

A Visualization Tool For Student Assessments Data

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July 9th 2008

Abstract

Computerized student assessment tools provide educators with a number of different ways to assess student knowledge via standardized tests. While most standardized tests provide results in terms of a single numeric score and its relation to the mean, the on-line, adaptive, multi-dimensional testing tool developed by Children's Progress Inc (CPI)¹ gathers a robust data set for each student, highlighting specific areas of strength and weakness. We are working with CPI to develop tools for the educators to monitor student performance across time and over specific concept areas.

We designed a visualization tool to present the multi-dimensional (different concepts, i.e reading, writing, operations) student performance data from assessment to assessment across grades (first grade, second grade ...). A snapshot of the main screen is shown in figure 1. On top, we show all assessments administered (identified by their id numbers here). Assessments are sorted by date and the vertical lines separate the assessments by grade. Each row displays the results of the assessments taken by a student (identified by their student id numbers here). Each page displays 25 students and the rows are sorted by the average score over all assessments taken by each student. Therefore, the first page shows the best performing students while the last pages show the least performing students.

We developed a visualization design named a *daisy map* to display the scores received on different parts (ie. WR:writing, RE:reading) in the assessment. The scores for each concept is a number between 1 to 4 and the blades of each individual daisy are color coded with respect to the corresponding score. Hovering over a daisy displays a magnified image of that daisy. The utility of this compact visualization tool is two-fold. For one chosen assessment, it gives the educator to examine the group performance on that assessment, or the educator can examine the performance of one or more students over multiple assessments across different grades. Furthermore, each concept is divided into multiple sub-concepts. We used drill-down design principle in this application, namely, users can click on an individual daisy to see the details of that student's performance.

Our visualization tool has received positive feedback from test users at CPI and we are planning to develop a complete application based on this design to help educators examine assessment performances of their students.

We believe that our visualization tool is an example of a flexible multi-dimensional visualization design that can address multiple tasks, namely a snapshot of group performance at one specific time and monitoring the performance of individuals across time.

¹<http://www.childrensprogress.com>

