

Assessment of the Neurobiology and Behavior Undergraduate Major

End of Project Report

Andrea Nicholas & Raju Metharate

UCI Neurobiology and Behavior Department

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One of the four main learning goals of the Undergraduate Neurobiology and Behavior Major is to provide students with an understanding of key concepts in neurobiology and behavior. The aim of our project was to assess the Undergraduate Neurobiology and Behavior Program by defining those key concepts and mapping them to content taught within the required courses for the major (N110, N112A, N112B & N112C). We first compiled a database of questions in the summer of 2012 and uploaded those questions into Mastering Biology, an online educational support software system designed by Pearson. The Pearson software allowed us to build assessment tests using questions from our neurobiology database that mapped independently to each subtopic and course category. Students volunteered to take the assessment exam in the spring of 2013 to test the software.

Mastering Biology as an Assessment Tool:

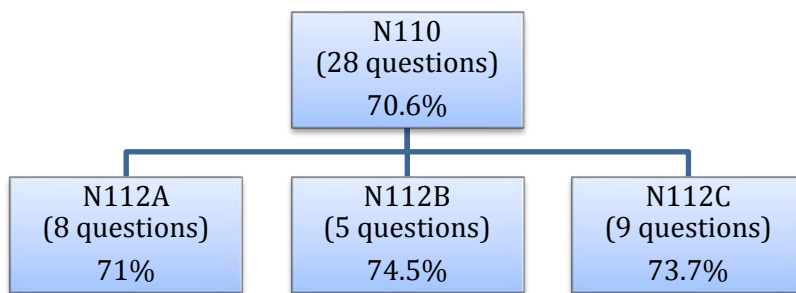
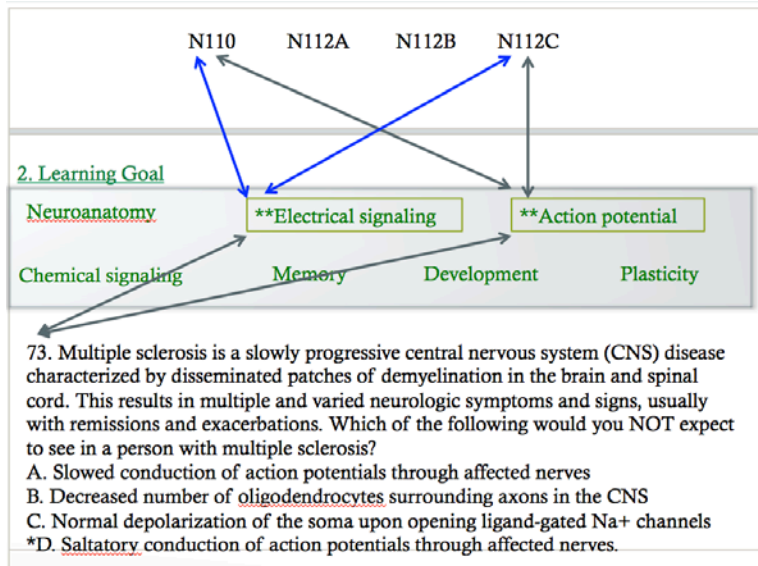
While Mastering Biology proved to be an exceptional and unique tool for designing tests and analytics for program assessment, the launch of the online test in the classroom revealed pitfalls. Ultimately, we resorted to paper exams since students did not bring laptop computers to class as instructed for the day of testing. Those students that did bring laptop computers had difficulty navigating the log in directions provided by Pearson. Paper exams were therefore provided and answers were entered into the system subsequently. All tests were taken anonymously and coded. This solution was effective for the small population of students in the major.

Student Participation:

Out of 34 students enrolled in the major, 11 volunteered to take the exam. In order to receive IRB approval to test students in Spring 2013, the assessment was made voluntary and anonymous. This coming year we will work towards amending the current IRB in order to make the assessment test a mandatory requirement for all students participating in the Neurobiology and Behavior major. This will ensure that we have better turnout and therefore a better sample of students to assess.

Assessment Design:

Figure 1. The following diagram shows how questions in the test are linked to learning goals and then to individual courses. The exam consisted of 28 questions, carefully selected to cover a wide sweep of neurobiology content.



Findings:

Figure 2. The above chart suggests overall performance was similar for content from all courses required for the major, as shown by % of questions answered correctly for each course category. The N110 course is taken by students in their second year. Students with excellent performance in N110 and overall strong GPAs are eligible for admission to the Neurobiology Major and the N112A-C course series that forms the core of the Major.

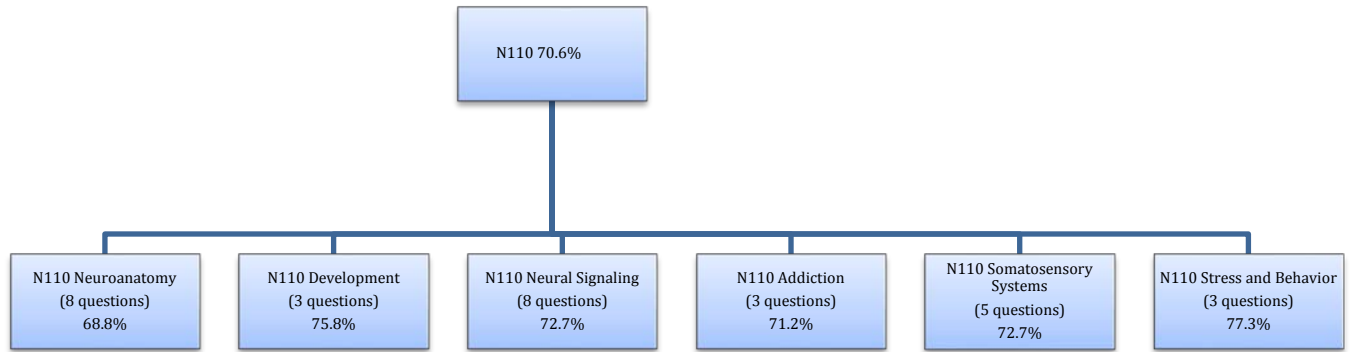


Figure 3. The above chart shows a sample of N110 concepts covered in the assessment exam. Performance in subcategories for content covered in the N110 is indicated.

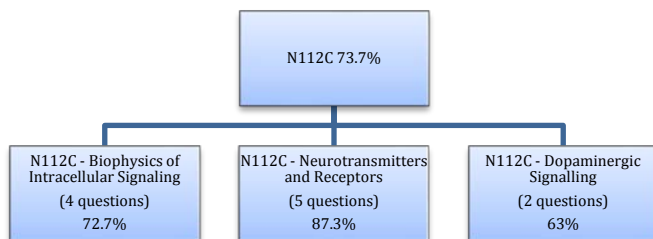


Figure 4. The above chart shows a breakdown of N112C concepts covered in the assessment exam. The topic of “Neural Signaling” for N110 and “Biophysics of Intracellular Signaling” for N112C share some questions and students perform similarly in both categories.

Purpose of the Assessment results:

Now that the assessment analytics has been developed, the Neurobiology and Behavior department can measure how well students are actually mastering key concepts taught in the program. The next step is to provide faculty members with the findings and discuss where we envision our majors students performing on this kind of exam. As a department we may now define a standard of excellence and then re-examine the learning goals and outcomes for our curriculum in order to meet our standard.

Future goals for assessment of the Neurobiology and Behavior Major:

The first goal for the future will be to re-write the IRB for the assessment exam and gain approval to require all students in the major to participate in the exam. Data collected this year does not serve to accurately represent student performance in the Neurobiology and Behavior Major as we were only able to test a small subset of volunteer students. However, this allowed us to test the system, which promises to provide a wealth of future data.

A second goal will be to write for further support to assess additional learning goals, specifically those relating to scientific quantitative skills, such as the ability to evaluate experimental design, read graphs, and understand and use information from scientific papers. We can then revise and improve our current

assessment exam and administer to students following completion of N110 and again for the students completing N112A-C for the Neurobiology and Behavior Major.