Assessing Both Institutional and ABET SLOs in One Platform

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Abstract

Measurement of student learning outcomes is one of the key academic activities that higher educational institutes employ to ensure accountability and assess what knowledge and skills students acquire form their academic work. Such activities are also important for maintaining accreditation with recognized accreditation organizations. Savannah State University (SSU), a SACS (Southern Association of Colleges and Schools) accredited higher educational institute, measures six Institutional Student Learning Outcomes (ISLOs) each academic year. Thus, all degree awarding programs at SSU obligatorily assess these six ISLOs every year. In addition to measuring the six ISLOs, Engineering Technology Department faculty members at SSU are also required to assess the ABET a-k Student Outcomes (SOs) as a part of the accreditation requirement. Assessment of the ISLOs and ABET SOs in two different platforms are sometimes reparative, time consuming, and might be cumbersome for some faculty members. Therefore, Engineering Technology Department of SSU has been implementing an assessment process that utilizes only one platform to measure both the ISLOs and ABET SOs. This process has led to the development of an exemplary format of annual assessment report. The main focus of the paper is to describe how the implementation of the direct assessment takes place in one platform that serves both SACs and ABET. This paper will also highlight how the assessment culture in the department plays a big role in the continuous improvement of the programs offered.

Introduction

According to Department of Education [1], student enrollment in postsecondary college level in the US increased from 15.9 to 21.0 million during the 10 year span of fall 2001 to fall 2011. It is predicted that this rapid growth of student enrollment in higher education will continue, and by fall 2021, college enrollment is expected to set a new record with an increase of 13 percent. By 2020, US should also have the highest population of college graduates [2]. While the enrollment data shows a fast growing picture, a recent article published by the Department of Education (DoEdD) reported some concerns regarding student learning in higher education. The overall quality of student learning in US colleges and universities is inadequate, and in some cases, it is declining [3]. DoED has called for quality assurance in higher education as there has been a "remarkable absence of accountability mechanisms to ensure that colleges succeed in educating students [3]." In recent years, assessment of student learning outcomes has become one of the key academic activities that higher educational institutes employ not only to ensure accountability, but also to assess what knowledge and skills students acquire form their academic work [4]. In addition to regular teaching activities, assessment is now an important individual and collective responsibility for all faculty members in institutions of higher education. Assessment activities conducted by faculty members are also important for maintaining accreditation with recognized accreditation organization. Having a degree from a program that is nationally accredited provides the students confidence in the quality of education they receive [5]. Accreditation status provides the opportunity to students to transfer their credits to other accredited programs or institutions, if needed and also signals the potential employers that a

student's degree met the widely accepted standards relevant to his/her program [6]. For a higher educational institution and its programs, accreditation provides the opportunity for self-definition and self-reflection, and opens the door for continuous improvement effort [7, 8].

Savannah State University (SSU) is a SACS (Southern Association of Colleges and Schools) accredited higher educational institution. Southern Association of Colleges and Schools Commission on Colleges is the accreditation body of degree-granting higher educational institution for the southern region of the US. It mission is "to assure education quality and improve the effectiveness of its member institution" [9]. SSU, being a SACS accredited school, measures six Institutional Student Learning Outcomes (ISLOs) in each academic year.

Department of Engineering Technology at SSU offers two ABET (Accreditation Board for Engineering and Technology) accredited Bachelor degree programs: Civil Engineering Technology and Electronics Engineering Technology. ABET is recognized for accrediting college and university programs in the disciplines of applied science, computing, engineering and engineering technology at associate, bachelor and master degree levels [10]. One of the major accreditation criteria of ABET for engineering technology programs (ETAC criteria: Engineering Technology Accreditation Commission [11]) is to document the Students Outcomes (SOs) with an effective process to measure those. There are 11 student outcomes, widely known as a-k outcomes.

Assessment of the ISLOs for SACS and SOs for ABET in two different platforms are sometimes reparative, time consuming, and might be cumbersome for some faculty members. Therefore, Engineering Technology Department at SSU has been implementing an assessment process that utilizes only one platform to measure both the ISLOs and ABET SOs. This process has led to the development of a standard format of annual assessment report. The main focus of the paper is to describe how the implementation of the direct assessment takes place in one platform that serves both SACs and ABET.

ISLOs and ABET SOs

As mentioned, SSU, being a SACS accredited school, measures six Institutional Student Learning Outcomes (ISLOs) in each academic year. Therefore, all degree awarding programs obligatorily assess these six ISLOs every year. The six ISLOs and their definition are listed in Table 1 below. Out of these six, ISLOs 1, 2, and 3 are measured in each fall semester and ISLOs 4, 5, and 6 are measured in each spring semester.

Table 1: The six ISLOs and their definition

ISLO	Definition [12]
ISLO 1: Written Communication	The development of clear expression of ideas in writing.
ISLO 2: Critical Thinking	"A habit of mind" characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.
ISLO 3: Information Literacy	The ability to know when there is a need for information,

	to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand.
ISLO 4: Ethical Reasoning	Ethical reasoning to reasoning about right and wrong human conduct.
ISLO 5: Quantitative Literacy	A "habit of mind," competency, and comfort in working with numerical data.
ISLO 6: Integrative Learning	An understanding and a disposition that a student builds across the curriculum and co- curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus.

It was already been stated that Department of Engineering Technology at SSU offers Civil Engineering Technology and Electronics Engineering Technology programs, which are ABET accredited. As required by the Engineering Technology Accreditation Commission of ABET, these two programs need to document SOs that must include, but not limited to, the following learned capabilities [11]:

Table 2: List of ABET a-k Student Outcomes:

ABET Student Outcomes	Definition [11]
a	An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.
b	An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
c	An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.
d	An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.
e	An ability to function effectively as a member or leader on a technical team
f	An ability to identify, analyze, and solve broadly-defined engineering technology problems.
g	An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.

h	An understanding of the need for and an ability to engage in self-directed continuing professional development.
i	An understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.
j	A knowledge of the impact of engineering technology solutions in a societal and global context.
k	A commitment to quality, timeliness, and continuous improvement.

A comparison between Tables 1 and 2 indicates that ISLOs are more general and ABET SOs are specific to Engineering Technology Programs. However, by measuring one ISLO, faculty members are eventually measuring one or more ABET SOs too. For example, assessment of ISLO 2 can also serve as that of ABET SO g, since both ISLO 2 and SO g are assessing students' ability to communicate appropriately. Thus, the measurement ISLO 2 and ABET SO g by a faculty member in two different platforms are basically the duplication of the same job. The repetition of the same job is time consuming and might be cumbersome for some faculty members. To minimize this repetition, faculty members of Civil and Electronics Engineering Technology Programs at SSU developed a mapping of the ISLOs with the ABET SOs. As a sample, the mapping of ISLOs with Civil Engineering Technology ABET SOs is shown in Table 3 below:

Table 3: Mapping of ISLOs with Civil Engineering Technology SOs:

Institutional Students Learning Outcomes (ISLOs)	CET Students Outcomes
ISLOs 1	c, d, e, f, g, i, k
ISLOs 2	a, b, c, d, f, h, j, k
ISLOs 3	c, d, e, f, g, i, k
ISLOs 4	c, d, e, f, g, i, k
ISLOs 5	a, b, c, d, f, h, j, k
ISLOs 6	b, d, e, f, g, h, i, j, k

Faculty members have also developed a plan of courses which they would use for assessment in fall and spring semesters. Based on this plan, the assessment coordinator of the department sends the list of the courses and the corresponding ISLOs to all faculty members at the beginning of each semester.

Assessment Data Submission Platform

The online data submission platform was developed in Visual Basic.NET (VB.NET). On this platform, faculty members can select the ISLO and at the same time, the corresponding ABET

SOs for a specific course. A snapshot of online data submission platform is shown in Figure 1, where the blue rectangles indicate where the faculty members need to insert the assessment data. There are thirteen pieces of information they need to insert using the drop-down boxes. They are (1) faculty name, (2) program, (3) semester, (4) year, (5) course name, (6) course section, (7) ISLO measured with this course, (8) corresponding ABET SOs, (9) method of assessment [by HW, exam, lab report, etc.], (10) expected success rate in percentage, (11) number of students in the course. After the faculty member selects the number of students in the course and click the 'Generate Grid' tab, a row for every student will be created, so that the faculty member can pick the performance Level (Levels 1, 2, 3 or 4) for each of them. The faculty members can then save

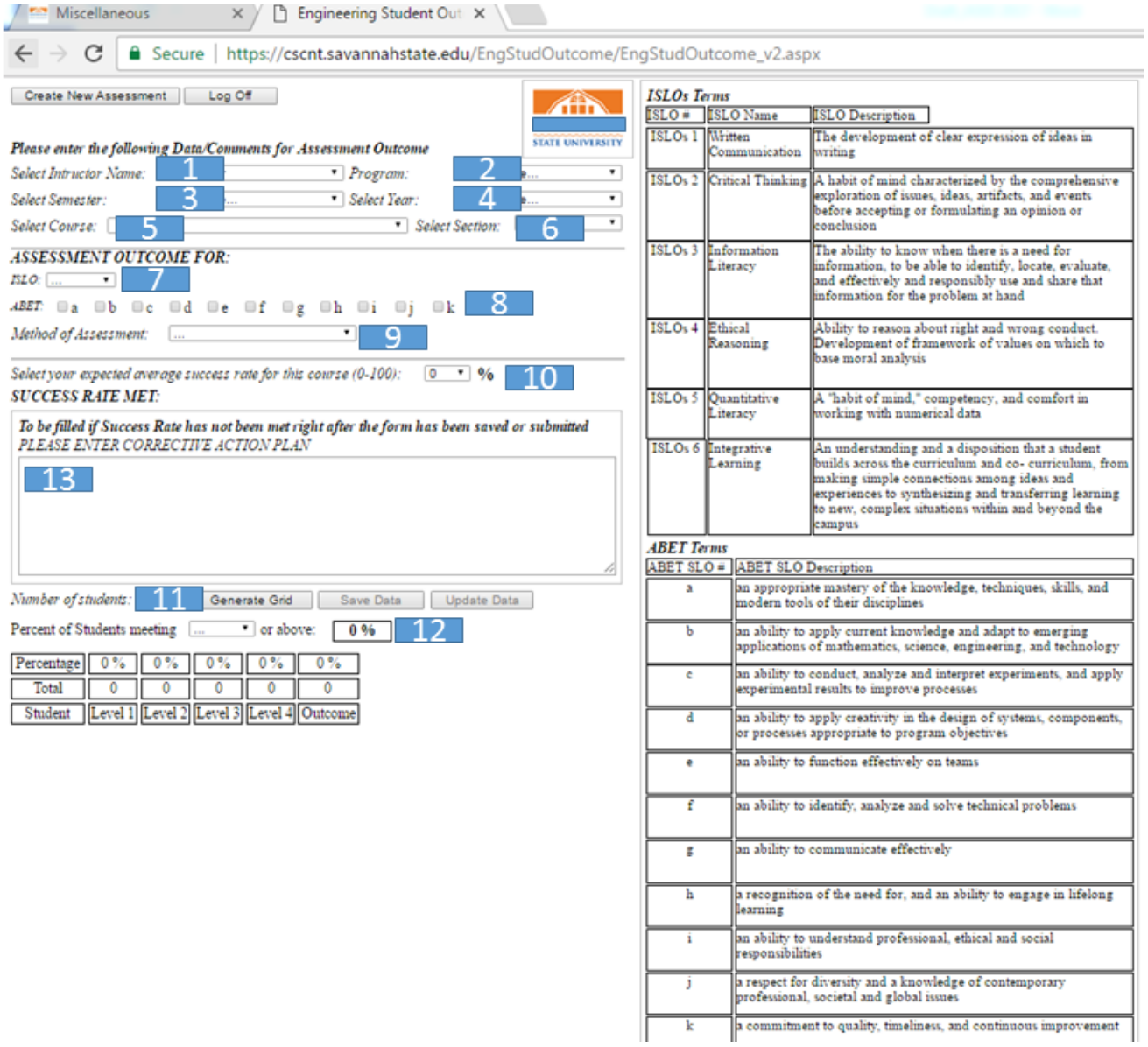

Figure 1: A snapshot of the online data submission form [the blue rectangles indicate where the faculty members insert data].

the data using the ‘Save Data’ tab. This will create the percent of student success rate and will be shown in box (12). The number in box (12) gets compared with the expected success rate in box (10). A lower number in box (12) than that in box (10) points out that the expected success rate is not met. In that case, a window will pop up asking the faculty member to write down the recommendations to be used in future to improve students’ performance. The faculty members can then summarize their recommendations in box (13). The form, after all submissions, produces a plot showing the distribution of students’ performance in all four levels. A sample is shown in Figure 2.

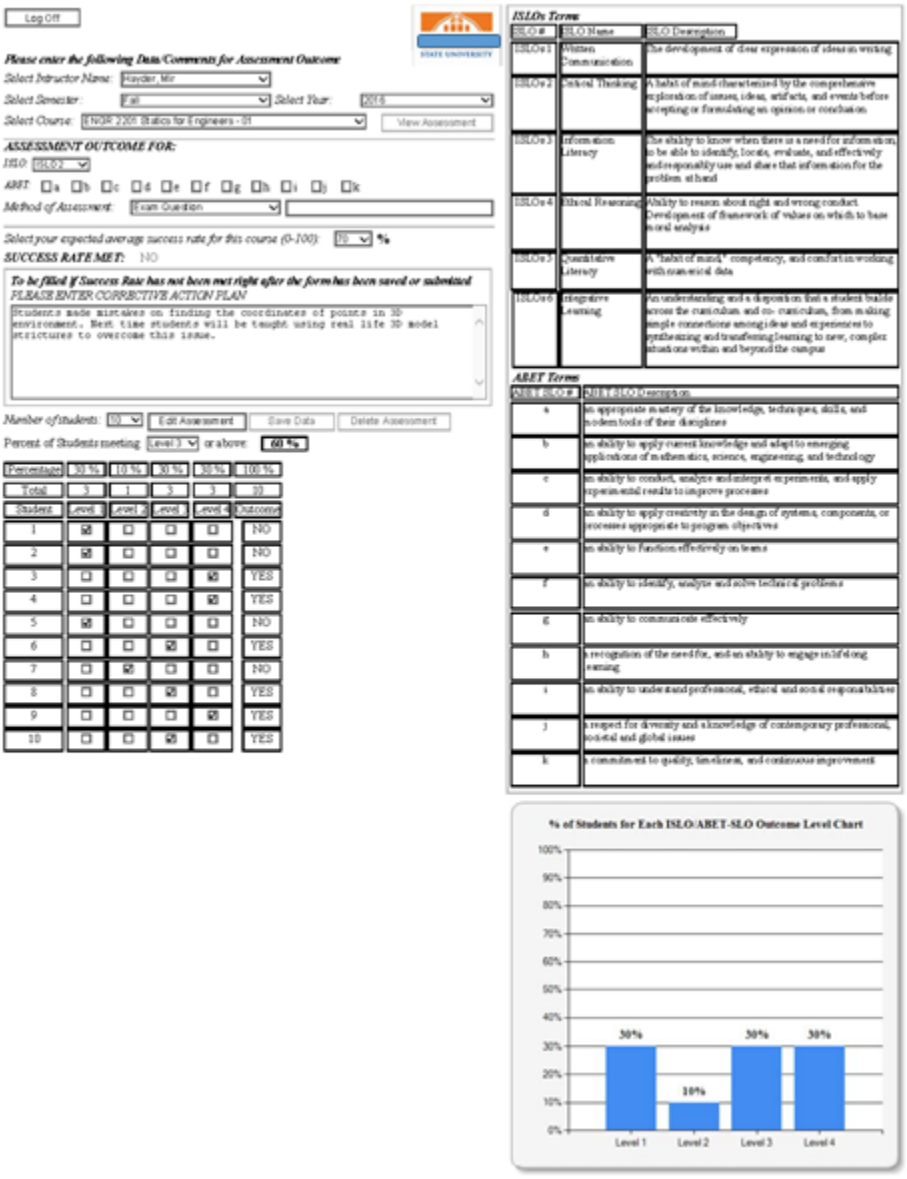

Figure 2: Sample data with faculty recommendations and the plot for student performance level distribution.

Finally, a confirmation email and the link of the submitted data is sent the to the faculty members for their review with a cc to the department chair and the assessment coordinator.

With each set of data as shown in Figure 2, faculty members also submit (1) the rubrics for assessing the student work, (2) the instrument (HW, exam, lab report, etc.) used for the assessment, and (3) and three sample student works to the assessment coordinator of the department. Faculty members are responsible for preparing their own rubrics; however, the department has developed a standard template to help them preparing the rubrics.

Annual Assessment Report

The development of the online platform has made the assessment process much convenient for the faculty members of Engineering Technology Department. It allows them to submit the both the ISLOs and ABET SOs data in one place avoiding any duplication of their jobs. The department has formed a 'Continuous Improvement (CI)' committee consisting of the department chair, all program coordinators and an assessment coordinator to assist them in the assessment process. The CI committee has come up with a mapping of Program Educational Objectives (PEOs) for each program with ISLOs and ABET SOs. A sample (Civil Engineering Technology program) is shown in Table 4:

Table 4: Mapping of Civil Engineering Technology Program Educational Objectives (PEOs) with Institutional Student Learning Outcomes (ISLOs) and ABET Student Outcomes (SOs):

PEOs	Institutional Student Learning Outcomes (ISLOs)						ABET Student Outcomes (SOs)										
	ISLO 1	ISLO 2	ISLO 3	ISLO 4	ISLO 5	ISLO 6	a	b	c	d	e	f	g	h	i	j	k
PEO 1		x	x		x		x	x	x	x		x					
PEO 2				x		x	x				x				x		
PEO 3	x			x									x	x		x	x

The mapping in Table 4 shows that each Program Educational Objective of a program can be measured by assessing the ISLOs and ABET SOs. These types of mapping for all degree awarding programs in the Engineering Technology Department have made the preparation of the annual assessment report easier. After receiving all the assessment data, the assessment coordinator of the department prepares the annual assessment report for each PEOs of all degree awarding programs. This report is then shared with the CI committee and the faculty members in the department meetings for their review.

Conclusion

This paper has highlighted the features how Engineering Technology Department at SSU has been implementing the assessment process by employing only one platform to measure the ISLOs and ABET SOs together that serves both SACs and ABET. This process has made the preparation of the annual assessment report much simpler. It has also improved the assessment culture in the department, a key factor for the continuous improvement of the programs offered by the department.

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