

NetCoach Course Design Rahul Agarwal http://irahul.com/workzone
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For designing these Adaptive Modules, NetCoach [NetCoach] was mandated as a requirement. NetCoach is designed to enable authors to develop a course without programming knowledge. It can adapt to user knowledge, goals and preferences and provides curriculum sequencing and adaptive annotation of links. The adaptive behavior of the system is specified by providing pre-requisites and inferences among various course concepts and test groups. It can also present interactive exercises and tests in different formats. Communicative elements include email, chat and discussions. This makes NetCoach very suitable.

NetCoach has a layered model and these layers store whether the student has visited the concept, completed exercises, whether current concept is inferred from a previous completed one, whether the student has marked the concept as completed. Each layer can be marked independent of the others and this provides flexibility.

NetCoach has the following adaptive features that need to be set:

Pre-requisites: These link concepts such that the system would suggest a topic only if the pre-requisites have been completed. There might be indirect pre-requisites when following two or more levels in the pre-requisite hierarchy.

Inferences: These infer a concept from the current concept or question. Inferences imply an implicit knowledge of the inferred concept, however it not necessary that the concept is actually known. There might be indirect inferences as well.

Difficulty and Weight of Questions: These properties determine the importance of questions in test groups and in turn their correct/wrong answer appropriately affects the student model.

The Introduction-to-Testing adaptive module being developed will consist of a pre-test, three sections of subject concepts and a post-test. The pre-test assess prior knowledge and each of the three sections then covers roughly one third of the course. Each section ends with a self assessment test that evaluates student performance on the section just completed. Each of these tests are essential in evaluating student performance as well as refining the student model. Finally the post-test evaluates student knowledge for the whole module.

Data Available from NetCoach

From the Administrator view click on “Users/Tutors” and the click “edit” for “Users and groups.” This will open a new window that looks as follows:

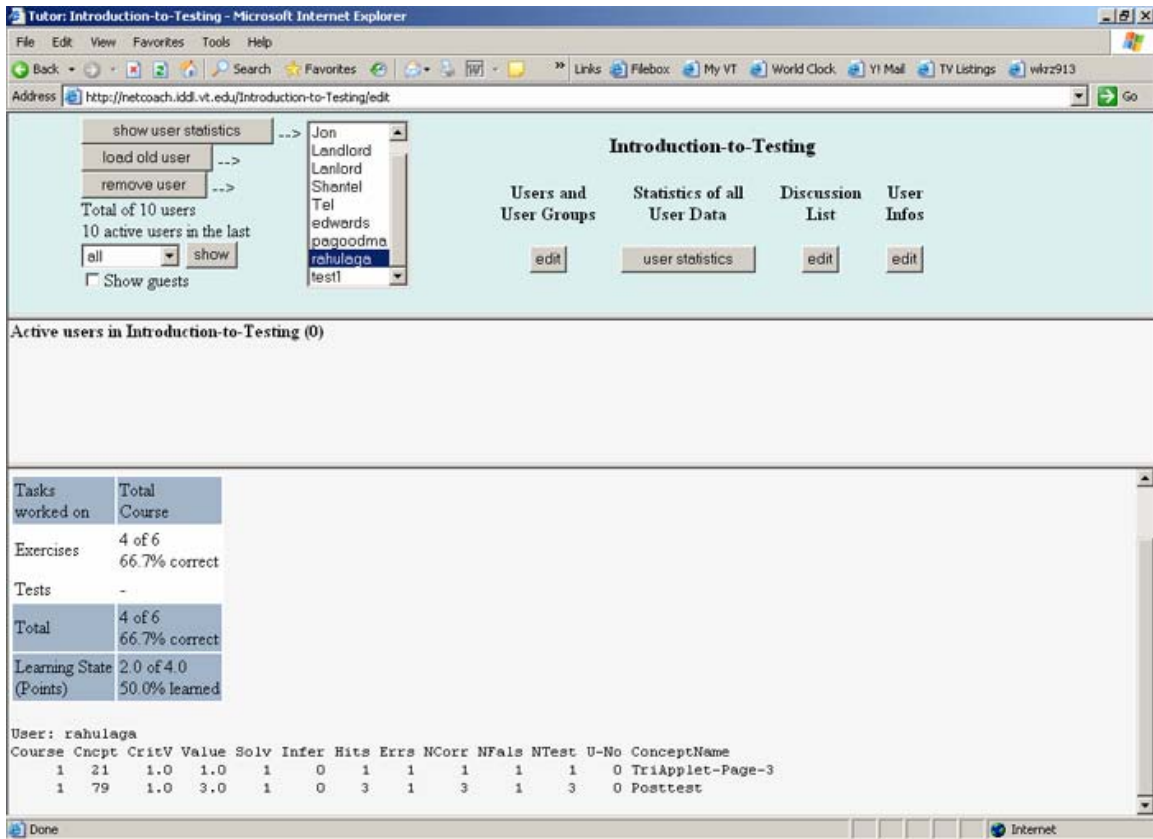


Figure-1: Tutor Window

The top frame shows the controls, the middle frame shows currently active users and the bottom frame shows detailed statistics for a selected user.

Clicking “user statistics” open the following window:

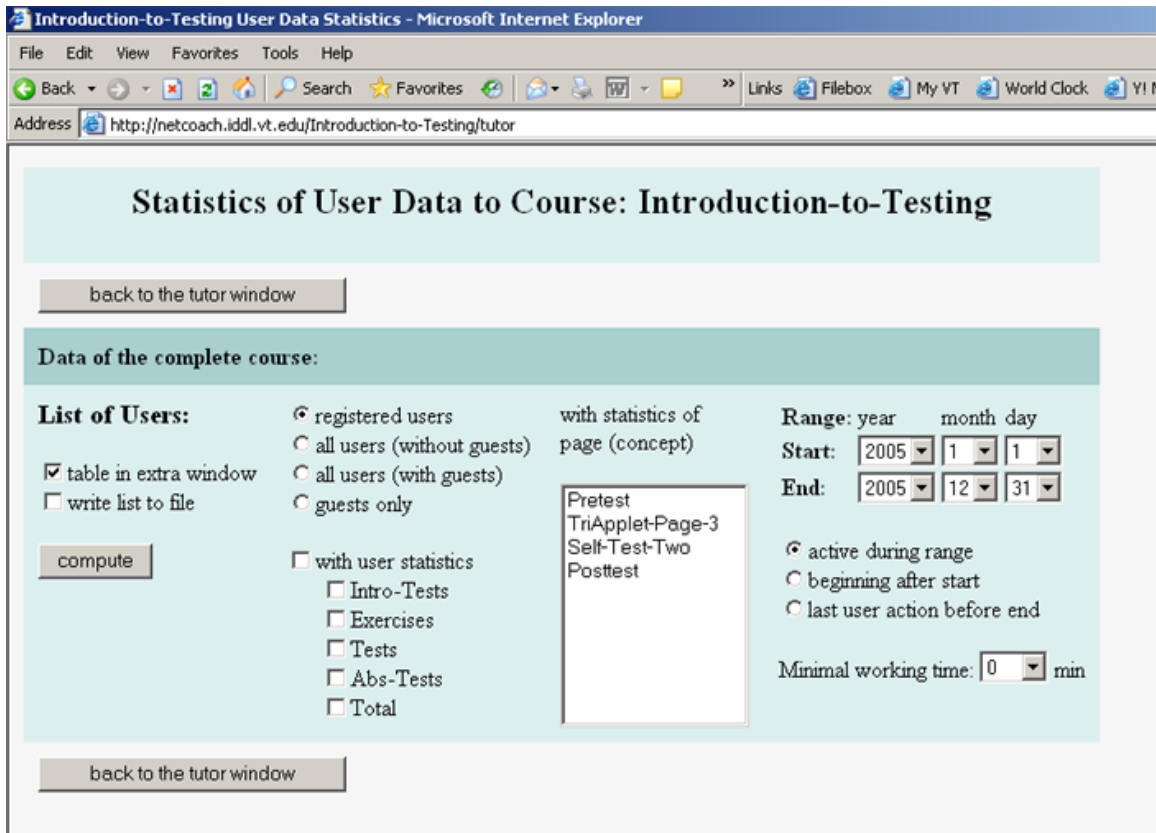


Figure-2: User Statistics

Student Data

Scoring Points

In NetCoach there are test items and test groups consisting of one or more test items. Each test item is assigned a difficulty (d) ranging from 0.5 to 1.5. Test items can be included in multiple test groups and for each test group each item is assigned a weight (w) ranging from 0.5 to 1.5. Using these values each test group has a Value defined as the sum of products of difficulty and weight:

$$TestValue = \sum_{i=0}^n d_i * w_i$$

where n is the number of test items in the group. Each test group is then assigned a *Critical Value* that must be scored to mark the test as learned. The value $d*w$ for each question answered correctly is added to give the score for each student on each test group.

Obtaining scores

NetCoach DOES NOT provide a method to export the scores attained by students.

Alternative: Write an extension to NetCoach.

Data for Adaptive Modules Evaluation

NetCoach provides an option to export a tab delimited file from the User Statistics window (Figure-2). A limited number of options can be selected and the following data values can be exported:

Username

Name

E-Mail

Course

Time (sec) and Time: Time spent online in learning activities

Intro %C: Percent correct responses in Intro section (my guess)

Intro Points: Apparently the points scored

Intro %P: I don't know what this is

Exercises %C

Exercises Points

Exercises %P

Tests %C

Tests Points

Tests %P

Abstests %C

Abstests Points

Abstests %P

Total %C

Total Points

Total %P

Pretest Points: These points are NOT the points by students, something else

TriApplet-Page-3 Points

Self-Test-Two Points

Posttest Points

First Access Date

First Access Time

Last Access Date

Last Access Time

Groups: Groups the user is part of – author, tutor or user

The data available for time spent online can be useful for evaluation. This value is collected based on two parameters set by the course administrator and should be fairly accurate for our study. The first parameter is “Max Interrupt Time” (in minutes) and this specifies the maximum time permitted during interaction (two clicks). The second is “Estimated Time Usage” (in minutes) and this specifies how the time should be counted if the user interacts after the timeout. For example when Max Interrupt Time is 5 minutes

and Estimated Time Usage is 1 minute. Now successive interactions within 5 minutes add as 10 minutes of learning however if there is a delay longer than 5 minutes then only 1 minute is added.

Data provided but NetCoach in its current version does not meet the evaluation we wish to do. A brief description of expected data sheets that would be useful is now described.

NetCoach Terms	Description
Username	
Value	Total points for a test = sum of products of question difficulty and weight on that test group
CritV	Upon reaching this value the test is assumed as successfully completed
Hits	Number of test items answered correctly
Errs	Number of test items answered incorrectly
NCorr	Number of test items with ATLEAST ONE correct answer
NFals	Number of test items with ATLEAST ONE wrong answer
Time(sec)	Total time spent on learning
Visited Pages	Total numbers of pages visited regardless of number times
First Access Date	
First Access Time	
Last Access Date	
Last Access Time	
New Terms	Description
ScoredV	Number of points scored on the test
NItems	Number of test items on this test

Data by Test/Exercise (Headers)

Username	Value	CritV	ScoredV	NItems	Hits	Errs	NCorr	NFals
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Usage Data (Headers)

Username	Time(sec)	Visited Pages	First Access Date	First Access Time	Last Access Date	Last Access Time
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