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"Construction of Science Knowledge: Scaffolding Conceptual Change Through Discourse

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Abstract: This study examined two elementary school students' learning about a self-chosen topic — space and space exploration — over six sessions each of one-to-one tutorials. Two questions, drawn from a contextualist view of constructivism, framed the investigation: How do students construct meaning during instruction, and how do we scaffold such conceptual change through discourse? Thematic threads in verbatim transcripts of the instructional discourse provided a trace of these students' understanding of selected science topics and their conceptual change over time, as situated within discourse. Findings suggest that conceptual change was related to the focus and reciprocity of the discourse during the science activities, which in turn depended on the students' prior knowledge and beliefs, as well the tutor's instructional intentions. These findings are consistent with research that shows that students from diverse experiential backgrounds construct science knowledge in different ways through scaffolded interaction, and that success of the scaffolding depends on what the students and the instructor bring to the learning situation as well as the interactional roles and patterns of joint activity they establish.

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Classroom Heterogeneity and the Use of Instructional Time in Dutch Secondary Schools

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Abstract: One important choice facing large Dutch secondary schools is the composition of classes according to the educational streams the students are expected to follow. The expected stream is generally based on the advice given at the end of primary school by the principal. For composing classes, schools can choose between options that differ in the degree of heterogeneity: one-stream classes, adjacent two-stream classes, or multi-stream classes (three or four streams). The purpose of this study was to examine the use of instructional time by teachers and the time-on-task levels of students in classes composed differently in terms of streams. Within a time span of three school years, 41 teachers, teaching different subjects (English, Dutch, and mathematics) and 246 students from three secondary schools have been observed during three lessons. The results show classroom composition relates to the preferred learning environments with “whole-class” instruction preferred in onestream classes and “guided individual seatwork settings” preferred in four-stream classes. Time-on-task levels during individual seatwork were found to be higher in onestream classes than in four-stream classes. In addition, students with a low academic position within their classes attain lower time-on-task levels than students with high or intermediate academic positions.

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The Development and Validation of a Learning Environment Questionnaire Using Both Quantitative and Qualitative Methods

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Abstract: The purpose of this study was to develop, validate and use a questionnaire (Cultural Learning Environment Questionnaire, (CLEQ)) to assess culturally-sensitive factors affecting the learning environments of science students. With a sample of over 3,000 secondary science students, the reliability of the CLEQ scales ranged from 0.69 to 0.86 and showed acceptable discrimination between the scales, as the mean correlation between scales ranged from 0.08 to 0.18. The construct validity of the questionnaire was confirmed through interviews with students which are reported in the paper. In an application, associations between student perceptions of the classroom learning environment as measured by the scales of the CLEQ, attitude to class and achievement of enquiry skills were found.

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How Classes Influence Students' Participation in College Classrooms

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Abstract: While previous studies have focused on how professors or students' traits shape classroom interaction, this report suggests that classes should also be examined as groups. Group characteristics such as norms, daily dynamics, and structure are explored in 51 college classes. Among various distinctions, we discovered that higher participation classes are seen as more cooperative, supportive, respectful, and familiar to their members, in contrast to lower participation classes. Comparisons of faculty and student viewpoints reveal that professors of lower participation classes have much more positive perceptions of their classes than do their students. Implications for college classroom pedagogy are discussed.