INTERVIEW: DALE WHITTAKER

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Why is the expansion of undergraduate research such an important initiative at Purdue?

From a learning perspective, research that is imagined by a student, and owned by the student, really activates a motivation that is hard to generate in the classroom where

the acquisition of knowledge is being guided by the professor. Involvement in research also stimulates higher level thinking skills such as synthesis, analysis, and critical thought. I have seen “C” students become “A” students after they started an undergraduate research project. Expansion of research also allows us to take advantage of the creativity, innovation, and research capacity of our faculty and make best use of the infrastructure we have built. It differentiates Purdue from just being a good teaching institution. So, why expand? The expansion is so that more of our students can have the opportunity to experience research as undergraduates. We estimate that around 50% of Purdue undergraduates have that opportunity now. I’d like to see that percentage move much closer to 100% in the next few years.

So how much undergraduate research currently happens across the Purdue University system?

Due to the distributed nature of undergraduate research activities at Purdue, we don’t have an exact answer to this question. However, there are three points of data that provide some insights: Students self report that approximately 50% have been involved in undergraduate research. We also know that about 1,200 of our students each semester are enrolled in an independent study project for credit. We don’t have a good way of knowing the overlap in these two numbers. The third data point is that we know we have approximately 2,500 students who were paid on research projects last year. I don’t know to what extent they were actually conducting independent research or supporting the project as labor. If you take all three of these figures, while understanding that there is currently no good single evaluation of what undergraduate research is and who is doing it, I would probably still say that when a student departs Purdue they will have had a 50:50 chance of doing research — so 15,000 of our 30,000 students in any one year. The percentage would be highest in the life sciences, engineering, technology, liberal arts, and business. The life sciences probably have the strongest tradition of involving undergraduates in research.

How does Purdue compare to other universities in terms of undergraduate research opportunities?

I think we compare favorably. We have a culture of hands-on-learning within a research-intensive institution that is fairly unique. Having said that, I think that, with more deliberate coordination (products and services such as JPUR), we could see a significant increase. There is pent-up, unmet demand for these opportunities among the students.

What is university doing to expand undergraduate research opportunities?

Recently, there has been an expansion of SURF (the Summer Undergraduate Research Fellowship program), an enlargement in scope of the Undergraduate Research Poster Symposium in the spring, and the introduction of Discovery Park's Undergraduate Research Internship (DURI) program. We are also seeing more evidence of faculty adding Research Experiences for Undergraduates (REUs) to funded NSF projects. In the future, we will try to provide more coordination so that students can find opportunities, and faculty are able to offer them, more easily (I count on JPUR to help with this). We should also be better at articulating learning outcomes for independent research in a way that these can become a part of the academic transcript. We can then track who is doing research and the degree to which it is student initiated. Proposal centers (the centers around campus that help faculty apply for research funding as part of the Vice President for Research's portfolio) also facilitate the introduction of opportunities for undergraduates into proposals. Finally, in the future I believe we will have more deliberate class work preparing students so that they understand what research is and how one does it, initiated within the new Honors College.

If a student wants to do undergraduate research, what steps should they currently take?

They should contact their academic advisor as early as possible and get it into their academic planning. Contacting the Discovery Learning Research Center about opportunities for research in Discovery Park is also a good strategy. The start of the sophomore year is ideal timing, because that is when the student should start having a sense of what they want to do and it is a good time to start inserting research into their schedules.

What are your ambitions for the Journal of Purdue Undergraduate Research going forward?

Firstly, I want it to raise awareness of and celebrate the really amazing creativity and discipline of our undergraduate students. We have some students who are doing world class work as undergraduates. Secondly, I hope other undergraduates will see what students just like them are doing, and find there is a pathway to also

become involved in research. Thirdly, I'd like JPUR to let other people outside of the university know that we at Purdue value innovation and entrepreneurship. We support our students' "can do" attitudes where they take an idea and do something with it.

Did you do undergraduate research as a student? If so, what kind of research were you engaged in?

Yes, I did, although it really was more of a design problem than research. My innovation was to develop a bandolier onion-transplanting system that can work like a machine gun. I learned to clarify my hypothesis (I was really pushed on that by my professor), I learned that I wasn't the first person to have thought about what I was thinking about (and that there was a lot to learn from literature), I learned about how to control an experiment (or at least develop a doable experiment that would give me clean results I could make a conclusion from), and I also learned to present to a group of professionals as a student (very scary but very satisfying).

How did your experience of undergraduate research influence your later career?

It pushed me along the path of thinking of either entrepreneurship or academia as my career. It was really something I enjoyed because it was the first time that something was intellectually mine. I would say that it was the reason that I went on to a Master's and then to a PhD and then into academic life. When I was in the College of Agriculture in my role (as Associate Dean and Director of Academic Programs) I interviewed every faculty candidate that my schedule was clear for, about 55 a year over ten years. In every one of those 500 interviews, I asked the question "did you do undergraduate research and in what way did it impact your career." I would say that over 90% came into academia because of a research project or because of a relationship with a professor through an individual research project. It was just an unbelievably high percentage.

Are there any last thoughts you'd like to share with JPUR readers?

I would like to emphasize that undergraduate research is not just for the honors students. It is for any student out there that knows they have an idea they want to explore. I want to say to them, "make the most of the opportunity of being at a research-intensive university like Purdue to follow that dream". Again, I have seen "C" students become "A" students once they have grabbed hold of the opportunities undergraduate research offers.

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