STEM Access and Inclusion – A Partnership between Western Washington University (WWU) and the Northwest Indian College (NWIC): Fall 2015 Report

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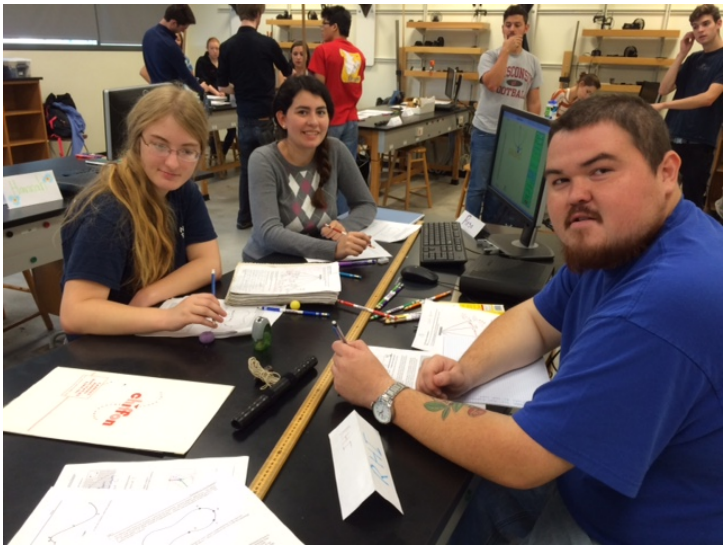
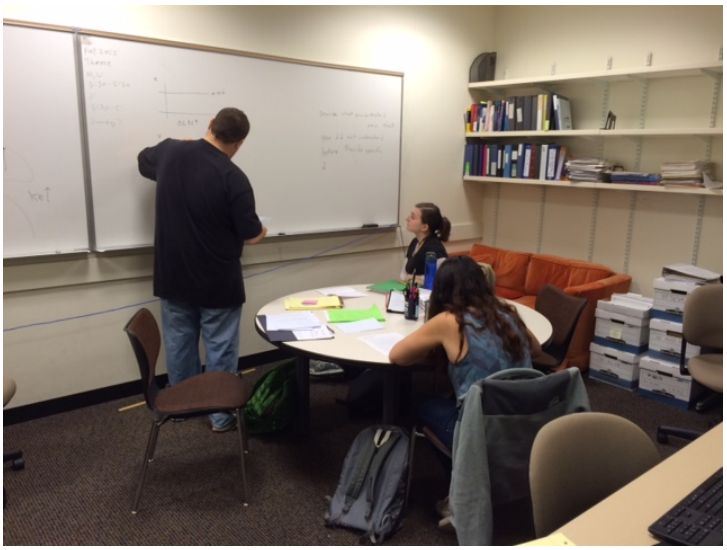
Project Summary: The goal of this program is to encourage cultural exchange between WWU and the Northwest Indian College (NWIC) (Bellingham, WA), and to provide a pipeline to WWU for students at NWIC interested in careers in STEM (Science, Technology, Engineering, and Math). NWIC students are not currently able to take the classes needed in order to transfer to a physical science bachelors degree program at a four-year institution. In particular, most will need to have taken the Physics with Calculus sequence (16X) or equivalent, a series of classes not offered at NWIC. Briefly, this program involves the formation of a small cohort of students from both WWU and NWIC. The students from NWIC attend the PHYS 16X sequence at WWU in 2015/16. The WWU students (enrolled in the same Physics 16X sequence at WWU) also attend one class at NWIC per academic quarter. This program is a wonderful opportunity for this cohort of students to experience the culture and climate in different educational settings, and to be part of building a collaborative relationship between our institutions. This program also supports Western's mission and strategic plan with respect to broadening our ties to the local community, along with building and supporting a diverse student body. Finally, it directly addresses ongoing issues in STEM related to diversity and inclusion.

Current activities: In this first year of our pilot program, we started out with two students from each institution. However, one of the students from NWIC needed to withdraw from the program due to personal circumstances after it was too late to recruit a replacement. Therefore, our first cohort of students consisted of two students from WWU (Rosa, a sophomore mathematics major, and Rhiannon, a junior geology major), and one from NWIC (Zach, who has been teaching mathematics at NWIC in addition to being a student there for several years). As described above, all three students have been enrolled in Physics 161, taught by Kathleen Sandelin, Senior Instructor in Physics and Astronomy at WWU. This class meets four times per week (lecture) with one two-hour lab section on Thursdays.



Rhiannon, Rosa and Zach in Physics lab!

In addition to attending the classes together, our students have been attending a weekly study/tutoring session that is led by Erin Brown, one of WWU's physics majors, who we were able to pay for leading the tutoring sessions through this grant.


Erin's tutoring session with Zach and Rosa.

In addition to taking the Physics class at WWU with Zach, Rosa has been taking *Introduction to Psychology* at NWIC, taught by Dr. Berrett, and Rhiannon has been taking *Digital Photography* at NWIC, taught by Dr. Murillo. This grant allowed us to provide these students with class materials as well as transportation between institutions and parking at WWU for Zach.

Finally, this grant funds several cohort-building activities. The first of these was a trip to the Spark museum in Bellingham, WA.


Playing at the Spark museum!


Rhiannon gets charged up at the Spark Museum.

These students have been a delight to work with and have really worked well together in the lab and outside of class. We plan to finish off our quarter with a dinner with these three students and our families.

Challenges and lessons:
Recruitment: The NWIC students were recruited in person, as the NWIC instructors know each of the students personally who are enrolled in the calculus sequence. Recruiting WWU students was more challenging – we pursued several avenues including emailing a recruitment flyer to students having the prerequisite coursework with a follow-up informational session, visiting several calculus courses (this is a prerequisite for the Physics course), and emailing all students registered in the appropriate section of the Physics course. In the end, the two participating Western students were both at the informational session that we held. Several other students indicated interest initially, but were not able to follow through for various reasons. We are hopeful that our successful first cohort will make the program more attractive for future recruitment efforts.

Mathematics requirements: The Physics with Calculus sequence requires significant math background (Calculus 1 prior to or concurrent with Physics 161, and Calculus 2 prior to or concurrent with Physics 162). As the majority of NWIC students in the freshman year place in much lower mathematics courses and because the student body there is relatively small, finding students who are far enough in their math studies to participate, but also have three quarters remaining prior to graduation, has been a challenge. However, small numbers are not a big concern, and we have already identified two NWIC students who are interested in participating in this program next year if we are able to provide funding.

Parking: Parking at WWU is remarkably challenging. We struggled to find a legal way for Zach to park here for his classes. In the end, we have decided that obtaining bus passes that will allow them to either take the bus, or drive and take the bus from the Lincoln Street park and ride will be the best option.

Tuition differentials: The single most challenging issue was navigating the logistics of enrollment and tuition for the three students participating in the program. The important considerations have been ensuring that the students do not incur additional expenses, ensuring that their financial aid is properly handled, and making sure that their courses are properly transferred back to their home institution. Some mistakes were made along the way in regard to this planning, resulting in WWU having to cover some of the extra tuition costs incurred by this first cohort of students. However, this allowed us to learn some important lessons that will improve future collaborations between NWIC and WWU for a variety of different student exchange models.

Future plans: Next quarter, our first cohort will continue with Physics 162, taught by WWU Professor Kristen Larson. In addition, Rosa and Rhiannon will both take *Introduction to Indian Legends* (ENGL148A) at NWIC with Dr. Martinez. We will continue with the tutoring sessions. Finally, we are planning to sponsor a trip to the WWU Spinel Planetarium as a joint activity between our students and NWIC's NASA-sponsored rocket club for Engineering-interest students.