Introduction

In 2013, the Francisco J. Ayala School of Biological Sciences entered into a partnership with UCI’s Office of Information Technology (OIT) in order to meet the research needs of their ever-growing undergraduate student population. The result was the “Research Dashboard”, a tool for students to submit and track proposals to research opportunities in the School’s prestigious labs. Now, a year into active use of the tool, we have noticed over a 100% increase in the amount of proposals by students. Thanks to this tool, Student Affairs staff have reduced their proposal management allocated time from 75% to 25%, enabling them to focus more on student academic success. The student affairs staff reports that the amount of time they spend is the same, but the quality of time has improved and the focus has shifted toward a more helpful, service oriented view between their office and the students.

History

Undergraduate students in the Francisco J. Ayala School of Biological Sciences may sign up for Bio Sci 199 Research Opportunities to receive credit for research. To do so, they must
submit proposals outlining their agreed participation in the labs. Over a decade ago, a system was created to aid in this process. This paper-intensive system worked early on but quickly became out-dated, resulting in subpar experiences to a tech-savvy student body.

The process and workflow were as follows:

Every year, in order for students to petition to take the Bio Sci 199 Lab course, students were required to fill out a form on the web and then print the form to get the appropriate signatures. A database of faculty sponsors for research opportunities was kept in an Microsoft Access database. This data was managed through a Microsoft Access form. Students would search a web page, built using ColdFusion at the turn of the century, to sift through a long list of research opportunities that might match their interests.

The student would log into a form using their UCINetID where they would have approximately an hour to complete the form before the browser would drop their login and they would be forced to login again and start all over, losing their work. To prevent this, they were encouraged to write the answers in a Word Document before logging into the system. In some cases, students did not have all of the answers to the required questions and would have to log off and return to the form at a later time once they were able to gather the appropriate information. Students would often have to repeat the application process several times before they were able to get all of the information they needed.

Once the student submitted their form, they could not submit again. At that point, the student would take the printed proposal to their research faculty member who might read their application and require that they make changes to it before they would provide the required signature. If this were the case, the student would need to contact the Ayala School of Biological Sciences Student Affairs office in order to have them release the ability to fill the form out again and the student would need to re-input everything they typed before and make the required changes for the faculty member and go through the entire process again.

After the students turned in their proposal, with the appropriate signatures, an intensive paper-tracking process would begin within the Student Affairs office. Over 1000 papers each quarter would need to be kept in an easy-to-reach location so that it could be retrieved during required meetings with individual students who opted to take a specific type of research lab that requires health clearances and various training certificates before participating.

After each year is completed, these 1000 proposals and packets of information and copies of certificates would then need to be stored for an indefinite amount of time.

Each quarter, students were asked to complete quarterly summary reports, which also had the same limitations regarding being logged out and having to repeat the data entry each time they returned to the form.
Solution

Through the unique partnership created between the Ayala School of Biological Sciences and the Office of Information Technology, a new ‘Research Dashboard’ was created that allows students flexibility, control, and historical documentation of their work in the Bio Sci 199 courses at UCI and staff to focus on working with students rather than being mired by paperwork processes.

OIT performed an extensive series of interviews and information gathering sessions with the school's student affairs staff members Sherry Ong and Kristin Fung to work out the many fine details and nuances of the relationship between the University, the School and the students. During the information gathering session, OIT created workflow diagrams that mapped out each user role and how they might interact with the system. These roles range from the standard cases to the edge case experiences that may exist for a handful of students. The meetings involved a developer, a UX/UI expert, a project manager and the student affairs staff.

Once the student affairs staff agreed that the workflow diagrams for each section of the application detailed the relationships accurately, OIT began an agile development process of developing work to demo every three weeks.

After four months of development work, code-audits, and quality assurance testing, the application was ready to meet the immediate need: allowing a student to create a proposal for their desired Bio Sci 199 lab (pre-approved by the research administrator). Students are now able to search a database of research opportunities and apply for an opportunity directly from the listing. Students can also log into a central dashboard to maintain their proposals and to begin work on new proposals. They can save their work and return at a later date without being logged out of the system.

The student affairs staff are now able to review proposals (regardless of whether they were submitted or not) and complete a two-step review process which requires interaction with our registrar systems, WebReg and WebAdmin. The purpose of the review process was to determine eligibility in terms of required courses taken as well as to enable the Bio Sci 199 course to be listed as an option for students to sign up for. For some students who elected to sign up for labs that require certification and clearances, they staff are able to get these simple eligibility requirement checks out of the way before meeting with the student in person.

The first phase was considered successful by Bio Sci and is used extensively by Bio 199 students. Three months later, OIT implemented the second phase of the project, Quarterly Summary Reports. Now students are able to edit, save and submit a quarterly summary report for each lab that they were enrolled in. Student Affairs staff are able to contact students who have not filled out their required summary reports at any time to remind them of
the deadline. This is important because if the students do not fill out their Summary Report, their transcript will be put on hold until the requirement has been satisfied.

The third phase of the project is to allow for a Quarterly Summary Report review process, performed by the Associate Dean, Mike Leon, Ph.D.

**Timeline**

- **January 2013** - Partnership established
- **July 2013** - Programmer hired
- **August 2013** - Data gathering sessions begin
- **December 2013** - Development begins, data gathering continues
- **June 2014** - Research Dashboard, Proposal Application & Approval Launched
- **July 2014** - Excellence in Research data gathering sessions begin
- **October 2014** - Quarterly Summary Report form launched
- **December 2014** - Quarterly Summary Report Review launched
- **January 2015** - Ongoing support and maintenance
- **May 2015** - Launch more tools to manage faculty members

**Student Affairs Staff**

Before the Research Dashboard was launched, the student affairs staff responsible for BioSci 199 Research Proposal applications were prevented to create a streamlined process to maintain the workflow between the staff, students and faculty members due to the limitations of the technology available as well as the compartmentalized and disassociated way that the information was passed from one party to the next. Furthermore, only the staff members that were assigned responsibility were able to process the proposals, which would create a bottleneck with mounds of paperwork and hours of meetings with students. In many cases, due to the process being so outdated and confusing, students would often be sent away to gather more information or start the proposal process all over again.

After implementation, all student affairs staff members and even student peer-workers were able to log into the system and pitch in a hand during major deadlines and milestones which alleviated the pressure from the primary student affair staff members responsible for the proposal process. In addition to that, the staff members no longer had to spend their time managing students proposals and summary report submissions if the student needed to make a change to the proposal or summary report. The Research Dashboard provided a consistent workflow between the staff and the students that allowed the Student Affairs staff to focus on the student's needs rather than the students paperwork and saved them countless hours of tedious double-checking against various databases or excel spreadsheets regarding both student and faculty eligibility.

**Students**

Before Research Dashboard, students were on a race against time. They had to fill out each proposal or summary report before their authentication would time out, causing them to have to redo their work all over again. Students did not have the ability to save their work or
duplicate it in any way. They only had one shot to print the form for their faculty members to sign and if they lost it, they would have to contact the student affairs office to get their form submission released so that they could redo it.

After implementation, students are now able to work on multiple proposals and save each proposal to come back later for editing. Students receive visual feedback when their proposal is missing items required for submission. They are even given visual feedback that prompts them to submit their summary report each quarter.

Control is at the fingertips of the student as they are able to edit, submit, or even delete proposals that they work on. The process is so intuitive for the students now that they no longer need to call and ask for help about submitting their summary reports. Their queries to the student affairs staff now relate more to their academic career rather than their application process for Bio Sci 199. The same goes for their Summary Reports as well.

Associate Dean
Each quarter, there are 1000+ Summary Reports submitted that must be reviewed by Dr. Leon. We added value to his process by grouping the Summary Reports together by lab rather than presenting him with a long list of people ordered by first or last name. He is now able to see patterns in the reports that would otherwise be harder to recognize when the submissions were not ordered around specific research projects.

Overall, the new project has opened up a new level of service between the University of California, Irvine's School of Biological Sciences and its undergraduate students. Students and staff are able to focus more on the items that matter, including their academic career and interests, and less on details of proposals and application processes or timely submission of Summary Reports. This project empowers the staff to focus on enrolling students in research projects rather than on spending time on paper-intensive processes and releasing locked-up proposals and reports. Finally, it allows the Associate Dean to focus on quality of undergraduate research produced by School of Bio Sci in a more cohesive way.

What’s next?
What's in store for the future of the Research Dashboard? Our next efforts are to implement a way for students to track their progress and process through the labs in order to apply for achievements and Excellence in Research awards, as well as publication in our Campus Journal. We plan to create an interactive interface that helps students write high quality papers to submit for consideration of this honor achievement.

There are endless ways that we could use the Research Dashboard, and we are always keeping an ear to the ground for ideas and suggestions, especially those coming from students as to how we can make their research interests come alive for them and help them interact in a more meaningful way.