General Education Assessment
2013-14

Natural Sciences

University in the High School Program

The University at Albany, SUNY

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October 2014
In 2013-14 the University at Albany assessed the degree to which students were achieving student learning outcomes in the Foreign Language, Natural Sciences, and U.S. History General Education categories. As with previous assessments, the assessment of General Education courses offered through the University in the High School (UHS) program were conducted at the same time. While traditionally a representative sample of classes from a particular general education category has been selected by IRPE and the General Education Committee, given the poor response rate in recent years the decision was made to sample the entire population for the UHS instructors. The UHS office provided materials electronically, and IRPE redacted instructor information.

There were a total of 13 courses offered through UHS in 2013-14 that met the Natural Sciences General Education requirement, with respondents noting enrollments ranging from 6 to 21. Nine of the instructors sampled responded. Seven returned the beginning of semester forms with indications of class activities, as well as submitting a syllabus, and critical end of semester quantitative data. The data contained in this report represents 7 classes, with a total enrollment of 102 students.

![Figure 1: Aggregated Performance on Natural Sciences Learning Objectives](image)
Natural Sciences courses enable students to demonstrate:

1. an understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence;
2. an understanding of the application of scientific data, concepts, and models in the natural sciences;
3. an understanding of the major principles and concepts that form the basis of the knowledge covered in the course and a command of the relevant terminology appropriate for basic discourse in the particular discipline or disciplines of the course;
4. that they have become more knowledgeable consumers of scientific information and are prepared to make informed decisions on contemporary issues involving scientific information acquired in the course.

Figure 2: Natural Sciences Learning Objective 1
2) Students will demonstrate an understanding of the application of scientific data, concepts, and models in the natural sciences.

3) Students will demonstrate an understanding of the major principles and concepts that form the basis of the knowledge covered in the course and a command of the relevant terminology appropriate for the basic discourse in the particular discipline.
In excess of 90% of assessed students either met or exceeded expectations in all four learning objectives in this category. Taken as a whole, these figures are similar to performance in the 2009 and 2011 General Education Assessment in this category.
Figure 7: Comparison of Results for Natural Sciences Learning Objective 1, 2009, 2011 & 2014

Figure 8: Comparison of Results for Natural Sciences Learning Objective 2, 2009, 2011 & 2014
In the Natural Sciences category, comparisons of performance between the UHS and On-campus populations appear dramatically skewed. While this is not uncommon when looking at the “Exceeded” and “Met” numbers separately, in this particular case the numbers remain skewed even when the “Exceeded” and “Met” numbers are combined. This may partially be attributable to the particularly small UHS sample, but it’s important to note that UAlbany students trail UHS students in all 4 categories—by between 20 and 55 percentage points depending on category.
The number of UHS students who “did not meet” the learning objectives is 0% for learning objectives 1, 2, and 4, and 2% for learning objective #3. In the on-campus population, this number was between 12% and 29%.

1) Students will demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence.
Figure 13: Comparison of Results for UHS and On-campus Populations on Natural Sciences Learning Objective 2

Figure 14: Comparison of Results for UHS and On-campus Populations on Natural Sciences Learning Objective 3
It is important to note that the majority of students who enroll in University in the High School courses tend to be highly motivated and high performing. In fact, only juniors and seniors with an overall average of B or better are allowed to enroll in UHS classes. One could reasonably expect students who have a high average overall to perform well in these classes. Additionally, on-campus students taking courses meeting this General Education requirement may be doing so only to fulfill the General Education requirement, and that is a potential explanation of differences in performance appear to exist across these populations.

We also recognize that the UHS courses cover the same material as the on-campus offerings, but do so in a year-long format rather than the standard semester format. Additionally, the typical UHS course meets every day, not a few times a week. Both of these could be contributing factors to explain the high performance of UHS students relative to their on-campus counterparts.

Recommendations:

1) IRPE needs to work closely with UHS to improve the response rate and quality of the data submitted by instructors. Sample videos and an online FAQ document that outline the General Education Assessment process and the use of the assessment forms were available to UHS instructors, but there is no evidence that any of the respondents actually used these resources to improve the quality of their submission. We strongly urge UHS administrators to continue to encourage UHS instructors to avail themselves of these resources.

2) It is possible that UHS instructors are transposing the high school grades into the General Education Assessment forms rather than keeping 2 grade books—one with the “high school” grade, and one with the “college” grade. Moreover, review of the assessment materials appears to show that instructors need to pay more
attention to separating out the performance of students in the class by learning objective. Most have simply inserted the same numbers into each category. As we have done in past years, IRPE continues to recommend that the UHS office issue a memo explaining the process and directing instructors to the IRPE produced videos and FAQ for more information.

3) IRPE recognizes the challenges in getting a good response rate from such a small population of courses, and also recognizes that one or two large classes can skew the results of the entire study. It is likely that we will continue to sample the entire population in the future, in the hopes that that effort – coupled with regular reminders from the UHS administration will result in a better response rate and a more robust data set.

Process notes

- This year the UHS office collected all the requested materials and scanned the sample documents into .PDF format before sending them to IRPE electronically. The names of the instructors were redacted from the forms, which were then coded. While this was a labor intensive endeavor for the IRPE office, it saved a substantial amount of paper, as well as additional copying time and paper when the material is be made available to the General Education Assessment Committee. IRPE has developed forms in PDF format that instructors can submit through our website, and they will be encouraged to use this method in the future.