

Investment Fund for Core Needs (IFCN)

Entry #181

A. PROPOSAL SUMMARY

Title: Microbiology Lab Microscope Replacement

Project Lead Name: Dawn Newman
Biology Department

Project Lead email address: dnewman@brockport.edu

Amount Requested: \$31275

Checked

Name of Sponsor 1: Jose Maliekal
Science & Mathematics

Name of Sponsor 2: Mark Kittleson
Health & Human Performance

Name of Sponsor 3: James Haynes
Academic Affairs

A-1. Description of the Initiative

This proposal is for the purchase of replacement microscopes required for a high-enrollment service course for nursing majors, BIO323 Microbiology, and an upper level/graduate level biology lab, BIO423/642 General Microbiology, and a general education course, BIO111 Principles of Biology Lab. The hands-on nature of these laboratory courses, particularly those at the upper level, necessitates a 1:1 ratio of one microscope for every student. Students are currently using microscopes that are approximately 17 years old. Heavy use, combined with inexperienced student hands, means frequent servicing.

These microscopes service BIO323 Microbiology, and BIO423/643 General Microbiology labs which include Nursing students (85%), and Pre-Professional Science, Med-tech majors, others (remaining 15%). The increase in pre-nursing student admissions, increases the demand for good, reliable microscopes in BIO323.

The following weighed heavily in our decision to pursue this proposal: First, the year-by-year replacement of one or two microscopes is impractical because models change frequently by suppliers, and teaching labs with variations in model type throughout the class causes confusion on the part of the student and inconsistencies in lab manual instructions for experiments using them. Second, we often scavenge parts from other microscopes in the department as they break to repair those used for Microbiology. This is becoming a nearly impossible task as ours age and other microscopes in the

department are purchased with incompatible parts. Finally, the demand for 24 working microscopes in BIO323 has led to curricular decisions in other courses requiring microscopes like BIO111. Many times, alterations have to be made in BIO111 labs due to shortages in microscopes. Thus, students entering BIO323, with BIO111 as a prerequisite, are underprepared, and lack individualized microscope training.

A-2. Impact Statement: What change will this project deliver in the short term? What are the expected longer term impacts?

Short Term Impact

- **Curricular Improvement** - The replacement of old microscopes (17+ years) will provide Pre-Professional Science students, Nursing students, Med Tech students, and others requiring a comprehensive Microbiology laboratory course invaluable, practical laboratory skills, that cannot be replaced by images on a page, or digital images viewed on a tv or computer screen. The images presented via media products are the “best” images, they are not even close to what is really seen under a microscope. Also, the department can also “recycle” the existing microscopes in the Microbiology lab for use in the BIO111 Principles of Biology lab, allowing for a 1:1 ratio of students to microscopes in that course as well.
- **Section Capacity** - Maintenance of current lab section capacity depends upon the equipment available to us. Less working microscopes could result in a need to lower the capacity of lab sections. If funded, section capacity is expected to remain at 24 student for the unforeseeable future.
- **Student Satisfaction** - Proper use of a microscope is a skill that is gained best through experience. Students have very little patience with equipment that doesn’t work perfectly, or experiments that don’t end with the right results. New microscopes would at least take one variable out of the challenge of teaching Microbiology to the students and learning microbiology by the students that are our future doctors, nurses, Med-tech, researchers, veterinarians, etc.

Long Term Impact

- **Economic Impact** - Choosing a microscope that is “student friendly” gives the student a microscope that is both easy to use, and easy for our department to maintain over the next decade. The proposed microscope model is both easy to use for the student, and easy for the department to maintain. The replacement parts for this model will be available for several years.
- **Institutional Reputation** – Many students taking these courses have commented that they had better microscopes in high school. As an institution of higher education, we compete with other institutions for students. The quality of simple equipment such as microscopes can be a reflection of our commitment to a modern science education.
- **Student Success** – The skill of using a microscope properly will be more and more valuable as fewer programs offer the hands-on experience. This model of microscope also has a port to allow students to take digital pictures with cameras the department already owns. A student’s microscope skills can be evaluated by the submission of images as portions of lab exams or reports. A student’s confidence also increases when they see how much their microscope skills improve through the semester, giving them an edge in their future careers.

B. STRATEGIC ALIGNMENT

B-1. To be a Great College at which to Learn

Teaching the sciences is, and probably always will be one of the more difficult challenges. Most students either don't like science, don't understand science, or don't care. This presents a problem for someone, such as myself, who instructs Microbiology labs. Thankfully, most students enjoy microbiology lab because they actually get to do "cool" stuff like grow bacteria. I have been an instructor at Brockport for over 12 years, and I still have to smile when a student says to me, "This is my favorite class". Engaging students is difficult, but the actual hands-on approach of microbiology lab allows for more individual instruction. Students respond positively to individual attention. Many colleges have forgotten this. There are less and less Microbiology lab courses offered that have the individual, hands-on instruction Brockport still offers. Brockport is a great college at which to learn because we still offer classes such as Microbiology lab, where every student gets their own microscope, and receives individual attention about how to use it properly.

B-2. To be a College engaged with its Community

I actually came into contact with one of my former students a couple weeks ago. I cut my finger and ended up in the emergency room at Strong West in Brockport. One of the nurses on duty was a former Microbiology student of mine. She said Microbiology lab was her favorite class because it was fun and very informative. She only had good things to say about the college. It was nice to see one of our graduates working right in the Brockport community.

B-3. To be a Sustainable Institution for the 21st Century

The model of microscope chosen is in line with the advanced nature of the Microbiology lab experience offered by Brockport. This microscope has advanced optics and an extra port to allow images of the specimen being viewed to be taken. The need to keep up with technology is important to allow Brockport to be a sustainable institution into the 21st century. The age of our existing microscopes is not in line with being a sustainable institution into the 21st century. These microscopes were actually made in the 20th century.

B-4. To be a Great College at which to Work

The purchase of these microscopes will also help me as I strive to provide the best possible education to our Microbiology students. I have been coordinating, and instructing Microbiology labs at for 12 years at Brockport. I love my job, and the challenges it presents. Part of providing the best possible instruction is having the proper, up-to-date equipment such as microscopes. Having a properly equipped Microbiology teaching laboratory that allows me to provide an organized, non-frustrating, and informative laboratory experience for the students makes Brockport a great college at which to work.

C. IMPLEMENTATION PLAN AND BUDGET

C-1. Identify the specific activities to be funded from the Investment Fund, estimated time-line for implementation, and for activities anticipated to be ongoing, plans for continued funding.

Item 1: Microscopes (26)

Item 1 Amount: \$31275

Item 2:

Item 2 Amount: \$

Item 3:

Item 3 Amount: \$

Item 4:

Item 4 Amount: \$

Item 5:

Item 5 Amount: \$

Item 6:

Item 6 Amount: \$

Item 7:

Item 7 Amount: \$

Item 8:

Item 8 Amount: \$

Item 9:

Item 9 Amount: \$

Item 10:

Item 10 Amount: \$

TOTAL EXPENSES, ALL ITEMS: \$31275

Matching Fund: \$10000

In-Kind Services: Provide FTE and name of personnel who have committed to in-kind services.

D. ASSESSMENT PLAN:

D-1. What are the anticipated outcomes and specific measurements for success?

- Objective #1 – Each student has access to a working microscope in BIO323, BIO111 and BIO423/643. All three of these courses consistently have full sections of lab, 24 students each. During the current academic year there has been; 6 sections of BIO323 (144 students), 14 sections of BIO111 (336 students) and one section of BIO423/643 (24 students). This objective will be assessed by tracking the actual availability of microscopes, as compared with the ideal 1:1 ratio of one microscope for every student.
- Objective #2 – Students successfully learn how to use the microscope in BIO111, which will improve performance in BIO323, a course that requires extensive use of the microscope. This objective

will be assessed by including questions on the midterm and final practical exams amounting to 10% of the exam.

- Objective #3 – Student satisfaction with laboratory equipment improves. Students get very frustrated with equipment that is difficult to use. A survey will be given at the end of the semester to assess student satisfaction with the microscopes.
- Objective #4 – Decreased maintenance and repair costs. These microscopes are “student friendly” meaning they have limitations preventing damage from improper use. These microscopes are also a Fisher Scientific product (a NYS preferred vendor), and the replacement parts will be available for several years. This objective will be assessed by comparing the maintenance and repair costs of microscopes required for BIO323, BIO111 and BIO423/643 labs in past fiscal years versus future fiscal years.

E. ADDITIONAL INFORMATION

E-1. Please provide any additional information to assist in the review of the proposal, including why the initiative cannot be funded from divisional resources.

First, \$30K is too large an expense for our Departmental Budget. Second, after adding this request to our annual equipment replacement request every year for the past decade, I’ve come to realize that it will never be funded through the Dean’s account. The equipment replacement allowance for the School of Science and Mathematics really doesn’t allow for one \$30K expenditure, because the available funds are spread across the needs of many departments. Also, there are, as yet, no external funding opportunities for a non-research, small equipment educational purchase such as this. Due to these financial issues, our department hasn’t been able to replace these microscopes.

Upload up to three supplemental files here (not required): [On file]

Signature of Project Lead: [on file]

Email: dnewman@brockport.edu

Signatures of sponsors are on file in the Administration and Finance Division.

Sponsor 1 Comments: very worthy request

Sponsor 2 comments:

Sponsor 3 Comments:

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