

At-Risk Students: An early intervention System

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Abstract

During the Covid-19 lockdown, the University of the South Pacific (USP) had to close the Face-to-Face (F2F) delivery of lectures, tutorials and Drop-in support services at all its campuses. This included closing the Drop-in sessions at Student Learning Support (SLS) that provide additional literacy, numeracy and remedial support for students studying at USP. Given that all courses changed to online mode, contact with students was only possible using online virtual sessions such as Big Blue Button (BBB) or Zoom. Such sessions were only possible for students who had facilities and resources and could afford to study online. With Internet cafes and USP's Outreach Hubs, computer labs, and libraries closed, it further limited facilities for studying online for many. Realising major accessibility issues for the majority of its students, particularly those who needed support the most, USP formed a working group of SLS, First-Year Experience Coordinators (FYEC), Information Technology Services (ITS), and Student Administrative Services (SAS) to design a strategy to identify and support the At-Risk Students (ARS). Moodle, the Learning Management System (LMS) used at USP, which records all students' activities became the central platform for this intervention. With SLS and FYEC access to student activity and logs across the different schools at USP, the team worked on the design and implementation of an intervention system to help students isolated due to COVID-19 lockdowns. Intervention systems have been successfully used at many universities (Carroll, 2007; Burmack, 2002; Riddle, 2009; Frey & Fisher, 2008; Trilling & Fadel, 2009; Zhang, Fei, Quddau and Davis, 2014), showing a reduction in dropout and a better pass rate. The approach used at USP involved creating regular contact with the ARS studying in isolation or lockdown, supporting them through internet data plans for studying and virtual academic support sessions. The following paper discusses the planning and strategies implemented during 2021 to support learners at USP. The results of a primary survey conducted on the ARS' performances and the feedback given by the learners for such support is also discussed. **Introduction**

A study conducted by the Organisation for Economic Co-operation and Development (OECD, 2013) found that around one-third of first-year university students drop out of their studies. Termed student attrition, at any level of education, such move by students has a negative impact on the institution, students, and the people. Higher education institutions thus make efforts to support learners who are at the risk of dropping out of their studies. It then becomes the University's responsibility to identify and support such 'at risk' students. One such approach to identify and support 'at risk' students is through the Educational Data Mining (EDM), which is then shared with support sections set up by universities.

USP had already established support systems through its Learning and Teaching policy (USP, 2022), where SLS and FYEC track students who enrol for their studies at USP. SLS and FYEC then conduct workshops and drop-in counselling services for 1st year and continuing students to support them in their studies at USP. In the past, such activities were conducted F2F, and students could book one-to-one consultations for academic support at Laucala (the main campus of USP) and other USP campuses where SLS staff are located. COVID-19 made such support impossible due to lockdowns and the establishment of confinement zones within the cities and towns of Fiji where the main campuses of USP can be found. Therefore, other measures were necessary to identify and support learners at risk of dropping out.

The EDM system at USP included information from the SAS, ITS, and the LMS used at USP; Moodle became useful to track and support learners during the lockdown period. The following paper discusses the planning and strategies implemented during 2021 to support learners at USP and the feedback given by the learners for such support.

ARS Problem at USP

With students spread over 12 different Pacific Island countries across five time zones, 33 million square kilometres and with different access to technology and resources, a high student attrition rate was on the horizon. Prior to COVID 19, there were strategies to identify ARS and provide additional support. First, potential ARS were identified in week 4 of the semester in close collaboration with SAS. The data at

this stage identified C graders of prerequisite courses, repeaters and students who arrived late as ARS. This list was shared with the Course Coordinators and the Learning specialists (SLS and FYEC) to provide additional support. The second phase of ARS detection was then carried out by course coordinators through the Mid-Semester test results, which flagged the underperforming students. However, COVID 19 made most mechanisms redundant with remote Teaching and isolation. USP is a regional university co-owned by 12 Pacific countries: the Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu. There are campuses and sub-campuses in each of these countries. Courses are offered by F2F, Print, and Online mode both semesters and by Flexi School on demand at all campuses of the university. SLS staff are based at most of the large campuses, while FYEC staff are based at USP's largest campus in Fiji and provide support online for all campuses.

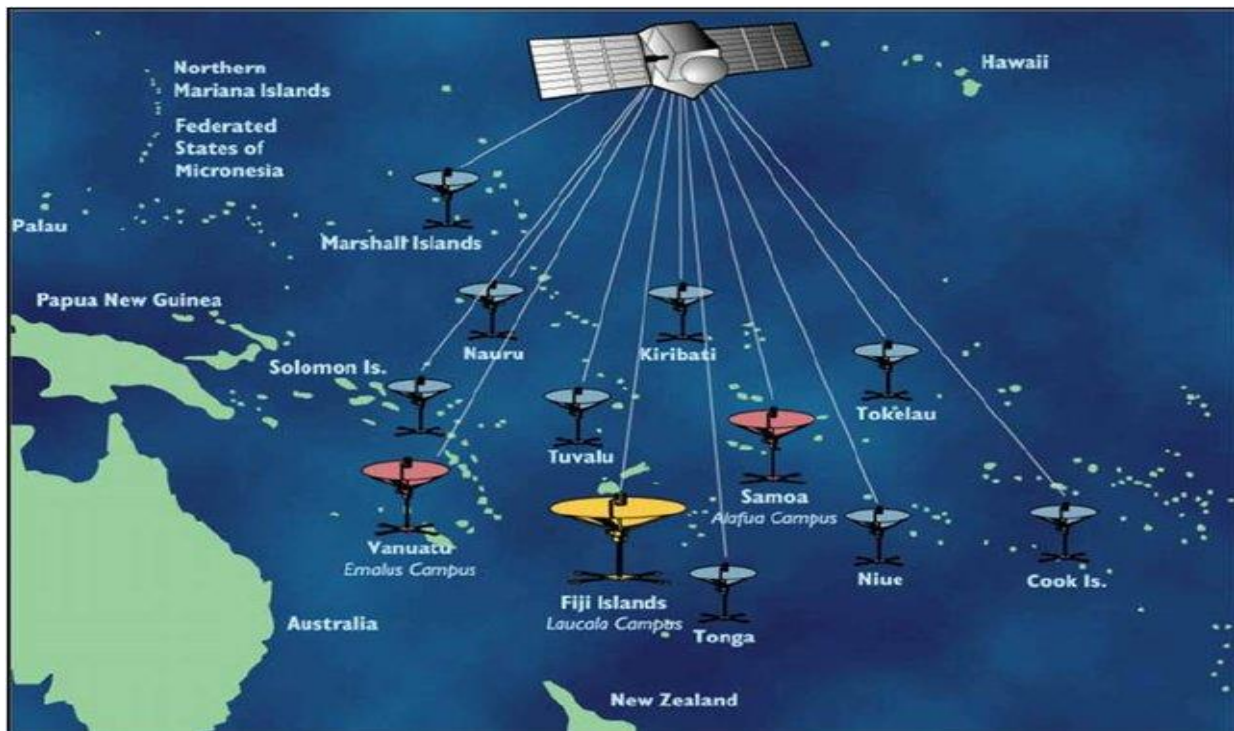


Figure 1: USP Campuses in 12 Member Pacific Islands (This figure was uploaded by [James P. Terry](#))

Through SLS and FYEC, early intervention programs have worked successfully. However, COVID 19 and consequent lockdown in Fiji, where the University's largest campus is located, led to various challenges for ARS. To continue providing support to the students, the University formed a COVID response team, the Learning and Teaching Continuity Committee (LNTCC), which worked aggressively to develop a system to identify ARS and provide support early enough for the students to bounce back.

Initially, assignments, tests, quizzes, tutorial participation and mid-semester marks were used to flag ARS; however, with COVID 19, deadlines were extended, assessments were modified, and students were allowed to submit their tasks just before final exams; thus, all indicators for identifying ARS were lost. There was a need for a quick and cost-effective system to identify students and provide support. In 2020, the LNTCC came up with the idea of identifying ARS through student Moodle Logins. USP uses Moodle as a LMS, and it was the main means of delivery during remote Teaching. It was decided that Moodle logins would be used as an indicator of ARS. Those students who did not frequently log into Moodle would be flagged. The Moodle and IT team got together to pull out the log of students with little or no Moodle activity. This list was shared with academic and learning support staff. Calling this plan *Model 1*, the team aimed to find the underlying cause of the problem and help the students overcome it. Thus, SLS for different disciplines started calling up individual students from the Moodle Login ARS list.

Findings

Calling up individual students opened up Pandora's Box of Remote Teaching. Students were going through several issues, and they were not only academic. This paper will look at data extracted from the 325 Science discipline ARS correspondences. It was found that some students were not connecting because they did not have either a computer or internet or electricity. Many outer islands and remote villages in Fiji have minimal electricity. While in 2019, Fiji stood at 100 % access to electricity, the definition international adopts a very low cut off for what it means to 'have access to electricity. It is defined as having an electricity source that can provide very basic lighting, and charge a phone or power a radio for 4 hours per day" (Ritchie & Roser, 2020).

A recent study on attitudes and awareness of regional Pacific Island students towards e-learning "showed that 88% of the 287 USP students owned at least one ICT device and had access to the internet." (Johnson et al., 2021). However, 12% of those students were without it and with COVID lockdown, they could not use computer labs. Noting that USP has more than 30,000 students, the 12% equates to a significant number of students who do not have access to a device.. The other issue was that the one device was not necessarily a computer, and not all online learning pages were mobile user friendly. However, not having the appropriate gadget was not the only problem; having internet data was another problem. Many students could not afford to buy data and thus were not logging into Moodle. Some students were not logging in or had given up because of their financial situation.

Fiji relies heavily on tourism. With tourists not coming due to lockdown, many Fijians were laid off. This resulted in students (especially those who were studying privately) withdrawing from their courses. With this, some students in remote places did not have connectivity and thus only logged into Moodle occasionally to download notes. With a population of 896,445 (*Fiji Population (2021) - Worldometer*, n.d.) Fiji had 586000 internet users in 2020(*Digital 2020*, n.d.).

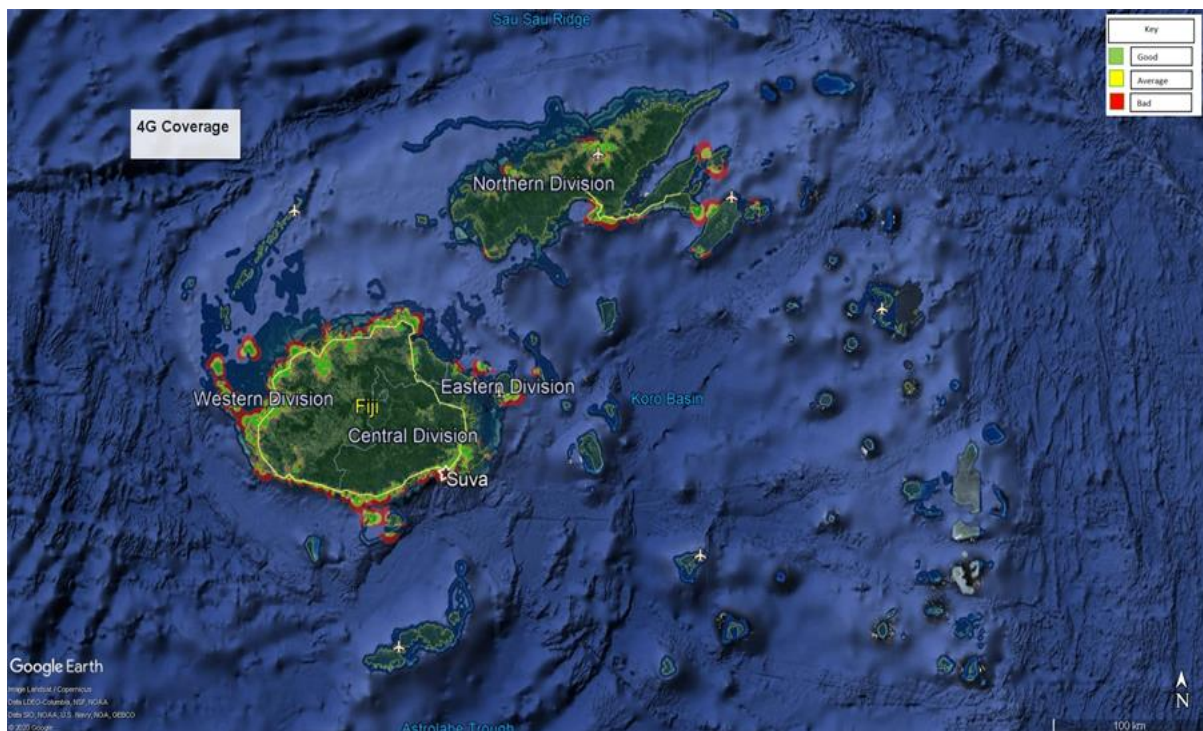


Figure 2 :4G Internet Connectivity (Vodafone Fiji Coverage Map, n.d.)

The map above shows the 4G internet connectivity in Fiji. The red areas depict bad connectivity, and it is noted that there is a significant red portion on the two central Islands. At the same, it shows that the outer smaller Islands show no connectivity.

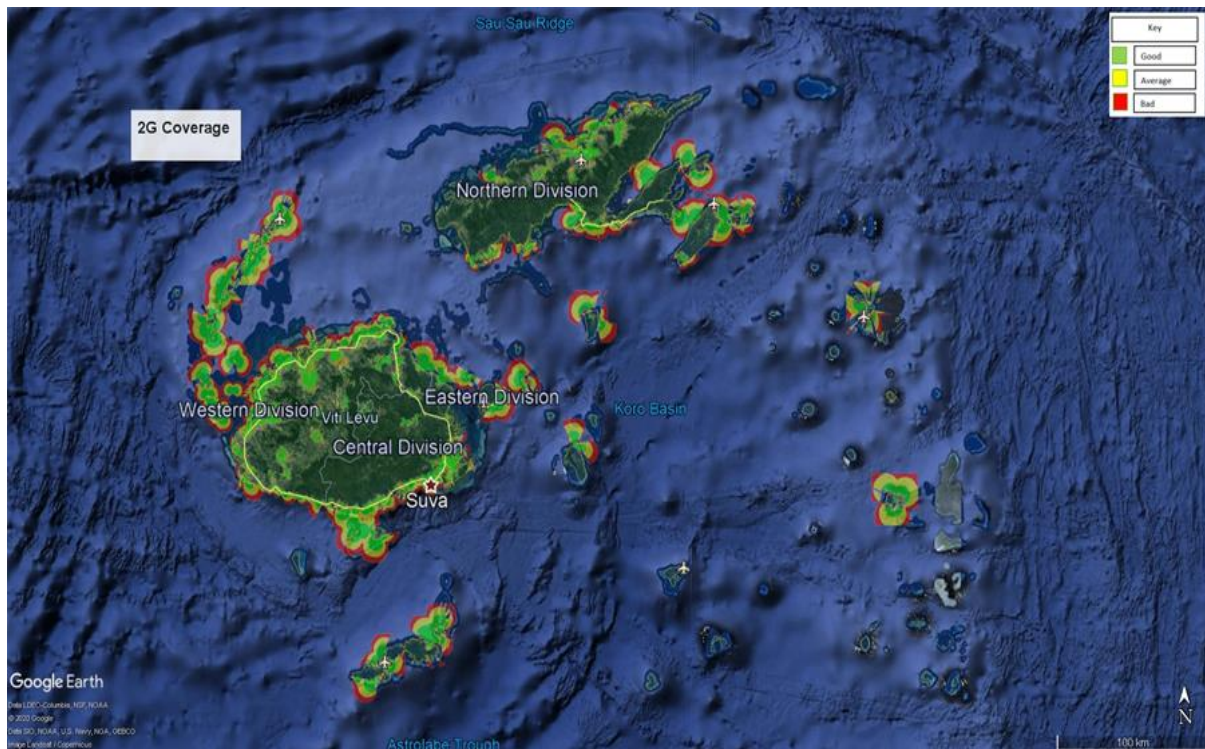


Figure 3: 2G Internet Connectivity(Vodafone Fiji Coverage Map, n.d.)

The 2G network was widely available throughout Fiji and in a handful of outer Islands. So while most of Suva (the capital), where the main campus is located, worked with 4G connectivity, many students in outer parts of Suva were on 2G. This disparity was significantly affecting remote learners.

Challenges of Model 1

While model 1 oriented the intervention team to the student challenges, it also had its flaws. For example, students who showed as ARS due to login data were not all ARS, as some students were only logging in occasionally to download notes to reduce costs. Furthermore, some students were studying in pairs or groups, so only one person logged in. In addition, some students during COVID had changed their phone numbers, so reaching out to them with their profile phone contacts was futile. In addition, students who had connectivity issues were shown as ARS. However, these challenges helped the University realize and better equip itself when Fiji went into a total lockdown in 2021 for nearly the whole year.

Intervention

Learning from the experiences of 2020 and understanding the student challenges, USP put intervention plans into perspective. The University negotiated with the country's two major mobile internet providers and provided free internet access to USP learning sites. This was negotiated as a COVID package; however, through the phone calls, it was found that students were not aware of this; thus, the learning support team called students and informed them of the free internet access to USP sites. As the initial lockdown was in towns and cities, learning labs (Outreach Hubs) with computers were opened for students in different locations to allow those who did not have a computer to access one. This, however, were forced into closure when COVID cases increased in mid-2021. Additional support strategies needed to be implemented, including delivery of offline print packs of course material to students in remote locations with internet connectivity issues via DHL, taxis, and buses. The University allowed students to pay their fees in instalments and removed the general service fee to ease the financial burden.

The SLS team realising the students' lack of awareness, isolation, and stress, extended its support in various modes and even ventured into the student domain, such as through chats and creating virtual communities through social media apps. USP News, announcements, short quizzes, and activities sheets were shared in course-specific Viber communities created by Peer Leaders. The eMentoring programme

had successfully been trialled in Samoa for the Science Teachers Accelerated Programme (STAP) in 2014. e-Mentoring had Peer Mentors at the main campus in Fiji guided students in Samoa for different courses online. eMentoring is a “student-centred learning tool that encourages many students to discuss and clarify their doubts with their peers and seniors, engaging in more informal sessions that many Pacific students are not very comfortable attending with their lecturers and tutors.”(Sharma et al., 2018). Given the success of this tool, it was emulated for the Peer Assisted Study Session (PASS) (a Peer Leadership programme adopted from the University of Wollongong). PASS leaders facilitated online zoom sessions for students out on the regional campuses from the main campuses. This proved to work quite well pre-COVID. It also did work during COVID, but those students who could not access Moodle could not attend. The PASS leaders suggested using Viber communities to reach out to other students and engage them to overcome this situation. Each PASS leader created a community, and through the help of the Course Coordinators, 37 Viber communities were created for different science courses. Considering that it was an informal platform, some community guidelines were set up and pinned. Communities protected the users' contacts, so users would only chat in the community until they allowed another student from the group to engage with them. It was restricted to course specific courses. In total, the 37 communities had 2920 members.

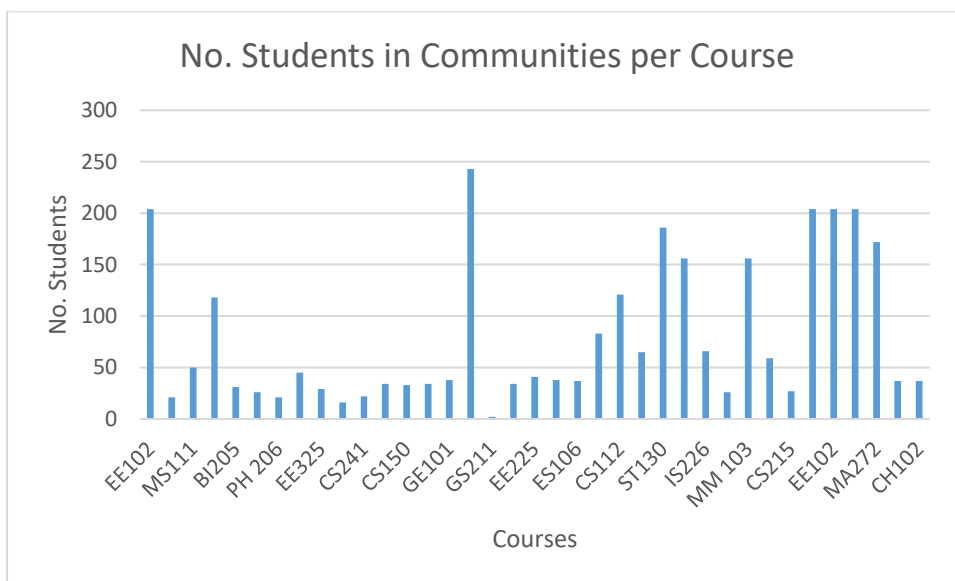


Figure 4: The number of Viber communities under Model 1

The PASS leaders used the communities for scheduled short 30-minute chat sessions four times a week for quick queries. The community was open to all the members, and anyone could post or share any relevant material at any time and anyone could respond. They also shared worksheets and solutions used in online (Zoom) PASS sessions, online session recordings, resources, tips, and motivational videos. This greatly benefitted many students. Peer support involves interactions between the students in the same discipline who work towards achieving the same academic objectives. This type of support can be very useful in situations when there is physical distancing between students. For instance, a study conducted by Rastegar Kazerooni et al. at Shiraz University’s medical school in Iran, highlights that positive results in student engagement was achieved through peer mentoring between medical students through the use of social media during the COVID-19 pandemic. Even though this type of academic support is not new to this pandemic, using such support strategies may benefit student engagement given the challenges of social and physical distancing.

A survey was conducted to gauge the effectiveness of this intervention tool. A total of 172 students from the Viber community completed this survey. There was a good distribution of male and female respondents.

ANSWER CHOICES	RESPONSES	
Female	52.33%	90
Male	47.67%	82
TOTAL		172

Figure 5: Gender Distribution for Model 1 Viber Community

The survey included students from Year 1 to Year 4, with the majority being in year 1. Year 1 students were worst hit by COVID as just two months into the semester in their first year, and the University adopted remote Teaching due to COVID lockdowns.

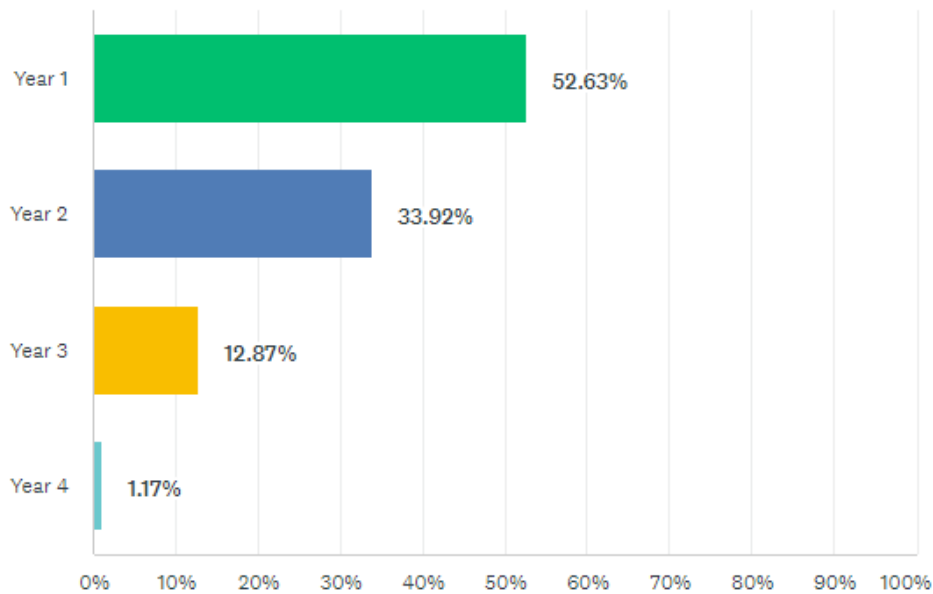


Figure 6 Student Distribution by Year of Study

Various other interventions were implemented for the first years through the FYEC office. This included collaboration with First-year Course Coordinators for extra remedial sessions, liaising with SLS to provide extra support through workshops, one to one consultation, Peer mentoring and PASS online. SLS staff across 10 Campuses facilitated 1104 one to one consultations with students (inclusive of face to face and online); facilitated more than 147 Academic and Study Skills Workshops. In addition, provided Peer Mentoring and PASS for about 81 courses (online in Fiji and face-to-face in the outer regional campuses).

One of the most popular aspects of this intervention tool was that it helped the students stay connected with the rest of the class. As Viber is a social platform, students not only discussed academic content, there were frequent exchanges of greetings such as Good Morning, have a good day, 'all the best' or emojis. This made the environment like a real classroom where students not only interacted for academic matters but also chatted with each other. Some students got confused with assignment deadlines, submission, or extension dates in Remote Teaching. With communities, all they needed to do was to ask questions and members of the community who were apparently in the same class responded or directed each other. This helped break the isolation barrier COVID had created and helped solve many student issues that were earlier faced in 2020 remote Teaching.

ANSWER CHOICES	RESPONSES	
It was great way of keeping connected with rest of the class and the PASS leader while being away from campus.	92.77%	154
It helped with quick queries	38.55%	64
It was not useful	1.20%	2
Total Respondents: 166		

Figure 7: Student View on Viber Communities

Recognising the student population, frequency of use and efficiency of this intervention, many Course Coordinators also joined these student communities and sent messages and notifications and gave students directions through these communities

ANSWER CHOICES	RESPONSES	
Daily	80.00%	132
Once of twice a week	13.94%	23
Once a month	0.61%	1
Anytime I had a quick question	5.45%	9
TOTAL		165

Figure 8: Frequency of Viber Communities Usage

Unlike the Moodle log, which showed students not logging in frequently, the Viber Chat community showed 80% daily users. It was a breakthrough for the team as it reflected that this mlearning initiative through Viber communities proved effective in reaching out to students. Students' level of interaction and engagement was another excellent example of this intervention working. While some students in the community used this tool daily, other students (5.45%) were doing well and only needed a little help once. This group, which only came online when they had a question, replicates the normalcy of face-to-face delivery at the University. Learning support has students who come in daily, and some need help occasionally. The balance on this platform reassured that the intervention tool was quite close to emulating the face-to-face environment.

Model 2

With findings of Model 1 and intervention tools, the LNTCC ventured into a more intelligent system of ARS tracking and early intervention tools. A team of IT, SLS, FYEC, Scholarship Officers and Student Academic Services set to tweak the system for an improved tracking system. The IT section took the helm in 2021, while other members made suggestions for improvement based on their challenges and success stories of Model 1. The lockdown ended in 2021, and Fiji Higher Education institutes returned to face-to-face Teaching in 2022. Understanding that students coming out of remote Teaching would be facing

many challenges, the team worked to identify these students much earlier. Considering the needs of various sections of the University that worked with students, the new system had several filters embedded. ARS could now be identified through Grade Point Average (GPA), assignment submission percentage, repeaters, and prerequisite C graders. Campuses could also filter students (as USP has 14 campuses) for targeted support. The new system embedded all pre-COVID manual tracking systems into an automated intelligent system accessible to relevant stakeholders. The most significant feature of this system from a Learning Specialist perspective is the assignment submission percentage. If a student shows ARS by this filter, it should trigger a Learning Specialist intervention. The hypothesis is this if the team can help out students as they initially fall behind for assignment submission or even Quiz marks, necessary support can be provided to remedy the problem of student attrition. This model is being rolled out, and more data needs to be collected to test this hypothesis and the effectiveness of early interventions.

The current COVID cases in a couple of USP countries has led to complete lockdown of countries as well as USP campuses there. The Model 2 is becoming very useful in these countries to identifying the ARS and providing online support to them through the SLS and FYEC support through the Moodle, Viber, other Social Media systems. USP countries such as Samoa, Kiribati, Solomon Islands, Vanuatu, and Tonga are currently closed and students are studying in total lockdown.

Covid-19 Cases in the Pacific

Cumulative numbers | Updated on April 11, 2022 from PDH.stat

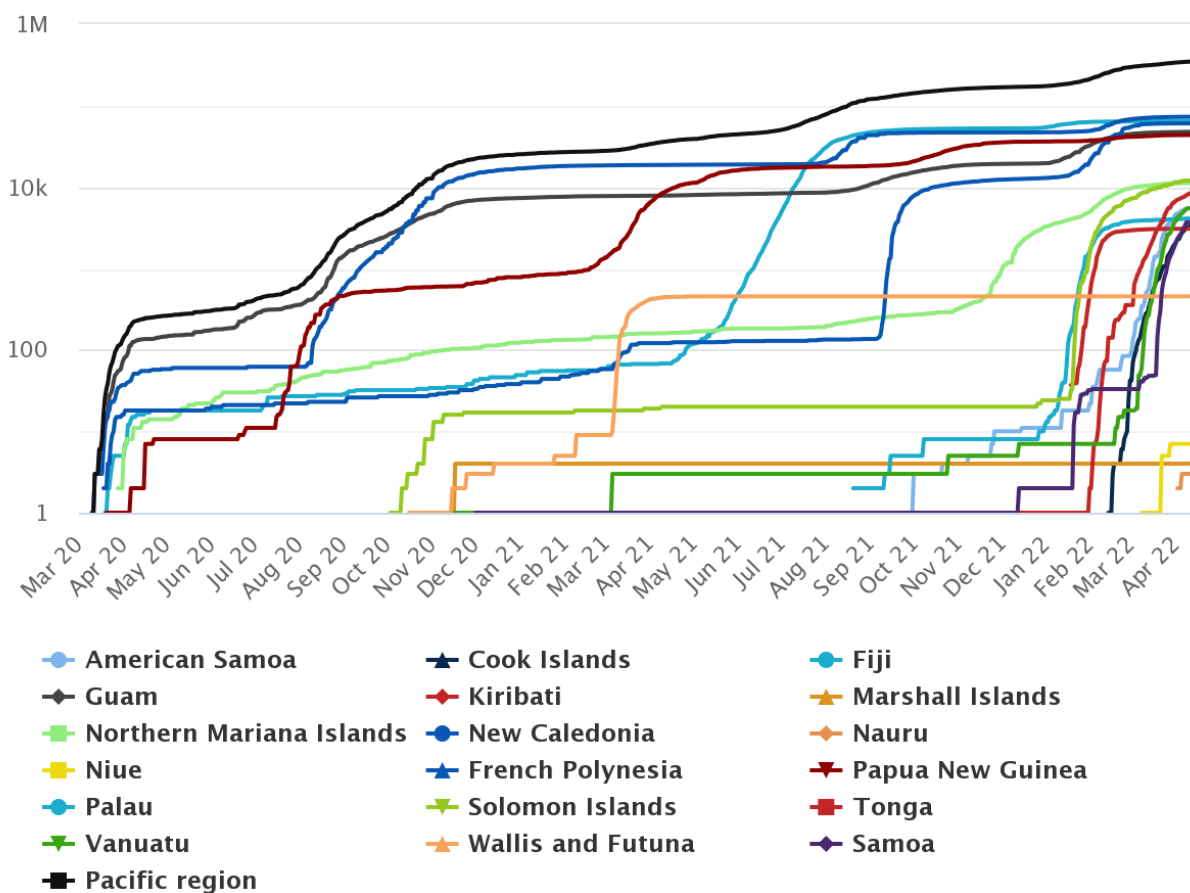


Figure 7 Covid status April 2022 Source: Pacific Community - <https://www.spc.int/updates/blog/did-you-know/2021/07/stat-of-the-week-cumulative-cases-of-covid-19-in-11-pacific>

Conclusions and Recommendations

USP's expertise in offering courses by all modes and providing support for students regardless of their location gave it the confidence to support its registered learners during Covid lockdowns as well as during recent natural disasters. Its additional ability to switch from one mode of study to another and strategizing when no F2F support could be given shows its confidence and ability to respond in times of need. While USP was able to provide support for most learners, students' personal challenges made the institute realise the level of support necessary during such crises. Any lack of support would have further led to ARS falling through the cracks and leading to them dropping out of their studies.

Learning support plays a vital role in combating ARS at tertiary institutes. With USP's support services in place, campuses most affected by Covid lockdown managed to provide additional support during the 1st lockdown in 2020, and used similar strategies to assist learners in 2021. These experiences are definitely being useful during the current lockdowns in other USP countries.

Any future strategies will require additional information about the learners such as the resources they have access to during the most dire situation, including during natural disasters. The COVID situation has made tertiary institutions realise the need to be as flexible as possible where learning, teaching and supporting students is concerned. The lack of connectivity, communication infrastructure and learner confidence are issues USP will need to deal with in order to better support the ARS that come to its doorsteps.

The findings of this study indicates that the successful delivery of student learning supports, especially for ARS relies on various factors, including the availability and better management of information and ICT infrastructure, institutional management support, teachers and student's knowledge of using eLearning systems and tools and the ability of all the stakeholders of the university advanced ICT systems for learning. More research needs to be conducted to capture students' lived experiences in the Pacific regarding the impact of COVID-19 on their learning including challenges and needs, with a special focus on ARS.

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