

**Strategic Task Force  
End of Year Progress Report (June 2014)**

**Task Force Name:** Bottlenecks

**Charge:** 1) Assessment of bottleneck, gateway, and low-success-rate academic course programs. 2) Develop baseline of bottleneck, gateway, and low-success-rate academic course programs

**Committee Members:** Robert Koch (August 2013-January 2014, Chair), David Bowman (January 2014-May 2014, Chair), Berenecea Johnson Eanes, Harriet Edwards, Lynn Sargeant, Raman Unnikrishnan, Stephen Westbrook, Rochelle Woods

**Meeting Dates:** 10/31/13, 11/15/13, 12/16/13, 1/28/14, 3/10/14, 4/14/14

**Summary of Work Performed:**

The Bottleneck Task Force focused initially on refining the definition of “Bottleneck Course”. There were also extensive discussions about what structural, instructional, and behavioral characteristics of students, instructors, and programs may lead to the development of a curricular bottleneck. Latter efforts focused on identifying data that has been collected or should be collected to assess the success or failure of efforts to ameliorate bottlenecks.

Data collection and analysis is ongoing. This is particularly important to assess the success of current course redesign projects. The committee has discussed or begun numerous data-collection projects, listed below.

- Potential data to collect for Bottleneck courses were discussed. These included:
  - 1) Demographics, numbers and percentage of C- to WU for courses (This existing data is the basis for the CO definition of a bottleneck)
  - 2) Are courses defined as a bottleneck truly an impediment for students? Test this by measuring the numbers and percentage of C- to D for GE courses where D is passing. This data collection is ongoing.
    - a) A related measure is the number of students who could have passed with a D, but still chose to repeat the course. This will again assess whether bottlenecks are truly an impediment to graduation, and guide decision-making during advising.
  - 3) Is there a correlation between student success rates and the use of common syllabus in multi-sectioned courses?
  - 4) Is there a correlation between students’ Math placement test scores and their grades in the GE math courses (MATH 110, 120, 115, 130, 135, 150A)? This data collection is ongoing.
    - a) Similar question for MQE, since this is the qualifying exam for STEM GE math courses.
    - b) How do these data compare to those for EPT and ENGL 101 where there does not seem to be a bottleneck issue?
  - 5) Is there a correlation between college or major gpa and success in all bottleneck courses?
  - 6) Correlation of instructor characteristics with all bottleneck courses. Can changing the instructor solve part or all of the problem?
  - 7) Can identification of student mastery of selected learning outcomes help identify solutions for the low-success problem? This is often hindered by poorly defined student outcomes and/or inadequate assessment infrastructure.
  - 8) Does class level correlate with success in bottleneck courses? How do 3-yr native students compare to UDT with respect to bottlenecks taken as Jr/Sr? How does SB1440 status correlate with this?
  - 9) What measures can be used to assess whether the interventions in the Course Redesign experiments are effective?
    - a) ASAM service learning HIP courses—tracking gpa and completion of GE courses compared to

level of success

- b) BIOD 101—direct comparison of student success with and without interventions, which include SI, frequent clicker assessment of materials associated with learning outcomes, flipped classroom, and simultaneous enrollment in lab.
- c) BIOD 171/172—see document 2 for list of 8 data items
- d) CHEM 120B—compare to previous semester student performance as measured by final course grade, ACS exam scores, other standardized test yet to be purchased, lab experience survey as the compare to previous semesters where there was no intervention, which is the offering of virtual lab components that allow easy visualization of difficult concepts.
- e) ECON 160—direct comparison to sections without intervention, which was blended technology using flipped class modes for some parts of the class; compare pass rates, track students' participation in Moodle activities; correlation of attendance and pass rate in treatment and non-treatment classes.
- f) HIST 110A/B, 170A/B, 180—compare treatment to non-treatment; Intervention in critical thinking, writing experience, flexibility in in-class, online, or hybrid modes
- g) POSC 100—compare repeatable grades for intervention and non-intervention sections; correlate data base on faculty member

• Potential policy changes that could affect success rates in Bottleneck courses were discussed. These include:

- 1) It may be appropriate for majors to switch from C-average to C-or-better as the criteria for success in the major.
- 2) The average gpa in a course is a factor in RTP decisions for some departments that prescribe an acceptable grade range in their personal documents. A UPS change is in the works, but are there departmental policy changes that could/should be made to ameliorate the impact of this policy and the principles that underlie it?
- 3) Are bottlenecks created by access issues that depend on department/college policies?
- 4) Can campus interpretation of course repetition policies affect student behaviors that may contribute to bottlenecks?
- 5) Does the use of +/- grading policies contribute to the bottleneck effect?
- 6) Should special-focus versions of GE/Service courses be developed as part of pathways specified for colleges/majors?
- 7) What performance-based incentives can contribute to removal of the bottlenecks?

• Student behaviors that may negatively impact success rates in bottleneck courses were discussed.

Several outstanding questions emerged from this discussion, including:

- 1) Is there a correlation between work hours, success rate, and gpa?
- 2) Is there a correlation between family obligations, success rate, and gpa?
- 3) How do students behave with respect to the course repetition limits in GE v. major courses? Does this behavior influence bottleneck effects?
- 4) Are there student behaviors with respect to course sequence or repeat of failed courses that can be modified to improve student performance overall?
- 5) Does tuition/fees structure provide an incentive (positive or negative) to complete degree program in a timely fashion?
- 6) How do we get students to engage in behaviors known to improve student success?

## **Recommendations:**

- Close attention should be given to assessing whether bottleneck courses are being offered at an appropriate level, and whether students are being advised to take bottleneck courses at an appropriate time in their academic career. There is anecdotal evidence that students' maturity and college experience, as measured by class-level, has a significant impact on success in bottleneck courses. The committee specifically noted a change in success of engineering majors in BIOL 101 due to advising. Successfully completing this course has traditionally been a major barrier for engineering students. According to the Dean of ECS, the college saw an immediate improvement in the success of their students in BIOL 101 when they began advising ECS students not to take that class until their junior year. In the absence of any other changes, this suggests that student maturity and experience with college-level classes may be a major impact on success rates with more difficult and/or technical courses.

- Bottleneck Courses should be assessed not just on the rate of C- to WU grades, but also on the repeat rate for the courses. Preliminary data suggest that repeatable grades do not necessarily mean a repeated class. This can be illustrated with enrollment data for the Fall 2012 cohort of students enrolled in GE classes:

- 1) 31.5% of students in a Life Science GE class had a repeatable grade, but only 10.5% of students actually repeated the class (through Spring 2014).
- 2) 28.5% of students in a GE Math class had a repeatable grade, but only 18.9% actually repeated the class (through Spring 2014).
- 3) 19.1% of students in a GE History class had a repeatable grade, but only 4.7% actually repeated the class (through Spring 2014).

Similar patterns exist for all other GE courses.

Math repeat rates are notably higher than other disciplines; this is anecdotally attributed to the fact that students require a grade of "C-" or better to fulfill this GE requirement, whereas most other GE categories require only a "D" or better. This suggests that students are not focused on whether the grade is repeatable, but rather on whether their grade is sufficient to meet the GE and/or graduation requirements.

- Departments and faculty should integrate criterion-based assessment to ensure that (often normative-based) grading practices reflect the desired mastery of course learning outcomes by students.

- Improved mentoring and professional development for faculty may make a significant impact on bottleneck success rates. Many faculty and departments were unaware that success rates in their courses were low. New faculty orientation discussions and FDC workshops on assessment, grading strategies, and student success strategies may help ease some structural bottleneck issues. Special attention should also be paid to professional development and mentoring of lecturers.

- Course coordinators should be provided where appropriate for multi-section bottleneck courses (e.g. BIOL 101).

- Where appropriate, proven pedagogical strategies such as Supplemental Instruction or flipped classrooms should be implemented and institutionalized.

- "Low-success" courses (BIOL 101, POSC 100, MATH 115/125/135/150A) should investigate possibility of administering "Concept Inventory" and Reading Comprehension pre/post-exams to students in order

to test significance of student preparation on Bottleneck success. The committee has held preliminary discussions on this subject with the affected departments.

- Pre-collegiate, pre-requisite, and early warning data should be leveraged to identify at-risk students early in the semester to facilitate interventions such as tutoring, peer mentoring, or supplemental instruction.
- Departments with “low-success” courses should develop criteria to assist advisors in determining if and when students should be advised to take recognized bottleneck courses.

**Conclusions:**

• Several initiatives are underway across the university to address curricular bottlenecks. The success of these initiatives will not be known for several semesters, however it is imperative to develop a framework for assessing the success of these initiatives now. This effort will necessarily span multiple academic years, and require professional development of faculty and greater penetration of strategies proven to improve student success.

**Supporting Documents:**

1. Bottleneck Course Data
2. Task Force Progress Reports
3. Town Hall Presentation and Feedback