

Connecting the Teachers of Victoria with Wildlife Conservation Partners

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WPI



Connecting the Teachers of Victoria with Wildlife Conservation Partners

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ABSTRACT



We created a hi-fidelity prototype of a web application that will connect teachers with local conservation groups and provide them with real-world learning opportunities in collaboration with Zoos Victoria. Through conducting questionnaires and feedback forms with teachers, we determined what users desired most in this application while also ensuring simplicity and creativity. Our application, which we designed to integrate into the Statewide Integrated Flora and Fauna Teams (SWIFFT) website, will address the need for a platform that can both aggregate wildlife conservation classroom resources and meet the needs of busy teachers.



PROJECT OVERVIEW

IMPORTANCE OF WILDLIFE CONSERVATION IN AUSTRALIA

Australia is one of the most biologically diverse nations on Earth with over one million species of plants and animals. Approximately 90% of the animals native to Australia are found nowhere else in the world (Animal Facts Encyclopedia, 2020). There are more than 378 species of mammals (approximately half are marsupials), 828 species of birds, 300 species of lizards, 140 species of snakes, and two species of crocodiles that live in Australia (Australian Government, 2020). Due to Australia's rich and unique biodiversity, wildlife conservation organizations stress the need to minimize any threats to biodiversity by promoting conservation

Approximately 90% of the animals native to Australia are found nowhere else in the world

initiatives. To aid them, one solution is to foster wildlife conservation education in the classroom. Wildlife conservation education is necessary to teach people about the best practices to protect wild species and their habitats in order to prevent them from going extinct. In fact, several studies suggest that there is a significant correlation between the level of environmental knowledge

and the degree of pro-environment and conservation behavior. Thus, learning about wildlife conservation at an early age has the potential to inspire students to become further involved with conservation efforts later in life.

ZOOS VICTORIA

Our sponsor, Zoos Victoria, is a not-for-profit wildlife conservation organization that works to fight animal extinction both locally and globally. In addition, Zoos Victoria aims to be part of every Victorian child's education and stresses the importance of utilizing real-world learning to teach students about wildlife conservation efforts. Teachers struggle with developing relevant and engaging conservation lessons for their students because of the effort and time commitment it requires. There is a need to support these teachers in this process of finding resources to increase wildlife conservation discussions in the classroom.

PROJECT OBJECTIVES

The goal of this project is to support Zoos Victoria's initiative to provide real-world learning opportunities to students and to raise awareness for wildlife conservation in the state of Victoria. Our team accomplished this by developing a web application that connects school teachers with local conservation groups

and provides them with educational activities.

Our sponsor identified a potential host for our application within the existing website of one of their partners, the Statewide Integrated Flora and Fauna Teams (SWIFFT), which is managed by the Centre of e-Research and Digital Innovation (CeRDI). The SWIFFT website has extensive wildlife conservation resources, but is mainly designed for scientists. We propose implementing our web application into the existing SWIFFT website, which allows us to utilize the extensive conservation resources already available on the SWIFFT website while also making the site more accessible to teachers.

To accomplish our goals, we completed the following objectives:

- 1 Discover what features teachers desire in the application
- 2 Developing the mockup of the application
- 3 Testing the mockup of the application
- 4 Creating a future development plan for the application

Figure 1. Our project objectives



BACKGROUND

This section presents information concerning Zoos Victoria's collaborations with schools and partner organizations, such as SWIFFT, in Victoria and the current status of animal conservation issues taught in Victorian schools. Additionally, it explores features implemented in other applications that can aid in this project.

ZOOS VICTORIA'S COMMUNITY OUTREACH

The role of zoos has changed drastically over the past couple of decades to become more of a conservation-based organization rather than a menagerie for pure entertainment. Zoos have a unique opportunity for conservation education due to the number of recreational visitors they draw annually (Tribe & Booth, 2003). Zoos Victoria encapsulates this change and works hard to incorporate community members into its work with its outreach campaigns that focus on animal extinction. Multiple factors contribute to animal extinction, yet a lesser-known, but still serious, threat to the survival of these endangered species is the public's unawareness of such species. A majority of the public is also unaware of any preventative measures that people can undertake to aid in their survival. Zoos Victoria focuses on this threat through its high level of engagement within the community and schools of Victoria (Zoos Victoria [ZV], 2020b).

In 2019, Zoos Victoria developed a five-year conservation master plan per the Victorian State Government's Protecting Victoria's Environment – Biodiversity 2037 plan. The master plan outlines the steps and actions that the zoo will take to recover the 27 threatened native species of south-east Australia, called the Fighting Extinction 27 (FE27). These species could disappear within the next decade without intervention (ZV, 2020d). Throughout the plan, Zoos Victoria explains its role of exciting and educating communities in order to inspire wildlife conservation advocates of future generations. The success of the plan is contingent on the public's participation in the proposed projects and campaigns (ZV, 2019a).

Zoos Victoria's Education Programs

As part of its master plan, Zoos Victoria works directly with schools to connect young students with wildlife through meaningful learning programs. There are 78 excursion programs offered between the three zoos, which tailor to the participating students' ages and the objective learning outcomes of the curriculum. These programs span all levels of education from early childhood to Year 12 and support the Victorian curriculum and Victorian Early Years Learning and Development Framework (VEYLDF). Many of the programs cover vast areas of learning, including science, design, technology,

mathematics, critical and creative thinking, ethics, and more (ZV, 2020a).



Figure 2. Students visiting Healesville Sanctuary to conduct a scientific investigation (ZV, 2020a).

The project-based learning aspect of these programs engages the students with wildlife in an impactful way. Project-based learning often involves completing a tangible task which gives the experience a deeper meaning (Ramey-Gassert, 1997). Oppositely, traditional classroom learning is more abstract and has little to no connection with the real world. By utilizing project-based instead of traditional classroom learning, the student experience is more memorable. These experiences are invaluable because they will spark further interest and curiosity among the participating students.

Zoos Victoria also provides resources for Victorian teachers to help them incorporate wildlife conservation into their classrooms. Teachers who have connections with their local wildlife conservation organizations can offer more real-world learning opportunities to their

students. Zoos Victoria works to support teachers through professional development and networking events designed to educate them on the best practices for inspiring students about wildlife. Teachers can obtain a teacher membership, which offers exclusive access to hands-on conferences and workshops. Free web conferences are also available for non-members. Zoos Victoria designs these programs to follow the Australian Professional Standards for Teachers (ZV, 2020e).

Additionally, Zoos Victoria offers work experience programs to inspire the next generation youth to work with wildlife, or join the Zoos Victoria workforce. Zoos Victoria is not the only organization that promotes wildlife conservation education. Each of its partner organizations works diligently to motivate and inspire others to practice conservation efforts.

THE STATEWIDE INTEGRATED FLORA AND FAUNA TEAMS (SWIFFT)

As a partner organization of Zoos Victoria, the Statewide Integrated Flora and Fauna Teams (SWIFFT) is an independent network dedicated to providing free resources related to threatened species and biodiversity conservation. The SWIFFT website (Fig. 3) features information

about flora and fauna in the state of Victoria as well as opportunities to get involved with wildlife conservation. SWIFFT highlights citizen science initiatives by emphasizing community and collaboration from its wide range of partner organizations and others who have an interest in wildlife conservation. In addition to Zoos Victoria, SWIFFT's partner organizations include the Helen Macpherson Smith Trust, the Department of Environment, Land, Water and

Planning, and CeRDI at Federation University Australia. Their wide range of partners and pre-existing website infrastructure make them an excellent candidate for an application that connects teachers with independent conservation organizations and real world learning opportunities. This application will fill the gap of a lack of real-world learning opportunities and wildlife conservation topics within the Victorian science curriculum.

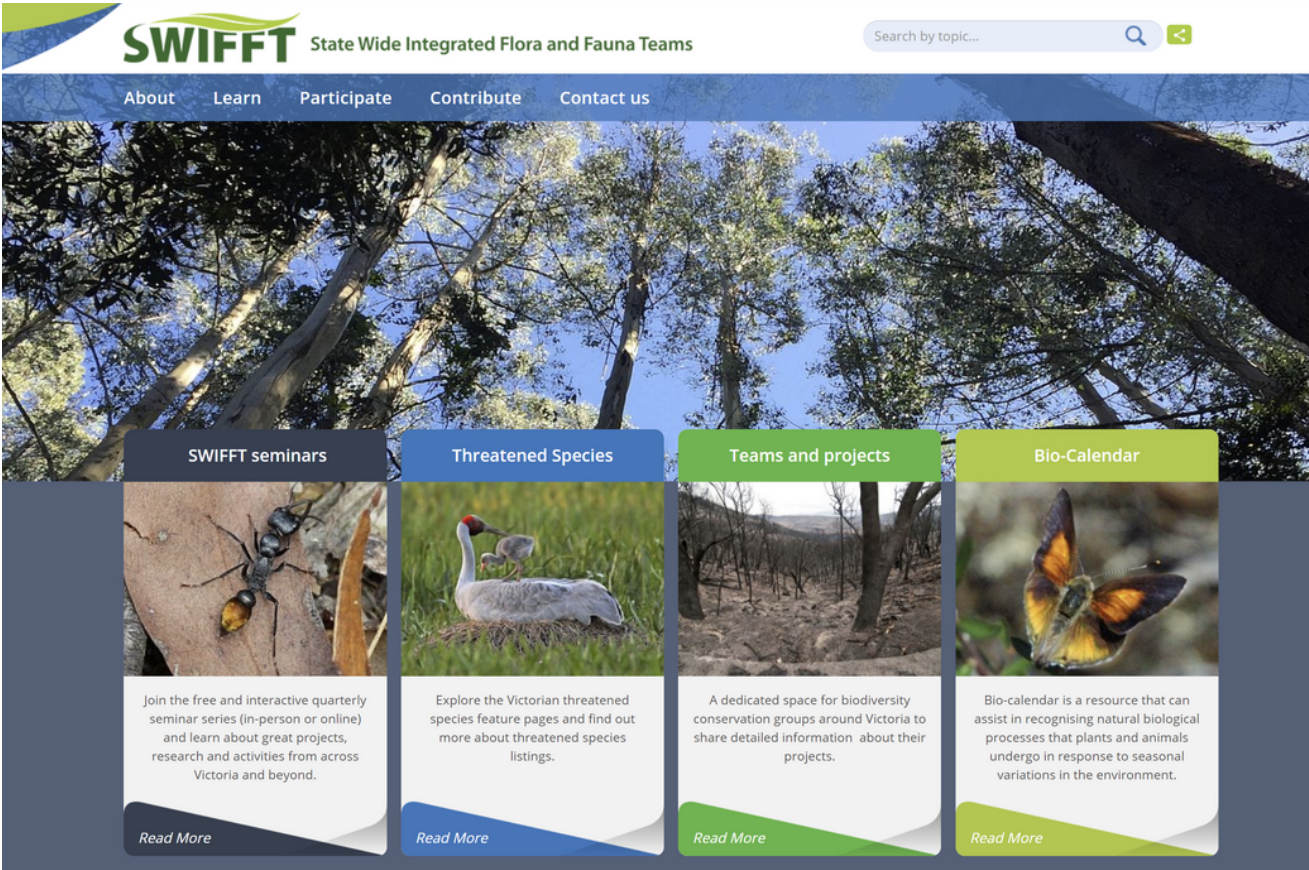


Figure 3. The home screen of the SWIFFT website (SWIFFT, 2020)

VICTORIAN WILDLIFE EDUCATION

The Australian Curriculum Assessment and Reporting Authority (ACARA) develops and approves the class curriculum used in schools throughout Australia. The curriculum that is in place now is called “Foundation – Year 10” or F-10 and it provides a set of guidelines for states to follow and objectives for them to incorporate into their own curriculum. The Victorian Curriculum and Assessment Authority (VCAA) uses its own version of F-10 that reflects Victorian priorities and standards. However, neither curriculum covers the topic of environmental science or animal conservation issues. In doing so, the VCAA loses an opportunity to utilize the impact that teachers have on their students to make them passionate about wildlife conservation.

Victorian Science Curriculum

The VCAA mandates all primary schools to use the F-10 curriculum, which outlines eight different learning areas and three cross-curriculum priorities (Fig. 4). Cross-curriculum priorities are topics embedded in all areas of the curriculum in order to instill in students a more holistic and global world view. Sustainability was originally incorporated as one of these principles in 2008 in an attempt to make the curriculum consistent with the “Melbourne

Declaration on Educational Goals for Young Australians” (Gough, 2011). As a result of sustainability being a cross-curriculum priority, environmental science is not included as part of the F-10 science curriculum.



Figure 4. The Three Dimensions of the Australian Curriculum (Australian Curriculum, 2020)

The science curriculum instead focuses on helping students become scientifically literate and building a strong foundation in the biological, chemical, physical, earth, and space sciences (VCAA, 2020). In fact, environmental science is not offered as a separate subject until senior secondary school, which consists of grades eleven and twelve, and it has the lowest enrollment of all the science subjects (ACARA, 2020). The lack of formal environmental science education in Victorian primary schools emphasizes the vital role that independent

organizations must take in teaching young people about conservation issues.

Impact of Teachers on their Students

Teachers are the key to inspiring interest and concern in wildlife conservation issues among students. A study was conducted at a high school in rural Western Australia where researchers asked students about the impact that their teachers had on their learning, the good and bad qualities of teachers, and the teaching curriculums used in their classes (Strikwerda-Brown et al., 2008). The researchers' findings suggest that the students' success and overall interest in classes directly linked to the quality of the teachers. Thus, having unfavorable experiences learning about a topic negatively influences peoples' feelings towards it permanently. By connecting good quality teachers with conservation partners, we hope to create more interest in wildlife conservation issues among students.

KEY FEATURES OF WILDLIFE CONSERVATION APPLICATIONS

As teachers are the key to inspiring action among the younger generation, one way to inform teachers about wildlife conservation issues is to support them with an application that contains a wide range of conservation resources.

There are several applications that focus on wildlife conservation in terms of connecting, informing, and teaching people. Determining and evaluating applications that are similar to the one that was developed in this project is essential for establishing the application’s initial framework. The key features of applications that are relevant to the project were:

- Informational Features
- Location-based Features
- Classroom Resource Features

Informational features, which consist of facts and figures, provide additional knowledge to the user about the intended purpose of the app. Many applications convey these in an engaging and visually appealing manner to retain the interest of the users. Location-based features provide users with a unique experience of being able to view personalized content based on their locale. They also give users the ability to view any area they want, letting them gain different perspectives of the world. Location-based features can vary as some might be interactive maps, while others might just be finding local news. Classroom resource features supply teachers with access to lesson plans and activities that will enhance the learning experience of their students.

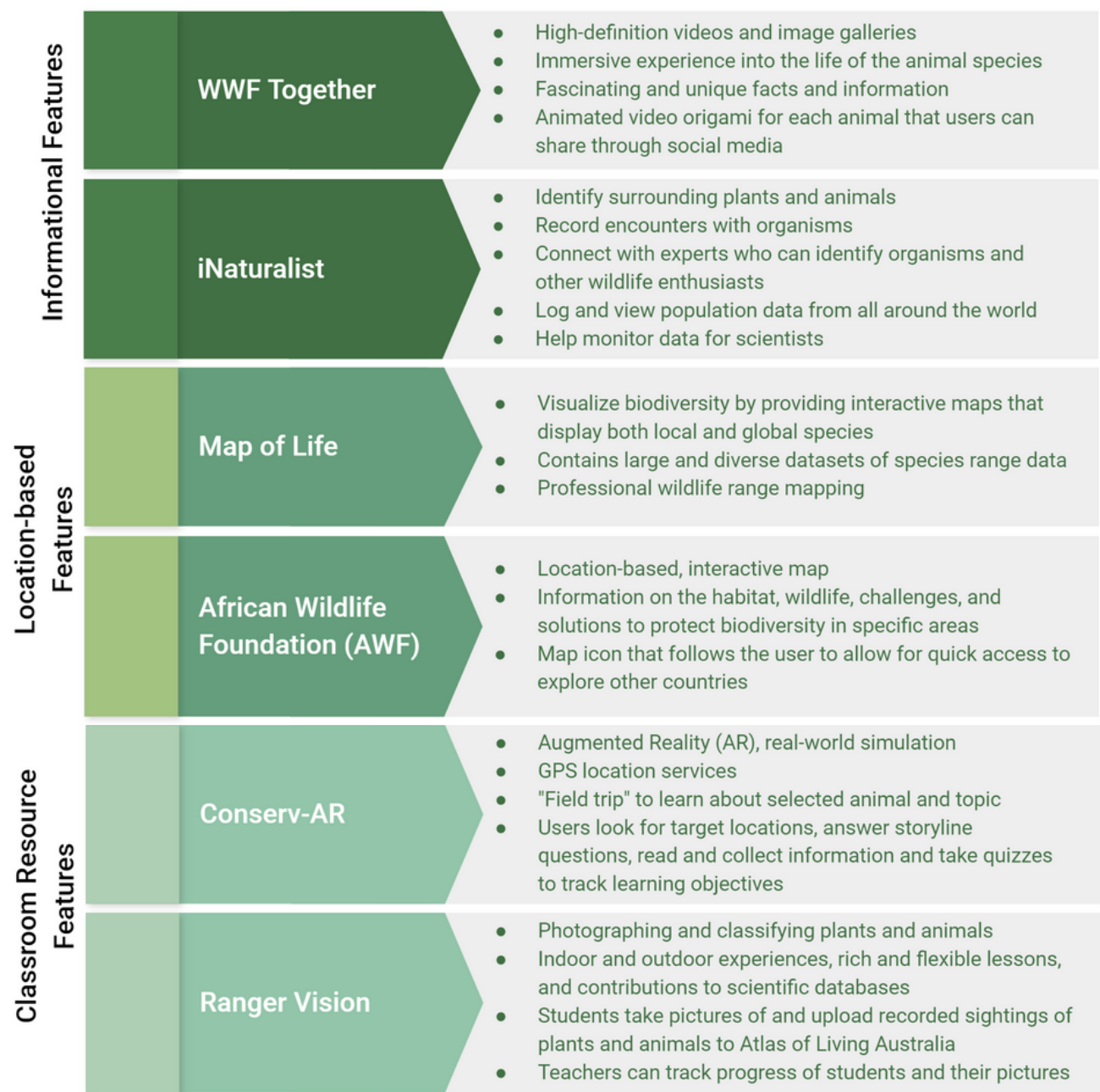


Figure 5. Examples of informational, location-based, and classroom resource features in conservation applications.



METHODOLOGY

The goal of this project was to assist Zoos Victoria in raising awareness for wildlife in the state of Victoria by developing a web application that connects teachers with local conservation groups and provides them with real-world learning opportunities. Our web application, SWIFFT for Teachers, is designed specifically for integration into the SWIFFT website. Once our design is incorporated into the SWIFFT website, it will support Zoos Victoria’s initiative to provide real-world learning experiences to

students in hopes of inspiring future leaders to support wildlife conservation efforts.

Due to the COVID-19 pandemic that began in early 2020, international travel was restricted and the project had to be completed remotely. To complete our objectives for this project, we followed the development process in Figure 6.

First, we assessed the needs of teachers to create a list of initial specifications for the application.

Next, we aggregated educational resources from conservation groups. We then developed a mockup of the application following the initial specifications and incorporating the resources previously identified. After that, we assessed the design and feasibility of the application and made changes in response to teacher feedback. Lastly, we developed plans to aid the future development of our application.

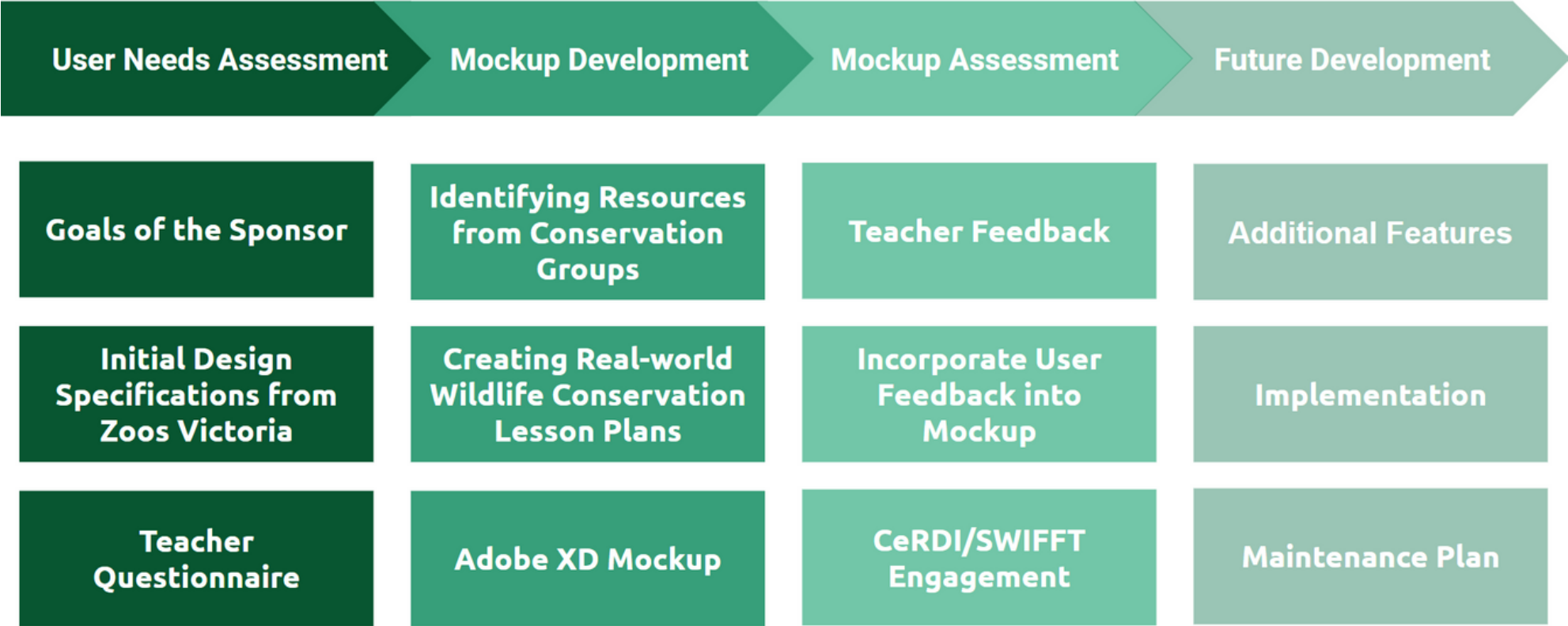


Figure 6. The process diagram for this project.

DISCOVERING WHAT FEATURES TEACHERS DESIRE IN THE APPLICATION

This objective focused on gathering information and inspiration from school teachers to design a web application that appeals to them, the potential users. Teachers will devote more time into using and sharing the web application if they believe that their opinions and views contributed to its design. For this reason, the project team obtained their perspectives from:

- A list of initial design specifications developed by Zoos Victoria
- A teacher questionnaire

Initial Design Specifications from Zoos Victoria

In order to complete the first objective, we needed to do some information gathering from members of the community who specialize in working with teachers. The Education Strategic Team of Zoos Victoria first identified the opportunities and challenges of teacher access to real-world learning opportunities by focusing on two main questions:

- What enables teachers to work with people outside of school gates?
- What obstacles/blockers do teachers face?

A document of possible answers to these questions and proposed design specifications for the web application served as qualitative data for analysis. From this document, we extracted major themes and organized them by their potential to become a feature. After identifying these actionable ideas, we incorporated them into our design process.

Virtual Teacher Questionnaire

We created a virtual questionnaire to receive input from teachers in the United States in order to supplement the list of initial design specifications. We identified teachers with personal relationships to team members as possible participants because it was more likely for them to dedicate time to the questionnaire during the COVID-19 pandemic. To create the questionnaire, we utilized the Qualtrics Survey Software and focused on teachers' opinions on applications that they use to create lesson plans. Some questions in the questionnaire were:

- Do you currently use any applications to assist you in creating your curriculum?
- In general, what do you like/dislike about these applications?
- Do you currently incorporate wildlife conservation topics in the classroom?
- Would you use an application to aid you in this process?

Recorded reports from the questionnaire served as qualitative data for analysis. From these reports, we extracted major themes and organized them by their potential to become a feature. After identifying these actionable ideas, we incorporated them into our design process.

DEVELOPING THE MOCKUP OF THE APPLICATION

This objective was twofold. The first part focused on identifying and collecting resources, such as general information, opportunities to get involved, and educational activities, from key supporting conservation partners of SWIFFT to include in our mockup of the application. Using these resources, we created seven lesson plans that served as examples in the mockup of the application.

The second part details how we developed a prototype for our project. By following the steps listed in these processes, we ensured that our application adhered to the needs and capabilities of the users. The HCD process focuses solely on solving a specific problem while keeping the user in mind during all stages of development. Moreover, Agile Project Management and Scrum were essential for creating an application and continually building upon previous designs to ensure that the prototype will be suitable for

investors and stakeholders. Both processes are valuable tools for developers to utilize during all software development projects.

Creating Real-world Learning Lesson Plans

Due to the global COVID-19 pandemic, it was difficult for the team to contact conservation organizations to inquire about their educational resources on wildlife conservation. Instead, the team extensively researched the conservation partners of SWIFFT to gather information about current projects that they support as well as any learning material available on their respective websites. We incorporated these resources into the mockup of the application and compiled them as a deliverable. It should be noted that SWIFFT has a plethora of partners with valuable educational resources. The conservation partners chosen for research are only a small portion of SWIFFT's partners due to the time limitations of the project.

In order to create these lesson plans, the team extensively researched the conservation partners of SWIFFT to gather information about current projects that they support as well as any learning material, such as activities or recommendations, available on their respective websites.

We created seven real-world lesson plans

inspired and influenced by the educational resources from conservation organizations. These lesson plans act as example templates for future users to follow when making lesson plans out of the educational resources provided on the web application. Each lesson plan has the same structure to provide continuity of examples posted on the application.

Adobe XD Mockup

To develop a mockup web application for our project, we used Adobe XD. Due to the varying degrees of technical and programming knowledge across our team, we wanted to choose a prototyping tool that adhered to the following criteria:

1. The tool must be able to create hi-fidelity prototypes.
2. The tool must be easy to use and understand.
3. The tool must allow for collaboration among at least four people.
4. The tool must be cost-efficient.

Adobe XD meets these criteria as it is a collaborative, vector-based design tool for web and mobile applications that requires no prior knowledge of coding or technical skills. The software provides an easy-to-use interface for designing both low-fi and hi-fi prototypes and is free for students. Our team explored all of the

features of Adobe XD, such as components and animations, and incorporated them into our mockup. Over the course of the project, we continually made revisions to the mockup per the Human Centered Design (HCD), Agile Project Management and the Scrum Methodology.

Following the Human-Centered Design (HCD)

The HCD process is an iterative process that focuses on ascertaining the right problem and the right solution with the future user in mind (Norman, 2013). Within each iteration, there are four activities as seen in Figure 7:

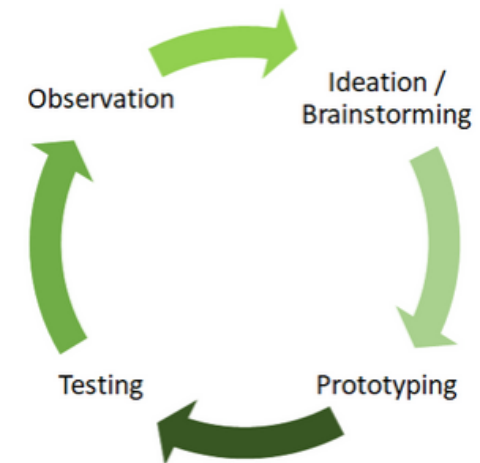


Figure 7. The Iterative Cycle of the HCD process.

The project team acted as the product designers and used the HCD process iteratively to guarantee that the final product satisfied the needs of the potential users. In the first step of

the HCD process, we analyzed results from a list of initial design specifications developed by the Education Strategic Team of Zoos Victoria and sent a questionnaire to teachers to find out what features they find helpful and useful to this web application. After gathering information from teachers and conservation partners, we brainstormed possible solutions for figuring out how to best incorporate their feedback and suggestions into the application.

For the prototyping step, we developed several mock-ups of the application using Adobe XD. Additionally, we used the Agile Project Management and Scrum Methodology in this step to ensure the improvement of our product during development. Finally, for the last step of the HCD process, we tested the functionality and user interface on potential users with a feedback form to determine how to improve our web application web application for ease-of-use, simplicity, and appeal.

Utilizing the Agile Project Management & Scrum Methodology

Agile project management is an iterative approach to managing software development projects that focuses on continuous product releases and incorporating customer feedback with every iteration (Atlassian, 2020). Scrum is a

framework for Agile that software and technology industries utilize due to its structure of roles, meetings, and rules (Cprime, 2020). Teams usually consist of about seven people, and the goal of the team is to deliver a releasable product at the end of each “sprint,” the name given to the fixed-length iterations (Scrum Reference Card, 2014). As shown in Fig. 8, each team uses a product backlog to manage the tasks they have to complete. The backlog consists of user stories, which represent features that are important to the product’s user base and appear in the prototype. At the beginning of each sprint, the team chooses a reasonable amount of achievable user stories to complete by the end of the sprint and moves these to the sprint backlog.

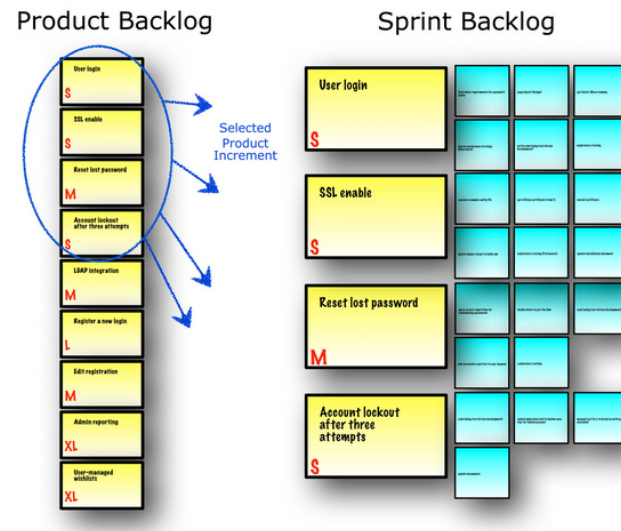


Figure 8. Agile Scrum Product and Sprint Backlogs (Scrum Reference Card, 2014)

At the end of each sprint, the team presents and demonstrates their product to the stakeholders in the scrum review meeting to receive crucial feedback that the team will implement in the next sprint as seen in Fig. 9.

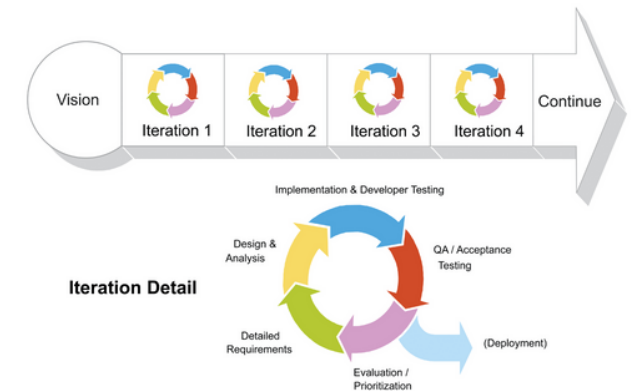


Figure 8. Agile Scrum Iteration Map (Scrum Reference Card, 2014)

The project team utilized the Agile Scrum methodology to ensure the creation of a prototype that meets the needs of both our sponsor and the platform’s user base. Agile was the best choice for this project because it incorporates the needs of the stakeholders and the users at every step of the iteration process.

TESTING THE MOCKUP OF THE APPLICATION

To test our mockup with potential users, we sent out a feedback form to teachers in the United States. Due to the constraints of the global

COVID-19 pandemic, feedback forms were necessary to solicit teacher assessment of our mockup because of their dynamic ability to help improve products and/or services by capturing feedback and satisfaction. We identified teachers with personal relationships to team members as possible participants because it was more likely for them to dedicate time to the form during this time. To create the feedback form, we utilized the Qualtrics Survey Software and included a consent form for permission to transcribe and incorporate the responses for data analysis in this project. The beginning of the form gathered information about the teachers, such as the grades and topics that they teach in schools, with about half of the respondents saying that they teach science topics in the classroom. The rest of the questions on the form asked questions about specific tasks that the participants were instructed to do. The tasks were:

- User interface/design aspects of the pages
- Ease-of-use
- Comprehension of the wording and icons
- Any improvements or suggestions

Recorded responses from the feedback form served as qualitative data for analysis. From these responses, we extracted major themes and ideas and organized them by their potential for inclusion in the mockup. Then, we assessed the

pros and cons of incorporating these ideas into the mockup and made appropriate changes.

CREATING A FUTURE DEVELOPMENT PLAN FOR THE APPLICATION

The future development plan for the application was developed by working closely with the Centre for eResearch and Digital Innovation (CeRDI), the group who is currently responsible for the design and upkeep of the SWIFFT website. The plan for this application consisted of three sections:

- Additional Features
- Implementation
- Maintenance

For the implementation and maintenance sections, we had a conversation with the CeRDI development team. In this conversation, we discussed the following topics:

- Who would manage the site?
- What would be the technical integration process into SWIFFT?
- What are the storage requirements?
- Who would manage accounts?
- How would resources be kept up to date and how would they be stored?







We organized a transcript containing all the information gathered from this meeting into the topics listed above and incorporated it into the corresponding maintenance sections in the future development plan.

A small tree frog with brown and yellow stripes is perched on a large green leaf. The frog is facing right, and its body is covered in brown and yellow stripes. The leaf is large and green, with prominent veins. The background is a blurred green, suggesting a natural habitat.

WEB APPLICATION: SWIFT FOR TEACHERS

FEATURES TEACHERS DESIRE IN THE SWIFFT FOR TEACHERS APPLICATION

We assessed the initial specifications from the Education Strategic Team at Zoos Victoria and teacher questionnaire for feasibility for becoming a feature in the application. We sorted these ideas by similarity to each other and then into distinct categories. From the categories, we identified a total of six features that teachers desire:

-  **Categorise** the needs of school teachers
-  **Quick** and **easy** access to information and real-world learning opportunities
-  Creating **relationships** within the community
-  Identify **local** organizations that offer programs to **engage** students
-  **Sharing** information and advice with other teachers
-  Information about their **local** natural environment and projects

We implemented these features in the application design process in order to build an application that appeals to the future users, school teachers.

FEATURES OF OUR WEB APPLICATION

Our proposed solution for the SWIFFT website is the addition of a “Teachers” tab on the homescreen of the web application. This tab

consists of three major components, which we identified as crucial to our user base as seen in Fig. 10:

1. The Explore Resource page
2. The My Workspace page
3. The Community page

The first component is the Explore Resources page, which is an area for teachers to search for educational resources that fit their classroom needs and identify local organizations that offer

programs to engage students by offering opportunities to bring them out of the classroom. The second component is the My Workspace page. This page is a personalized space for teachers to view and organize their favorited resources. The third component is the Community page, which is a community forum where teachers and community members can communicate.

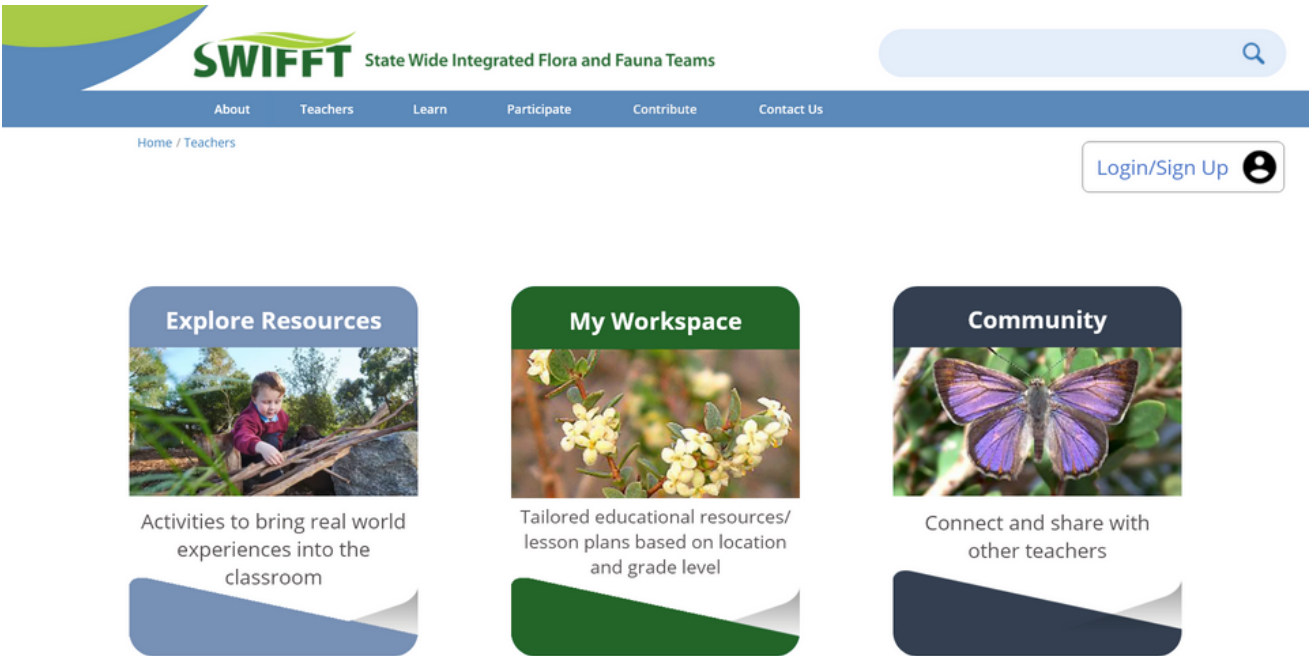


Figure 10. SWIFFT for Teachers - Teacher Home Screen

Explore Resources

The Explore Resources page (Fig. 11) is the most prominent of our proposed features and the one that is likely to be utilized the most by teachers. This page serves as an area for teachers to easily search for resources of many different categories such as:

- Real World Learning Opportunities
- Lesson Plans
- Classroom Activities
- Citizen Science Initiatives
- Threatened Species Information

Teachers can filter the list of resources displayed on the right side of their screen by using the extensive filter options presented on the left side. They can filter resources by category, location, education level, and learning area. Additionally, there is a search bar above the filter options that allows teachers to enter custom criteria to help them find the exact type of resource they are searching for.

Each resource displays its name, description, category, and educational level. Teachers can click on each resource's picture to navigate to that resource's page containing more extensive information about it as well as additional resources that may be attached.

At the top of this page, there is a share button that allows teachers to share resources with other teachers. In addition to sharing resources, teachers can also favorite resources by pressing the star button located in the top right corner of each resource preview. Each resource that is

favorited will now have a gold star to indicate that it has been favorited and saved to that user's My Workspace page.

The screenshot shows the SWIFFT website's 'Explore Resources' page. The header includes the SWIFFT logo and navigation links: About, Teachers, Learn, Participate, Contribute, and Contact Us. A search bar is located in the top right corner. Below the header, the page is divided into a left sidebar with filters and a main content area with search results.

Filters:

- Category:** Real World Learning Opportunities (RWL), Citizen Science Initiatives (CS), Threatened Species Information, Lesson Plans, Classroom Activity.
- Location:** 3741, Alpine Shire, within 10 km.
- Education Level(s):** Early, Foundation - Year 2, Year 3 & Year 4, Year 5 & Year 6 (checked), Year 7 & Year 8, Year 9 & Year 10, VCE, Tertiary, VCAL.
- Learning Area:** Biodiversity (checked), Biology, Camps, Critical & Creative Thinking, Design and Technologies, Environmental Science, STEM.

Search Results:

- Local Legends:** Melbourne Zoo | Year 3, Year 4. RWL. 28 Jan - 18 Dec, Mon-Fri. In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures. Links to Victorian Curriculum levels 3-4 Geography and Science and Intercultural Capabilities.
- Citizen Science - General:** Victoria, AUS | All Ages. CS. Explore SWIFFT's database of Citizen Science initiatives in Victoria, Australia. Links to SWIFFT - Participate - Citizen Science.
- Threatened Fauna Alpine Shire:** Alpine Shire, AUS | All Ages. SPECIES. Learn more about the threatened fauna found in the Alpine Shire. Links to SWIFFT - Threatened Fauna by Local Government Species - Threatened Fauna Alpine Shire.

Each resource preview includes a star button in the top right corner for favoriting.

Figure 11. SWIFFT for Teachers - Explore Resources Page

My Workspace

The My Workspace Page (Fig. 12) allows teachers to view and organize their favorite resources that they discovered from the Explore Resource page. In order to provide this customized content, teachers must sign into their accounts prior to viewing this page of the web application. The page organizes resources by category inside one of four collapsible sections:

- Real World Learning Opportunities
- Lesson Plans
- Citizen Science Websites
- Community Forum Posts

Teachers can further organize their favorite resources by creating new folders on the left side of the screen. They can move resources into these folders by pressing the folder icon to the right of a resource and then selecting the folder they wish to move the resource into. The purpose of these folders is to provide an extra organizational tool to teachers, so that they can take the resources they have found and group them together not just by category, but by how they plan to use them in their classroom. Additionally, teachers can download resources from this page by pressing the download icon associated with it or they can remove it from their workspace by pressing the gold star icon.

SWIFFT

State Wide Integrated Flora and Fauna Teams

About

Teachers

Learn

Participate

Contribute

Contact Us

Home / Teachers / My Workspace

My Workspace

My Folders

■ Add New

■ Biodiversity Unit

■ Local Species Unit

■ Outdoor Activities

■ Potential Class Activities

Real World Learning Opportunities

Caring for Animals | Terms 1 and 2 2020

Equip your students with new STEM skills and knowledge whilst designing solutions for Zoo animals.

↓

📁

★

Saving Endangered Species | Terms 1 and 2 2020

Explore Healesville Sanctuary, meeting our unique, endangered wildlife and learn what you can do to help fight extinction. Are you up for the challenge?

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Eat or be Eaten

In the wild it's a case of eat, or be eaten. Animals are specially adapted to digest their favourite food and avoid being eaten themselves.

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Local Legends

In this new version of the Local Legends program, students will discover animals that are Local Legends and learn how they can become a hero in the lives of these unique creatures.

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Lesson Plans

They're Calling on You

Get involved in Zoos Victoria's They're Calling on You campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum experience exploring inquiry questions that investigate wildlife...

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Wipe For Wildlife

Get involved in Zoos Victoria's Wipe for Wildlife campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack will help you guide students through an integrated curriculum experience exploring inquiry...

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Love Your Locals

Get involved in Zoos Victoria's Love Your Locals campaign with this specially designed Teacher Resource Pack. With access to a range of unique resources and classroom ideas, this pack...

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Zoos: For People Or Animals?

In this lesson, students tune into the topic of zoos and animal welfare. The class begins by participating in a 'Stand On The Line' barometer activity about their understanding and thoughts on animals and zoos. They are then introduced to the topic of animal welfare...

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Citizen Science Websites

Community Forum Posts

Hello, Charlotte!

Figure 12. SWIFFT for Teachers - My Workspace Page

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Community

The Community page (Fig. 13) is a place where teachers and other community members can communicate to exchange their ideas and experiences regarding incorporating conservation issues in the classroom. The page mimics a forum. This page displays all forum posts on the right hand side of the screen and sorts them from newest to oldest by default. Each post displays the title of the post, the time the post was shared, the name of the author of the post, and a preview of the post content. Teachers can comment on posts, share them through social media or save posts right from this screen to the My Workspace page by clicking on the respective icons.

On the left side of the page, there is a filter option that allows teachers to quickly sort and filter posts so they can easily find relevant ones. Currently, posts can only be sorted by the following categories:

- Real World Activities
- Lesson Plans
- Conservation Organizations
- Questions

They can also find more specific results by typing in keywords in the search results bar. Furthermore, teachers can make a new post by

clicking the “Create Post” button located above the list of forum posts. On the “Create Post” page, as seen in Figure 4.10, teachers can give their post a title, description, and assign multiple categories to it in order to encourage others teachers or community members to respond to their post. The categories that teachers can tag their posts with are the same ones that appear in the filter section of this page. After creating a

post, a screen containing that post’s page appears, as seen in Figure 4.11. Teachers can then respond to the post by typing their response in the comment text box and then pressing the “Comment” button. All comments appear directly below the post for others to respond to.

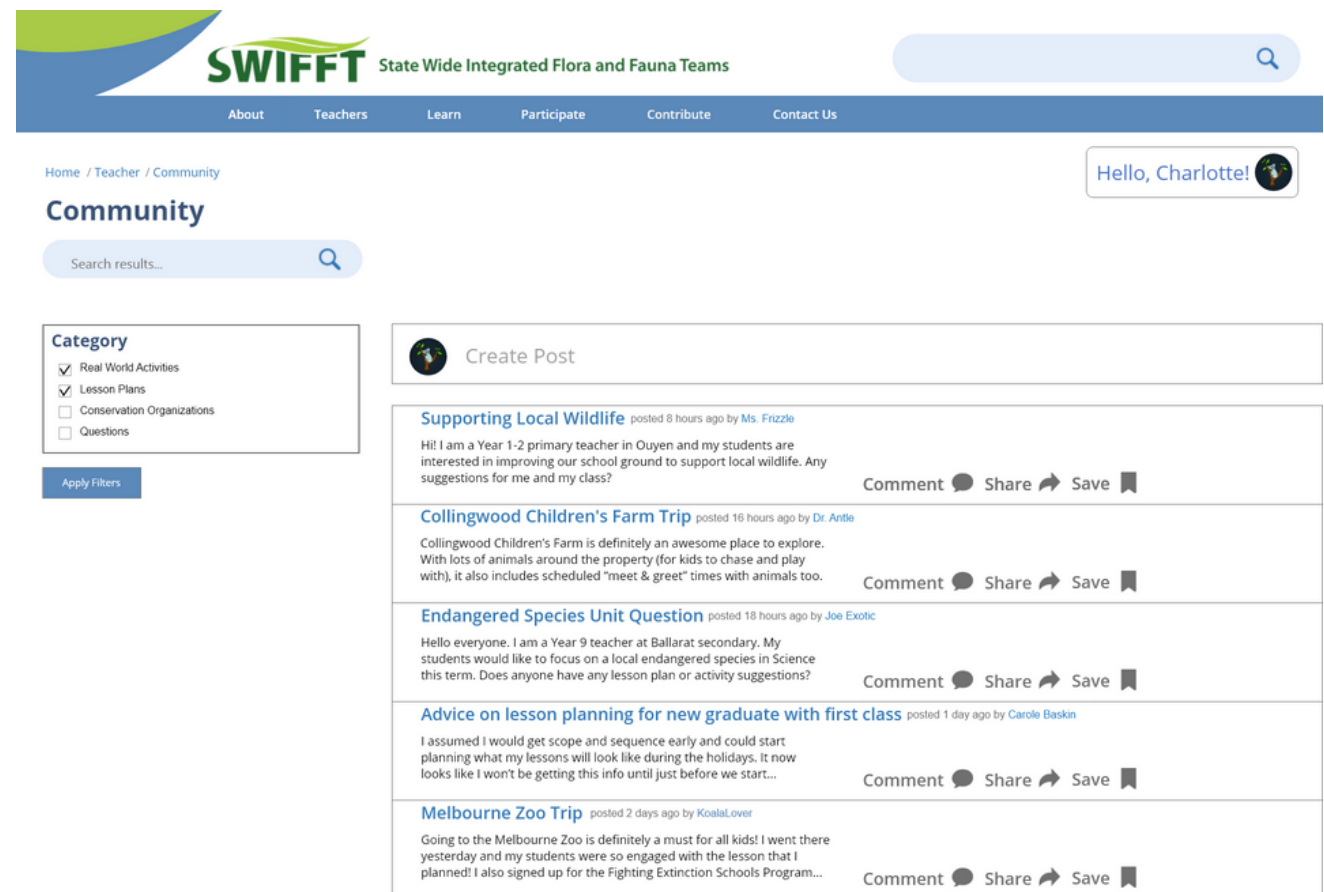


Figure 13. SWIFFT for Teachers - Community Page

FEEDBACK ON THE MOCKUP

After creating a hi-fi prototype of the mockup as part of the testing phase of the HCD process, we gathered feedback about our mockup from teachers in the United States. We analyzed the results from the feedback form and incorporated them into the final design of our mockup.

Results from the Feedback Form

Task 1: Create an Account

When asked to navigate to the login/sign up screen of the mockup, a majority of the participants noted that the design of the login and sign up screens were clean, straightforward, easy to navigate, and easy to understand. They provided suggestions on how to improve the profile pages by adding grade levels that the teachers teach, age groups of the students, and types of school (i.e. public, private, etc.).

Task 2: Navigate through the Explore Resources Page

In general, the participants believed that this page had a user-friendly interface and was easy-to-navigate. Many noted that the design of the page was standard and familiar to them, which allows the user to feel comfortable while using the application. Regarding the filters on this page, three users commented that there should be more learning areas for students in elementary schools,

as these learning areas applied more to students in higher grades. Another teacher commented that the learning areas were too broad. One suggestion from this page was to allow teachers to post the links from this page to one of the services that teachers already use for lesson plans, such as Google Classroom / Site or a Learning Management System (LMS).

Task 3: Navigate through the My Workspace Page

One teacher suggested that the home screen of this page should be organized by content/unit rather than by type of resource as she teaches in units. Some major problems among the teachers on this page included the font size and the visual appeal. The font was too small for many of the teachers, which made the text difficult to read. Additionally, two teachers found that this page was not visually appealing and suggested that there should be more colors and images.

Task 4: Navigate through the Community Page

In general, almost all of the teachers described this page as easy to navigate and simple. Since the design of this page is similar to the My Workspace page, similar comments regarding font size, color scheme, and images appeared from the teachers. When asked to create a post, one teacher suggested the ability to link specific

modules and lesson plans so other users can directly access the document in question. One teacher commented about the lack of consistency of the icons on this page; icons for “share” and “save” were used in the Explore Resources page, but were different icons on the Community page.

Overall, the nine teachers in this feedback form believed that the mockup was simple and creative. When asked about the **simplicity** of the mockup, the average rating from the teachers was an 8.44 out of 10, with a low of 7 and a high of 10 (Fig. 14). The teachers who gave lower ratings (rating of 7 or 8) reasoned that the “confusing wording” and “small font” detracted from the simplicity and ease-of-use of the mockup. On the other hand, those who rated the mockup on the higher end of the scale (rating of 9 or 10) believed that the design was intuitive, familiar, and easy to navigate.

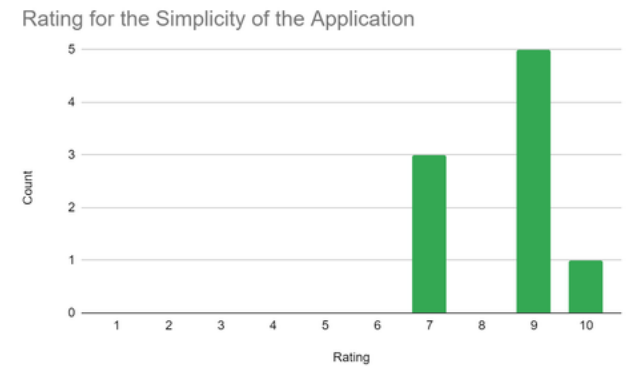


Figure 14. Feedback Form Results about the Simplicity of the Application

When asked about the **creative design** of the mockup, the average rating from the teachers was an 8.56 out of 10, with a low of 7 and a high of 10, as shown in Figure 4.13. People who rated the creative design on the lower end of the scale (rating of 7 or 8) reasoned that there should be more color and images in the design. Oppositely, those who rated the creative design on the higher end of the scale (rating of 9 or 10) believed that the theme was consistent, creative, and appealing and that the design uses images to engage the teachers and capture their attention.

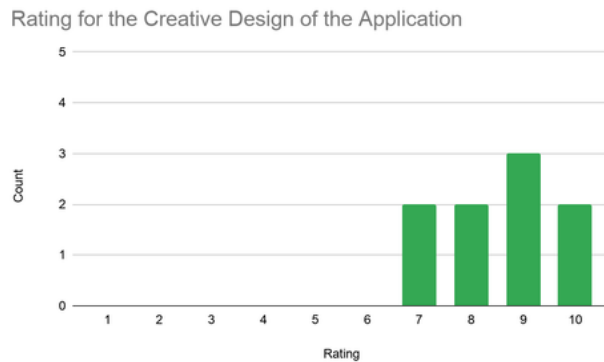


Figure 14. Feedback Form Results about the Creative Design of the Application

Changes to the Mockup

In response to the engagement with CeRDI and the feedback form, we made appropriate changes to the mockup to better fit the desires of the teachers. One change to the mockup was the Community page. Originally, this page solely contained teacher-created resources, meaning

that there were two places on the mockup that had resources. Since organizing the resources in this way was inefficient and repetitive, we combined the teacher-created content with the organization-created content in the Explore Resources page and used Community to host a forum.

Another change to the mockup was the with the filter options in the Explore Resources page. We gave the users more control over the search results by incorporating a search bar for more advanced results and provided more categories for resources. Furthermore, we replaced any “vague” or broad learning areas, such as science, with more specific ones, such as biodiversity and environmental science.

The format of the resulting resources on the Explore Resources page also changed to clearly categorize the types of resources featured on this page. We used color-coded categories and added markers of each category to the resulting resource boxes. Also, we added dates to the real-world learning opportunities because these have specific dates and times and sorted them from most recent to oldest to allow teachers to find eligible resources easier.

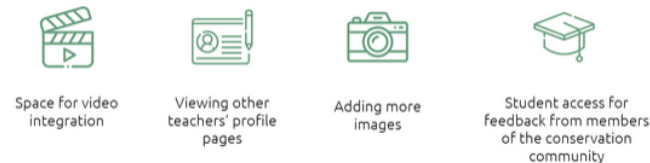


FUTURE DEVELOPMENT

The purpose of this section is to provide a brief overview of additional feature recommendations to our mockup and our implementation and maintenance plans. The implementation plan is a guide to anyone that will continue the development of our project by providing a manual that contains our proposed design and a maintenance plan that describes how to deploy our project to the SWIFFT website.

ADDITIONAL FEATURES

Based on the results from the feedback form, there are several future improvements that could be made to our mockup. They are:



One is creating a space for video resources. One of our teachers in the feedback form noted that “Children love videos and they are a great learning tool!”. Our sponsor also expressed an interest in incorporating videos through SafeShareTV, which is a platform similar to YouTube, that will allow for teachers to find appropriate videos for use in the classroom. We would also like to add the functionality for viewing other teachers’ profile pages, which would foster deeper connections between teachers. Another improvement is adding more

images to the website to increase the visual appeal. As previously seen, a couple of our pages have a lot of text and boxes so adding more videos and colors will add to the visual appeal of the site. The final future improvement is adding student access so students can ask their own questions, view resources, and ask for feedback from conservation members on the work they are doing.

IMPLEMENTATION

After presenting our mock-up to the developer team, we established a plan to slowly roll out our proposed changes to SWIFFT in order to receive further feedback from users. The Explore Resources page will be the first page to be implemented, although it will not yet feature the ability to favorite resources and store them on

user accounts. From this initial test, CeRDI will be able to gauge the interest of its users in this page before adding the My Workspace page, which allows for further customization of the resources contained in the Explore Resource page in addition to teacher accounts. Lastly, the need for a Community page and forum will then be re-evaluated based on the success of the other two pages. This is due to the difficulty of motivating teachers to speak openly on an online public forum, a problem our sponsor has encountered in the past with their own Facebook page for Victorian teachers.

MAINTENANCE PLAN

In order to develop a maintenance plan for our proposed additions to the SWIFFT website, we worked closely with the developers from CeRDI.

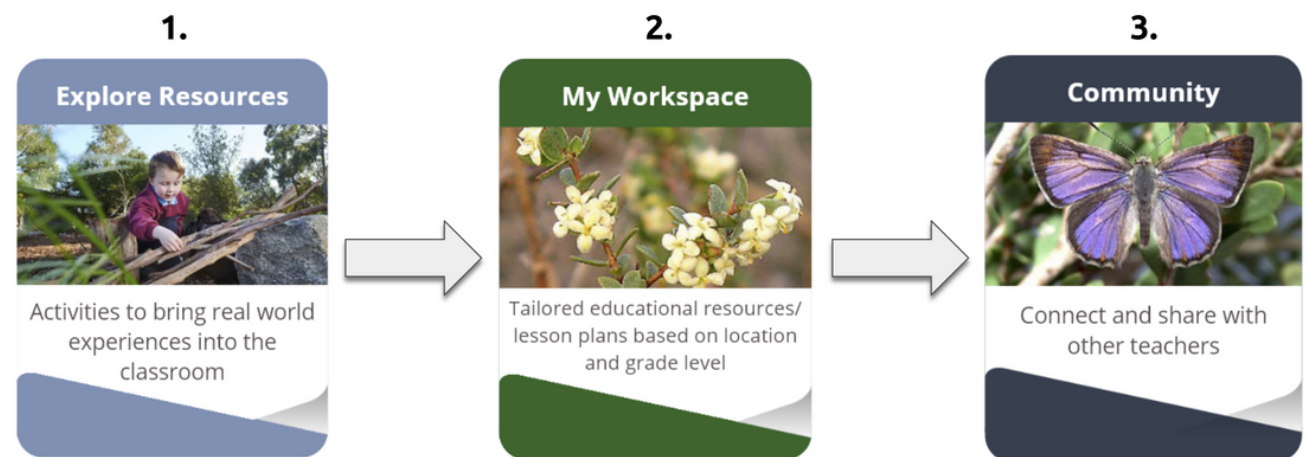


Figure 15. Implementation Process

The maintenance of the SWIFFT site will be greatly facilitated by CeRDI's own in-house content management system (CMS) called Content Builder. A CMS is a powerful tool that allows for people with little to no programming experience to maintain and update their website. We recommend that CeRDI should continue using Content Builder, as the volunteer who currently maintains the site is comfortable with it. The web application will utilize the CMS to add new teacher resources, keep existing ones up to date with new information, and to remove old real-world learning opportunities that already occurred.

The Explore Resources page, which is the main proposed addition to the site, will require little to no additional storage. This is because we plan to utilize existing resources from the SWIFFT page as well as new ones that have been aggregated from conservation organizations. This will entail re-categorizing the existing resources to meet the criteria of the new teacher resources. Furthermore, the pre-existing Resource Library page on SWIFFT will provide a solid structure for this new page. Lastly, the My Workspace page may also require a separate database in order to store user data, which CeRDI has previous experience with from their other websites. Both CeRDI and our sponsor have expressed interest in allowing teachers to login

via their school emails in order to encourage more teachers to use the site by removing the hassle of having to create an account. The user data used on the My Workspace page will consist solely of each teacher's organizational folders and favorite resources so that they may access them without having to browse Explore Resources to find them again.

Recommendations

As previously mentioned, CeRDI uses Content Builder as the CMS for the SWIFFT website. However, if there is interest in transitioning away from Content Builder in the future, we recommend that CeRDI use WordPress for their new CMS due to its extreme popularity, flexible and simple interface, and ability to be self-hosted with the SWIFFT website for no extra cost. Another advantage of WordPress is that it meets CeRDI's commitment to open-source software.

Moreover, the CeRDI development team has expressed interest in moving away from their existing search engine, SWISH-E, and to one that is more efficient and provides more relevant results. We recommend Algolia for this purpose as it is the leading search API used among software engineers and is capable of delivering real-time results based on less user input.



CONCLUSION

The goal of this project was to assist Zoos Victoria in raising awareness for wildlife in the state of Victoria by developing a web application that connects teachers with local conservation groups and provides them with real-world learning opportunities. Our application addresses the need for a platform that can both aggregate wildlife conservation classroom resources and meet the needs of busy teachers who want to teach wildlife conservation through the use of real-world learning. The three components of our application enable teachers to easily find relevant resources, foster the creation of lesson plans for the classroom, and allow the teachers to communicate with similar-minded individuals.

Despite the limitations to this project imposed by the COVID-19 pandemic of 2020, there is potential to build upon our deliverable of a high-fidelity prototype of a web application to construct this necessary platform. We designed the prototype specifically for integration into the SWIFFT website. It features the same color scheme and structure as the current SWIFFT site and it uses resources that are already available on the site or included in CeRDI's repertoire of prebuilt resources from other sites. Furthermore, conversations with the SWIFFT/CeRDI development team suggested that our design is achievable and is likely to be developed in the future.

All in all, using this web application will aid teachers in educating their students through hands-on experiences that are memorable and incite a deeper interest in the subject of wildlife conservation. Providing students with the opportunity to apply learned skills in a real-world context helps them transform working memory to long-term memory. We hope our application is a first step to incorporating wildlife conservation in the classroom through real-world learning opportunities in hopes of inspiring future leaders to support wildlife conservation efforts.



ACKNOWLEDGMENTS

First, our team would like to thank our advisors, Professor Carrera and Professor McCauley, for all of their guidance and support throughout both the prep term and the project term. We know that it hasn't been easy, but we appreciate everything that you have done for us and all of the time that you spent working on the project with us to make sure that we deliver something meaningful to our sponsor and that we have a memorable and rewarding IQP experience.

Much gratitude is also expressed to our sponsor, Mel Wyatt, for her continued support throughout this project despite having to complete our project remotely due to COVID-19. We were devastated when we found out we wouldn't be traveling to Australia, and, more specifically, spending time at the zoo everyday. We were so excited to meet everyone and to see what great work you all do in person. We would love to still come and visit some day when it is safe to do so.

Lastly, we would like to thank Rob Milne and Paul Feely from CeRDI for taking the time to meet with us and their guidance regarding the design and technical aspects of our mockup.

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