PROGRAM ASSESSMENT REPORTING

2015-2016

Indiana University Kokomo

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Internal Assessment for the Informatics Program

Learning Outcome

Briefly describe the learning outcome(s) you are reporting on for this cycle. If you have submitted a full copy of your program assessment plan to the Director of Assessment, you may use your numbering system from that document to identify the learning outcome of interest (i.e., We are reporting on learning outcome 2.4, Writing Effectively, described on page 7 of our assessment plan). You may also note specific components of learning outcomes in your description.

In this cycle, we are reporting on Learning Outcome A3: Students will utilize a programming language to implement computer Software.
There are two components of this learning outcome:

a. Coding standard compliance (naming, documentation, etc.)
b. Program Functionality

Assessment Date(s)

If you have previously assessed that/those learning outcome(s), when did that assessment occur, and what was your main conclusion from that assessment? What change(s) did you implement in teaching, curriculum, or other aspects of your program to address any weaknesses your assessment revealed?

I assumed assessment responsibility for the Informatics program only this year. Therefore, this is my first time reporting on assessment for the program. Up to my knowledge, this learning outcome was not assessed previously. It seems that there was an attempt to assess it in 2008-2009 but the information obtained from that attempt is incomplete due to the fact that the instructor who taught the respected course departed the university without providing enough data to meaningfully assess this outcome.

Method of Measurement

Briefly describe how you measured student learning on the program learning outcome(s) you noted, in this cycle. Also, describe the course(s) or setting(s) where the assessment took place. For example, quizzes/tests/exams (or selected questions on quizzes/tests/exams), written papers, or presentations from specific courses, or standardized tests given at specific points in the program, are common student artifacts that are used in learning assessment.

Informatics students enrolled in the spring 2016 offering of INFO-I 211 (Information Infrastructure II) and INFO I451 (Design and Development of an Information System) will be evaluated. In I211, the most significant programming assignment (the course's final project) of the semester is used for this assessment evaluation. In I451, the implementation of the student's final capstone project is used for this evaluation.
The outcome being assessed in this cycle is aligned properly to these courses. In particular, the outcome is introduced in I211 pre-requisites (i.e., I210) but it is emphasized in I211 and then it is

reinforced in I451. The assigned project in I211 was a comprehensive project that encompass the fundamentals of writing computer programs. The programs students write in I451 demonstrate their programming abilities just before graduation. Thus, these two projects require students to create a fairly sophisticated computer programs in different programming languages, which makes them a proper fit for assessing this particular learning outcome.

Student Sample

Briefly describe the student sample (i.e., sample size, typical year in college at time of enrollment) to aid interpretation.

In INFO I211, there were 16 students enrolled in the course. These students are juniors enrolled in their second and final course that is devoted to teaching students how to write computer programs. The programming language used is Java, which is a language that they learn only in this course.
Five teams with 2-4 students and one team with one student were established in I211. These teams participated in a course project that calls for implementing a simple bank management system using Java. This project is chosen for assessing this learning outcome mainly because it was graded based on the correctness of functionality of the implementation along with the documentation and readability of the submitted code. These grading criteria are aligned properly with the components of this learning outcome.
In INFO I451, there were 10 students enrolled in the course. These students are seniors enrolled in their second and final course of a capstone course sequence, INFO I450 and INFO I451. The programming languages used in this course are SQL and PHP. SQL was covered in INFO I451, while PHP was learned in a different course or online.
Three teams with 3-4 students were established in INFO I451. These teams were assigned to three different projects. The projects are:

1. Howard County Science Fair
2. Campus Strategic Tracking System
3. Graduate Courses Webpage

All these projects are real life projects, where the students have real clients. Part of these projects is meeting with the clients in order to gather the requirements for these projects. Most of the requirements gathering process was established in INFO I450, but in reality, this process may last for the entire life cycle of the project, as the requirements' continue change.
These projects are chosen for assessing this learning outcome because they were graded on the correctness of functionality, client acceptance, and documentation.
Source of Evidence: Project, either individual or team work.

Quantitative Results

Please report the quantitative findings resulting from your data analysis. For example, you might report the percentage of students who met an acceptable level of performance, or average student performance on a particular measure, or the percentile rank achieved by a group of students in comparison to a larger pool (such as on a standardized assessment tool).

We used the following benchmark level of performance that will be considered acceptable for assessing this learning outcome:
a€œThe level of performance where students create programs that follow coding standards, run and implement all of the requirements as specified in the project specifications document will be

considered acceptable. We expect that Seventy Percent (70%) of students will provide programs that are coded properly, run and implements the requirements or implement more than requireda€□
Component#1 for Learning Outcome A3: Coding standards compliance (naming, documentation, etc.)
Performance Criteria:
a€¢ Does not comply
a€¢ Complies
a€¢ Exceeds compliance
In INFO I211, student performance was very good and above the 70% benchmark. In this course, there were 6 different projects created and submitted at the end of the semester. Two of these projects did not comply with mainstream coding standards. Four complies and one exceeds compliance.
In INFO I451, student performance was good and above the 70% benchmark. In this course, three projects created and submitted by the end of the semester. One of the projects exceeds compliance and the other two project comply with the coding standards
Component#2 for Learning Outcome A3: Program functionality
Performance Criteria:
a€¢ Program developed do not run
a€¢ Programs developed run, but does not implement all requirements
a€¢ Programs run and implements all requirements
a€¢ Programs run and implements more than required
In INFO I211, student performance was very good and above the 70% benchmark. In this course, there were 6 different projects created and submitted at the end of the semester. In 0 of these projects the program does not run. In 0 projects, the program runs, but does not implement all requirements. In 4 of these projects, the program runs and implements all
Requirements. Finally, in 2 projects, the program runs and implements more than required. In particular, the projects that exceed the requirements implement a Graphical User Interface (GUI) for the bank system, a feature that students were not asked to do.
In INFO I451, student performance was good and above the 70% benchmark. In this course, all three teams created and submitted the project. All submitted projects run. In one of the projects, the program runs, but does not implement all requirements (Howard County Science Fair). In one of the projects, the program runs and implements all requirements (Graduate Courses Webpage). Finally, in one project, the program runs and implements more than required (Campus Strategic Tracking System).

Interpretation

Please state your interpretation of these findings, and your Action Plan for future improvement of student learning.

That data that we collected in this assessment cycle indicates that most informatics students have very good knowledge of programming techniques. In particular, they were able to produce programs that comply with a set of specifications based on client's input. In I451, however, there was one group of students produced a project that didn't fully implement all requirements. We believe that the reasons for that are twofold. Firstly, the scope and the nature of the project is quite larger than regular course projects. Secondly, the PHP programming language that is used for implementing the course is being taught as a Computer Science course that is part of a CS cognate. This course is offered only once at IUK and also it is not required for Informatics students.
In analyzing the data related to the first component of this learning outcome, we believe that students have done satisfactorily in issues related to providing proper documentations and providing code that follows the mainstream coding standards. 33% of students in I211 have not produced proper

documentations of their code. However, their code to a large extent followed Java naming conventions and code organization. In general, most programmers tend to find little value in code documentation and would rather spend their time focused on producing code that functions properly. This is a well-known problem even in the industry. Many programmers tend to ignore the fact that the lack of code documentation can lead to future significant problems, especially in the maintenance phase of a program life cycle

It was noted that team-based projects are especially challenging in the capstone project. Some students have been having difficulties working with others. The most problem that was noted is that the workload among team members was not distributed fairly. Students usually cite family issues, work-related issues, or sickness and therefore they tend to miss group meetings and class meetings. These issues affect the overall performance of the team. However, we totally understand the importance of team-based learning and therefore, issues like this should be dealt with more effectively.

While the expected level of achievement was met for this learning outcome, there are several actions that Informatics instructors need to take in order to further enhance student's abilities to create computer programs efficiently. These include:

a€¢ Instructors who teach INFO I210 and INFO I211 need to put more emphasis on code documentation, both internal and external documentation so students can produced more quality code early on

a€¢ We need also to continue to emphasize the importance of producing functional programs that satisfy the client requirements

a€¢ In those courses that focus on programming techniques, we believe that devoting more time to lab works where the instructor get a better chance to stress the importance of code documentation can be beneficial. We also believe that providing more weight on code documentation while grading homework assignments can help.

a€¢ Group assignments are always challenging. As such, we need to put more emphases on building project teams in a more efficient manner. This include encouraging students to choose their teammates more carefully, implement team builder activities, and insure that all team members get involved more equally in each part of the programming project.

a€¢ In the capstone projects, the chosen clients need to be told to stay consistent with their requirements. While we understand that requirements can often change, these changes should be performed within an acceptable time frame so students can still deal with it before the semester ends.

Actions

Are there actions that IU Kokomo can take to support implementation of your Action Plan? Are there institutional challenges that your program faces that will make improvement of student learning on this outcome difficult? If so, you can describe those challenges and needs here.

None at this time

Sharing

Please describe how you have shared these findings (for example, with current and prospective students, faculty, specific accrediting bodies, or other relevant parties).
If you have not yet shared your findings, please describe your plan for dissemination.

The data presented in this report was collected from two courses that are taught by two different informatics instructors. After completing this report, I will call for a meeting that will also include the

third Informatics faculty member to discuss the entire assessment process. During this meeting, we will try to derive further meanings behind these results and what other actions that can be taken to improve the process. Also, I will share copies of the findings and Informatics assessment plan and describe the process. Hopefully this will lead to a more informed assessment in the next assessment cycle.

Comments

If you have other comments about assessment to share with the Committee, please do so here.

None at this time

Consultation

Do you wish for the Director of Assessment, Dr. Julie Saam (jsaam@iuk.edu), to consult with your faculty regarding this result? That is, are you wishing for assistance at this time with your next steps?

No