

igKnight Project

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Enormous amounts of data and results are being produced from fast-paced research within the broad field of biomedical sciences. Currently, most undergraduate education is centered on teaching sciences as individual blocks of information mostly because each block has become highly specialized. The students are lacking critical reading and writing skills necessary for research. Classes are turning into information silos where ideas from one block become specialized and therefore much more difficult to translate and intertwine with other classes.

We hope to break down the information silos through a scholarship competition that requires the participants to think creatively and critically about high impact research problems in the appropriate context. The participants select a topic to focus on and then study it using our self-paced guide in understanding its multiple faces: The socio-economic context, the impact on the healthcare system and also the clinical progress being made.

Overview

igKnight is structured as a scholarship competition where the participants pick one of the six open problems from the Open Problem Set and being their journeys. The scholars start by filling out the Phase-1 application which is a very quick form. The purpose of this form is to determine eligibility. After a scholar has been approved, they begin Phase-2 which is the scholarship competition. The entire process from start to end takes approximately four months. During this time, the scholars go through a rigorous training process that has three main goals:

- **Literature** - Teaching the scholar how to read research literature. Both review articles and primary literature.
- **Writing** - Teach the scholar how to write a research report.
- **Reading** - Teach the scholar how to present their findings to a panel.

To accomplish these goals, the entire program is designed to support the scholars in two main ways: The first one is an active and guided-approach through our Phase-2 packet. The packet is essentially a manual for the scholars to go through the competition. There are three sections in the packet itself, described as follows:

- **Timeline** - Contains the deadlines, requirements, office hours, and the online courses that the scholars have to complete.

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The scholars will be reading a few papers written by editors of journals on how to break down and effectively read a scientific paper.

- **Reading guide** - A walk through on how to read scientific literature, explained by experts in the field.
- **Writing guide** - A walk through on how to write a research report, explained by us.

The second method to supplement and support the scholars is a list of free Massive Open Online Courses (MOOCs) that they are required to take. Most of these courses are self-paced and require no more than a few days to complete, but the information available in each of the courses has been carefully evaluated. We hope that the packet and the MOOCs help the scholars excel in non-traditional areas which they may otherwise not get any exposure. These speciality areas include an introduction to bioethics, entrepreneurship, technological innovations and research methods.

igKnight front-end

In this section, let us expand on the student-side of igKnight and provide an overview of the packet itself. We briefly discussed the three components in the packet, however, some of those components have a few sub-components as well. The *Timeline* component is more like a compass for the scholars. It contains the following four sub-components:

- **Resources** - A list of resources that UCF offers to the students which they can access to gain additional support for the competition, such as the Writing Center.
- **Deadlines** - A list of hard and soft deadlines. The hard deadlines require the submission of a deliverable whereas the soft deadlines only require a progress update.
- **Readiness level** - A very comprehensive breakdown by levels of all the tasks and readings in the competition. This is designed to help the scholar gauge their own progress and determine how close they are to submitting their final proposal.
- **Office hours** - A list of available office hours for throughout the competition cycle for scholars to walk in and talk to the founding members for clarification with the open problem they picked. This time is not dedicated to help the scholar design their problem, but it is designed to answer particular questions.

The second component of the packet is the *Reading guide* and it deals with helping scholars read and understand scientific literature.



Figure 1: PLOS One has one of the best editorials on how to break down a scientific paper.



Figure 2: Coursera is the main source of MOOCs that we will be using

This section is comprised of readings on what to expect in each section of a research paper. These readings themselves are structured as research papers, however, they provide deep insight into what can be expected from reading new scientific literature. The readings themselves are very straight forward and strongly recommended as the first set of readings in the competition cycle.

The final component of the packet is the *Writing guide* and it deals with actually writing the final proposal that will be submitted as the scholar's entry into the competition. This section is written by the founding members based on a lot of the material presented in the *Reading guide*. This section directly correlates with the open problem set where a very detailed description of the problem is given along with necessary references. Our guided methodology allows the reader to look at the open problem set and answer the question in context as a research report.

igKnight backend

In this section, let us explore the powers, characteristics and the nature of committees that power igKnight. There are 3 of them, explained as follows:

- **Student Approval Committee** - This is a committee comprised entirely of students who have diverse backgrounds and have taken several upper level electives. The purpose of this committee is to review the entire scholarship process and all the related component. Through this review, we can gauge the tweaks that need to be made in terms of practicality and relevance of the proposed problems, resources and the packet. This review portion is designed to signal a level of confidence for the participants as well. A committee of their peers decides whether the proposed problems and the entire competition is doable by the scholars.
- **Faculty Review Committee** - This committee is further divided into two sub-committees: A faculty committee comprised of UCF faculty that will act as reviewers for the applications and score them based on a strict criteria provided to them. The second sub-committee is comprised of partner physicians to the igKnight project who act as the faculty counter part to the Student Approval Committee. The involved partners are experts in their own specialties and therefore very valuable to our project. Their role is to approve the open problems in terms of their impact.
- **Resources committee** - Finally the resources committee has several roles essential internally to igKnight. This committee decides on the marketing and advertising strategies. In addition, this commit-

You might notice that the Phase-2 packet has a lot of directions and guidelines. There is a rationale behind this design choice: Standardizing the packet allows us to know that we are providing the best type of training and exposure that we can over a four month period. In this manner, we can also have a greater control over the resources being offered and we can get an independent committee to review the standardized material more effectively.

The Student Approval Committee signs a contract with the project to maintain confidentiality and integrity throughout their involvement with the scholarship competition.

tee is directly responsible for collecting and integrating new and upcoming services available at UCF into igKnight. This ensures that all the resources that can possibly be incorporated into our project are made available to the students. Finally, this committee will recruit volunteers or interns for the project as needed throughout the competition cycle to help provide the scholars easier access to information or resources.

Author Contributions

- Vikram: Original ideas and development
- Sean: Student Committee development
- Clara: Faculty Committee development
- Taylor: Resources, marketing development and graphic design