PRAC Project Report, 2007-8

Assessing Computer Science Majors Using the Capstone Experience

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This report summarizes the actions taken during the PRAC grant period in Academic Year 2008-2009 for our project assessing the competence of Computer Science majors on three main areas of domain content knowledge. We were awarded funds to support the implementation of a commercial exam called the Major Field Test (MFT), distributed by the Educational Testing Service (ETS). Funds were sufficient for two rounds of exam implementation, and will likely be sufficient for a third as well. The original grant application included funding to support a part-time graduate student employee to help analyze the resulting test data. We concluded that this step was not necessary because of the significant data provided through ETS.

Attached to this report are summary sheets detailing student competency in the three core areas: Computer Programming, Data Structures & Algorithms, and Systems, for each year of the exam. As you can see, the results indicated that IUPUI students outperformed their peers in each area both years. However, the percentage of questions answered correctly in the Discrete Structures & Algorithms area was of significant concern to faculty, as these topics are central to our discipline. In order to rectify this situation, the faculty considered a number of curriculum changes. After much discussion, the faculty decided to require a course in computing theory, CSCI 48400, as part of the undergraduate core curriculum. This addition will strengthen the core discrete structures and algorithms area, adding to the rigor of the curriculum. It is slated to be required in the Bachelor of Science plan of study in Fall 2010.

Because we found great value in the MFT, our plan is to continue using it to assess graduating student competency for many years. The types of questions and competencies tested match the

student learning outcomes that have been indicated in our curriculum, and thus the instrument seems to be a fairly reliable indicator of student learning.

Should additional funds remain in the grant account, we will use them to fund the third Major Field test offering near the end of the Spring 2010 term.

Major Field Tests

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Institution: INDIANA UNIVERSITY-PERDUE UNIVERSITY
Test: COMPUTER SCIENCE
Form Code: 4CMF
Cohort: MFT PPT COMPUTER SCIENCE 16039
Processing date :   · March 7, 2008

Students responding to < 50% of the questions: 0
Students in frequency distribution: 11
Students tested: 11

TOTAL TEST

Scaled Score Range	Number in Range	Percent Below
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	1	91
175-179	1	82
170-174	0	82
165-169	0	82
160-164	1	73
155-159	3	45
150-154	3	18
145-149	2	0
140-144	0	0
135-139	0	0
130-134	0	0
125-129	0	0
120-124	0	0
Mean	158	
Std. Dev.	11	

Percent below is the percent of scores from your institution falling below each score range.

Major Field Tests

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Institution: INDIANA UNIVERSITY-PERDUE UNIVERSITY
Test: COMPUTER SCIENCE
Form Code: 4CMF
Cohort: MFT PPT COMPUTER SCIENCE 16039
Processing Date: March 07, 2008

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Programming Fundamentals	70
2	Discrete Structures And Algorithms	40
3	Systems:Arch/OS/Network/Dbase	54

Students responding to less than 50% of the questions: 0
Students in frequency distribution: 11
Students tested: 11

Major Field Tests

DEPARTMENTAL SUMMARY OF TOTAL TEST AND SUBSCORES

Institution: INDIANA UNIVERSITY-PERDUE UNIVERSITY
Test: COMPUTER SCIENCE
Form Code: 4CMF
Cohort: MFT PPT COMPUTER SCIENCE 16039 ADMIN 4/3/09
Processing date :   April 3, 2009

Students responding to < 50% of the questions: **0**
Students in frequency distribution: **13**
Students tested: **13**

TOTAL TEST		
Scaled Score Range	Number in Range	Percent Below
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	1	92
165-169	1	85
160-164	1	77
155-159	3	54
150-154	2	38
145-149	4	8
140-144	0	8
135-139	1	0
130-134	0	0
125-129	0	0
120-124	0	0
Mean	154	
Std. Dev.	9	

Percent below is the percent of scores from your institution falling below each score range.

Major Field Tests

DEPARTMENTAL SUMMARY OF ASSESSMENT INDICATORS

Institution: INDIANA UNIVERSITY-PERDUE UNIVERSITY
Test: COMPUTER SCIENCE
Form Code: 4CMF
Cohort: MFT PPT COMPUTER SCIENCE 16039 ADMIN 4/3/09
Processing Date: April 03, 2009

Assessment Indicator Number	Assessment Indicator Title	Mean Percent Correct
1	Programming Fundamentals	62
2	Discrete Structures And Algorithms	39
3	Systems:Arch/OS/Network/Dbase	45

Students responding to less than 50% of the questions: 0
Students in frequency distribution: 13
Students tested: 13