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Henry Etlinger

Rajendra K. Raj

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Putting the ‘Student’ in Student Learning Outcomes

Henry A. Etlinger and Rajendra K. Raj
[hae,rkr]@cs.rit.edu

Department of Computer Science, Rochester Institute of Technology, Rochester, New York

Motivation

- Faculty routinely evaluate student performance, using various measures to determine how well students meet defined course goals
- Student performance in courses is often linked to attainment of Program-level Student Learning Outcomes (PSLOs) (referred to as Student Outcomes in our surveys)
- Typical assessment frameworks overlook the direct engagement of students in assessing their own progress toward meeting course goals and PSLOs
- This project developed survey instruments for engaging students in their own assessment and piloted their use for assessment during 2012-2013

Sample Initial Survey

Putting the “Student” in Student Learning Outcomes: Initial Survey

Name (please print) _____ Date _____

1) Prior to entering this course, did you know that the B.S. Computer Science degree had **student outcomes** that “describe what our students are expected to know and be able to do by graduation”? _____yes _____no

2) Please review the student outcomes and specific course goals for Programming Language Concepts shown below.

a) Do you think there are course goals missing? _____yes _____no
If you answered ‘yes’, please identify other course goals that you would have expected.

b) Do you think any of the currently listed course goals support other student outcomes besides student outcome (2)? _____yes _____no
If you answered ‘yes’, please indicate specific course goals and specific student outcomes.

Student Outcomes	Specific Course Goals
B.S. degree in Computer Science	4003-450 (Programming Language Concepts) Course goals defined to support student outcome (2) on the left
1. Apply the theory and principles of computer science.	a) Students will be able to learn new programming paradigms and languages on their own.
2. Demonstrate fluency in high-level programming languages, environments, and tools for computing.	b) Students will be able to describe programming language syntax formally and semantics informally.
3. Demonstrate knowledge of the principles of computer organization, operating systems, and networks.	c) Students will be able to identify appropriate programming languages to use to address the specific needs of a stated problem.
4. Apply computing skills and work effectively in teams in industry or research.	d) Students will be able to explain and apply basic constructs and concepts used in common programming languages.
5. Demonstrate advanced knowledge of a selected area within the computer science discipline.	e) Students will be able to describe a historical perspective of programming languages.
6. Prepare technical documents and make effective oral presentations.	f) Students will be able to program using a functional subset of a LISP dialect.
7. Comprehend and analyze both legal and ethical issues involving the use of computing in society.	

Sample Final Survey

Putting the “Student” in Student Learning Outcomes: Final Survey

1) Check the box how well you think the course helped you make progress on its listed course goals.

4003-450 (Programming Languages) – Course goals (To support Student Outcome 2 (shown at the bottom of this page))	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
a. Learn new programming paradigms and languages on your own.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Describe programming language syntax formally and semantics informally.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Identify appropriate programming languages to use to address the specific needs of a stated problem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Explain and apply basic constructs and concepts used in common programming languages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Describe a historical perspective of programming languages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Program using a functional subset of a LISP dialect.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2) If you checked a box as Agree or Strongly Agree, describe why you think so; otherwise leave the area blank.

3) If you checked a box as Disagree or Strongly Disagree, describe why you think so; otherwise leave the area blank.

4) Do you think there were course goals missing for the course? ☐ yes ☐ no
If you answered ‘yes’, please identify other course goals that you would have expected.

5) Now that you have taken the course, indicate whether the course helped you progress toward any of the other Student Outcomes (the skills or learning you will have completing your BS degree).

Student Outcomes	Progress toward each Student Outcome			
B.S. degree in Computer Science	None	Little	Some	Significant
1. Apply the theory and principles of computer science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Demonstrate fluency in high-level programming languages, environments, and tools for computing.				
3. Demonstrate knowledge of the principles of computer organization, operating systems, and networks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Apply computing skills and work effectively in teams in industry or research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Demonstrate advanced knowledge of a selected area within the computer science discipline.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Prepare technical documents and make effective oral presentations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Comprehend and analyze both legal and ethical issues involving the use of computing in society.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Next Steps

- Our student-oriented surveys have been adapted to create a similar course assessment instrument intended to be used by all instructors teaching courses this spring
- Once faculty see that the faculty course assessment instrument is easy to use, we also plan to expand usage by using our initial and final student surveys

References

1. Ducrot, J., Miller, S., and Goodman, P. S. (2008) “Learning Outcomes for a Business Information Systems Undergraduate Program,” Comm. Assoc. Info. Sys., 23 (6). Available at: <http://aisel.aisnet.org/cais/vol23/iss1/6>

2. Chappuis, J. (2005) “Helping Students Understand Assessment,” ACSD, Assessment to Promote Learning: 63 (3), pp. 39-43. Available at: <http://www.ascd.org/publications/educational-leadership/nov05/vol63/num03/Helping-Students-Understand-Assessment.aspx>

Some Comparative Results

- Course 1: Professional Communications
 - A required lower-level course focused on writing and speaking tasks for computer scientists
- Course 2: Programming Language Concepts
 - A required upper-level course presenting a broad overview of programming languages and paradigms
- Course 3: Database Concepts
 - An upper-level elective covering basic data management concepts (this course has become required since Fall Semester 2013)
 - This course was taught in a compressed format so the initial survey was not administered

Item	Course 1	Course 2	Course 3
Initial Survey – unaware of PSLOs	35%	25%	NA
Initial Survey – thought there should be additional course goals	20%	10%	NA
Initial Survey – thought listed course goals might support other PSLOs	20%	45%	NA
Final Survey – agreed that progress toward PSLOs was made	45-80%	71-95%	87-100%
Final Survey – felt no course goals were missing from those stated at the outset	90%	95%	80%
Final Survey – progress in achieving PSLOs not formally associated with the course	55-80%	55-95%	73-100%