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Improving digital literacy in Papua New Guinea through Remote Learning

Gavi The Vaccine Alliance

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Why

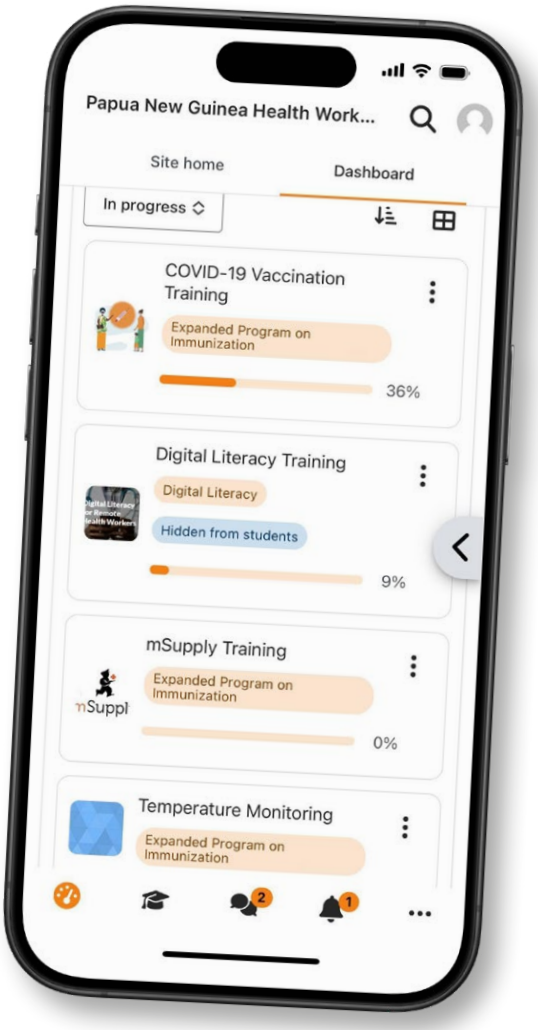
Papua New Guinea (PNG) faces critical challenges in immunisation. The country has some of the lowest infant vaccination rates globally, with only 37% of infants vaccinated against DPT3 (WHO 2023). These low immunisation rates are driven largely by a severe shortage of healthcare workers (HCWs), an essential component of the healthcare system (Vallely et al., 2024). PNG's healthcare crisis stems from multiple challenges: a decentralised and dispersed population, a lack of government-supported training infrastructure, and a hard-to-reach landscape that makes healthcare delivery difficult. With fewer than 500 doctors and an estimated total of about 5,000 healthcare workers (including doctors, nurses, and midwives) for a population of 9 million (McKee 2021), PNG's healthcare workforce density stands at approximately 0.55 per 1,000 people. This is significantly below the World Health Organization's recommended minimum of 4.4 healthcare workers per 1,000 people needed to provide basic care (Population Pyramid 2010, WHO 2011). This severe shortage has contributed to the closure of over 50% of the country's more than 3,500 health facilities.

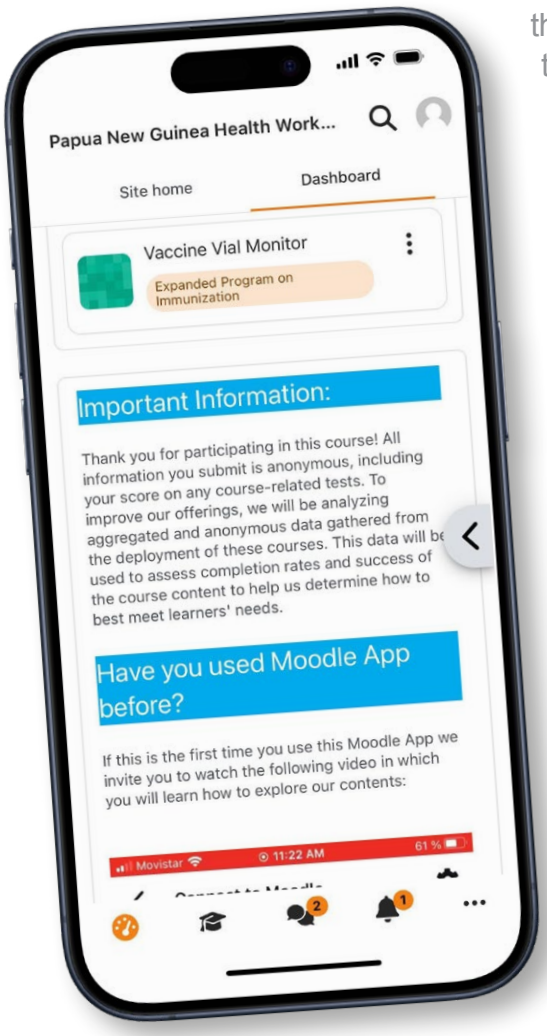
Key informants highlighted that most HCWs in PNG are women who often lack familiarity with digital tools, while men, more commonly in management roles, tend to have greater access to and experience with digital platforms (WHO 2020). This gender digital divide limits women's ability to effectively use digital tools, despite their critical role on the healthcare front lines. Additionally, PNG's linguistic diversity—with over 800 languages—further complicates health communication. These combined challenges, including shortages of trained professionals, information gaps, and logistical barriers, intensify the country's low immunisation rates and growing vaccine hesitancy.

These issues underscore the need for a more coordinated and comprehensive approach to healthcare delivery and health worker training in PNG to strengthen immunisation service delivery and primary healthcare more broadly.

What

In 2020, in an effort to address the significant challenges faced by HCWs in PNG responding to the COVID-19 pandemic, the government launched mSupply, an electronic Logistics Management Information System (eLMIS), to manage and track COVID-19 vaccine supplies and ensure accurate record-keeping. Despite its intended benefits, the initial implementation faced challenges related to digital literacy, network connectivity, and governance such as lack of clear ownership. These barriers further complicated the process and impacted the system's effectiveness. Along with improving system governance, there was a need to improve digital literacy skills and provide ongoing support to HCWs using this new technology.





To bridge this gap, UNICEF launched a remote HCW training program with funding support from Johnson & Johnson and Gavi. This digital intervention was designed to provide consistent, effective training on COVID-19 vaccines—covering what the vaccine is, why it's important, accurate information to debunk myths, strategies for generating demand, and support for HCWs in effectively using mSupply. Moodle, a learning management system with offline functionalities, already loaded onto the mSupply tablets, was leveraged to deliver the digitised training content featuring culturally resonant imagery and tailored information. This strategic choice ensured that HCWs already had a device to access relevant training resources since they were already using tablets to access the eLMIS system.

The Moodle platform was designed to facilitate the delivery of vetted high quality information to support HCWs to deliver high quality services. It featured a dedicated cloud space for PNG, providing a user-friendly interface where HCWs could access various courses on the front page. Moodle's built-in tracking system enabled HCWs to monitor their learning progress and track completed and ongoing courses. To support continuous engagement and address learning gaps, automated notifications and reminders were leveraged. While Moodle is accessible in many languages, the content was delivered in English, which was understood by all HCWs.

A two-day workshop launched the initiative with HCWs from both the National Capital District (NCD) and Central District. HCWs completed a digital literacy assessment to establish baseline digital literacy levels and were introduced to the Moodle platform. The Moodle platform gave HCWs access to three training courses:

- Digital literacy
- COVID-19 vaccination
- How to use mSupply

HCWs were also provided with contact details for technical assistance to ensure ongoing support.

How

The implementation of the Moodle app was initially driven by the urgent need to provide HCWs with critical training and real-time information to provide health services during the COVID-19 pandemic. Given the circumstances, a rapid rollout was prioritised to get essential information to HCWs quickly.

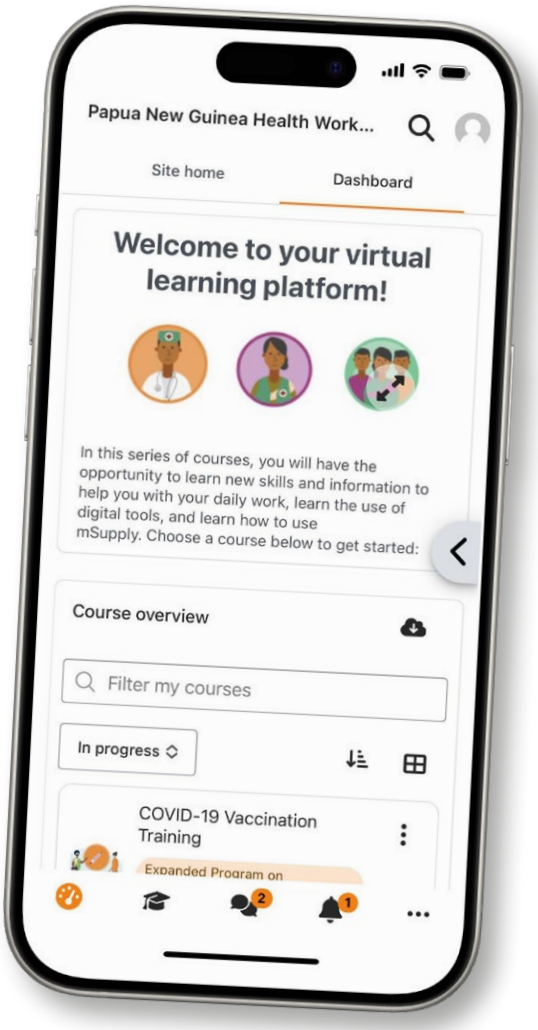
The rollout was conducted in the NCD district reaching around 100 HCWs. The training involved two groups of 50 HCWs, which compromised community healthcare workers (CHWs), midwives and nurses. The expected competencies of a digitally literate individual, which guided the creation of the digital literacy assessment, were drawn from UNESCO's (UNESCO 2018) framework which evaluated their ability to independently and efficiently use the provided digital tools and ensure they were prepared to use the tool independently.

To ensure ongoing support, a video tutorial on navigating the app was made available on Moodle's front page, supplemented by in-country assistance from the local mSupply team.

Feedback from the HCWs was overwhelmingly positive. They found the training valuable and appreciated the information provided through the app, particularly given the scarcity of reliable resources at the time. However, no follow-up sessions were conducted, and as a result, active engagement with the app waned in the months following the initial rollout.

Currently, there are efforts underway to update the Moodle app, shifting from COVID-19 content to supporting Routine Immunisation (RI) initiatives particularly in the following three areas:

- Cold chain
- Microplanning
- Routine Immunization vaccine vial monitors



Results

The deployment of the Moodle app in PNG as part of the mSupply initiative has had a generally positive impact on enhancing the capabilities of HCWs, particularly during the COVID-19 pandemic. While formal data is limited, stakeholders believe that Moodle has not only improved HCWs' proficiency in using mSupply but also strengthened their overall ability to deliver health services and encourage community uptake of the COVID vaccine. Completion rates for the Moodle training have been documented, and informal feedback suggests a favourable reception, although usage has not been extensively measured.

> *"As one clinic manager remarked, "I've never heard of Moodle. It's eye-opening. I was looking at my phone and thinking how I can use it to bring health to the doorsteps. Using Moodle and this phone, we can reach the untouched. Even reaching out to colleagues in remote areas. This tool is something I can use during patient care. Everything is about patient care."*

The program's support was widely appreciated, highlighting the importance of localised efforts in strengthening healthcare systems in challenging environments. Critical to the program's success was the engagement of local teams and champions who supported and motivated HCWs to participate. This personalised, on-the-ground approach fostered a sense of ownership and commitment among the HCWs. The HCW familiarity with tablets and digital technology also facilitated the effectiveness of Moodle's remote training program as a digital health intervention.

Challenges like poor infrastructure and the theft of tablets impacted the program's success. However, the pre-installation of Moodle helped address connectivity issues by allowing offline access to training materials. Additionally, digital literacy assessments and targeted training equipped healthcare workers with the necessary skills to use the devices effectively. At the governance level, the challenge of lack of accountability is particularly pressing, as establishing clear accountability measures is vital for fostering government support and ensuring the successful adoption of digital health interventions.

So what

The implementation of the Moodle app in PNG, though challenging, has provided valuable insights and a roadmap for future improvements of leveraging digital technologies for capacity building of frontline health workers. Given the low uptake and the rapid content delivery during the pandemic, plans are now underway to refine the approach, addressing these challenges more effectively and exploring opportunities to scale the program by working with partners and capacitating supervisors and teams/managers at the provincial level to follow up with the HCWs at the last mile. Moving forward, the program aims to expand its reach to more regions and HCWs, scaling up the intervention to enhance engagement and improve completion rates. For other governments considering the adoption of eLearning platforms, this case study offers important lessons. It's crucial to select a platform that is not only easy to use but also adaptable to the specific needs of the target audience. One size does not fit all, and different contexts may require different platforms or approaches. Localising and contextualising content is essential—delivering training using culturally resonant imagery can significantly enhance engagement. Additionally, the content must be of high quality, delivered on a reliable platform, and designed to tap into the intrinsic motivations of HCWs, such as their desire for professional development, better patient care, and mastery of new skills.

By applying these lessons, future implementations of eLearning platforms can be more effective, ensuring that HCWs receive the training they need to improve healthcare delivery, even in challenging environments like PNG.

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