INTERACTIVE CASE-BASED ASSESSMENT TOOL (iCAT): BRINGING TOGETHER THE "WHAT" AND "HOW" OF LEARNING

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Introduction: Advances in multimedia and instructional technology have shaped the design and implementation of novel educational tools that enhance the *process* of learning. The impact of such tools cannot be adequately captured using conventional assessment methods which tend to focus on measuring just learning outcome. Based on the hypothesis that measuring the process of learning is a key component in enabling a systematic improvement of educational outcomes, we have created the Interactive Case-based Assessment Tool (iCAT). Here we show the design and infrastructure of iCAT.

Method: The iCAT student is presented with a web-based, problem-solving event in the context of a clinical case. The student is provided with a menu of tools to retrieve information concerning the patient's complaint and history, and to order laboratory tests, imaging studies, and consults. Related cost charges for some of these items are also calculated just like in a real-life case. While navigating the case, the student is asked to rate each piece of information based on clinical relevance and importance. If the information is deemed valuable, the student saves it in a "notebook" feature to be accessed later. A fill-in differential diagnosis table is provided to help organize the student's framework of thinking. A tracking mechanism is also embedded in the background to continuously and unobtrusively record all of the student's choices and ratings.

Each student is assigned a unique identifier. Upon completion of the case, the student's sequence of choices, incurred costs, rating of information, notebook entries, and differential diagnoses are automatically tabulated in an Excel spreadsheet. Each information item in the case is pre-tagged to denote its category and level of relevance, such that the usage data can be quickly sorted to reflect the *process* of learning and utilization proportion for each item category.

Result: Based on the methodology we describe above, we have completed the development of iCAT (see figure). The iCAT site is live and interactive cases are presented and reviewed for the user.

Conclusion: iCAT enables assessment of not only *what* solution is offered by the student, but also *how* that solution is reached. We see this as a new research method for educators who are involved in the development of interactive learning tools and for those who study the correlation between the process and outcome of learning.

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