

Considerations of Design, Pedagogy and Evaluation of Electronic Case-Based Learning Environments

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Charles Kinzer, Professor of Education in the Department of Mathematics, Science and Technology at Teachers College, Columbia University, began his presentation on Case Technologies to Enhance Literacy Learning (CTELL) project by stating that "retrofitting" theory to design is problematic. Instead, he continued, one should specify theories up-front, and then consider design. This helps one to remain clear about why selected actions were taken and to develop assessment tools based on theories.

CTELL reflects an "anchored instruction" approach to the teaching of effective literacy instruction. Kinzer identified three issues in anchored instruction that CTELL is designed to address. These are: dissimilar student backgrounds, differences in shared knowledge, and "inert knowledge," or "things you know for a test and then don't use." With respect to the latter, Kinzer referred to the theory of cognitive flexibility, which maintains that situated learning facilitates the transfer of knowledge to real-world problems, in the process, he added, creating background knowledge and also shared knowledge.

In constructing environments like CTELL, Kinzer specified that the concern should be with the construction and content of cases, and then with the interface design. In selecting the cases that populate CTELL, Kinzer reported that the project team tried to represent diverse conditions, such as those in Tennessee versus Chicago, for example.

Kinzer noted that "cases" in education are different from "cases" in law or medicine. He explained that whereas in law, cases are based on precedent, and in medicine on diagnosis, in education they are based on a social system. Cases in education therefore need to be structured differently from other types of cases.

Kinzer also stressed the idea that the case is not an example. He recommended providing cases that have key elements in common will enable students to analyze a prototype across classrooms.

In CTELL, video is combined with other media (e.g., text) to form cases of effective literacy instruction. Kinzer clarified that in CTELL, the case is the classroom, including teacher, students, and others who impact the reading curriculum. The anchor consists of a one-minute teacher voice-over followed by a 20-minute video segment of effective reading instruction. Kinzer noted that students must view the anchor video before accessing the other components of the case. He explained that this means that everyone starts at the same place, thus resolving the instructional issue of divergent background knowledge.

In describing the web interface developed for CTELL, Kinzer paid particular attention to its initial page. He pointed out that it displays the full range of cases available for review, thus enabling students to choose to explore them informally.

Kinzer further explained that one should think of the interface design as a shell because the aim is to learn and assess principles of effective literacy instruction in an environment. He added that the videos could be utilizing various kinds of environments and subjects — whether they are auto mechanics or a third grade classroom is irrelevant. The focus is not on the content of the lesson but rather on how it is delivered.

After viewing the anchor, users are free to access the remaining components of the case. These fall into three categories: children, class, and interviews. The "Children" category features information about three students from each classroom, including test scores, video of them reading aloud, samples of their written work, and interviews both with them and their parents. The "Class" category contains a diagram of the classroom, additional student work, teacher lesson plans, assignments, and additional video of appropriate literacy instruction. The "Interviews" section contains commentary by the target teachers, teachers in the grades above and below, school principals, and assorted literacy experts. Kinzer noted that interview subjects were all asked the same questions so students could compare the responses.

Users can access multiple aspects of the same case and/or individual aspects of multiple cases. This allows them to draw comparisons within, between and across cases. For example, they can listen to various children reading the same passage of text and analyze differences in skill.

A key feature of CTELL is the ability of the learner to excerpt and bookmark any of the case components within it — segments of video or of children's work, for example. This allows students to identify and review significant aspects of the case. Other notable features of the site include the ability to print samples of children's work; to record and save notes on the case; and to email

these segmented elements to other members of the class for comment. Kinzer pointed out that the latter capability fosters group analysis and reflection, a central tenet of case-based instruction.

Another prominent feature of CTELL that Kinzer described is the "Portfolio," a section of the site that is divided into areas corresponding to twelve instructional principles of effective literacy instruction. Students are directed to bookmark case components under the various headings. Thus students can mix and match cases and their respective elements. Moreover, the portfolio is viewable by the instructor (at either his/her own or the student's initiative), enabling faculty to assess the students' understanding of the relevant principles.

The second part of Kinzer's presentation detailed efforts to evaluate the CTELL environment. Specifically, Kinzer explained, the team has been interested to know whether participating students display any change in their knowledge of effective literacy instruction. The team has sought to detect and measure such change primarily through concept maps. These were analyzed for their internal links and more specifically, for the number, centrality and specificity of their constituent nodes. These scores were used to gauge students' understanding of the elements of and relationships among "effective literacy instruction."

Kinzer explained that because conceptual change is difficult to measure, the team paired the concept map task with pre- and post- interviews. These focused on how students addressed different principles of effective literacy instruction in the classroom. Kinzer reported that the team plans to incorporate an assessment of student narratives into their evaluation rubric. This might, for example, involve students picking a set of nodes and writing about how they would use them in practice.

In summary, Kinzer said that CTELL is a rich environment with strong fidelity to principles of instructional design, including anchored instruction, and research validated elements of literacy teaching and learning.