TECHNOLOGY CONSULTING
IN THE GLOBAL COMMUNITY

Final Consulting Report

Palau Ministry of Education

Ryan Donegan

August 2016

Carnegie Mellon University

cmu.edu/tcingc

Palau Ministry of Education

Executive Summary

Student Consultant: Ryan Donegan
Community Partners: Debbie Tkel-Sbal, Marcia Inacio, Cathryn Evanoff, Edwel Ongrung

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I. About the Organization

The Palau Ministry of Education (MOE) is responsible for developing, evaluating, and advancing Palau's public education system. The MOE serves a network of sixteen elementary schools and one high school. In its own words:

> *The [Mission of the] Republic of Palau Ministry of Education, in partnership with students, parents, and the community, is to ensure student success through effective curriculum and instruction in a conducive learning environment.*

The MOE receives funding from the Palauan government as well as the United States Department of Education (US DOE). This project originates from the Palau Territories & Freely Associated States Education Grant Project (T&FASEG). The T&FASEG aims to

> *Improve students' performance in math and reading / language arts, integration of technology in classroom instruction and learning, and improve teacher quality.*

The T&FASEG grant has been used in part to provide Palauan faculty and students with tablets and tablet applications for educational use. The MOE has continued to extend this program into other areas that may improve classroom education.

II. Lesson Planning Tablet Integration

As part of their daily preparation, teachers are expected to complete lesson plans. Ideally, planning for each lesson will prepare teachers to use class time more effectively. The Ministry requires that teachers complete a daily lesson plan template for all classes. Because teachers hold six classes per day on average, the process of handwriting lesson plans is tedious. The differing learning targets can also make the process cumbersome. The MOE hopes to deploy lesson planning apps to tablets in order to streamline this planning process.

Major Outcomes:

1. Designed and developed initial MOE lesson planning application for tablets.
1. Integrated curriculum data into CSV format for English and Math, and established framework for integrating other learning targets as well.

2. Trained MOE specialist to support and maintain the tablet application.
3. Presented lesson planning application to a group of teachers, principals, and administrators.

Recommendations for future work:

1. Substitute digital plans for paper template
2. Define the lesson planning procedure
3. Teacher pilot program
4. Gradual App Rollout
5. Incorporate additional learning targets

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Ryan is a recent graduate. Ryan will begin working as a UX designer for APT this summer.

Palau Ministry of Education
Final Consulting Report

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I. About the Organization

Organization

The Palau Ministry of Education (MOE) is responsible for developing, evaluating, and advancing Palau's public education system. The MOE serves a network of sixteen elementary schools and one high school. The domain of the MOE spans financials, technology, curriculum, and transportation among others. The Ministry supports the following mission:

> *The [Mission of the] Republic of Palau Ministry of Education, in partnership with students, parents, and the community, is to ensure student success through effective curriculum and instruction in a conducive learning environment.*

The MOE supports 17 educational facilities and over 2,000 students in grades 1-12. Across those facilities are nearly 450 faculty and staff. The Ministry itself is situated in downtown Koror, directly across from the public high school. The MOE provides guidance to schools throughout Palau, including the Southwest islands.

Facilities

The Ministry of Education is situated across from Koror High School. The building itself contains two floors of several small and some medium-sized office spaces. Many work in desks at cubicles, or in specified rooms. Employees of the MOE generally sit near those in their department such as finance or curriculum. The building is equipped with printers, copiers, and scanners for employee use.

The server room is located on the first floor of the MOE. The server room is locked and only accessible by applicable IT personnel. The room is air conditioned and features a small office workspace.

The Ministry encompasses 17 schools and 3 offices overall. Of those, there are a total of 117 identified buildings. While the majority of the schools are located in central Palau, driving distance from Koror, others are more dispersed across other islands. For example, the Southwest Islands are located about 600 km from the main island chain of Palau. This distance and lack of internet infrastructure makes supporting the internet at these facilities difficult.

Programs

The MOE is able to fund many of its programs with support from external grants such as the United States Department of Education. In conjunction with the Department of Education, the MOE was

able to apply the College Access Challenge Grant (CACG) towards funding critical financial literacy and career preparation programs for high school students. The Palau Territories & Freely Associated States Education Grant Project (T&FASEG) has recently allowed the MOE to initiate a tablet program within schools servicing grades 1-8. T&FASEG aims to improve technology integration in the classroom, thus improving educational experiences in subjects such as English and Mathematics.

Staff

The Ministry of Education is headed by a politically appointed minister, Sinton Soalablai. The Ministry of Education itself is divided into two bureaus: the Bureau of Curriculum and Instruction, and the Bureau of Education Administration.

Edwel Ongrung heads the IT department situated within the Bureau of Education Administration. Edwel will be a primary contact for project concerns related to the MOE's server support system and intranet.

The development partner, Debbie Tkel-Sbal, Director of the Bureau of Curriculum and Instruction, is heading the initiative for the T&FASEG project. Working with Director Sbal is Cathryn Evanoff, who is assisting as an external evaluator of the T&FASEG project. Marcia Inacio, also at the MOE, has a working technical knowledge of the project and was also a primary contact.

Both the staff at Ministry and within the schools interact with computers and technology to at least a basic extent. Microsoft Office products such as Word, Excel, and Powerpoint are popularly used. Email is also an option for communication, yet phone and in-person is often more reliable due to low internet bandwidth.

An estimated 50% of current teachers prefer not to use technologies, computers, etc. in their daily workflow. Support and summer training does exist, as implemented and required by the MOE, for teachers to become acquainted with new technology.

Technology Infrastructure

Many of the computers within the Ministry are Mac OS X, yet there is a fair number of PC's as well. Employees are able to choose their preferred operating system, but default to Mac when they have no preference. Linux systems were tested on a wider scale in the past, but were found to be incompatible with too many of the Ministry's critical programs and are mainly used for server applications at this point.

Within the Ministry is a wireless internet network that utilizes WPA2 security protocols. The system supports authentication, mail, and web servers. Most schools are able to connect to the Ministry's network either by remote dialup or wireless connections. This can put a strain on bandwidth during the school year when more people are using the system at once. The MOE relies on many open source technologies and services such as RACHEL in order to keep costs down.

An OwnCloud server has recently been deployed for use within the schools. OwnCloud functions similar to Dropbox, and will allow schools to backup and access important data. OwnCloud also includes a tablet app for synchronization.

Technology Management

Edwel Ongrung and the IT team within the Computer Services Department are responsible for equipping and maintaining technology at the MOE. This also includes planning and servicing broken hardware at schools and the Ministry. Hardware needing servicing is often delivered to the Ministry and addressed by IT. In the past, an external tech consulting firm, Jezzarae, was employed on an ad-hoc basis, mostly to address installation issues.

The tablet program under T&FASEG is currently maintained by the staff and specialists within the Bureau of Curriculum.

Technology Planning

Edwel Ongrung is primarily responsible for much of the IT planning and infrastructure. There is no formal committee for evaluating and deciding on technological planning. Instead, ideas and plans are generated ad-hoc based on need such as in the case of a grant. The Ministry produces an annual report detailing goals of the Bureau of Education Administration and the Bureau of Curriculum and Instruction. Goals may sometimes incorporate the use of technology planning as well.

Communication

The Ministry hosts a public website describing its own mission and programs. Koror High School also has its own website which is used to communicate scheduling, faculty information, announcements, etc.

Within the MOE, information is communicated verbally, by phone, and by email. Most desks are equipped with phones, and this provides a reliable alternative to low bandwidth encountered with email. Likewise, to share files with another in proximity, the best option is to use USB rather than email. In schools, communication is likely similar, with less of an emphasis on technology and email.

Although efforts have been made at digitizing aspects of the Ministry's work, many paper forms and records still exist. Paper is the standardized form for recording student data in schools. A prior TCinGC project established an electronic system for tracking students' grades, but that system has since been overwhelmed by increasing data.

The MOE has also made available an intranet to schools with network capabilities. The intranet is used in part to host educational content and resources such as educational videos.

Information Management

The MOE manages a range of critical information including grades, student records, and grant information. Information is primarily managed via traditional paper and filing systems. Student grades and progress are similarly captured on paper, yet teachers are encouraged to then enter this data into a MySQL database.

There have been attempts to automate and digitize the collection of information. CMU teams have been major developers behind many of these endeavors - some successful and others falling out of use. A problem is that some faculty members refuse to use computers or technology in

their workflow. Technical training and on boarding programs have been introduced by the MOE in an attempt to rectify this resistance.

Business Systems

All business systems are taken care of by the Palauan national government. Areas such as payroll and accounting are not handled within the Ministry of Education.

II. Lesson Planning Tablet Integration

Motivation

As part of their daily preparation, teachers are expected to complete lesson plans in advance of their classes. A lesson plan is a daily, weekly, or even monthly summary of the standards, objectives, and resources utilized in a class. Ideally, planning for each lesson will prepare teachers to use class time more effectively and ensure they're capturing the key points of the curriculum as established by the Ministry. The Ministry requires that teachers complete a daily paper-based lesson plan template for all classes taught. The lesson plans for a given week are to be completed by the prior Friday and turned in to the school principal for review.

Because teachers hold six classes per day on average, the process of writing lesson plans is tedious, especially if done on paper. The differing standards for each subject, grade, and lesson can also make the process cumbersome. Even though it is mandated by the MOE and hopefully supervised by principals, some teachers choose not to complete lesson plans altogether.

With the grant from the T&FASEG, the MOE has equipped teachers in grades 1-8 with tablets. The MOE hopes to deploy lesson planning apps to tablets in order to streamline the planning process. Focusing first on English and math, the MOE expects this initiative to further integrate technology into teacher's workflows by providing a solution that improves efficiency and technical literacy.

Major Benefits:

1. Make it easy for teachers to refer to old lesson plans
2. Reduce time to generate lesson plans by making forms digital
3. Eliminate repetition in current lesson form template
4. Reduce paper generation
5. Make it easier for administrators to acquire and share lesson plan information

Outcomes

The conclusion of the project saw several major outcomes:

1. Designed and developed initial MOE lesson planning application for tablets.

The app successfully encompasses all A-list features as defined in the contextual inquiry. Namely, the tablet applications works as an offline-capable tool for teachers to design, edit, and share lesson plans. The app itself is tied in to a database of English and Math learning targets as defined by the

MOE in August of 2016. The app is able to reference learning targets to allow teachers to create lesson plans in a way similar to that of the template, and save plans so that they be referenced later. Additionally, the app lends itself to future expansion and flexibility. By building capacity within the MOE team to enter data into the designated CSV spreadsheet, the application can be updated in the future with relevant learning targets for Social Studies, Palauan, and Science.

2. Integrated curriculum data into CSV format for English and Math, and established framework for integrating other learning targets.

For the lesson planning app to be useful, it had to reference current learning targets for grades 1-8 in English and Math. The consultant collaborated with MOE staff to obtain this data and translate it into a form readable by the app itself. To achieve this, the consultant worked directly with MOE staff to teach them the process of translating data to CSV and then uploading to the MOE intranet so that it can be accessed by the app. Ultimately, the MOE staff was able to generate data for English and Math, quarters 1-4. This data will be shipped with the app initially. Moreover, the MOE will now be able to support future updates following the consultant's departure.

3. Trained MOE specialist to support and maintain the tablet application.

Establishing the MOE's part in the deployment and sustainability of the app was critical from the project onset. Training, to various extents and within the timeframe allowed, was provided in the following areas:

- Creating and saving lesson plans
- Exporting lesson plans
- Updating the backend database of the app
- Installing the app

Early training of key functionality will allow the MOE to sustain the project moving forward while also training other members of the staff to take on new responsibilities. While the app itself is self-sustaining, it will require further intervention on the part of the MOE to ensure that it is used consistently and accurately. If the MOE is unable to coordinate a process for maintaining the app, it will be impossible to integrate learning targets for other subjects in the future, making the application obsolete over time.

4. Presented lesson planning application to a group of teachers, principals, and administrators.

As part of the annual MOE convention, the lesson planning app was introduced during a special presentation. The presentation covered the project origins, key features of the app, and a hands-on app walkthrough. Palauan teachers and principals were invited to attend the presentation for a first look at the app and a chance to install on their own tablets if available. While this is not a substitute for formal training, the presentation served to introduce the project and its importance to key stakeholders. This will hopefully be the first of many endeavors to secure buy-in and confidence from stakeholders.

Incomplete Objectives & Risk Assessment:

1. Application release and teacher training.

A major aspect of the project that will need to be addressed in the future is a plan for release to teachers and administrators. An established plan for training and gradual rollout will be critical for ensuring the app is successfully received by educators (see recommendation section). Given the limited technical backgrounds of many teachers, it is important that the app not be released without more support offered by the MOE.

2. Inclusion of Introduction/Body/Conclusion section from Lesson plan template into app.

A conscious decision was made on the part of the consultant and his MOE collaborators to *not* include the Introduction/Body/Conclusion section of the current lesson plan template in the application. It was determined that having such a text-heavy field on a tablet would be inefficient and tedious for users due to having to type on a touchscreen. Many teachers also choose to structure these sections in slightly different ways that the tablet would not support.

With the app, teachers will be able to complete all other parts of the planning template and complete the Introduction/Body/Conclusion elsewhere such as on a Word processor. Because the tablet allows users to export and email their lesson plans, teachers will simply be able to attach the rest of their lesson agendas. Alternatively, a freeform space on the app allows teachers to input this information into the app directly if they choose.

This decision does pose a few risks, as teachers may initially be confused that the tablet planner doesn't exactly replicate the paper template. This makes proper training and guidance with the app all the more important so that teachers understand what they can and cannot do on the tablet. Another alternative could be giving teachers keyboard attachments for their tablets so it's easier to enter freeform information.

3. Integration of learning targets for Palauan, Social Studies, and Science.

Nearly all standards for English and Math were built into the app in order to limit the scope of the project initially. The app still maintains the ability to plan for the five primary subject, but learning targets will only be available for English and Math on release. The MOE has the capacity to update the database with learning targets for all other subjects if they choose to do so in the future. However, it is recommended that teachers get onboard with English and Math planning before integrating all other subjects.

III. Recommendations

The following recommendations are listed by priority and what the consultant believes is the best chronological order.

Substitute Digital Plans for Template

School administration and MOE staff must transition to accepting digital records instead of the Lesson Planning template. If teachers are required to fill out the plans on the app *as well* as information on the original template, they're going to resist using the tablet. As of this report, teachers would need to submit their app data in addition to other fields from the lesson plan. This is the greatest risk posed to the success of implementing the app.

Define The Lesson Plan Sharing Procedure

The ability to share lesson plans between administrators, teachers, and MOE staff is vital to the app's success. The app provides two methods for sharing: saving a file to the tablet containing lesson plans, and emailing the file. This process will be foreign to teachers using the app and administrators responsible for reviewing lesson plans. Thus, it is recommended that particular attention be paid to the act of sharing plans during training. Take this time to test a variety of sharing methods including USB drive, Email, Airdrop, Cloud backup, etc. Teachers themselves may be the best resource in this case, as they can provide insight into how they normally share plans. Defining this process in a way that is clear and simple will impact later success.

Teacher Pilot Program

Before the app is introduced into all schools, it should be piloted and tested by a small group of teachers. For simplicity, it would be best to contain the pilot to several schools originally. These teachers will be given access to the app, and instructed to incorporate it into their lesson preparation flow. Teachers may use the app to prepare for classes, and administrators will learn how to receive and review digital plans. This way, teachers will start to learn the app for themselves.

Early on, it's likely that teachers will have many questions and concerns. By limiting the release to a small pilot group, the MOE staff will be better equipped to answer questions and provide support. Retrieving feedback and reviewing common issues experienced by teachers will also allow the MOE to anticipate issues when the app is eventually released to a larger audience. Due to the relative lack of teacher input in the development and testing of the application, a pilot phase is necessary for convincing teachers of the app's usefulness.

Gradual App Release & Continued Support

If the pilot is determined a success, further release of the application should remain gradual. Ideally, a school-by-school rollout each quarter would give both teachers and MOE staff time to prepare themselves for the transition. The pilot should also have been used as a time to compile training material and support for future app users. Waiting until this support material has been produced and is ready to be used will positively impact future rollout.

Incorporate Additional Learning Targets

A noted desire of the MOE at the time of this project was to transition lesson plans totally to digital. While the application supports this change, it is advised the MOE focus on English and Math learning targets first before incorporating other subjects. That is, all schools should have access to the app and show evidence of its success before integrating learning targets for Palauan, Social Studies, and Science. Prioritizing English and Math will ensure teachers have time to learn and become familiar with the app before potentially overwhelming them with another adaptation.

Invest in Future Development

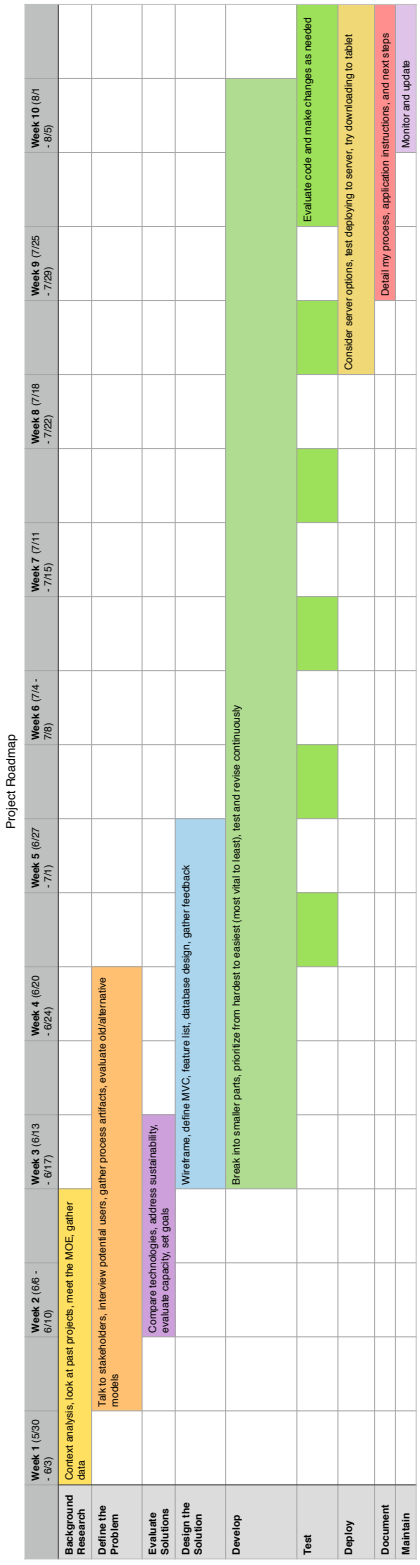
This is most likely a distant recommendation, as teachers should be familiarized with the current, simplified app before extending features and functionality. The initial app release encompasses all core functionality as established by the consultant and the MOE, and is designed to support multiple

years of use. An attempt to extend the app without first fully testing and evaluating it with teachers may only hinder adoption rates. An exception to this recommendation is the case that the underlying application has technical issues or bugs that were unknown at the time of release. In this case, it may be useful to have an external vendor or consultant come in to try to fix backend issues. Some possible resources could be the Technology Consulting in the Global Community program at Carnegie Mellon University or other project courses featured by the Information Systems Department. If interested in pursuing these resources, contact Professor Joe Mertz (joemertz@cmu.edu).

About the Consultant

Ryan Donegan is a recent graduate of the Information Systems program at Carnegie Mellon University. He graduates with a double major in Human-Computer Interaction and Information Systems, and will start work as a UX Designer at Applied Predictive Technologies in Arlington, Virginia in August 2016.

Appendix A


Project Roadmap
Week 1 (5/30 - 6/3)
Week 2 (6/6 - 6/10)
Week 3 (6/13 - 6/17)
Week 4 (6/20 - 6/24)
Week 5 (6/27 - 7/1)
Week 6 (7/4 - 7/8)
Week 7 (7/11 - 7/15)
Week 8 (7/18 - 7/22)
Week 9 (7/25 - 7/29)
Week 10 (8/1 - 8/5)
Background Research
Context analysis, look at past projects, meet the MOE, gather data
Define the Problem
Talk to stakeholders, interview potential users, gather process artifacts, evaluate old/alternative models
Evaluate Solutions
Compare technologies, address sustainability, evaluate capacity, set goals
Design the Solution
Wireframe, define MVC, feature list, database design, gather feedback
Develop
Break into smaller parts, prioritize from hardest to easiest (most vital to least), test and revise continuously
Test
Evaluate code and make changes as needed
Deploy
Consider server options, test deploying to server, try downloading to tablet
Document
Detail my process, application instructions, and next steps
Maintain
Monitor and update

Appendix B

Approaches and Heuristics

Approach	Android, Native (Java)	Hybrid, Native (Ionic, React, etc)	Web App (PHP, Ruby on Rails)	Pre-Made, (e.g. Common Curriculum)
Compatibility with Android				
Compatibility with other devices (e.g. iOS, desktop)				
Control over native functionality				
Flexibility of Design				
Ease of integrating with database				
Extendability				
Development time				
Speed				
Internet independence				
Maintainability				
Security				
Stability				
Native UX				
Ability to Update				
Offline Data Storage		Access to SQLite database. Could be a good option.	Android didn't support IndexedDB until browser version 4.4. It does support WebSQL, but WebSQL has been deprecated since 2010 and is risky to use as it may soon be replaced.	
Comments	While an Android app could offer the best overall tablet experience, required programming languages (Jave & Eclipse IDE) would make development slow and also specialized beyond the capabilities of MOE IT. Additionally, it would be more expensive if down the line the MOE hopes to deploy a similar app to iOS. In this case, a duplicate development project would need to take place to convert the app to an iOS compatible format.	Affords all the same functionality as a native application, but with less of a learning curve in development. A host of plugins and customizable modules exist to hopefully cater to the needs of the Ministry. What is uncertain is the ability of this type of app to store data natively. Using a wrapper like Phonegap or Cordova should assist in data storage, but testing on the tablets themselves will be very important.	A web application would likely be the fastest to develop and accessible by all devices (tablet and iOS). The main negative is this solution's reliance on the internet. While the web app could be cached on each user's device, doing so would require that each device download the entirety of the contents of the web app - a potentially lengthy process. A web app would also not be able to make best use of the native functionality of a device, possibly affecting the UX. Security might also be an issue, as the site will be available to any with internet access.	Many pre-made, professional options exist for electronic lesson planning. However, many are critically reliant on a stable internet connection, and lack the ability to be customized to the MOE's specifications.

Appendix C

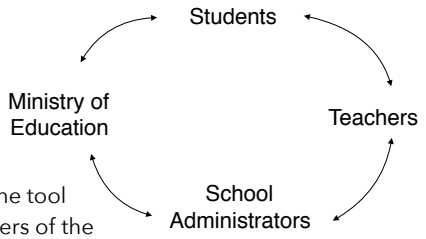
Preliminary User Analysis
Palau Ministry of Education

Ryan Donegan, Consultant
Week of June 6 - June 10

RESEARCH SUMMARY:

A variety of strategies were employed including meeting with staff at the Ministry of Education, speaking with several educators, and viewing lesson planning artifacts.

STAKEHOLDERS:



Target users are teachers, but the implications of their use of the application affects other stakeholders. Immediate effects can be observed as teachers are able to better prepare for the lessons and use their time more efficiently. Long-term, the tool could be used as a gauge for administrators and members of the MOE to evaluate where teachers & students are succeeding or failing in the classroom. These reflections could lead to new policies or curriculum being developed.

USE CASES:

Teachers are currently the primary user, yet their actions are linked to school admin. Sample use cases based on current lesson planning habits must be prioritized in developing the application.

Teachers

- Creating daily lesson plans
- Creating weekly (or greater) lesson timelines
- Referencing Ministry standards and objectives
- Referring to lesson plans during a class
- Taking notes on a lesson plan
- Evaluating and updating lesson plans
- Referring to last year's lessons in order to plan this year
- Sharing lessons with admin/other faculty
- Identifying resources and materials for class

School Administrators

- Review teachers' lesson plans for effectiveness
- Evaluate in-class performance of teachers
- Provide feedback and comments to improve teacher performance
- Store copies of teachers' deliverables for later review and analysis
- Communicate key developments to the Ministry

PAIN POINTS:

Teachers

- Referring to all the curriculum standards and objectives is tedious
- Handwriting or typing lesson plans for 6 classes/day on average can be time-consuming
- Lesson plan fields are repetitive
- Large amounts of paper work accrued that must be transported
- No formal record-keeping system
- It's difficult to search old lesson plans for reference

School Administrators

- Collecting paper-based lessons from teachers
- 'Backing up' or storing copies of lesson plans
- Some teachers do not complete plans, or use alternative formats
- Incomplete or inexistent lesson plans make it difficult or impossible for substitute teachers or others to effectively teach a class.
- Without lesson plans, it's difficult to understand what was taught or not covered in a class

PROFILING THE USER:

"I don't like writing out lesson plans because it takes too much time."

The current process of writing or typing lessons can be tedious. Teachers fill in many repetitive fields for classes, and must frequently refer to the different standards and objectives. Because many teachers in grades 1-8 teach different subjects, this can easily become a time-intensive process.

"I often take notes on how a lesson went so I can make changes the next time I teach it."

Looking up past lesson plans can be extremely useful for planning current lessons. By being able to easily see notes on how a past lesson went, teachers may be able to make adjustments in following quarters.

"I like to have a plan of what I'm going to do so that I can refer to it during class."

Lesson plans are used as mnemonic devices that teachers can use to make sure they're staying on track. Teachers who take the time to make a plan may frequently refer to it during a class to remind themselves of what needs to be accomplished. After a class, the plan helps evaluate what was covered or needs to be reviewed in the future.

DESIGN GOALS:

- Improve efficiency and productivity in creating multiple lesson plans
- Anticipate teachers' responses for common fields to save time and improve experience
- Allow teachers flexibility to modify or update lesson plans
- Emulate paper-based practices in a streamlined, friendly interface

Appendix D

Project Proposal and Spec
Palau Ministry of Education

Ryan Donegan, Consultant
Week of June 6 - June 10

SUMMARY & GOAL:

With the grant money from the T&FASEG, the MOE has equipped teachers in grades 1-8 with tablets. The MOE hopes to deploy lesson planning apps in order to streamline the planning process. Focusing first on english and math, the MOE expects this initiative to further integrate technology into teacher's workflows by providing a native app solution that improves efficiency and technical literacy.

The project goal is to **design and deploy a functional Android tablet application** to be used by teachers in grades 1-8. The app will work **offline** and make use of a **default database** of standards, objectives, and resources. Teachers will be able to **add and save lesson plans**, as well as review them later. **Lesson plans may also be exported** to excel/csv file.

FEATURES AND TIMELINE:

For the purposes of completion, all identified features have been included here. Features have been organized according to priority, feasibility, and the consultant's evaluation of time and resources:

- Data Gathering & Context Inquiry (May 30 - June 10)
- Technology comparison and Evaluation (June 6 - June 10)

A-LIST FEATURES (will be completed)

App includes selections for all current standards, objectives, etc.	June 8 -15
Teachers can create and save lesson plans	June 13 - 17
Lesson plans can be edited and deleted	June 20 - 24
Teachers can view past and current lesson plans	June 20 - 24
Lesson plans can be exported by USB	June 27 - July 1
App works offline and is not reliant on the internet	N/A

B-LIST FEATURES (time dependent)

The app can sync with a remote server to update curriculum standards based on the MOE's specs	June 27 - July 8
Lesson plans are backed-up to remote server when a connection is detected	Dependent on time
Teachers can leave notes about a lesson and review later	Dependent on time
Teachers can sort and view lessons based on timeframe, quarter, subject, etc	Dependent on time
Teachers can leave notes about a lesson and review later	Dependent on time
Teachers can create detailed daily agendas, uploading documents and individual resources	Dependent on time

FUTURE

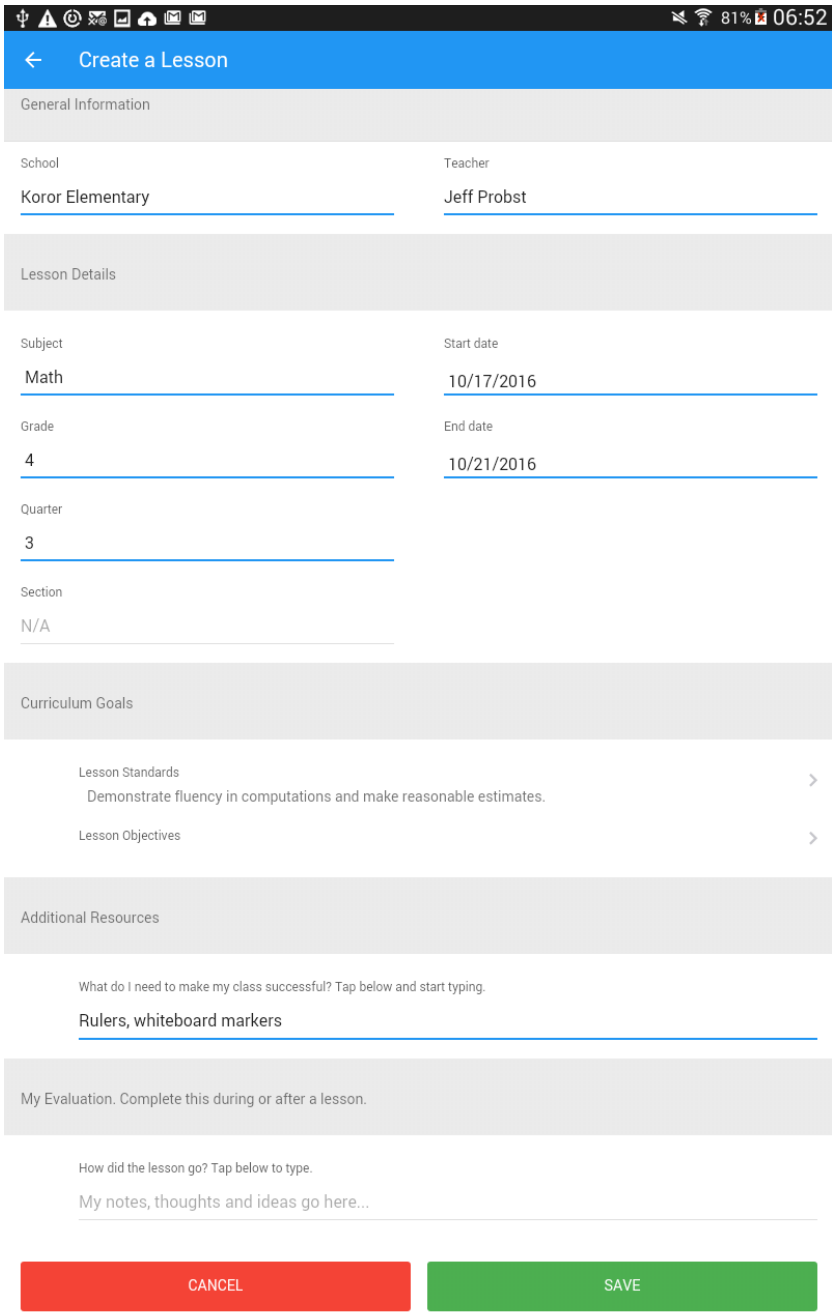
Principal can monitor teacher's progress through a separate app
Principal can backup documents to the cloud with comments
Teachers can export via wifi
User authentication
App is iOS compatible and can work offline
Teachers can create and share lesson plan content with each other

- Documentation (final 2 weeks)
- Deployment and Testing (final 2 weeks)

FEASIBILITY:

This is a conservative estimate of completion, hopefully leaving room for debugging, testing, and deployment before the consultant's departure. The goal is to have something teachers can use before the start of the 2016-2017 school year as part of a pilot program. Based on the goals set and features assessed, this should be attainable by the end of the consultant's term on August 7th, 2016.

Appendix E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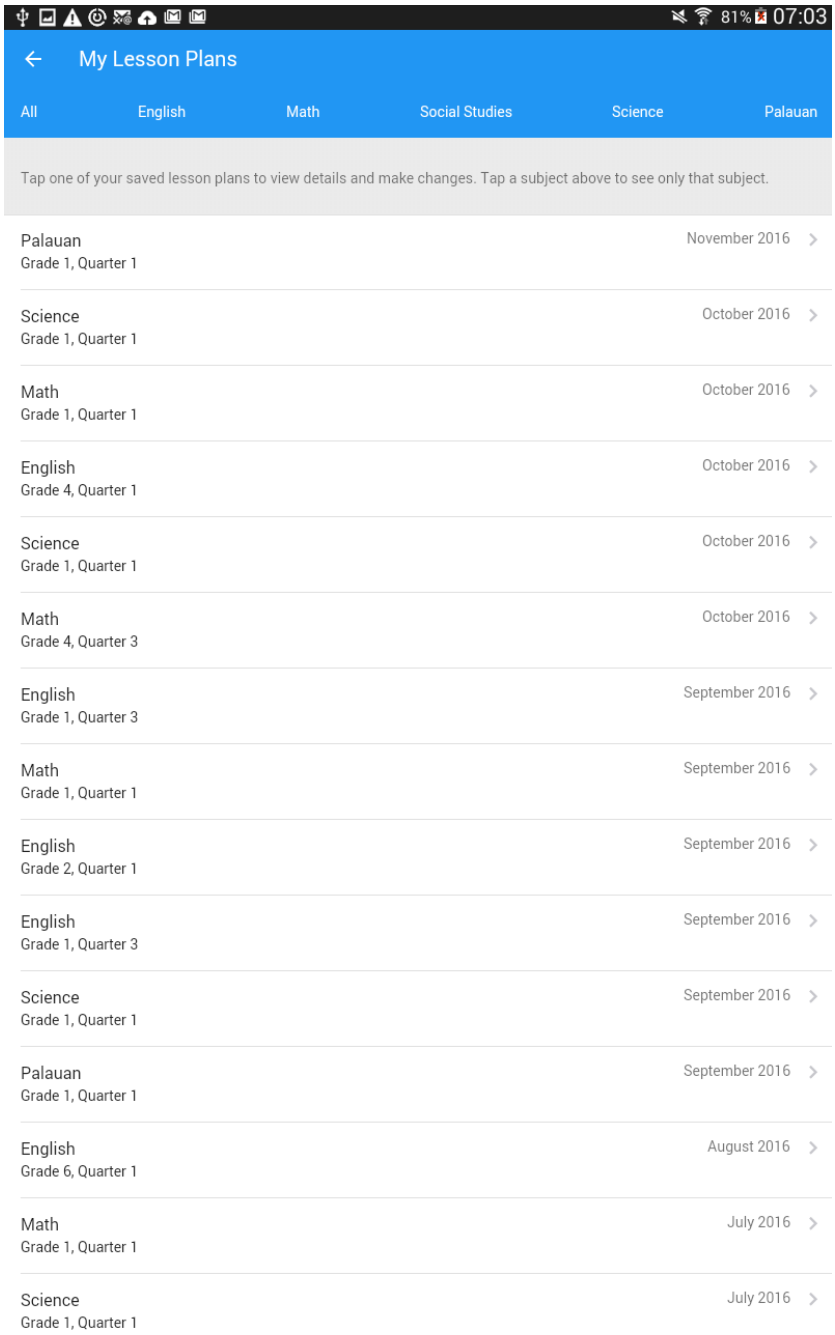
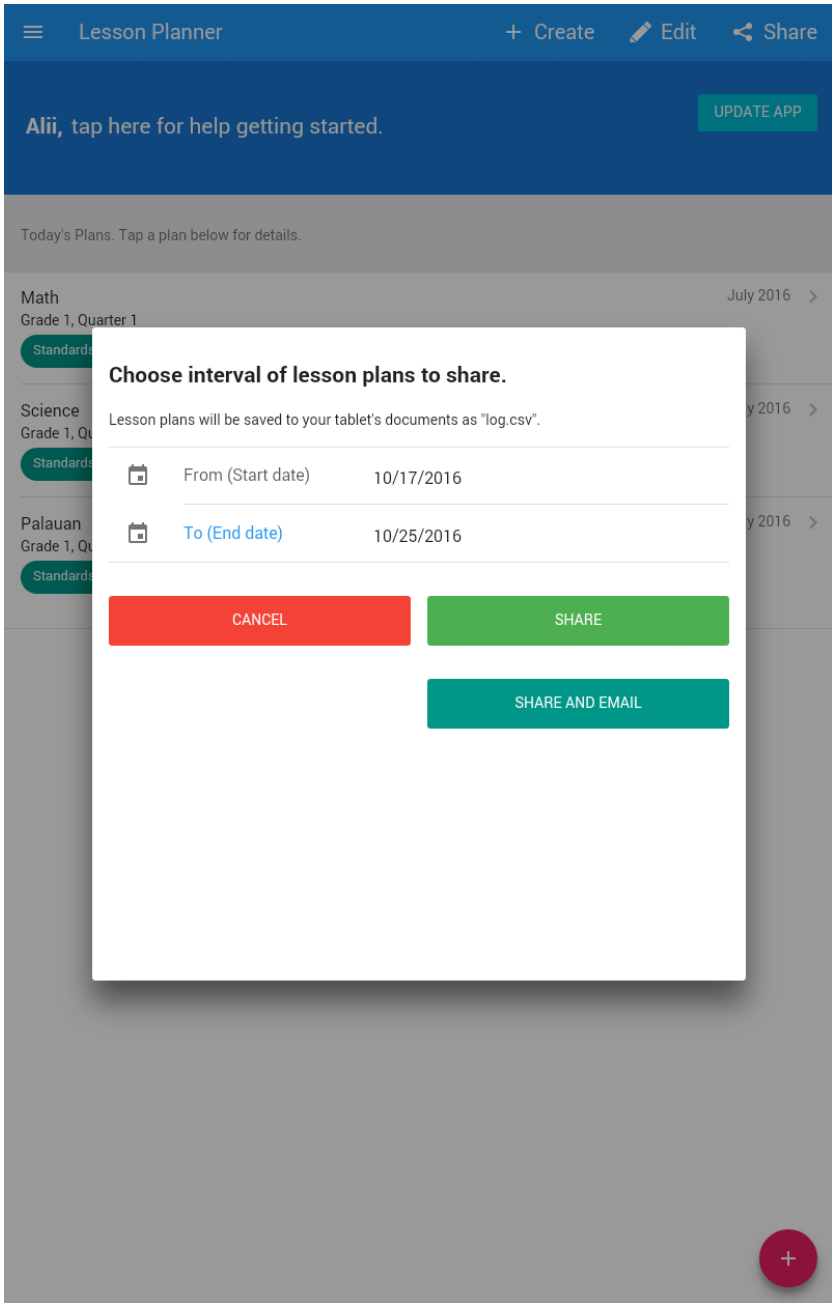
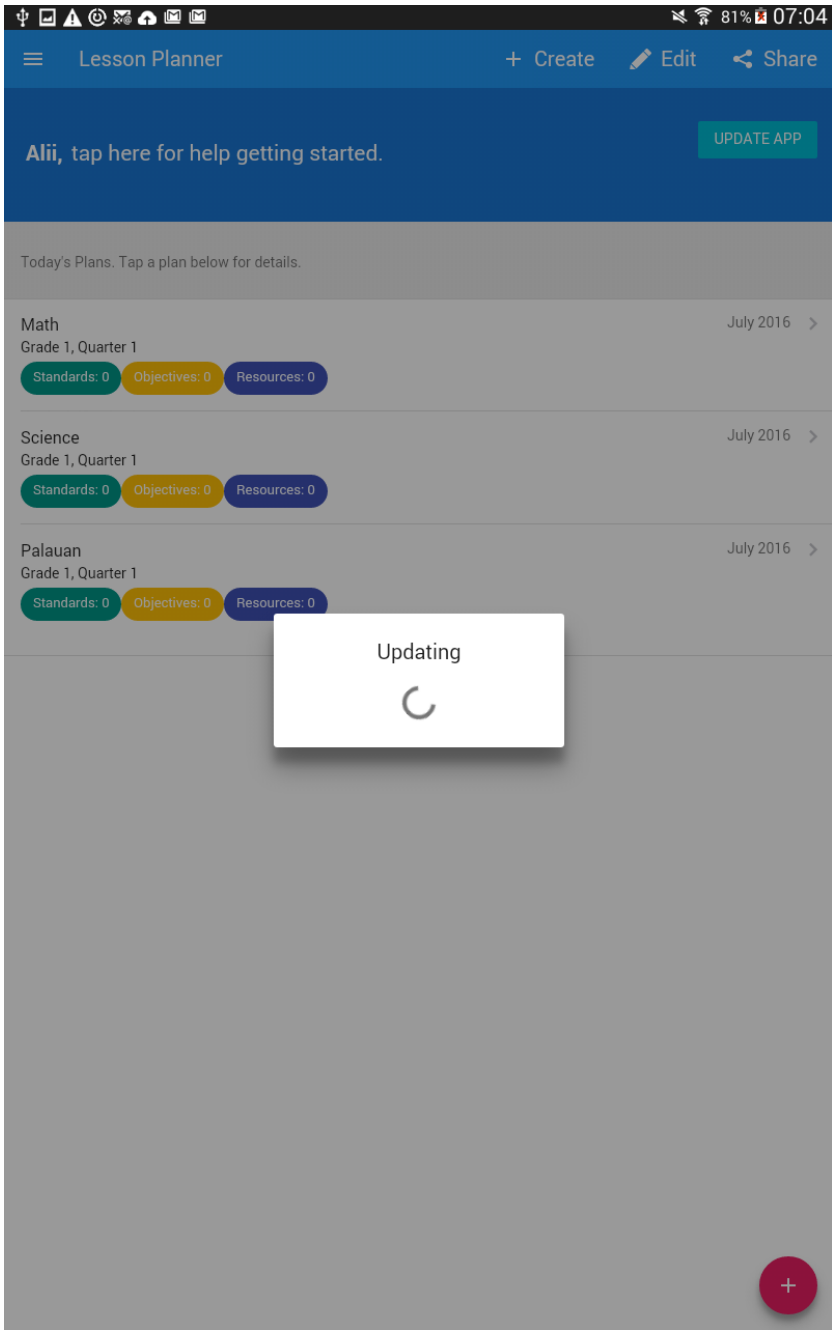
General Information
School
Koror Elementary
Teacher
Jeff Probst
Lesson Details
Subject
Math
Start date
10/17/2016
Grade
4
End date
10/21/2016
Quarter
3
Section
N/A
Curriculum Goals
Lesson Standards
Demonstrate fluency in computations and make reasonable estimates.
Lesson Objectives
Additional Resources
What do I need to make my class successful? Tap below and start typing.
Rulers, whiteboard markers
My Evaluation. Complete this during or after a lesson.
How did the lesson go? Tap below to type.
My notes, thoughts and ideas go here...
CANCEL
SAVE


81% 07:03
My Lesson Plans
All
English
Math
Social Studies
Science
Palauan
Tap one of your saved lesson plans to view details and make changes. Tap a subject above to see only that subject.
Palauan
Grade 1, Quarter 1
November 2016
Science
Grade 1, Quarter 1
October 2016
Math
Grade 1, Quarter 1
October 2016
English
Grade 4, Quarter 1
October 2016
Science
Grade 1, Quarter 1
October 2016
Math
Grade 4, Quarter 3
October 2016
English
Grade 1, Quarter 3
September 2016
Math
Grade 1, Quarter 1
September 2016
English
Grade 2, Quarter 1
September 2016
English
Grade 1, Quarter 3
September 2016
Science
Grade 1, Quarter 1
September 2016
Palauan
Grade 1, Quarter 1
September 2016
English
Grade 6, Quarter 1
August 2016
Math
Grade 1, Quarter 1
July 2016
Science
Grade 1, Quarter 1
July 2016


Lesson Planner
+ Create
Edit
Share
Alii, tap here for help getting started.
UPDATE APP
Today's Plans. Tap a plan below for details.
Math
Grade 1, Quarter 1
July 2016
Science
Palauan
Choose interval of lesson plans to share.
Lesson plans will be saved to your tablet's documents as "log.csv".
From (Start date)
10/17/2016
To (End date)
10/25/2016
CANCEL
SHARE
SHARE AND EMAIL


81% 07:04
Lesson Planner
+ Create
Edit
Share
Alii, tap here for help getting started.
UPDATE APP
Today's Plans. Tap a plan below for details.
Math
Grade 1, Quarter 1
July 2016
Standards: 0
Objectives: 0
Resources: 0
Science
Grade 1, Quarter 1
July 2016
Standards: 0
Objectives: 0
Resources: 0
Palauan
Grade 1, Quarter 1
July 2016
Standards: 0
Objectives: 0
Resources: 0
Updating