General Education SLOA Summary

General Education Category: **Biological/Physical Science** Semesters: **SU 15/FA 15/SP16**

Data Summary: ***(See chart attached)***

- In **Academic Year 2016** (SU 15, FA15 and SP16), there were **29** general education (Gen Ed) science courses offered (Biology = **11**; Biotechnology = **2**; Chemistry = **4**; Physical Science **7**; Physics **5**. A set of general education assessment questions has been developed for **all** of these courses and these assessments were administered with final exams for SU 15, FA 15, and SP 16 semesters to most of the sections of students completing these courses.
- A total of **2483** students registered for these **29** Gen Ed courses and **2112** students completed these courses which is **85.0%** of the registered students.
- General Education assessments are included in all General Education Science Courses. Data collected has not yet been imported into the "Einstein" database for analysis. Note: the Gen Ed assessment is not the same as the common course assessment.

What is being assessed?

All of the General Education assessments were designed to measure scientific reasoning as defined by the following learning outcome for the Physical and Life Science general education area:

The ability to access, process, analyze and synthesize scientific information

The assessments are usually 5 – 10 multiple choice questions which involve reading a case study or paragraph filled with data or solving a problem using course content. They were developed by the course instructors and are included with the final exam or embedded in exams during the course.

- All general education science courses have some end of course (or embedded in the course) assessment measuring scientific reasoning. The assessments are graded by the course instructors and results were submitted using the Einstein database.
- The Einstein database was used to collect course data for the first time at the end of SP2015.
- Previous to Einstein, data was submitted by instructors to the Y drive on their COGS for FA 2013 and SP 2014. The data was then accessed by the Division Office Associate and Division Chair, a process that requires each COG be checked in order to complete this report. This was a time-consuming process which should have been shortened tremendously by the implementation of the Science Assessment Database, "Einstein".
- Specific issues with the relationship between Gen Ed assessment process and COGS includes:
    - All courses have a Common Course Assessment which all sections of the course take. This is required of **all** courses, not just Gen Ed courses.
    - All Gen Ed courses have another assessment, called the Gen Ed assessment, and this is required IN ADDITION to the Common Course Assessment.
    - Some courses still have too many learning outcomes and they are redundant. This needs to be cleaned up because the course learning outcomes have to be aligned with Program learning Outcomes which then need to be aligned with Institutional Learning Outcomes. None of this can be cleaned up and finalized unless the course level outcomes are appropriate and measurable.
    - To "close the loop" on a specific content or skill area of a course or program, an item analysis must be done. This is what is not happening across the division.

- The database project that faculty are working on with R. Kendrick will solve most of the course level problems and issues. The Einstein database still has glitches and requires B. Shepherd to do the import from Datatel. The SLOA spreadsheets returned and saved on the Y drive have not been imported into Einstein.
- Because in most cases, assessment questions have **not** been aligned with the stated learning outcome for the content area (Physical and Life Sciences), this will be on the agenda for the upcoming workshops when full-time and some adjunct faculty are present.
- CAAP Exams in Scientific Reasoning are planned for alternate academic years. The last administration was 2015. (75 students in BIO 113, BIO 101L. HCC mean score = 61.8 ± 3.4 vs. National mean score = 59.1± 4.2 (N=15966). The exam will be administered again in SP 2017 to approximately 100 Gen Ed math students and 100 Gen Ed science students (BIO 113 and CHM 101). The administration of these exams requires Testing Center staff oversight because there are many rules which must be enforced or risk jeopardizing the scores. This was a problem this fall of 2015.
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Discussion of Analysis Results: (narrative in Word format of **who, what, where, when, what** was discussed and what was determined)

Who: Full-Time faculty have completed Gen Ed Assessments for all of their courses which satisfy Gen Ed requirements. For courses taught only by adjunct faculty, these instructors have developed and implemented assessments. These adjunct instructors have been contacted and given directions on what is needed and when the assessment should be implemented. These assessments are stored in a file on the Middle States folder on the desktop of the Division Chair. The plan is to move them to the Y drive in FA 2015.

What: **100. %** of the **AY 2016** Gen Ed courses in the Science area administered assessments to more than **1848** students during the final exam periods in summer 2015, fall 2015, and spring 2016. Without data from each instructor it is impossible to know how many of the course completers actually completed the course and how many were "walk away F s". This is because we do not have an administrative withdrawal for students who stop coming to class and they are considered "retained".

This was **74.4%** of the Science Gen Ed enrollees (1848/2483) for 2016 but it was 85.0% of the Science Gen Ed completers (2112/2483). The assessments measured how well students achieved the Gen Ed Learning Outcome ***The ability to access, process, analyze and synthesize scientific information.***

The BIO 104 assessment is benchmarked by the HAPS exam. THE CHM 103 and 104 courses were benchmarked with the ACS exam for General Chemistry I and II and the CHM 203 and 204 courses are benchmarked by the corresponding ACS exam for Organic Chemistry.

Where: The assessments were administered in the classroom as supplements to final exams or in the Testing Center if the final exam was given in the Testing Center, including the on-line sections of BIO 110, BIO 106, BIO 117, CHM 101, PHS 105, PHS 108, PHS 109 and PHS 113. CAAP testing was done in the Testing Center or in an approved classroom in order to meet the stringent requirements of the ACT.

When: Most of the assessing for both semesters was done during the final exam period. Analysis of the data was not done at the end of the semester because we were waiting to get "Einstein" functional.

WHY: This whole SLOA process is done to increase student learning and this is a weak spot in the process, at least in this division. We are finally getting data from every Gen Ed course, but item analyses are not included very often on the COGS. With the new database, this will be addressed by linking the

questions on the assessments to the Gen Ed expected learning outcomes for the Science Area. This should bring the Science course level assessment to a whole new level in this initiative. Once the linkage occurs (as was done with math several years ago) the outcomes can be linked to program outcomes and assessment of program outcomes at the course level will have some meaning.

Plan of Action: (closing the loop)

- Develop and implement the Einstein Course database and pilot for Fall 2016.
- Analyze 2016 data and find at least ONE weak content area for every Gen Ed course that should be address in the delivery of the course for 2017.
- These changes should be made to course content or course design as described on the COGS for each course.
- More benchmark assessments should be identified and used in at least one course in each discipline.
- For disciplines where there is no normed assessment available, faculty are encouraged to work with another college

Gen Ed Course	Avg % on Gen Ed Skills	Avg % on Final Exam	Avg Course Grade	Gen Ed Assessment Data	15/FA &16/SP Active	15/FA &16/SP Complete	15/FA &16/SP Success	F/U	Withdrawal
BIO 101	80.2	64.8	74		187	155	128	26	6
BIO 102	77.5	80.6	78.4		21	19	18	1	1
BIO 103	75.8	84.7	72.8		183	159	146	11	13
BIO 104	78.2	62.5	62.8		134	122	109	8	4
BIO 106	71.4	52.7	59.5	SP16 only on Gen Ed and final	136	120	102	12	4
BIO 110	68	67.3	65.8		279	239	217	30	10
BIO 111	75.4	71.9	68		20	15	13	4	1
BIO 112	90.6	92	62	SU16 only	38	15	13	3	1
BIO 113	85	78.9	83.6		23	22	22	1	0
BIO 114	95	84.2	74.6		18	16	14	1	0
BIO 116	64.2	68.6	43.8		30	27	26	1	2
BIO 117	89	77.9	63.4		22	17	16	5	0
BIO 205	80.8	55.8	79	FA15 only	137	127	126	5	4
BTC 101	73	79.9	65.5	FA15 only	45	41	39	2	2
BTC 103	no data yet				0				
CHEM 101	68.1	70.9	58.5		251	200	165	30	21
CHEM 103	81.6	72.1	54.6		110	85	63	8	17
CHEM 104	83.5	74	44.1		55	37	26	8	9
PHS 104	53.9	64.6	70.2		53	50	44	1	2
PHS 105	69.5	84	70		42	39	35	2	1
PHS 107	74.4	81	60.9		34	25	22	7	2
PHS 108	64.3	79.1	63		37	32	30	1	1
PHS 109	87.5	72.3	80.4		53	48	45	3	2
PHS 111	86.2	70	81.7		16	15	15	0	1
PHS 113	92.2	81.4	82.3		9	8	7	0	1
PHY 112	84	82	83.25		5	3	3	0	2
PHY 201	78	75	63.9		53	39	39	7	7
PHY 202	81	76	67.5		21	20	17	0	1
PHY 203	83	85	68.25		28	23	22	3	2
PHY 204	79	76	72.5		23	20	19	3	7
Totals					2063	1738	1541	183	124