



COMMONWEALTH of LEARNING



NEW ZEALAND
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Manatū Aorere

Partnership for ODFL in the Pacific

**Improving the efficacy of
mentorship with an open
education ecosystem**



**Commonwealth of
Learning**

**Partnership for ODFL in
the Pacific Project**

**Improving the efficacy of mentorship
with an
open education ecosystem**

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Abstract

New Zealand's Ministry of Foreign Affairs and Trade has funded the Commonwealth of Learning (COL) to implement a project to contribute to enhanced capacity and efficiency of Pacific education sectors through greater use of innovative delivery mechanisms and technology. This report provides an improved mentorship model for the capacity development courses of the Partnership for Open Distance and Flexible Learning Project. This report highlights the need to nurture a Pacific regional ecosystem to realise sustainable solutions for the future and proposes the establishment of a 'Collaborative OER Technology Community' drawing on the success of 'platform cooperativism'.

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1. Executive Summary

The [Commonwealth of Learning](#) (COL) contracted the [OER Foundation](#) to design an improved mentorship model for the capacity development courses of the Pacific Partnership for Open Distance and Flexible Learning (PPODFL).

The design of the proposed model has been informed by lessons from the Pacific including

- a review of the report *Literacy Research: People and Content* (Institute of Education, 2021),
- the data generated from the inaugural MOOCs (Massive Open Online Courses) offered through the initiative including evaluation surveys, website analytics, student comments, and direct facilitation experience, and
- analysis of best practice open initiatives including international cooperative projects in educational technology, relevant reuse and remix case studies from the region, and community approaches for mentorship.

Three trends emerged:

1. **Many Pacific educators do not have the digital fluencies to bootstrap their learning for independent study on the internet.** Data from the initiative shows that augmenting the PPODFL independent study MOOCs with blended approaches incorporating limited face-to-face sessions, increases completion rates. In addition, international experience suggests that integrating solutions for formal recognition radically increases completion rates; collaborative development of an openly licensed regional micro-credential framework (in consultation with the [Education Quality and Assessment Programme of the Pacific Community](#) and the relevant national Qualifications Authorities) to address the growing demand for **recognition of shorter-form courses that enable workers to upskill** is therefore recommended.
2. **Many Pacific states do not have the technical capabilities to support the range of cost-effective, cloud-based online services needed for a modern digital learning ecosystem.** Developing the skills to use the range of online cloud-based tools that support learning is challenging and frequently teachers resort to using proprietary corporate online environments, which expose them and their learners to surveillance capitalism. The success of [Platform Cooperativism](#) and initiatives like the award-winning [Open EdTech Collaborative](#) (OpenETC), demonstrate the viability of establishing a “Collaborative OER Technology Community” to operate a digital learning ecosystem of shared services for the Pacific.

3. **Many in-country facilitators, who have been supporting the MOOCS delivered to date, are not well versed in utilising the digital affordances of distributed interaction technologies to support remote learners.** From the perspective of course facilitators and mentors, training support in effective mentorship in using the features of the technology platforms, combined with proactive efforts to build a Pacific community of practice in mentoring OER-enabled online courses, will improve in-country mentorship and provide opportunities to scale up the number of in-country mentors.

This report highlights the need to nurture a Pacific regional ecosystem to realise sustainable solutions for the future. In the absence of cost-effective technology solutions for sustaining and scaling up mentorship support over the longer-term, short-term interventions for improving mentorship of a small number of PPODFL online courses are doomed to failure.

The OERF proposes the establishment of a 'Collaborative OER Technology Community' (working title) drawing on the success of 'platform cooperativism' to:

- operate as a **shared** Free and Open Source Software (FOSS) technology ecosystem for educators, technologists, and administrators providing access to a range of online tools needed for collaborative work towards the goals of the PPODFL initiative,
- enact the Pacific concept of '**Motutapu**' as a digital safe space for discussion and negotiation of viable solutions, recognising indigenous expertise and engendering the cooperation required to navigate complex and dynamic regional challenges,
- function as a **mentoring network** for Pacific island technologists wanting to build hands-on skills supporting open technologies locally, that is, a 'Community Garden' for authentic learning,
- nurture the development of a thriving **community of practice** for ODFL for the region, and
- welcome and encourage active engagement and ongoing participation from a wide range of **institutions** in a 'neutral' organisational space that fosters open and transparent dialogue. Institutions could include the University of the South Pacific as a regional provider, PACFOLD, International Governmental Organisations (including, for instance, COL and UNESCO Office for the Pacific States), respective National Commissions for UNESCO in the Pacific region, autonomous national tertiary education providers (for example: Western Pacific University, University of Papua New Guinea, and National University of Samoa), Ministries of Education from the region, relevant Non-governmental Agencies working in the region, and aid agencies and funders.

Finally, the OERF proposes a phased implementation approach that builds on the foundations of trust COL has established among participating Pacific countries, informed by small demonstrator projects suggested by the community before scaling up operations.

2. Lessons from the Pacific

2.1 Relevant findings from the report on *Literacy Research: People and Content* and implications for the design of a mentorship model

The *Literacy Research: People and Content* report (Institute of Education, 2021) analysed three projects on school literacy and leadership in the Cook Islands, the Solomon Islands, and Tonga to determine the particular mix of conditions and components that contributed to their relative success. The success of these projects was attributed to the way the following five themes were implemented:

1. *Enacting the Pacific concept of 'Motutapu'*: In many Polynesian languages the concept is translated literally to mean 'Sacred Island' referring to the places of safety before continuing on journeys across the open sea (Johansson-Fua, 2020). It is a place to "allow locally contextualised negotiations to start projects" (Institute of Education, 2021).
2. *Incorporating indigenous expertise*: Engage local indigenous expertise to facilitate agile leadership, from 'knowing what works' in a local context to mentoring agile solutions for challenges where initiatives do 'not yet know' what will work.
3. *Utilising Pacific methodologies*: Prioritise values of the Pacific specifically: reciprocity and respect of "let's make good together - you have something, I have something, let's do this together." (Institute of Education, 2021)
4. *Planning for Sustainability*: Embedding sustainability of the project beyond completion as the collective responsibility of designers and participants.
5. *Acknowledging the unresolved*: Unresolved challenges specific to the design of a mentoring model include questions about the effectiveness of the 'train-the-trainers' model, tensions between indigenous languages and language of instruction, limited timeframes to complete projects, division of roles between national versus regional and/or international implementing agencies, and restricted capacity on the ground of small-scale educational systems.

2.2.1 Implications for the design of a mentorship model

Establish the digital equivalent of "Motutapu" - a harbour to nurture a thriving mentorship network for PPODFL course reuse, guided by indigenous expertise

The PPODFL has succeeded in identifying course developers (located in the Pacific region) who are familiar with the local context and target audiences for the majority of courses developed to date. In addition, in-country mentors from a small number of Pacific countries have been contracted to facilitate the delivery of the MOOCs and provide support for learners.

The fundamental problem is that Pacific teachers do not have reliable and affordable access to the digital environments needed to build their skills in technology-enhanced learning. They need safe digital spaces, free from commercial exploitation (like 'surveillance capitalism') and associated risks like vendor lock-in. Moreover, there is not a shared neutral "Motutapu" space to foster locally contextualised collaboration guided by indigenous expertise.

The initiative needs the digital equivalent of a “Community Garden” where gardeners come together to acquire new knowledge and skills while serving immediate needs and sharing maintenance tasks, all while enjoying the camaraderie of a community of practice.

The PPODFL initiative would benefit from a shared “Motutapu” space for building a space in which nascent mentorship has room to grow and thrive. This could be achieved at low cost by establishing a Free and Open Source Software (FOSS) digital learning ecosystem for **shared services**. The shared infrastructure can then be utilised as *a live training and mentoring environment* in which in-country technologists can build expertise so they can support, and subsequently even replicate, these systems locally.

Open education as realisation of the Pacific practice of working together

The PPODFL strategy to develop open online courses and publish these as Open Educational Resources (OER) is well aligned with the Pacific value of reciprocity and tradition of doing things together. Moreover, the [UNESCO OER Recommendation](#) provides a powerful policy incentive for Pacific Small Island Developing States (SIDS) to increase and continue engagement with the PPODFL OER-enabled online courses. As signatories of the document, member states have national reporting obligations on their implementation of the UNESCO OER Recommendation.

The UNESCO OER Recommendation was adopted unanimously by member states at the 40th UNESCO General Conference in November 2019 and identifies five areas of action:

1. Build the capacity of stakeholders to find, re-use, create, adapt, and share OER,
2. Develop supportive policy for OER,
3. Ensure inclusive and equitable access to quality OER,
4. Nurture the creation of sustainability models for OER, and
5. Facilitate international cooperation in OER.

The PPODFL courses provide a unique opportunity for Pacific Ministries of Education to demonstrate local leadership in the implementation of the UNESCO OER Recommendation.

Planning for sustainability

The COL’s decision to implement low cost FOSS technologies for the delivery of the PPODFL courses has done more to ensure the future sustainability of the project than any other approach. The advantage of this component-based environment is that core technologies can also be used for functions beyond course delivery alone. For example, the discussion forum platform (Discourse) could be used for building and supporting a thriving Pacific community of practice, i.e. an ecosystem of educators, policy makers, technologists, and decision makers working together to increase the return on investment of the PPODFL capacity development courses.

To facilitate a sense of ownership for individual Pacific SIDS, the project will need to help Pacific Ministries of Education improve their technical capabilities so that they can deploy these technologies and scale up reuse of the assets produced by the project.

The proposals put forward in this report to improve sustainability have been guided by the

following principles:

- Diversity builds more resilient organisational systems - therefore building ecosystems incorporating diversity in:
 - participating roles and functions, e.g. incorporating national technology support in addition to educational facilitation,
 - management levels, e.g. incorporating policy-makers and operational staff,
 - participating organisations to minimise the associated risks of a single point of failure, while sharing lessons learned from national implementations for the benefit of the wider Pacific network, and
 - wide country representation including open participation from Melanesia, Micronesia, and Polynesia.
- Fostering approaches and organisational models that facilitate open participatory design and decision-making.
- Supporting open and transparent communication platforms.
- Designing mentorship solutions that facilitate learning-by-doing alongside experienced practitioners.

Acknowledging the unresolved

Acknowledging the unresolved challenges specific to the design of a mentoring model, we recommend the following strategies:

Unresolved challenges	Mitigation strategies
<p><i>Effectiveness of the ‘train-the-trainers’ model</i></p> <p>To date, the majority of mentors have not had specific training in the available distributed interaction technologies supporting learning on the internet. The project needs to expand the cadre of course mentors beyond a few Pacific countries.</p>	<p>Develop a short hands-on course on how to mentor learning on the internet, where candidates from each Pacific country work alongside experienced facilitators during future cohorts offerings of PPODFL courses.</p>

<p><i>Tensions between indigenous languages and language of instruction</i></p> <p>English has been used as the language of instruction for the PPODFL MOOCs and teachers have managed to participate effectively in the courses. Using FOSS solutions provides the ability for Pacific countries to translate the language of the software interfaces when developing content for indigenous languages. For example, an Assistant Chief Executive (based at the Samoan Ministry of Sports Education and Culture) has commenced translating into Samoan the 'Register and enrol' WordPress plugin, which was released as open source.</p>	<p>Proactively recruit volunteers from Pacific SIDS to translate the 'Register-enrol' WordPress plugin to provide examples of how open source can support indigenous languages. This will enable teachers to develop online resources in indigenous Pacific languages while increasing local ownership of the technologies.</p>
<p><i>Limited timeframes to complete projects</i></p> <p>Due to the impact of repeated lockdowns resulting from the COVID pandemic and associated increase in the workloads of teachers, limited time frames are a reality of the current landscape.</p>	<p>Adopt an agile design model that can accommodate changes dynamically, via the open source practice of incremental design informed by "rough consensus" followed by working code. The project must continue to acknowledge the complexity of building ODFL capacity in the Pacific and accept that this will be a long-term initiative.</p>
<p><i>Division of roles between national versus regional and/or international implementing agencies</i></p> <p>The PPODFL is characterised by multiple players including a regional University, an International Governmental Agency, and a number of national Ministries of Education, which are engaged to various degrees.</p>	<p>Open systems are ideally suited to consideration of both national and regional environments, because individual nations can replicate parts of the system without compromising the regional effort, and without significantly increasing the marginal cost of implementation. When supported with open and transparent communication solutions, lessons learned from national experiences can be shared back for the greater good of the larger ecosystem.</p>
<p><i>Restricted capacity on the ground of small-scale educational systems</i></p> <p>The ability for small countries to achieve economies of scale will remain a challenge for the Pacific region.</p>	<p>Establish low cost, cloud-based FOSS infrastructure that can be shared equitably by SIDS.</p>

2.2 Insights from offering the inaugural MOOCs

The experience of offering three MOOCs for the PPODFL provides valuable insights for improving mentoring for students. These insights are derived from the following courses offered to date:

Course	Initial registrations
Digital Skills for OER Sharing (DS4OERS)	1,628
Communication Skills for Open, Distance and Flexible Learning (CS4ODFL)	1,183
Assessment Skills for Open, Distance and Flexible Learning (AS4ODFL)	773
TOTAL	3,584

These capacity development courses are popular among teachers and have succeeded in attracting a large number of learners. Site statistics demonstrated high levels of participant engagement. For the three MOOCs facilitated to date, the average session duration for each visit to the course website was 14.1 minutes, which is 65% better than the most popular MOOC offered on the OERF hosted platform, which achieves an average session duration of 8.57 minutes.

2.2.1 Digital fluencies of Pacific educators

For the purposes of this report, the concept of ‘digital fluencies’¹ is used to distinguish basic digital skills in using software applications from the broader digital literacies of judging the credibility of information, creating new digital artefacts, and social competence in communicating online in a safe, responsible, and sustainable way.

Based on the self-assessments of basic computing skills (managing files and word processing) during the DS4OERS MOOC, only one in ten participants rated their knowledge as “Beginner”. However, when it comes to more advanced skills like using graphics and audio software, roughly half of the learners rated their knowledge as “Beginner” with only 4% rating these more advanced skills as “Excellent”. Practical experience in creating or remixing OER was on the lower end of the spectrum with 80% of participants not having applied a Creative Commons licence before, or being unsure of whether they had applied a CC licence before.

However, when observing actual competence, many students who participated in the PPODFL

¹ The difference between [digital literacy and digital fluency](#) is described by Jennifer Sparrow (2018) as follows: “In learning a foreign language, a literate person can read, speak, and listen for understanding in the new language. A fluent person can create something in the language: a story, a poem, a play, or a conversation. Similarly, digital literacy is an understanding of how to use the tools; digital fluency is the ability to create something new with those tools. Digital fluency can be viewed as an evolving collection of fluencies including, but not limited to, curiosity fluency, communication fluency, creation fluency, data fluency, and innovation fluency.”

MOOCs did not have the digital fluencies required to achieve success for learning on the internet. This was demonstrated, for example, by the large number of students who:

- did not have the ability to correctly insert a hyperlink in a word processor document, merely copying and pasting the full URL without corresponding label text for the link,
- attempted to log into websites where they had not created accounts,
- requested password changes from web sites where they did not have user accounts,
- used login credentials from sites administered by their employers for accessing the PPODFL online resources,
- sent 'thank you' reply messages to automatic system emails,
- did not know how to use social media technical conventions like hashtags or @mentions, and
- did not adhere to the minimum legal requirements for correct attribution of openly licensed images sourced from internet searches.

Integrating blended delivery options in conjunction with independent online study, however, increased completion rates and provided the orientation support learners needed to acquire the digital literacies for learning on the internet as illustrated in the following case study.

Case study

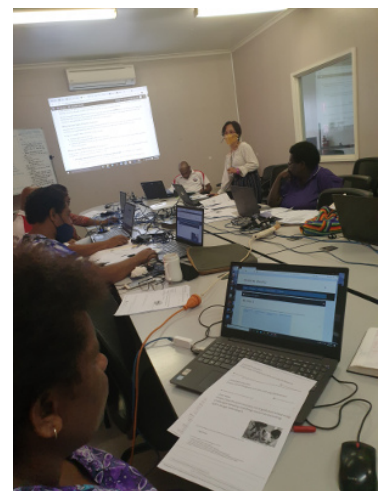
Blended delivery approaches improve learner success in PPODFL MOOCs

Many teachers who registered for the PPODFL MOOCs, which are designed for independent self-study, did not have the prerequisite digital fluencies in using online platforms effectively to underpin their learning and to succeed in completing the courses.

Data from the pre-course surveys indicated that more than two-thirds of the educators had not registered for a MOOC before, while a third had never taken an online course. This is a concern coming out of the COVID pandemic where teachers were required to support their students through technology mediated tools.

Dr Janet Subagan-Mondez (Assistant Deputy Principal, from the Flexible, Open, and Distance Education Unit of the Department of Education in Papua New Guinea) took the initiative to facilitate weekly face-to-face sessions for learners taking the DS4OERS online course.

Early in the course, Dr Subagan-Mondez informed the OERF that the Papua New Guinea Department of Education computers did not permit users to install the prerequisite open source software needed to complete the course. In this case, the interventions of a local facilitator, enabled the OERF to liaise with the Ministry's IT Department to install the relevant FOSS applications.



Dr Subagan-Mondez prepared weekly lessons and was able to demonstrate the use of the software tools for students. A direct line of communication was established between FODE and the OERF where the local facilitator acted as a face-to-face intermediary for resolving technical challenges; for example, students not remembering passwords, or attempting to log into websites where they had not previously created accounts.

Despite the COVID related death of a staff member at the Ministry and work absences arising from the pandemic, 40% of the participants achieved one or more of the DS4OERS digital badges, thereby achieving a completion rate that was 56% better than the average for independent study learners.

Key learnings

Implementing a blended delivery approach to augment independent online study:

- is beneficial for learners who do not have the prerequisite digital fluencies to utilise online learning environments,
- increases course completion rates when compared to open access PPODFL MOOCs, and
- provides a communication channel to resolve local technology challenges.

2.2.2 Formal recognition and completion rates

The completion rates for educators who participated in the PPODFL MOOCs was low, ranging between 10% - 20% for the self-study options. As measured by the pre-course surveys, one fifth of learners who expressed interest in joining these courses commented that active participation was unlikely.

By way of international comparison, the PPODFL completion rates are similar to those exhibited by the large MOOC platforms currently averaging a completion rate of 10% (Crane & Comley, 2021). Published as OER and designed for scale, the additional cost for opening up access to learners who may not complete the courses is negligible. The MOOC modality provides opportunities to learn rather than focusing on throughput. Providing access to all course materials without the need to register on a course site offers opportunities for learners to participate anonymously if they choose building skills and confidence to ensure formal success in future.

There is evidence to indicate that the introduction of formal recognition can improve completion rates of open online courses. For example, North West University in South Africa prescribed the "Introduction to Entrepreneurship" MOOC hosted by the OERF as a participation requirement for a first year business management course. Students were required to complete a quiz based on participating in the MOOC. In this example, completion rates were over 90% of the students who registered on the course site.

Based on these successes, the OERF recommends that the PPODFL initiative should promote the development of national microcredential frameworks (in consultation with the relevant national Qualifications Authority in the Pacific) to expand formal recognition of learning to include PPODFL micro-courses in support of the professional development of educators.

Internationally, there is growing demand for shorter-form courses that enable workers to upskill in support of lifelong learning.

The Australian National Microcredentials Framework (Department of Education, Skills, and Employment (Australia), 2022), defines a micro-credential as “a certification of assessed learning or competency, with a minimum volume of learning of one hour and less than an [Australian Qualifications Framework] (AQF) award qualification, that is additional, alternate, complementary to, or a component part of an AQF award qualification.

In 2018, the New Zealand Qualifications Authority formally recognised micro-credentials within its national qualification framework. Including micro-credentials within a qualifications framework provides a standardised process for recognising the level and amount of learning effort associated with shorter-form courses within a known framework to facilitate articulation and formal recognition of lifelong learning. For example, the New Zealand Qualifications Authority assessed the Learning in a Digital Age (micro-credential) delivered by the OER Foundation, comprising four micro-courses, to be equivalent to 16 credits (160 notional learning hours) at Level 5 on the New Zealand Qualifications Framework. This provides a working example of how OER-enabled MOOCs can be recognised within a qualifications framework. Engaging a number of Pacific countries in a collaborative effort to draft a micro-credential policy framework published under an open licence, would enable individual Pacific countries to quickly adapt, approve and implement policies at the national level. The PPODFL MOOCs could then be mapped to the relevant micro-credential frameworks providing a mechanism for Ministries of Education to formally recognise capacity development of its teachers within the context of lifelong learning.

It is conceivable that offering options for improved formal recognition of MOOCs for lifelong learning will improve completion rates.

It would also be possible to integrate PPODFL MOOCs as micro-credentials within Pre-Service training of teachers to improve digital fluencies for prospective educators. The following case study from Papua New Guinea provides a Pacific example of integrating a micro-credential within an existing university qualification.



Case study

OER online course reuse combined with local assessment at Western Pacific University, Papua New Guinea - Shared infrastructure for local delivery



Western Pacific University (WPU) is a new institution in Papua New Guinea. The University aspires to be a leader in technology and innovative industries and places a strong emphasis on building digital fluencies for its learners. A unique feature of WPU is the Foundation Year Program, a compulsory program which provides the foundational academic knowledge and required skills for post-secondary study for students seeking entry to the University's Bachelor's degree program.

WPU has adopted the [Learning in a Digital Age](#) series of open online micro-courses as part of the Foundation Year Program and is committed to expanding OER-enabled courses in its curriculum.

With materials published as OER, using the same FOSS digital learning ecosystem as the PPODFL courses, WPU students do not need to purchase expensive textbooks or proprietary software licences. The first cohort of students commenced their study in 2021. Faculty members at WPU completed the LiDA micro-courses prior to the first cohort and provide face-to-face support for students. WPU will reuse and adapt the OERu assessments (also published under open licences) to assess their students for local credit at WPU.

The Learning in a Digital Age (micro-credential) has been assessed by the New Zealand Qualifications Authority to be equivalent to 16 credits at Level 5 on the New Zealand Qualifications Framework providing the confidence for Pacific universities to integrate a micro-credential into a local Pacific post-secondary qualification.

Key learnings

- Reuse of high-quality, OER-enabled, online courses to help tertiary students build digital skills can be achieved without institutions incurring expensive course development costs.
- Micro-credentials can be integrated into local degree qualifications.
- Each institution can utilise a regionally shared FOSS Digital Learning Ecosystem for its own students thus generating significant cost savings.

2.3 Cooperative models for shared infrastructure and mentorship

There is growing international concern with the corporate controlled internet technologies and the business models that accompany them becoming more dangerous for our citizens and our democracies, making a strong case for digital public infrastructure that is funded by public money rather than for-profit organisations (Zuckerman, 2020). During the peak of the pandemic, many Pacific nations made use of the “no-cost” technology services offered by the corporate world during the pivot to online learning.

A recent report (Human Rights Watch, 2022) investigating children's rights violations arising from

technologies endorsed by Governments for online learning during COVID-19 found that 89 percent of the EdTech products reviewed “appeared to engage in data practices that put children’s rights at risk, contributed to undermining them, or actively infringed on these rights” (Human Rights Watch, 2022). Moreover, “these products monitored or had the capacity to monitor children, in most cases secretly and without the consent of children or their parents, in many cases harvesting data on who they are, where they are, what they do in the classroom, who their family and friends are, and what kind of device their families could afford for them to use” (Human Rights Watch, 2022).

At the institutional level, many information technology departments operate as ‘suppliers’ of third-party corporate Software-as-a-Service (SaaS) solutions rather than “being enablers of a digitally fluent organisation” (Scott, 2022) hosting their own technologies. In higher education, the pivot to online learning during the pandemic means that institutions are “in danger of fast becoming a site of surveillance capitalism, with the concomitant dangers for equity, little transparency, and unequal terms of engagement (Czerniewicz et al., 2020).

During the fiftieth session of the Human Rights Council of the United Nations, a report was tabled on the impact of digitalisation of education on the right to education, focusing specifically on the “4 As” framework of availability, accessibility, acceptability, and adaptability of educational technology (Boly Barry, 2022). This report provides the following recommendation to governments:

“States should invest in free and public digital platforms and infrastructure for education, grant adequate funding to public institutions to develop alternative free digital solutions and tools that do not involve the private personal data market, and support the development of non-proprietary data tools, platforms and services that are based around values of openness, transparency and common stewardship (rather than individual ownership) of data. They should prioritize the production and use of content in the form of open educational resources and provide a professional, systematic and personal guiding service to individual users” (Boly Barry, 2022).

Within the context of the PPODFL initiative, platform cooperativism provides an affordable solution for Pacific nations to collaborate on the provision of public digital platforms and infrastructure for education without the need to inflict these corporate-run systems on learners with their associated risks of data tracking.

2.3.1 Fundamental challenge for the provision of public digital platforms for education in the Pacific

With the exception of Papua New Guinea, the population of each Pacific island state is below 1 million people with 70% of the island nations with populations under 500,000. With small populations, it is not easy to achieve the economies of scale for provisioning a wide range of digital technologies required for educational purposes in today’s connected world.

Drawing on the data derived from the PPODFL course surveys, 40% of the teachers surveyed do not have access to a Learning Management System. Of those with access to a Learning

Management System, one third report that they have not used the technology. The OERF suspects that the actual data regarding lack of access to online delivery technologies for teachers in the Pacific is far greater given the potential halo effect because 70% of the respondents in these surveys reside in Fiji where the local Ministry provides these technologies.

Nonetheless, this is a critical challenge for the region. If teachers do not have reliable access to a range of secure online technologies to practise and improve their skills without risks associated with surveillance capitalism utilising “free” services from corporate providers, the PPODFL MOOCs will not be sustainable in the long term. Moreover, data held in these systems are not always exportable in open formats thus effectively locking teachers into these systems. While access to open digital publishing tools is provided for the duration of the PPODFL courses, the project should consider alternatives for sustainable access into the future.

The University of the South Pacific (USP) and PACFOLD will be able to host PPODFL cohorts in the future utilising their infrastructure. Individual Ministries in the Pacific, however, will be restricted to the dates when PPODFL MOOCs can be offered by these institutions. With the current model, there is a single point of failure. With shared infrastructure, however, it would be possible for individual countries to run their own workshops and course offerings at times better suited to local requirements to augment the delivery options offered by USP and PACFOLD. This is a key point of difference with OER and open technologies because the marginal cost of replicating repeat offerings is near zero.

2.3.2 Platform cooperativism as viable alternative to support shared educational technology infrastructure

Platform cooperativism is based on the notion of creating a “People’s Internet” whereby corporate owned platforms are replaced by “user-owned” cooperatives (Sandoval, 2019). Platform cooperatives are anchored in the principles of collective ownership, democratic governance, and commitment to the global commons.

The notion of shared technology infrastructure for OER was embedded in the Cape Town Open Education Declaration as follows:

*“Open education is not limited to just open educational resources. It also draws upon **open technologies** that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues”* (The Cape Town Open Education Declaration, 2007).

Platform cooperatives are more than the software applications themselves and **include the network of institutions and users** (Scholz and Schneider 2017) that make up the cooperation.

The Open EdTech Collaborative (OpenETC) in British Columbia provides a working example of a platform cooperative in the education sector for post-secondary institutions (OpenETC, n.d.). This has been a successful initiative that has gained international recognition as evidenced by an award of excellence in open infrastructure conferred by Open Education Global.

Within the post-secondary sector in British Columbia, it is a challenge for the information technology departments of smaller institutions to host their own open FOSS technologies due to lack of expertise and budget constraints. The OpenETC set up a collaboration to pool resources and provide shared infrastructure for hosting selected FOSS technologies and to provide

technology support using a community contribution model. BCcampus came up with a small grant to cover the cost of hosting, and the universities and colleges participating in the cooperation contributed technical support for the shared infrastructure. WordPress Multisite and the Mattermost digital messaging platform are used extensively by the cooperative. Academics and students from institutions participating in the Collaborative have access to these shared applications. The OERF contacted the founders of OpenETC to seek advice and guidelines for setting up a successful platform cooperative in the education sector. Their recommendations:

- Secure funding to cover commodity cloud hosting services and software maintenance.
- Work collaboratively with the community to develop governance structures and policies for the collaborative.
- Develop, define, and communicate what different tiers of contributions are. This requires considerable effort initially. In this way, participating organisations and individuals can see how best to contribute to the cooperative.
- The greatest value from the collaborative is generated for small institutions who have the least in terms of fiscal resources, but a community contribution model enables these institutions to participate without the need for cash contributions.
- In collaborations where technical support is provided by the community in the form of contributions, working within similar time zones is important.
- While the integration of FOSS applications can scale technically, it is important to limit the scale based on what is achievable from community contributions.

2.3.3 Sociocracy 3.0 - Evolve effective collaboration at any scale

Sociocracy 3.0 is a *social technology*² for “evolving agile and resilient organizations at any size, from small start-ups to large international networks and multi-agency collaboration” (Bockelbrink et al., 2022).

In 2014, James Priest and Bernhard Bockelbrink came together to develop an extensive set of resources, published under a Creative Commons licence, that provide a flexible menu of practices and structures enabling organisations to achieve greater effectiveness, alignment, and wellbeing. Openly licensed, these resources can be adapted for the local context and therefore provide a solid starting point to build an agile and resilient collaboration.

Sociocracy 3.0 is underpinned by seven foundational principles for agile collaboration:

1. *Effectiveness*: Allocating sufficient time to achieve overall objectives.
2. *Consent*: Ensuring that participants resolve objections to actions.
3. *Empiricism*: Utilising demonstrator projects to learn fast from authentic experiments.
4. *Continuous improvement*: Adapting to changes when necessary to improve effectiveness

² Social technology is any process, technique, method, skill, or any other approach that people can use to influence social systems — organizations, societies, communities, etc. — to support achieving shared objectives and guide meaningful interaction and exchange (Published by Bernhard Bockelbrink, James Priest, and Liliana David licensed under the [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)).

over time.

5. *Equivalence*: Engaging people and institutions in the decisions that affect them.
6. *Transparency*: Recording information that is valuable for the organisation and making it available to everyone in the organisation.
7. *Accountability*: Responding to what the organisation agreed to do and accepting responsibility for the course of the organisation.

Sociocracy 3.0 provides over 70 customisable '[Patterns](#)' to build new collaborations, including meeting formats, meeting practices, and ways to organise work and establish organisational structures that are fit for purpose.

The OERF recommends that PPODFL convenes a group to plan the establishment and development of a Pacific 'Collaborative OER Technology Community'. With representation from the nine Pacific Commonwealth member states, this group will customise a local version of Sociocracy 3.0 in order to define: what the community will do, how it will structure itself, and how it will operate. This is a way to enact the Pacific concept of 'Motutapu' in negotiating the establishment of a mentorship network for PPODFL.

3. A Free and Open Source Software (FOSS) Digital Learning Ecosystem for the Pacific

The OERF's FOSS digital learning ecosystem is a component-based approach assembling a stack of 'best of breed' open technologies that together support learning on the internet, providing students with the opportunity to develop digital fluencies required for the 21st century (Lane and Goode, 2021). Data derived from website statistics indicate that more than 200,000 learners participated in open courses hosted by the OERF in 2020 using this digital learning ecosystem on an information technology (IT) infrastructure budget of less than \$10,000 per year (Lane and Goode, 2021). This digital learning ecosystem has also achieved international recognition as a 2021 recipient of the Open Education Global [Open Infrastructure Award](#).

The system is:

1. scalable,
2. cost effective,
3. innovative,
4. designed for collaboration, and
5. suitable for use in developing countries.

COL has successfully deployed its own instance of one of the OERF's FOSS components for the delivery of the PPODFL courses as described in the following case study.



Case study

Innovative and low cost cloud hosting using FOSS for OER-enabled online courses in the Pacific - Solutions for affordable scalability and training support for educators



COL commissioned the OER Foundation (OERF) to deploy its [award winning](#) Free and Open Source Software (FOSS) digital learning ecosystem for the PPODFL MOOCs. To date, these online courses have provided free online capacity development to more than 3,500 educators from Pacific Small Island Developing States (SIDS) in partnership with Pacific Centre for Flexible and Open Learning for Development (PACFOLD).

Using cloud hosting services which **cost only US\$46 per month**, the server performance metrics derived from the first three courses indicated that for the duration of the cohort sessions of the three MOOCs, the virtual server was operating well below its potential capacity. For example, the CPU percentage typically averaged below 2%, with machine memory at around 11%. These metrics confirm that there is considerable room for growth; this infrastructure could readily scale up to 150 courses serving up to 10,000 students. The data also demonstrate the cost efficiencies that Pacific nations could achieve by adopting shared infrastructure for cloud-based, Free and Open Source Software solutions.

The COL commissioned the OERF to set up a WordPress Multisite instance on their own sub-domain: pacificopencourses.col.org. WordPress provides greater reuse potential for low cost hosting, since by using FOSS components there are no ongoing or per-user licensing costs for the software deployed. WordPress Multisite is a configuration of the FOSS content management system that enables multiple course sites to run on a single installation of WordPress. The OERF deployed a DigitalOcean Droplet (a flexible Linux-based commodity virtual server in the cloud) on which to install the WordPress Multisite.

Materials for the new PPODFL MOOCs were authored in [WikiEducator](#) (another FOSS technology) to provide version control for collaborative development and flexibility in publishing multiple iterations of the course site. This approach facilitates future reuse and remix options for any country deciding to host their own versions of these courses. Using [FOSS scripts](#) (developed and [shared](#) openly by the OER Foundation) the [collection of wiki pages](#) which make up the PPODFL courses were published to the WordPress Multisite for

delivery of these courses. (For more information, you can view this [video summary](#) of the OERF's digital learning ecosystem.)

The COL has commissioned the development of a new MOOC: "[Empowered digital teacher for online learning](#)" (EDT4OL) which will provide hands-on training for teachers in the Pacific to learn how to publish online content using this low-cost infrastructure.

Key learnings

1. By reusing existing OER course content, Ministries of Education and institutions can host their own course sites to support up to 10,000 learners for less than US\$50 per month.
2. Low cost shared FOSS infrastructure can provide teachers with ready access to online publishing tools in all Pacific SIDS.
3. The PPODFL initiative has sufficient training resources to scale-up the number of educators capable of developing local content for online learning.

3.1 The need for FOSS solutions to support educators

At the onset of the COVID-19 crisis the COL and the OERF joined forces to establish an Open Educational Resources for Covid ([OER4Covid](#)) support community (OER Foundation, 2020a). The goal was to assist educational institutions around the world making the transition to online learning.

Under the OER4Covid initiative the OERF conducted a short online survey to find out what support educators really needed, and how best to provide this. Between 21 April and 5 May 2020, 711 responses were received, from participants in 85 countries (OER Foundation 2020b). All potential interventions suggested in the survey were rated as helpful, however, the top three provided valuable insights into what educators really need:

- Free online courses to support **capacity development** for educators in OER and open educational practices (46% rated as "Extremely helpful")
- Access to **open source software** tools (44% rated as "Extremely helpful")
- Free access to **web-conferencing tools** for synchronous communication for OER4Covid collaborators working together (41% rated as "Extremely helpful")

Through the OER4Covid initiative, the COL and the OERF gained valuable experience in the ability to scale access to FOSS cloud-based solutions and with funding support from the New Zealand National Commission for UNESCO the project was also able to provide access to a BigBlueButton open source web-conferencing system allowing teachers to connect synchronously during lockdown without creating dependencies on expensive or limited commercial solutions like Zoom or Microsoft Teams.

The PPODFL initiative is addressing the need for capacity development in OER, however, as evidenced from the pre-course surveys referenced above, many teachers (40%) do not have access to a learning management system for online course development. The COL implementation of a FOSS digital learning ecosystem demonstrates the feasibility for Ministries to implement similar systems and PPODFL has the training materials for teachers to learn how to publish online content on these systems. While it is possible to outsource the provision of these

services, it would be better for Pacific nations to acquire the technical expertise in hosting these technologies themselves.

3.2 Components of a FOSS digital learning ecosystem

In the COL case study described above in Section 3, a single component of a larger ecosystem was selected to host the delivery of course content for PPODFL on COL's infrastructure. The learner interactions for the courses utilised tools hosted by the OER Foundation, demonstrating the potential for collaborative solutions whereby organisations cooperate in achieving a rich distributed learning environment. Later in this section reference is made to a case study of a Pacific Ministry of Education which has implemented its own instances of multiple components of this digital learning ecosystem.

Using a component-based solution has a number of advantages (Lane and Goode, 2021):

- *Functionality*: Selecting only the 'best-of-breed' FOSS contenders means that the ecosystem uses the most mature solutions for specialised applications.
- *Flexibility*: The ability to replace any component as better alternatives become available as most FOSS solutions implement open standards for ease of integration.
- *Scalability*: Preferring solutions that have a proven track record operating at 'internet scale', namely operating at a scale of tens of millions of users.
- *Multipurpose implementations*: Many of the component systems can be deployed to serve multiple purposes. For example, a discussion forum technology (with advanced category systems and user access management) can be used for hosting course discussions alongside community planning and development discussions, thus achieving greater cost-efficiencies and leveraging familiarity with the tool.
- *Technology diversity and avoiding vendor lock-in*: If relying on a single supplier which goes out of business or implements excessive price increases, the entire infrastructure could become unsupportable or economically unsustainable. With FOSS applications, however, there is very little such risk, since users typically retain ownership and access to data so that installations can easily be replicated.

The OER Foundation recommends the following components for a minimum viable 'platform' to establish a shared digital learning ecosystem for the Pacific. The 'platform' will support the design, development, and delivery of PPODL courses but also provide the digital spaces for the Pacific community to plan and implement cooperative projects as part of a Collaborative OER Technology Community (cOERtc) - see Section 4 below.

FOSS technology component	Description	Potential functions within a shared infrastructure implementation
WordPress Multisite	<p>WordPress is the world's leading blog and website hosting platform. This content management system (CMS) holds more than 60% of the market share for content-managed websites.</p> <p>WordPress Multisite is a special configuration that enables multiple websites to be hosted on a single installation.</p>	<ul style="list-style-type: none"> • Hosting of online courses • Personal learner blogs for online learning portfolios • Enabling Pacific schools to publish websites
BigBlueButton	<p>BigBlueButton is a web conferencing system, originally developed as a virtual teaching platform, that supports real-time sharing of audio, video, slides (with collaborative whiteboard controls), chat, screen sharing, polling, and breakout rooms.</p>	<ul style="list-style-type: none"> • Conducting synchronous teaching and support sessions with students • Facilitating synchronous planning sessions for projects. • Online conferences.
Discourse	<p>Discourse is the market-leading online forum application which has successfully implemented a mobile first design. It can be used as a mailing list, forum, and long-form chat room. Discourse has advanced features for spam management, user access privileges, and community building features.</p>	<ul style="list-style-type: none"> • A single installation would be adequate to host course forum discussions for all PPODFL courses. • Hosting of community groups supporting the Pacific OER community.
Mastodon	<p>Mastodon is a micro-blogging social media platform (similar to Twitter). It is a federated technology meaning that multiple 'instances' can be created with the ability for users of individual instances to communicate with each other like email in a global network. This means that</p>	<ul style="list-style-type: none"> • Providing a safe environment for Pacific educators to acquire digital literacies for social media conventions • Providing alternatives for Pacific states to host their own social media "instances" with agency

	users of Mastodon don't need to rely on a single provider for social media.	to implement local moderation rules without exposing learners to the risks of surveillance capitalism. It would also be possible for Pacific nations to contribute to language localisations for indigenous languages.
Rocket.Chat	Rocket.Chat is a digital messaging communications platform ideally suited to support small project teams working on shared projects.	<ul style="list-style-type: none"> • Messaging platform for PPODL facilitators accessible from any internet-connected device
Vaultwarden	Vaultwarden Is a cloud-based password manager enabling educators to manage unique strong passwords for all websites they access. Supports organisational-level password management, too.	<ul style="list-style-type: none"> • Promoting and supporting online hygiene and security for Pacific educators • Improving security for staff working at Ministries of Education or other institutions
Moodle	<p>Moodle is the world's most popular FOSS Learning Management System (LMS).</p> <p>Commercially provisioned hosting services are expensive for Pacific SIDS and beyond the budget reach of many of the smaller states. This is the likely reason that 40% of teachers do not have access to a LMS.</p>	<ul style="list-style-type: none"> • Shared hosting of all PPODFL courses designed to support an open registration model whereby any Pacific state can host their own local course cohorts. • Shared platform to support continuous professional development in training teachers to use the system.

This minimum viable platform could be provisioned for between \$1,500 and \$2,000 per annum for commodity cloud services based on the actual costs of the Samoan Ministry of Education Sports and Culture who have recently deployed their own instance of this ecosystem.

Establishing a FOSS digital learning ecosystem for Samoa while building local capacity in open technologies - Pacific reuse of PPODFL OER courses



The Ministry of Education, Sports, and Culture (MESC) working under the auspices of the Samoan Knowledge Society Initiative (a joint programme of the United Nations under its agencies, UNDP and UNESCO, and financed by the Indian-UN Development Partnership Fund) is establishing the MESC innovative Lifelong Learning Lab (MiLLL). The MiLLL is a physical facility adopting a multi modal approach investing in a broad range of technologies for learning delivery. This initiative is aligned with Samoa's vision of becoming a knowledge hub in the Pacific as well as the country's stated Development Strategy outcome of achieving universal access to reliable and affordable ICT services.

The Ministry selected a range of FOSS cloud-based solutions for the MiLLL including:

- Discourse - available at <https://forum.milll.ws>
- Moodle - available at <https://moodle.milll.ws>,
- BigBlueButton - available at <https://bbb.milll.ws>
- WordPress MultiSite - Samoa has created two separate instances of this platform:
 - <https://course.milll.ws> - a site for OER online courses offered by the MESC innovative Lifelong Learning Lab. Each course is a separate "sub-site" supported by this implementation , and
 - <https://school.milll.ws> - a site intended to provide each school in Samoa with the opportunity to create its own customisable "sub-site" to publish their school information and to celebrate student and community activities in a digital form, with stories and pictures and other media.
- Mastodon - available at <https://mastodon.milll.ws>
- Vaultwarden - available at <https://safe.milll.ws>
- Rocket.Chat - available at <https://chat.milll.ws>

Samoa will host local instances of the PPODFL OER-based MOOCs on their own implementation of this FOSS digital learning ecosystem, and have already published a local version of the [Digital skills for OER sharing](#) (DS4OERS), duly [acknowledged](#) under the provisions of the Creative Commons Attribution-ShareAlike 4.0 International License. Staff from MESC's Curriculum Development Department will complete the course to become local facilitators. The aim is to train IT administrators at every school so that there will be local support staff for teachers taking these courses in the future. The MESC will also publish local copies of the remaining courses for use in the Lifelong Learning Lab using a blended delivery model.

The Samoa Knowledge Society Initiative is also building local capability of IT staff in the Ministry with training sessions supporting them to deploy and manage this FOSS digital learning ecosystem. The OERF has published, as OERs, a range of technical instructions

and supporting tutorials for setting up and hosting these cloud-based services. These technical training resources are available for reuse by any Pacific Ministry of Education.

The current infrastructure costs for this range of cloud-based services are surprisingly low at US\$82 per month (US\$948 per year).

Key learnings

1. The MiLLL provides a working example of a Ministry of Education in the Pacific replicating a low-cost, FOSS digital learning ecosystem.
2. Hosting local instances of the PPODFL MOOCs provides greater agency and autonomy for the delivery of training for teachers because cohort instances can be offered at selected dates without reliance on third party providers.

As a component-based platform new applications can easily be integrated into the ecosystem. For example, [WeKan](#) - a FOSS collaborative kanban board application which could support project planning for collaborative cOERtc projects. The Pacific region, given small populations, is well suited to capitalise on the maturation of FOSS federated technologies referred to as the 'Fediverse'³. Examples of Fediverse technology include:

- [Mastodon](#): Microblogging social media platform
- [PeerTube](#): Decentralised video hosting platform
- [Plume](#) and [WriteFreely](#): Blogging platforms
- [Mobilizon](#): Platform used to find, create, organise, and register for events

Technologists from Pacific countries could develop knowledge and skills supporting a shared Pacific instance of any or all of these platforms. When these technologists have gained sufficient confidence in a given tool, they could then host national instances of the technology.

4. Establish a Collaborative OER Technology Community as a Pacific mentoring network

The *Collaborative OER Technology Community* (cOERtc - pronounced 'courtesy' - embracing the notion of showing respect and consideration) draws on the success of platform cooperativism to establish a shared technology infrastructure for Pacific educators combined with the agile community organisation principles derived from sociocracy.

The PPODFL will not be sustainable in the longer term without the technology platforms and technical skills to support it. A shared platform will provide a dynamic environment in which Pacific nations can collectively develop these skills while providing the environment for educators, policy-makers, and technologists to build a PPODFL community of practice and

³ The Fediverse is a collection of federated (interconnected) servers used for online publishing including social networking, microblogging, and blogging.

manage its activities.

This community of practice is not “owned” or governed by any country or organisation, but countries and organisations come together as a community for the common good of the initiative. Within that, however, each country and organisation retains the freedom to implement their own systems in the ways they prefer.

As mentioned previously, the cOERtc initiative itself will operate as a mentoring model drawing on the principles of ‘Community Gardens⁴’: that is shared spaces for growers to work with experienced gardeners, building relevant skills while working cooperatively on shared tasks. The community garden concept provides flexibility because participants can choose what seeds they wish to grow or can start their own garden spaces when they feel sufficiently confident to work on their own.

Drawing on the principles of sociocracy, the community will be organised as ‘Circles’ or groups of interest. Circles form the heart of a sociocratic organisation and this is where the day-to-day work is regulated and carried out (Rau, 2019). Typically ‘policy-makers’ and ‘workers’ of a circle interact with each other through transparent dialogue. The principle is that no decision impacting on the work of a circle is taken outside of the circle. It is based on the notion that those who are performing the work are the experts in that work and have the skills to govern the operations of the circle (Rau, 2019).

The circles must be determined by the community itself, so it is somewhat premature to recommend specific circles, but by way of illustration, circles could be established to develop the capacity of in-country personnel to fill such roles as:

- *Course facilitators* - who support blended and online delivery of the PPODFL courses
- *FOSS technologists* - who support the technology platform through the provision of systems administration skills
- *Software administrators* for each of the applications - who oversee moderation and associated administrative activities, e.g. account invitations, approvals, etc
- *Micro-credential managers/advocates* - representatives from the Pacific Community’s Educational Quality and Assessment Programme and national qualifications authorities to progress formal recognition of short courses
- *Policy writers* - who develop policy for the operations of cOERtc.
- *Project managers/ participants* - for each of the collaborative projects that cOERtc initiates; for example, developing new courses or implementing demonstrator projects.

4 Minchington, L.J. (2014) [Community gardens: Growing plants or people.](#)

Göttl, Ida & Penker, Marianne. (2020). [Institutions for Collective Gardening: A Comparative Analysis of 51 Urban Community Gardens in Anglophone and German-Speaking Countries.](#) International Journal of the Commons. 14. 30-43. 10.5334/ijc.961.

Each member of an agreed cOERtc circle will be provided with access to a BigBlueButton web conference room and access to a Rocket.Chat channel to support synchronous communications among members, as well as membership of a dedicated group on the Discourse platform.

The project will also need to set up a virtual ‘sandbox’ server where technologists can practise their software administration skills working with experienced software administrators from the region without the risk of disrupting ‘production’ services in active use by the community. As part of the Samoan Knowledge Society Initiative, the OER Foundation has published a series of tutorials and technical guidelines under open licences which could be reused for training and mentoring of Pacific systems administrators. Consequently, the training resources to initiate systems administration mentorship for cOERtc are already available. These are summarised in the table below:

Application	Description	Tutorials and videos
Linux Administration	Creating a new user with Sudo (administrative) access, setting up remote passwordless Secure Shell (SSH) access.	Tutorial Video
Linux Administration	Creating strong random passwords	Tutorial
MariaDB Server	Installing MariaDB (MySQL work-alike replacement) server	Tutorial
SSL Certificate	Creating SSL Certs with Let's Encrypt	Tutorial
Docker Compose Host	Creating a new generic Docker-Compose server from scratch	Tutorial Video
Docker Compose Host	Creating a new generic Docker-Compose server based on a Digital Ocean snapshot suitable for installing most of the OERF's FOSS services.	Video
Moodle	Upgrading a Minor / Major version	Video
WordPress Multisite	Installing, from start to finish	Tutorial Video
BigBlueButton	Create a BigBlueButton server with Docker Compose	Tutorial Video

Discourse	Upgrading the Discourse Server via the browser or via the command line	Video
Rocket.Chat	Installing and upgrading	Tutorial Video
Vaultwarden	Install and upgrade a Vaultwarden server (replicating the Bitwarden server API)	Tutorial

5. Proposed phased implementation model

The proposed model should entail a phased implementation to cultivate community leadership and trust:

Phases	Considerations
<p>Phase 1: Establish Trust Cultivate relational leadership, expertise, and engagement.</p>	<ul style="list-style-type: none"> • Develop an organisational model for active cooperation and agile decision-making to achieve shared objectives, based on Sociocracy 3.0. • Hold regular (weekly) “office hour” and planning webinars incorporating Circle governance structures. • Develop, refine, and maintain a shared understanding of an agile plan of action.
<p>Phase 2: Needs-based reuse and remix prototypes Encourage national demonstrator projects utilising existing PODFL resources.</p>	<ul style="list-style-type: none"> • Build on the principle of empiricism to design and implement small demonstrator pilots responding to in-country needs; adopt a learning-by-doing model working with experienced practitioners. For example, use PPODFL train-the-trainers courses to achieve in-school focal points for blended face-to-face support for online versions of courses. • Document and share experiences transparently.
<p>Phase 3: Scale up in-country OER-enabled ODFL initiatives</p>	<ul style="list-style-type: none"> • Build the capacity of countries to develop, host, and share their own OER-enabled ODFL initiatives.

6. Summary of key recommendations

1. Establish a FOSS **Collaborative OER Technology Community** (cOERtc) based on the principles of platform cooperativism to:
 - provide educators access to a FOSS-based online infrastructure to facilitate the development of digital fluencies for teaching online,
 - operate the FOSS-based platform as a shared planning and communication channel for the activities of this Pacific community, and
 - create a Pacific mentoring network through which Pacific nations can collectively develop skills for the system administration of a range of FOSS technologies.
2. **Develop a short hands-on course on “How to mentor learning on the internet”** where candidates work alongside experienced facilitators to support learners from their respective countries during future cohort offerings of the PPODFL courses on the FOSS-based infrastructure.
3. **Implement a phased approach** to support community leaders to trial local needs-based demonstrator prototypes, before attempting to scale up to country-wide/regional OER-enabled ODFL initiatives.
4. **Implement organisational solutions** guided by the **principles of sociocracy** (remixing the Sociocracy 3.0 open resources) to work collaboratively with representatives from each Commonwealth Pacific country to **determine the ‘Circles’** (groups of interest) for success of the cOERtc initiative.
5. **Develop a Pacific framework for micro-credentials** (to be published under an open licence in consultation with the [Education Quality and Assessment Programme of the Pacific Community](#) and the relevant national Qualifications Authorities) to address the growing demand for the formal recognition of shorter-form PPODFL courses that enable workers to upskill.

7. Conclusion

The COL notes that the Pacific SIDS are facing the triple challenges of

(i) inadequate access to internet-enabled computers, (ii) expensive connectivity, and (iii) low levels of digital skills (T. Mays, personal communication, June 14, 2022).

Notwithstanding these challenges, it is imperative that the PPODFL continues to prepare educators and students for the digital skills required in the 21st Century. In the short-to-medium term, initiatives like [Starlink](#), which is rolling out high-speed, low latency connectivity via satellite, will likely result in significant reductions to the cost of connectivity. Given the relatively high levels of access to mobile phones, it is important to prioritise mobile-first designs for learning materials while in parallel providing FOSS solutions and corresponding reductions in IT costs so that teachers can have ready access to the technologies required to develop open content suitable for delivery via smartphone.

The provision of a low cost, cloud-based, FOSS shared infrastructure will provide the platform needed for teachers to improve their digital skills while simultaneously operating as a mentoring environment for in-country trainers and technologists implementing component tools. The component model enables countries to select the most cost-effective tools for the local context in a region where it is challenging for every Pacific nation to achieve the economies of scale for every application.

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