Institute of Statistics and Computerized Information Systems
Faculty of Business Administration

Report on assessment of SICI outcomes (January – May 2010)

Prepared by:

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Revised by SICI ABET Committee on September 8, 2010:

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August 31, 2010

Report on assessment of SICI outcomes
(January – May 2010)
Prof. A. Ramos

Introduction

During last semester (January – May 2010) we assessed all ten student outcomes of our major. This achievement was possible due to several factors, among which we want to emphasize the use of course-embedded assessment methods, as well as the use of an automated tool to support the assessment process.

Outcomes were assessed using course capstone projects, short essays, and exit interviews. These interviews, which were started last semester, were conducted by a committee of at least two professors to several graduating students individually. Except for the exit interviews, all other methods were assessed within courses, specifically in the following: SICI 3245, 3255, 4015, 4025, 4266, 4275, 4278, and 4998.

The semester was very particular because classes were interrupted from April 21 until July 6 due to a student strike. They were reinitiated on July 7 up to July 30, in order to complete the three remaining weeks of the semester.

Assessment process for the semester

During the first half of the semester we worked with the recommendations made in the assessment report for the previous semester (August – December 2009). Specifically, we worked with the following:

1. The rubrics used for some of the courses, like SICI 3255 and SICI 4266, were revised to make them more generic. Others were revised as well.

2. The assessment performed in SICI 4015 and SICI 4266 was also used to support outcome # 2, besides supporting outcome #4.

3. The assessment of outcome # 7 (Lifelong learning) was incorporated to SICI 4278, where this material is covered at a higher cognitive level than in SICI 3211.

4. The assessment of outcome # 8 (Ethical values and interpersonal relationships) was incorporated to SICI 4275, together with outcomes # 6 (To value the protection of information system resources in an organization, and to identify ways in which this protection can be achieved) and 9 (To communicate effectively with a range of audiences).

5. The assessment of outcome # 9 (To communicate effectively with a range of audiences) was incorporated to SICI 4278 using a short essay that students prepared in this course.

6. We prepared and approved a rubric to assess the Exit Interview, as well as a guide to conduct this interview.

7. The table "Summary of All Outcomes" was modified in order to classify the assessment methods by cognitive level (low, medium, high).

8. The tables where student outcomes are mapped to SICI courses, both requisites and electives, were updated accordingly.

On March 15, we emailed the most recent version of the corresponding rubrics, together with some instructions and remarks regarding the assessment process, to all professors involved in this process. A "motivational message" was sent by the Department Head on June 15. Additional reminders were sent by me on August 7 and August 14, and by the Department Head on August 19.

Between the end of last semester (July 30) and the beginning of this one (August 30), I received all the rubrics already completed by the professors, except for one[1], together with remarks from some of the professors regarding their experience with the process. The results of the individual rubrics were integrated into a summary table by outcome (see Appendix 1), based on the outcomes supported by each rubric. Finally, I analyzed the data, prepared this report and presented it to the ABET Committee[2].

Assessment results

The following remarks are derived from the data in the summary table, together with the feedback received from some of the professors involved in the assessment.

1. Most students did very well on the assessment of student outcomes. See Appendix 1.

    a. The percentage of students that obtained a passing score ranged from 71.43% to 100% throughout the individual outcomes, except for outcome number 2 (To select or design a system to solve the problems identified in an operation), where this percentage was 64.29.

2. For the second semester in a row, outcome #2 (To select or design a system to solve the problems identified in an operation) got the lowest percentage of student performance, with 64.29. The two contributors to this percentage were SICI 4025, with 42.86, and SICI 4266, with 85.71. The previous semester (August – December 2009) , this outcome also got the lowest percentage, with 36.36, with SICI 4025 being

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[1] By the date of this report we still have not received the completed rubric for the outcomes related to the course SICI 4015. This is the second time that this course is left out of this report.

[2] I want to acknowledge the support and the contributions received from the members of the ABET Committee (Dr. Katherine Franceschi, Prof. María del R. Rodríguez, and Dr. Rosarito Sánchez), as well as the support and contributions received from our Department Head (Dr. Pedro Rodríguez) and the SICI professors.

the only contributor. We must continue analyzing this situation in order to find explanations and to take additional corrective actions to improve it.[3]

a. The fact that the semester had a 60-day interruption due to a student strike must have had an influence.

b. Also, the fact that students are now taking SICI 4025 earlier in the course sequence may have had an influence.

3. There was a higher than usual number of dropouts in SICI 3255, probably due to the student strike. But the students that stayed in the course did very well in the assessment. Although we consider dropouts to be out of the scope of the assessment process, since these students are not included in the assessment sample, it is an issue that we need to address anyway.

4. Some project descriptions are still in Spanish (SICI 4025, 4275 and 4998). They have to be translated to English.

5. One professor did not fill the remarks column in the rubrics. This column should be used to enter student feedback regarding the score assigned to the corresponding characteristic, particularly when the student did not get the highest score.

6. Two professors emailed the projects, essays, etc., used for assessment. This allowed me to electronically store the whole package (projects, project descriptions and rubric) used in the assessment process as evidence of the assessment results.

Recommendations

1. We have to continue emphasizing logical systems design in SICI 4025, in order to improve assessment results for outcome #2, probably through measures like the following:

   a. Allocating more time to this topic in SICI 4025.

   b. Exposing students to some of the components of a system (like screens, reports, and databases) earlier in the course sequence, using a user-oriented database management system. This could be done in the very first course that our students take (SICI 3211).

2. The dropout issue on SICI 3255 should be addressed to find out its causes and to take whatever actions are necessary, such as providing more support to students and changing educational strategies.

[3] It is important to emphasize that the professor teaching this course (Prof. María del R. Rodríguez Orellana) brought this situation to the attention of the ABET Committee and she has been working with it since last semester.

3. The project descriptions that are still in Spanish should be translated to English (SICI 4025, 4275 and 4998).

4. The ABET Committee should promote that professors fill the remarks column in the rubrics. This column should be used to enter student feedback regarding the score assigned to the corresponding characteristic, particularly when the student did not get the highest score.

5. The ABET Committee should promote keeping all the assessment related documents electronically in a central location. This responsibility should be assigned to one particular person. This semester, two professors emailed the projects, essays, etc., that they used for assessment. This will allow to electronically store the whole package (projects, project descriptions and rubric) used in the assessment process as evidence of the assessment results.

6. Students should orally present their projects so that the evaluator can better assess it. Because projects are take-home, it is important for the evaluator to validate the extent to which the student really prepared the project himself. Also, in the case of group projects, presentations will help the evaluator to assess the individual contribution of group members to the project.

7. SICI 4025 should be used to support outcome #10 (Teamwork) instead of outcome #9 (Communication). Right now, outcome #10 (Teamwork) is supported only by SICI 4278 while outcome #9 (Communication) is now supported by SICI 3245, SICI 4025, SICI 4275 and SICI 4278. This way the number of courses supporting these outcomes will be better balanced.

8. SICI 4998 should be used to support outcomes #9 (Communication) and 10 (Teamwork). The short essay that students are now preparing at the end of the course provides for assessing both outcomes.

Additional remarks

1. This semester all professors provided the description for the method used to perform the assessment. The summary table now provides a link to quickly access these descriptions.

2. Rubrics continue to be a useful tool to facilitate the assessment process. They are easy to use, and reduce the probability of data entry and calculation errors. They simplify the data collection, the calculation of student scores, as well as the calculation of scores related to the specific outcomes being assessed.

3. The use of course-embedded assessment allowed assessing student outcomes without an additional burden on students and professors. All that professors had to do was to make sure that the method requirements support the characteristics contained in the corresponding rubric.

4. The main contributors to the assessment results obtained are the contents of the courses and the educational strategies used by professors. But we believe these results can also be attributed to other factors, like the following:

    a. By the time the assessment was performed, most students not performing well in the course had already abandoned it.

    b. Students knew beforehand all the characteristics to be assessed in the particular method used.

    c. The methods used were mostly take-home projects, with reasonable time for preparation. Projects usually raise student interest and performance.

    d. Projects used resemble the work performed by IS professionals in industry and government, which probably contributed additionally to raise student interest.

    e. All students assessed belong to the SICI major, so it is reasonable to assume that they put a special interest in the courses, as well as the assessment methods.

Mapping of student outcomes to SICI courses, exit interview and ABET outcomes

As part of our continuous improvement process, Appendixes 2 and 3 present a revised version of the tables mapping student outcomes to SICI courses, exit interview and ABET outcomes. The revision was based on the results obtained from the assessment process, as well as on the recommendations we are making in this report.

Table mapping objectives, outcomes and performance criteria ("Constitutional table")

As part of our continuous improvement process, Appendix 4 contains a revised version of the SICI Constitutional Table, specifically in the column containing the SICI courses that will support each outcome. The revision was based on the recommendations we are making in this report.

Graph of all outcomes (approved vs. not approved)

Appendix 5 presents a graph showing the relationship between the number of students approving and not approving each outcome.

Appendix 1
Summary of assessment results

Institute of Statistics and Information Systems
Faculty of Business Administration
University of Puerto Rico - Rio Piedras
Major in Computerized Information Systems
Assessment of Student Outcomes
January-10

Assessment results

O #	Student outcomes	Assessment methods			Approved		Not approved	
		Rubric	Level	Ref.	Total	Percent	Total	Percent
1	To analyze an operation within an organization, identify problems and make recommendations to solve these problems.	COIS 4025	Medium	Ref.	7	100.00%	0	0%
				Totals for this outcome	*7*	*100.00%*	*0*	*0.00%*
2	To select or design a system to solve the problems identified in an operation.	COIS 4025	Medium	Ref.	3	42.86%	4	57.14%
		COIS 4015	Medium					
		COIS 4266	Medium	Ref.	6	85.71%	1	14.29%
		COIS 4405 (E)	Medium					
				Totals for this outcome	*9*	*64.29%*	*5*	*35.71%*
3	To plan and supervise the implementation of a system that solves the problems identified in an operation.	COIS 4278(1)	High	Ref.	7	100.00%	0	0.00%
				Totals for this outcome	*7*	*100.00%*	*0*	*0.00%*
4	To use current techniques, skills, tools and best practices to design, implement and manage information systems.	COIS 3245	Low	Ref.	23	100.00%	0	0.00%
		COIS 3255	Low	Ref.	14	100.00%	0	0.00%
		COIS 4015	Medium					
		COIS 4266	Medium	Ref.	7	100.00%	0	0.00%
		COIS 4285(E)	Medium					
		COIS 4286	Medium					
		COIS 4405(E)	Medium					
		COIS XXX2	High					
				Totals for this outcome	*44*	*100.00%*	*0*	*0.00%*
5	To understand the impact that organizational, local and global environments have in the implementation and management of information systems.	COIS 4266	Medium	Ref.	7	100.00%	0	0.00%
		COIS 4278(2)	High	Ref.	7	100.00%	0	0.00%
		COIS 4405(E)	Medium					
		COIS 4465(E)	Low					
				Totals for this outcome	*14*	*100.00%*	*0*	*0.00%*

Assessment results

O #	Student outcomes	Assessment methods			Approved		Not approved	
		Rubric	Level	Ref.	Total	Percent	Total	Percent
6	To value the protection of information system resources in an organization, and to identify ways in which this protection can be achieved.	COIS 4275	High	Ref.	6	75.00%	2	25.00%
	Totals for this outcome				*6*	*75.00%*	*2*	*25.00%*
7	To be aware of the high level of change in the Information Systems field, and the need to use different mechanisms to update his knowledge.	Exit interview	All	Ref.	3	100.00%	0	0.00%
		COIS 4278(2)	High	Ref.	5	71.43%	2	28.57%
	Totals for this outcome				*8*	*80.00%*	*2*	*20.00%*
8	To recognize the importance of ethical values and interpersonal relationships in an information systems professional.	Exit interview	All	Ref.	3	100.00%	0	0.00%
		COIS 4465(E)	Low					
		COIS 4275	High	Ref.	8	100.00%	0	0.00%
		COIS 4998(E)	High	Ref.	3	100.00%	0	0.00%
	Totals for this outcome				*14*	*100.00%*	*0*	*0.00%*
9	To communicate effectively with a range of audiences.	COIS 3245	Low	Ref.	22	95.65%	1	4.35%
		COIS 4025	Medium	Ref.	7	100.00%	0	0.00%
		COIS 4275	High	Ref.	8	100.00%	0	0.00%
		COIS 4278(2)	High	Ref.	7	100.00%	0	0.00%
		COIS 4998(E)	High	Ref.	3	100.00%	0	0.00%
	Totals for this outcome				*47*	*97.92%*	*1*	*2.08%*
10	To function effectively in teams seeking to accomplish a common goal.	Exit interview	All	Ref.	2	66.67%	1	33.33%
		COIS 4278(1)	High	Ref.	7	100.00%	0	0.00%
		COIS 4998(E)	High	Ref.	2	66.67%	1	33.33%
	Totals for this outcome				*11*	*84.62%*	*2*	*15.38%*
	Tool developed by Prof. Arnaldo I. Ramos-Torres during Christmas vacation of 2008. All rights reserved.							

Institute of Statistics and Information Systems
Faculty of Business Administration
University of Puerto Rico - Rio Piedras
Major in Computerized Information Systems
Assessment of Student Outcomes
January-10

Corrective actions

O #	Action items	Responsible person(s)	Dates
1	(Three droputs/incompletes.)		
2	Students ability to design needs to be improved. (3 dropouts/ incompletes)	ABET Committee	October 31, 2010
	Rubric not yet received.		
	(One dropout/incomplete.)		
	Course not offered this semester.		
3	(Three dropouts/incompletes.)		
4	(Seven dropouts/incompletes)		
	(Seventeeen dropouts/incompletes.)		
	Rubric not yet received.		
	(One dropout/incomplete.)		
	Course not offered this semester.		
	Course not offered this semester.		
	Course not offered this semester.		
	Course not offered this semester.		
5	(One dropout/incomplete.)		
	(Three dropouts/incompletes.)		
	Course not offered this semester.		
	Course not offered this semester.		

	Corrective actions

O #	Action items	Responsible person(s)	Dates
6	(One dropout/incomplete.)		
7			
	(Three dropouts/incompletes.)		
8			
	Course not offered this semester.		
	(One dropout/incomplete.)		
	(No droputs/incompletes)		
9	(Seven dropouts/incompletes)		
	(Three droputs/incompletes.)		
	(One dropout/incomplete.)		
	(Three students dropped out.)		
	(No droputs/incompletes)		
10	(One student said no teamwork performed in SICI courses.)		
	(Three dropouts/incompletes.)		
	(One student barely addressed teamwork.) (No droputs/incompletes)		
	Tool developed by Prof. Arnaldo I. Ramos-Torres during Christmas vacation of 2008. All rights reserved.		

Appendix 2
Mapping of student outcomes to SICI (required) courses, exit interview and ABET outcomes

Mapping of student outcomes to SICI (required) courses, Exit interview and ABET outcomes Prof. A. Ramos, Revised May 2010												
		Required courses									Exit	ABET
#	Student outcomes	3211	3245	3255	4015	4025	4266	4275	4278	4286	interview	outcomes
1	To analyze an operation within an organization, identify problems and make recommendations to solve these problems.					X						A,B,J
2	To select or design a system to solve the problems identified in an operation.				X	X	X					A,C,J
3	To plan and supervise the implementation of a system that solves the problems identified in an operation.								X			A,C,J
4	To use current techniques, skills, tools and best practices to design, implement and manage information systems.		X	X	X		X			X		A,C,I
5	To understand the impact that organizational, local and global environments have in the implementation and management of information systems.						X		X			G,J
6	To value the protection of information system resources in an organization, and to identify ways in which this protection can be achieved.							X				E,J
7	To be aware of the high level of change in the Information Systems field, and the need to use different mechanisms to update his knowledge.								X		X	H
8	To recognize the importance of ethical values and interpersonal relationships in an information systems professional.							X			X	E
9	To communicate effectively with a range of audiences.		X			(X)		X	X			F
10	To function effectively in teams seeking to accomplish a common goal.					X			X		X	D
	Note: We are trying to assess not more than three outcomes per rubric (or assessment method). (A large **X** means "add to this outcome", and a small **(X)** means "remove from this outcome".)											

Appendix 3
Mapping of student outcomes to SICI (elective) courses, exit interview and ABET outcomes

Mapping of student outcomes to SICI (elective) courses and ABET outcomes Prof. A. Ramos, Revised May 2010											
		Elective courses									ABET
#	Student outcomes	4285	4405	4465	XXX2	4998					outcomes
1	To analyze an operation within an organization, identify problems and make recommendations to solve these problems.					(See notes)					A,B,J
2	To select or design a system to solve the problems identified in an operation.		X								A,C,J
3	To plan and supervise the implementation of a system that solves the problems identified in an operation.										A,C,J
4	To use current techniques, skills, tools and best practices to design, implement and manage information systems.	X	X		X						A,C,I
5	To understand the impact that organizational, local and global environments have in the implementation and management of information systems.		X	X							G,J
6	To value the protection of information system resources in an organization, and to identify ways in which this protection can be achieved.										E,J
7	To be aware of the high level of change in the Information Systems field, and the need to use different mechanisms to update his knowledge.										H
8	To recognize the importance of ethical values and interpersonal relationships in an information systems professional.			X		(X)					E
9	To communicate effectively with a range of audiences.					X					F
10	To function effectively in teams seeking to accomplish a common goal.					(X)					D
	Notes: We are trying to assess not more than three outcomes per course. SICI 4998 could support any of the outcomes, depending on the particular job obtained by the student. But since students have to prepare a paper, outcomes 8, 9 and 10 should be assessed here.										

Appendix 4
Table mapping objectives, outcomes and performance criteria ("SICI Constitutional table")

University of Puerto Rico
Faculty of Business Administration, Information Systems Major
"SICI Constitutional Table"
Educational objectives, student outcomes and performance criteria (including modifications)
Prof. A. Ramos, August 2010

Educational objectives (What the graduate must accomplish in the first few years (3 to 5) of his professional career.)	**Student outcomes** (What the student must know, value, and be able to do, at the time of his graduation, which will enable him to achieve the educational objectives.)	**Performance criteria** (What the student must be able to do, or to produce, in order to show that he complies with the learning outcomes.)	**SICI Courses supporting the outcome**	**ABET Outcomes supported**
1. To implement and manage the development of information systems in an organization.	1. To analyze an operation within an organization, identify problems and make recommendations to solve these problems.	1. To prepare functional, technical, and other requirements for an information system that solves the problems identified in an operation.	4025	A, B, J
	2. To select or design a system to solve the problems identified in an operation.	2. To design the components of an information system based on the functional requirements prepared for that system.	4015,4025, 4266, 4405(E)	A, C, J
	3. To plan and supervise the implementation of a system that solves the problems identified in an operation.	3. To develop a plan to implement an information system, including the phases and activities that this process requires.	4278	A, C, J
2. To apply technological, analytical, and critical thinking skills in the solution of problems related to information systems in organizations.	4. To use current techniques, skills, tools and best practices to design, implement and manage information systems.	4. To identify the hardware, software and data communication components needed to operate an information system, and to integrate them in a technological solution.	3245	A, C, I
		5. To code, test, and document computer programs to perform the automated processes that compose a system, using modern programming tools.	3255, 4266, 4405(E), XXX2 (E)	
		6. To design a properly normalized database based on requirements prepared by systems analysts or by users.	4015	

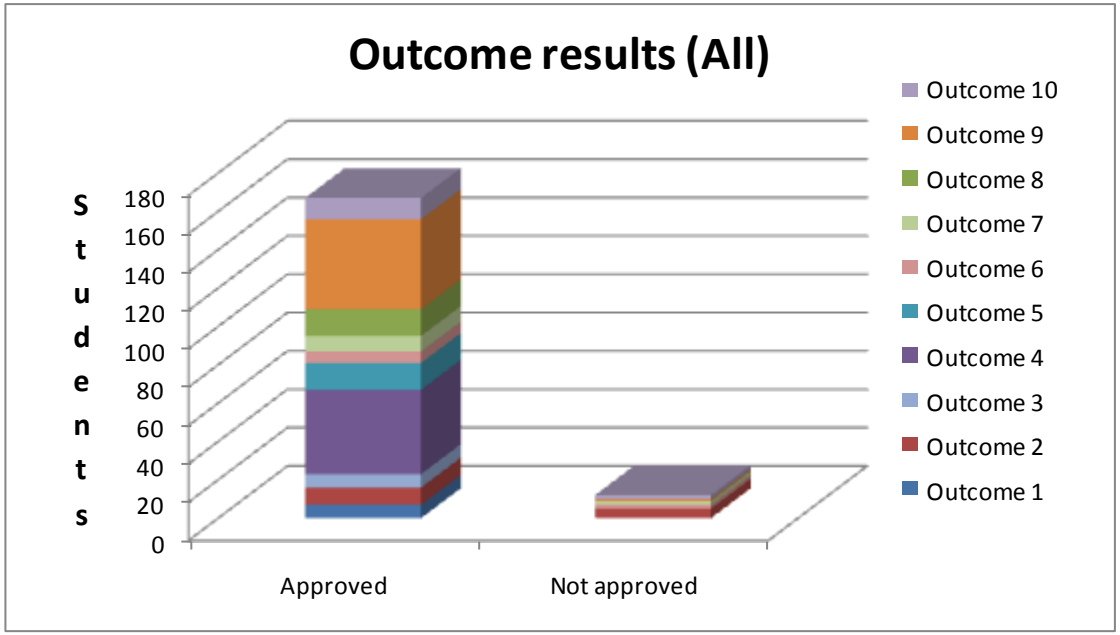
University of Puerto Rico
Faculty of Business Administration, Information Systems Major
"SICI Constitutional Table"
Educational objectives, student outcomes and performance criteria (including modifications)
Prof. A. Ramos, August 2010

Educational objectives (What the graduate must accomplish in the first few years (3 to 5) of his professional career.)	**Student outcomes** (What the student must know, value, and be able to do, at the time of his graduation, which will enable him to achieve the educational objectives.)	**Performance criteria** (What the student must be able to do, or to produce, in order to show that he complies with the learning outcomes.)	**SICI Courses supporting the outcome**	**ABET Outcomes supported**
		7. To identify the components of a communications network, mention the main characteristics of these components, and to present the way they integrate into a network.	4286, 4285(E)	
3. To take into consideration the context in which information systems operate, when implementing and managing these systems.	5. To understand the impact that organizational, local and global environments have in the implementation and management of information systems.	8. To analyze administrative, organizational, local and global aspects that affect information systems, and to define strategies to deal with these aspects.	4278, 4266, 4405(E), 4465(E)	G, J
	6. To value the protection of information system resources in an organization, and to identify ways in which this protection can be achieved.	9. To prepare a disaster recovery plan for the information system operations of an organization.	4275	E, J
4. To maintain his professional expertise by updating his knowledge in technology and information systems.	7. To be aware of the high level of change in the Information Systems field, and the need to use different mechanisms to update his knowledge.	10. To get related with professional associations, publications and Continuing Education alternatives in the geographic area where he lives or works.	4278, Exit	H
5. To perform his functions showing respect and appreciation for ethical values, interpersonal relationships, communication, and team	8. To recognize the importance of ethical values and interpersonal relationships in an information systems professional.	11. To identify and evaluate ethical and interpersonal relationship aspects related to information system professionals.	4275, Exit, 4465(E)499 8(E)	E

University of Puerto Rico
Faculty of Business Administration, Information Systems Major
"SICI Constitutional Table"
Educational objectives, student outcomes and performance criteria (including modifications)
Prof. A. Ramos, August 2010

Educational objectives (What the graduate must accomplish in the first few years (3 to 5) of his professional career.)	**Student outcomes** (What the student must know, value, and be able to do, at the time of his graduation, which will enable him to achieve the educational objectives.)	**Performance criteria** (What the student must be able to do, or to produce, in order to show that he complies with the learning outcomes.)	**SICI Courses supporting the outcome**	**ABET Outcomes supported**
work.	9. To communicate effectively with a range of audiences.	12. To prepare written reports and oral presentations related to information system topics.	3245, 4275, 4278, 4998(E)	F
	10. To function effectively in teams seeking to accomplish a common goal.	13. To demonstrate ability to work effectively in task-oriented groups, like information system project teams.	4025, 4278, Exit4998(E)	D

Appendix 5
Graph of outcome results


Outcome results (All)
Students
180
160
140
120
100
80
60
40
20
0
Approved
Not approved
Outcome 10
Outcome 9
Outcome 8
Outcome 7
Outcome 6
Outcome 5
Outcome 4
Outcome 3
Outcome 2
Outcome 1