

Division Themes and Trends Summary

*Please submit the completed form to IPC co-chairs, Jennifer Hughes, VPSS, and James Carranza, Academic Senate President by **April 30, 2013**. Also submit it to the appropriate VP. The Summary will serve as a cover letter to your division's program reviews, which will be distributed to members of the Institutional Planning Committee for review.*

Division: Math and Science

Date: September 7, 2014

Departments Reporting: Architecture, Astronomy, Biology, Health Science, Chemistry, Engineering, Geology (includes paleontology and oceanography courses), physics, mathematics, Dental Assisting and Nursing

Academic Year: 2013-14

Student Learning, Section II, Summary of Student and Program Data

II.A. Student Learning Outcomes Assessment – In general, students who complete science courses are meeting SLOs (80% threshold success). Some areas need to adjust course sequences to build greater success. Some SLOs may need to be adjusted to reflect technology changes or new standards from accrediting agencies. Much unofficial assessment results in course improvements every year. All departments are finding that English and math skills of students are weak. In addition, non-science majors have difficulty with spatial visualization skills.

II.B.1. Student success and demographic variables – Older students and female students succeed at a higher rate than others. In many science departments there are many more males than females enrolled. Pacific Islanders, African Americans, Hispanics and Filipino students have lower success rates.

- Exception: African American males, who visit the Integrated Science Center (ISC) succeed at a much higher rate than their counterparts
- Exception: There has been improved success for underrepresented students in math and chemistry. The numbers in chemistry are very low and probably not statistically significant....but interesting.

II.B.2 Course delivery mode – Student success is the same, and frequently higher for on-line courses vs. on-campus courses. It is exactly equal in most math's with the exception of elementary algebra, which has a lower success rate than the on-campus offering

Many courses in the division use web-assisted technologies. The students appreciate this extra support both for its quality and the 24 [x] 7 access.

II.F. Additional Career Technical Education Data – EDD data shows excellent growth for dental assisting and good growth for nursing. The nature of the jobs for nursing is changing with technology and an aging population. Students need to be encouraged to continue on from the ADN to BSN.

II.F.1. Degrees, certificates, and employment: Identify areas of accomplishment And areas of concern – Astronomy now has an Astroimaging and Observatory Operating (AOOC) Certificate. This prepares students to move directly into jobs in technical support. In addition, students can apply course work towards the B.S. in astronomy or astrophysics.

General Comments:

OVER

Sections IV and V: Additional Factors and Institutional Planning

I.V. Additional Factors – For engineering and architecture, upgrades to building 19 (particularly 19-114) are desperately needed. The run-down infrastructure perpetuates a sloppy, down-scale attitude, which students and faculty must constantly battle.

For engineering and biology, the complexity of lower division offerings is slowing progress towards a TMC

For departments that have complex laboratory experiments, the lack of ability of many students to focus has made laboratory experiments more challenging and risky.

For nursing, students need to be advised of the increasing necessity for pursuing the BSN

Interactive technologies (like iClickers) increase student focus and interaction

All students should be advised that, while TMCs guarantee transfer, they do not guarantee to what school or into what major.

The College and the District should continue to work on aligning prerequisites across the district as computerized checking of prerequisites increases student success.

V.A. Results of Previous Plans and Initiatives - Across the division there is an urgent need to hire additional full time faculty. Net loss of full time faculty means faculty are spread too thin to support increased college reporting demands (program review, tracdat reports, curricunet processes and student success initiatives).

In addition, as we move towards more hybrid and on-line instruction, the work increases. Faculty invest more time per student for and on-line vs. a traditional course offering

Additional faculty are particularly needed in mathematics (2), biology, chemistry and physics. This is due to faculty attrition from retirement and expansion of course and program offerings to support student success.

On the bright side.....

- Significant equipment funds awarded to engineering will support purchase of replacement equipment of some of the 40+ year old pieces that had become a safety issue
- Purchase of iClickers for astronomy, biology, geology and physics has really sparked student engagement and discussion of class materials. Other interactive technologies have expanded this outcome
- Recent microbiology and chemistry hires have had a very positive impact on those department and their student outcomes. However, retirements threaten to undermine this advance. This is exacerbated by the lack of qualified adjunct faculty in our service area.
- Math and physics have increased their Load through the use of more flexible scheduling

V.B. Program Vision – Engineering and architecture would like to increase project based learning and increase outreach to high school students. They want to increase enrollments and student success.

Astronomy would like to continue to develop additional courses and certificates that would place students directly into jobs.

Faculty in several department want to devote extra time to programs that increase student success (i.e. Reading Apprenticeship or RA)

Dental Assisting, nursing and chemistry need to update and align course offerings with new guidelines

All departments need to continue to update technology in lecture and laboratories to support increased student success

Staff support to learning centers (ISC, Math Resource Center or MRC and Open Anatomy Lab) must be increased to support the large numbers of students using these centers. Staff includes instructional aids, additional faculty hours, peer tutors and, in

some cases, clerical staff. In addition, each learning center (ISC and MRC) requires that they be supervised by a full time faculty member so that program review, student surveys and other work required by the learning centers be completed. While there is some time assigned to a math faculty member for identification and training of student peers and MRC faculty, the learning center official business is only temporarily assigned for fall 2014.

V.B.1 Future faculty and staff development initiatives and professional enrichment – The College needs to continue and/or implement professional activities in the following areas:

1. Peer support in small programs
2. Project based learning
3. Distance education
4. Use of WebAccess
5. Teaching styles to reflect student learning styles
6. RA expansion in the science division
7. Supplemental Instruction (SI) expansion in the science division (can RA go on-line?)
8. Interdisciplinary collaboration
9. Quality control for nursing courses
10. Training/mentoring for new full and new part time faculty – though we are very hopeful about the outcomes of the professional development program established this fall.

V.B.2 Future collaboration across student services, learning support centers, and Instructional programs – Expand SI from math across the science division.

While it is currently housed in the new division of Academic Support and Learning Technologies, faculty in many science courses are eagerly awaiting expansion to biology, chemistry and physics.

Mathematics would like to continue its very successful collaboration with counseling to populate the newly formatted math 811 with counselors AND instructional faculty. This should probably be happening in all basic skills math courses. It has also proven useful to assign an SI student to each section of math 811. I must commend the time investment of all math 811 faculty to regular meetings and common exams. It makes outcomes assessment much more statistically significant.

Continue the very successful collaboration of representatives from all the learning centers across the College.

Expand RA to more science faculty, particularly new faculty.

V.B.3 Long-range planning, categorized by resources (i.e. faculty, equipment and Technology, instructional materials, etc.) –

FACULTY: Content experts are needed in Dental Assisting and Nursing. Biology needs a and physiology instructor. Physics and chemistry need additional faculty due to retirements. Astronomy needs an additional faculty due to increased course offerings. Mathematics needs at least 2 additional faculty due to retirements, to support the MRC and to support SI, which is proving very successful and to support the newly formatted math 811.

EQUIPMENT AND TECHNOLOGY: B36 is now 8 years old. When built, it was stocked with equipment that had a lifetime of approximately 5 years. Things started aging out years ago, and it is a constant, ongoing concern. But it is not just about science. The science faculty would like to see a line item in the budget to support technology upgrades. This should be coupled to plan that identifies the date of replacement of equipment room by room. There should be complete turnover every 3-5 years. The new system for evaluating labs for replacement has been useful and we hope it can continue to be supported.

INSTRUCTIONAL MATERIALS: All science labs are in need of instructional materials to replace everything from models, to prepared slides to the bits and bobs used in physics experiments and the rocks and fossils for geology.

STAFF: Additional staff are required to support the learning centers across campus. This includes instructional aids, peer tutors, clerical staff and additional hours to put/keep faculty in the learning centers. If the college is going to focus more on securing grants, a grants coordinator needs to be hired. Initiatives like SI and RA are growing beyond the ability of regular full time faculty to direct them. These and other programs need staff coordinators. In addition, the division office lost a very talented student worker in spring 2014 and that workload needs to be picked up. We would like to replace the position with a 48% office assistant, or, at the very least, another student worker. Finally, nursing is going to need additional staff help to screen applicants as they roll out the new application process this academic year. Also, since the retirement of Stephen Opson, the department needs some additional midlevel technical support for the sim people laboratories.

FACILITIES: The only building on campus virtually untouched by renovation is B19. Architecture and Engineering are offered in B19. The rooms are old, cluttered and shabby. The infrastructure is old and barely supports the programs. These concerns must exist for other programs housed in B19. Modernization is a necessity. B36 needs upgrades to support increased air quality and improved temperature and humidity control. Finally, someone needs to figure out how to adjust the air pressure in B36 so that the doors to the outside will stay closed.

V.C. Plans and Actions to Improve Student Success –

- Studio and laboratory modernization in B19 to provide a safe and productive learning environment for students
- Expand peer tutoring in all learning centers

- Several science departments are in the process of rewriting and updating laboratories to reflect contextualized learning. This requires updating of equipment includes computer hardware and programs
- Expand SI across the division and campus. This will require a coordinator and additional peer tutors and SI leaders
- Expand RA across the division. This will also require a coordinator and more peer tutors
- While RA and SI have been successfully Institutionalize, the science faculty would like to continue to work closely with the project managers.
- Additional counseling and math faculty will be the best way to support the restructured math 811. Additional contact hours have been added, but the students need to learn more than arithmetic.
- Nursing has successfully moved from lottery for admission, to a multicriteria admissions process. This is going to require additional staffing help to screen applications to the nursing program in spring 2015

General Comments:

There really needs to be a new process put in place for recruitment of nursing and dental assisting faculty. The nursing program has only 3 full time faculty and the director (non-teaching). Programs of similar size average 6 or 7 full time faculty. Also, the director will be retiring in 3 years and with so few faculty, there will be no one to replace her and still have sufficient faculty to teach the courses. While we are grateful that the College has assigned a full time hire to the department, we have come up empty for two years. It is time to consider hiring a 'head hunter' to tap into available faculty as they are simply not applying in the normal fashion. The dental assisting program has only one full time faculty, and that is the Director. This position is a combination of teaching and management. They really need one more full time faculty member and they are running up against the same challenges as the nursing program. If the College wishes these programs to continue, then a new hiring process must be identified.

Thanks for the opportunity to present our thoughts.

Thanks for having the patience to read through these things!!!! 😊