education Technology for Human Development Research Group with research lines that include educational gaming, XXI century technological skill sets, education innovation, education technology, and commercial videogames, among others (University of Alcala, 2022). These examples are only several of the more pioneering projects and programs available in this realm, but they serve to highlight the increasing importance of edtech in HEI research.

Within university research centers and schools of education, edtech programming is expanding to target education of the public at large, as well as of those on campus. Oxford University's "Frontiers in Educational Technology," for instance, is a free online seminar series open to the public that offers sessions led by experts in the field on topics such as responsible and sustainable edtech, the roles of public and private players in the sector, and the challenges facing mobile learning in low resource settings, among many others (Oxford University, 2022b). The Harvard EdCast also explores many of the same edtech themes in its weekly podcast about ideas currently shaping education globally. The hosts interview educators, researchers and policymakers in the US and around the world looking for positive approaches to confronting education challenges and inequities.

These tendencies are less evident in Latin America, but the SUMMA Laboratory of Education Research and Innovation for Latin America and the Caribbean offers an interesting exception of HE collaboration for equitable learning. Based in Chile and launched in 2016 by the Inter-American Development Bank (IDB) with the support of the Ministries of Education in Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and Uruguay, SUMMA is the first non-profit Research and Innovation Laboratory in Education for Latin America and the Caribbean. Since 2018, the governments of Guatemala, Honduras and Panama have also joined the effort. The SUMMA Board of Directors and professional team are multinational, multicultural, and multidisciplinary and both include highly credentialed scientists and teachers from across the region. Much of SUMMA's work over the past two years is tied to edtech, particularly through its *Concurso de Innovación para la Justicia Educacional* (Innovation for Educational Justice Invitational) (SUMMA, 2022).

In Panama, there is minimal evidence of HE edtech programming and research or of the sector serving as a driver for equitable digital learning, though it does have the potential to do so. Most Panamanian HEI edtech efforts have been largely limited to institutions' adapting their existing programming to virtual modalities. Exceptions to this generalization, however, include the public UTP and the private QLU, both of which have begun to expand teacher training and edtech programming and research (QLU, 2023; UTP, 2023).

Panama's Higher Education Structure

The Republic of Panama has quite a few universities for the size of its population of four million inhabitants, most of which have been established in the past several decades. The Public Registry lists over 100 higher education institutions but the National University Evaluation and Accreditation Council (Consejo Nacional de Evaluación y Acreditación Universitaria de Panamá, CONEAUPA) recognizes far fewer. The CONEAUPA list of accredited institutions includes five public universities, 23 private universities and 13 international university programs established in the capital's City of Knowledge, a higher education free zone that operates under a special decree passed in 1998 outside of the jurisdiction of MEDUCA (CONEAUPA, 2023). These public and private institutions offer degrees at technical, bachelor's, master's and doctorate levels across a wide range of disciplines, though PhD programs are few.

There are currently about 160,000 undergraduate and graduate students studying in the country, the majority of whom (slightly over 80%) attend public institutions. Pre-pandemic, the ratio between public and private university attendance was closer to 2:1 (INEC, 2023). Public institutions tend to serve students of lower socioeconomic status (SES) because of the low tuition fees. Estimates indicate that less than 20% of all Panamanian university students graduate with degrees (Svenson and De Gracia, forthcoming).

The University of Panama (UP) is the largest public institution and educates roughly half of all university students in the country. The Technological University (Universidad Tecnológica de Panamá, UTP) is the second largest public institution and enrolls about 15% of the country's university students (INEC, 2023). The UTP is the most highly regarded

of Panama's public universities and, indeed, of nearly all the universities in Panama (QS University Rankings, 2023). Universities granting dual degrees with other international institutions also tend to be held in higher regard by the productive sector with regard to labor market recruitment (Svenson and De Gracia, 2017).

Oversight

As mentioned above, CONEAUPA, established in 2006, is the official national body for university evaluation and accreditation. Interestingly, Article 99 of the Constitution grants Panama's public universities official oversight over all programs and degrees offered by all private universities operating in the country and over the validation (or revalidation) of foreign university degrees within certain disciplines. This oversight is carried out through CONEAUPA's Technical Audit Commission, which conducts the monitoring and evaluation of all private university programming and reports in turn to MEDUCA. This Commission is chaired by the rector of the UP and the rectors of the rest of Panama's public universities also hold seats there (Pacheco, 2019; CONEAUPA, 2023).

This normative situation, in effect, subjugates all private universities in Panama to public university authority. It assumes that the public universities are (1) technically superior to the private universities and (2) have the knowledge and capacity to adequately perform this supervisory function. These assumptions are not necessarily true, however. With regard to the second, the public institutions have neither capacity nor resources to provide appropriate supervision of even their own departments, much less external entities. And regarding their technical superiority, there is significant debate on the issue. At the start of CONEAUPA's quality assurance activity, many low-quality private universities were exposed and some were closed. But now, private universities have established themselves as a viable HE alternative and a number of them have reputations that surpass those of most of the public universities. The private university investments in infrastructure, technology and operations often exceed those of their public counterparts and their academic programming tends to be more in line with productive sector demand. Thus, the logic behind the quality assurance norms seems shaky and has caused considerable distrust and animosity among HEIs. It also limits development and innovation in the HE sector by implicitly setting the current (and not very defensible) public university model as the standard (Pacheco, 2019).

Teacher Training

National legislation determines that non-university teacher training and certification be conducted by MEDUCA in association with the public universities and the Juan Demóstenes Arosemena Pedagogical Institute (formerly the Normal School), although presently this has been expanded to include certain private universities. At present, the UP and the Pedagogical Institute educate and certify the majority of Panama's K-12 teachers. MEDUCA takes responsibility for providing the majority of the continuing education courses available for public school teachers, working through pre-approved national and international service providers.

Numerous reports and articles cite the need for strengthening Panamanian teacher training as a means to improving the student outcomes associated with it (De Leon et al, 2022; Elacqua et al, 2022; González de Núñez & Salcedo Estrada, 2017; Svenson, 2018). A recent law passed in April 2023 lays the foundation for the establishment of the Institute for Continuing Education and Well-being of Educators (Instituto de Perfeccionamiento y Bienestar Docente), which seeks to mitigate and improve the existing teacher training situation. This is a welcome advancement, though implementation will take place during a national election year (2024) and could be complicated by the campaign and administration transition process.

Research

Panama invests very little in scientific research, in spite of the country's relative economic stability and success. In the past decade, the Republic has dedicated between 0.1% and 0.15% of its Gross Domestic Product (GDP) to scientific research. This represents more than four times less than the regional average and about 20 times less than the average for

North American and European countries (UNESCO, 2022). And unlike other countries where the private sector is responsible for up to three quarters of research investment, Panama's private sector participation has been negligible (SENACYT, 2019). Furthermore, the number of researchers per million inhabitants is only 39, a number which also figures among the lowest in the world (World Bank, 2022).

For these reasons, in addition to the fact that Panamanian HE has been primarily dedicated to teaching since its inception, it has been difficult to cultivate a research culture within the universities. The founding of the National Secretariat for Science, Innovation and Technology (SENACYT, for its acronym in Spanish) in 1997 and its establishment of the National Research System along with a small but constant annual public budget for research projects has helped considerably to advance the national research agenda. The subsequent creation and legislation in 2006 and 2010 of the Public Interest Associations (AIPs for their acronym in Spanish), Panama's organizational mechanism for public-private research entities, has also contributed to this end. One of these AIPs, the Center for Education Research (CIEDU for its acronym in Spanish), led the pandemic project described in this article.

The Pandemic Context

Panama is a small country but an international transit hub and, as such, was struck early on in 2020 with a record number of cases of Covid-19. The government quickly moved to enact a national quarantine and school closure in March of 2020. A year later, Panama headed the list of countries worldwide with the most consecutive days out of the classroom (De Hoyos & Saavedra, 2021; Svenson, 2021). This extended shut-down affected every level of schooling from pre-kinder to university and it was not until March of 2022 that the return to classroom learning was fully re-implemented.

Effects on HE

The Covid-19 school closures took a major toll on the Panamanian HE system and highlighted many of the existing weaknesses and inequities as institutions were forced to abruptly switch their programming to virtual formats. Online learning options grew quickly, but with different results in the public and private university systems.

Overall, the private universities with ties to international programs, like Florida State University-Panama and Quality Leadership University (QLU), and others like the Universidad del Istmos, which had started to offer online courses years before, were in a better position to confront the crisis. The Private University Association of Panama (AUPPA, for its acronym in Spanish) reported that its member institutions started the pandemic with a total of almost 200 virtual programs for undergraduate and graduate courses officially approved and accredited. Also, 80% of the AUPPA professors had already received considerable training in online education (Svenson & De Gracia, 2020). Among the public universities, only the UTP was in a similar situation; the UP and the rest of the public institutions faced serious difficulties switching from in-person to online learning. They made available a number of digital tools ranging from official emails to Zoom, Microsoft Teams and WhatsApp platforms, but most professors struggled to adapt and many of the students lacked adequate access to connectivity, both in terms of internet and devices. Added to this, the migration of students from private to public universities, due to financial constraints brought on by the pandemic, put pressure on both systems to achieve more with diminished resources (Svenson & De Gracia, 2020).

Finally, HE-led research nearly ground to a halt during the pandemic as SENACYT public funding was frozen for most of 2020. Interestingly, it was the AIP public-private research entities described above that were able to continue at least a portion of their work throughout, largely as a result of their ability to raise private funding (Svenson & De Gracia, 2020).

Effects on K-12 education

Among the hardest hit by the pandemic educationally were Panama's more than 400,000 primary school students, around 85% of whom attend public school and are of lower SES. These children were homebound for months and most had little access to learning materials of any kind. The government demanded an official return to classes through distance learning beginning July 20, 2020, but schools remained closed through December 2020, the end of the Panamanian school year, and throughout the subsequent three-month summer vacation period, January-March of 2021.

This extended school absence prompted concerns about major academic setbacks, especially for children in lower grades beginning to explore the basics of reading, writing, and arithmetic, since it has a marked, negative effect on primary school attainments, especially with reading (Carroll, 2010; Gottfried, 2014). As subsequent learning in nearly all areas depends on early reading comprehension, obstacles to literacy attainment at the early stages bode poorly for future educational outcomes (National Institute for Literacy, 2008).

These concerns were amplified given the country's poor pre-pandemic showing on national and international education evaluations. Recent standardized tests measuring reading, math, and science learning in third and sixth graders reported that half of third graders and nearly a third of sixth graders tested at low or very low levels in both literacy and mathematics (MEDUCA, 2019). UNESCO-led evaluations produced similar results (UNESCO, 2021). In both tests, private school and higher SES students tended to obtain significantly higher scores than their public school and lower SES counterparts. Thus, the combination of prolonged pandemic school closure and students' chronic underperformance in foundational subjects posed a grave threat to Panamanian primary school students' future achievement across multiple subjects. The effects of this are now readily evident in the post-pandemic return to the classroom (Samaniego, 2023).

Digital Learning as an Alternative

Digital learning introduces a promising means for continued education even with school closures (Yang et al., 2018) and was widely employed in Panama during the pandemic, especial at the university level as discussed above. For this to be a realistic alternative, students and families must be able to rely on accessible connectivity. Low SES households everywhere without the means to access connectivity and digital devices were disproportionately marginalized by the pandemic, propelling existing inequities related to education quality (Reimers & Schleicher, 2020). In Panama, only around 40% of public school students have access to the internet at home and less than 30% have access to computers (INEC, 2017). Cellular access, however, is far more prevalent with 2020 market data reporting nearly five million mobile connections countrywide. This translates to more than one cell phone per person, which suggests that most families, on average, have access to at least one mobile telephone. This connectivity differs dramatically across regions, and families in indigenous and other non-urban areas often have more difficulty obtaining access (De Leon, 2020; INEC, 2017). Nevertheless, cellular connectivity appears to offer the most immediate promise for delivering digital learning to lower SES households and learners, though the quality of this medium of instruction tends to vary considerably, in Panama and many other developing regions around the world (West & Chew, 2014; UNICEF/ITU, 2020).

Crisis as a Driver for Collaboration

Educational innovation often originates outside government since corporate and non-governmental organizations are typically less constrained bureaucratically, better positioned for pursuing research and development, and freer to pursue collaborative partnerships (IDB, 2014). And crisis can actually provide a catalyst to propel such collaboration. Many times, organizations take advantage of disasters to further self-interested agendas that would not normally be feasible or acceptable (Klein, 2005). This happens in the education sector, as well, as players use catastrophe and uncertainty to jockey for power and influence public policy to their advantage (Saltman, 2007). But it also happens that crisis can be used to propel initiatives to advance public good, and that is what happened in Panama with regard to digital transformation for educator capacity development, at least temporarily.

It has always been complicated in Panama for HEIs and non-governmental entities to work directly with MEDUCA on educational program design and implementation. Beyond the conflicts of interest mentioned earlier that often exist between private universities and state actors, the bureaucratic impediments, lack of transparency in partner selection, and payment terms associated with MEDUCA all present additional obstacles. However, the pandemic crisis-level circumstances and limited resources available to address accompanying urgencies propelled a period of streamlined cooperation among public sector, HEIs and civil society organizations, which resulted in unparalleled innovation in certain areas. MEDUCA involvement with HEIs and non-governmental entities (non-profits and for-profits), which under normal circumstances would have required navigation through excessive bureaucracy, was streamlined dramatically during the pandemic in an effort to develop and implement the necessary technological capacity development of public school teachers nationwide to prepare them for remote teaching (Svenson et al., 2022).

The simplification of bureaucratic process and MEDUCA's immediate need to utilize all available knowledge and capacity allowed for a number of innovative public-private pandemic programs. This led to the establishment of the Gran Alianza Educativa (Great Education Alliance), a coalition of education non-governmental organizations (NGOs) dedicated to supporting MEDUCA and transforming Panamanian education (Gran Alianza Educativa, 2022). This pandemic coalition was critical for developing and implementing much of the technological retraining of public school teachers necessary for pivoting toward remote learning. MEDUCA's willingness to work with these NGOs offered a more flexible, less bureaucratic space within which state and non-state actors could collaborate to launch and scale innovative educational projects far more rapidly than would normally have been possible pre-pandemic (Svenson et al., 2022; Svenson & Leon, forthcoming).

When schools closed in March 2020, HE professors and researchers in Panama came together for the initiative described in this article from three local institutions: CIEDU, Panama's recently established public-private think tank for education research; QLU, a nationally and internationally accredited private university with extensive experience in education technology; and the ProEd Foundation, a UNESCO prize-winning non-governmental organization dedicated to teacher training and continuing education for educators. The leaders of these organizations (who are also the authors of this article) worked with MEDUCA to design and implement a nationwide mobile literacy program, *WhatsApp Remote Reading Recovery*, to reach families and children without access to instruction or educational materials. These leaders also researched, quantitatively and qualitatively, the effectiveness of this program for reading promotion. Results indicated statistically significant gains in participants' literacy levels and confirmed the feasibility of using WhatsApp and mobile phones to promote supplemental or complementary learning (Leon et al, 2022).

The *WhatsApp Remote Reading Recovery* project described above was one of many similarly inspired digital education programs to come out of this collaborative effort. At the same time and in the same vein, the Panamanian government and local telecommunications groups united during the pandemic to launch Internet para Todos (Internet for All), which deployed 85 internet hubs to impoverished communities nationwide in an effort to provide free wireless internet access to help students attend classes remotely as they dealt with the effects of Covid-19. In the end, however, little was actually achieved for the affected communities despite the well-intentioned agreements (Samaniego, 2020). Likewise, with the education NGOs, as the scare of the pandemic has receded and students and educators have returned to school in person, much of the pandemic induced collaborative spirit has diminished, and MEDUCA has returned to its previous highly bureaucratized state—with even more stringent and cumbersome requirements for partnering than were in place before the pandemic. The WhatsApp project described here was not picked up or continued in any way by MEDUCA after 2020. Nevertheless, some of the creative alliance-building that took place during Covid-19 has been retained and propelled by certain non-governmental actors. Also, importantly, a process of state and non-state collaboration has been established as a precedent in response to dealing with emergency conditions.

If these types of collaborative creativity uniting state and non-state actors were properly supported and evolved, they could enable the education sector to leapfrog technologically and substantively. Unfortunately, Panama's record with sustaining and expanding this type of collaboration is dubious. In the case of technological education advancements, this is largely due to political economy constraints at the national level that impede expanded internet connectivity and device accessibility, along with the incentives in place to maintain these constraints. The technology, knowledge, and experience

to enable digital transformation for education at all levels are readily available. More often, however, the political will is not (Svenson & Leon, forthcoming).

Conclusion and Considerations for the Future

The Covid-19 pandemic immediately raised awareness worldwide about the potential of digital learning—and its accompanying inequities. Digital learning embodies the promise technology holds for bridging gaps in knowledge attainment, yet it also represents the means to exacerbate those gaps, principally between richer and poorer communities and learners (Jones, 2019; Williamson et al., 2020). Dissemination of high-quality digital learning materials and instruction to the simplest electronic screens, as was done with *WhatsApp Remote Reading Recovery*, presents a way to take knowledge previously reserved for only those with computers and internet connections and transmit it to a broader audience. This, in turn, offers direct support for SDG 4 and many of its targets. As argued above, HEIs have huge potential for driving this type of effort because of their cumulative experience with digital learning, research, extended academic networks, and capacity to influence the global education sector. But to achieve successful collaborative endeavor for digital transformation and equitable learning requires commitment from a variety of academic and non-academic actors. Often, the incentives to facilitate such collaboration are lacking, especially in Latin America.

In Panama, the pandemic created an emergency situation that enabled considerable collaborative effort between government and HEIs that otherwise would have been difficult to bring forth. This crisis scenario set the stage for the *WhatsApp Remote Reading Recovery* project and the successful alliance between its HE designers and implementers: CIEDU, QLU, the ProEd Foundation, and MEDUCA. The project and the collaboration itself—between a public-private research center, a local private university, an NGO, and a ministry of education—generated valuable lessons on both the potential power of digital learning at the bottom of the pyramid and the power of HE partnerships to impact digital learning across all three HE missions of teaching, research and community outreach. The project introduces scientific evidence for literacy progress utilizing the simplest of mobile edtech. It also provides a replicable process for teacher training, daily instruction, and research on mobile literacy that can be implemented almost anywhere. And it shows how HE can be a potent driver of equitable digital learning. For these reasons, the *WhatsApp Remote Reading Recovery* project and the HE collaboration behind it led to international recognition as well as various academic presentations and publications (CIEDU, 2022; Leon et al., 2022; Svenson et al., 2022; Svenson & Leon, forthcoming). Nevertheless, none of this success has led to any national support, public or private, past the initial pandemic involvement with MEDUCA.

In part, this lack of support is an indication of how post-crisis, the dynamics of global and local politics and economics worldwide tend to revert back to their previously established modalities (Andrews et al., 2021). Additionally, for digital transformation and learning to reach broader, and often more remote and vulnerable populations, thorny and potentially expensive connectivity issues must be addressed. As Jones (2019) discusses in his edtech political economy exploration, redirecting the global and local power dynamics linked to education reform and digital transformation will require strategic action on the part of the state to incentivize the necessary multisectoral collaboration involved. This suggests that technological change and academic efforts alone will not suffice.

For post-pandemic Panama to leverage and further some of the learning, collaboration, and innovation developed in projects like *WhatsApp Remote Reading Recovery* and other pandemic HEI initiatives, immediate public sector change in two key areas is urgently necessary. The first is the bureaucracy surrounding external actors' involvement with MEDUCA. If this cannot be substantially streamlined and simplified, collaborative efforts of the kind witnessed during Covid-19 will be virtually impossible. The second area is public support for research and development. Latin America as a region is notoriously inadequate in this regard, and Panama is among the worst of the region. Whereas OECD countries devote, on average, about 3% of their gross domestic product (GDP) to research and development, Latin America and the Caribbean as a region averages less than 1% of GDP. Panama over the past decade averages about a tenth of the regional average (UNESCO, 2023). The combined effect of paralyzing bureaucracy and negligible financial investment assures the country of minimal HE knowledge production.

Panama can be proud of its economy, its level of globalization, and multicultural productive capacity—all of which contribute to the type of collaborative HE effort described in this article. What it should be ashamed of is that the country does nothing to support this effort and much to thwart it. Without serious state reform in this regard, digital transformation and learning will continue to be the privilege of the few that can afford to obtain it on their own.

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