

multiple choice items. Qualitative aspects of the optics rules are considered in the speed WHAT-IF test. In the conventional test items also quantitative aspects of the optics rules were questioned.

The preliminary results indicated that, against expectation, general metacognitive skillfulness and intellectual ability did not share significant variance. Correlational analyses showed that learning performance measured by the conventional test items, i.e. quantitative knowledge, is related to intellectual ability and that the learning performance measured by the speed WHAT-IF items, i.e. qualitative knowledge, is related to elaboration. It appears that type of acquired knowledge is influenced by type of skill. These findings are in contrast with results of earlier research of Veenman (e.g. 1993), which showed a positive correlation between metacognitive skillfulness and intellectual ability. This difference could be explained by the nature of the learning task used in this and earlier experiments. In Optics lab learners can operate at a qualitative level, in the other simulations learners had to operate at a quantitative level. Currently Optics lab is being compared with another learning task. At the conference also some methodological problems will be discussed.

In the second experiment 44 high or low intelligent novices and advanced learners were being followed during a two hour session of self-directed inductive learning in Optics lab. Three phases with different levels of complexity, were created in Optics lab, from simple to rather complex. For every phase metacognitive skillfulness and learning performance will be assessed, so that the relationship between metacognitive skillfulness, intellectual ability and learning performance for quantitative and qualitative knowledge at three different levels of complexity can be determined. The level of complexity represents the learner's relative position on a novice-expert continuum. This experiment is presently being carried out, so data will be available at the conference. The relevance of these studies concerns a better insight in the relation between metacognitive skills, cognitive skills and learning performance at different levels of expertise. In view of the increasing attention for self-directed learning it is important to know which skills are conditional for the acquisition of various types of knowledge, at what level of expertise, in order to be able to present each learner with the right educational program.

**Prista Guerra, Marina, Jose Tavares, Leonor Lencastre & Marina S. Lemos**  
Portuguese students' factors related to College adaptation

The present study is part of a larger research project aiming to identify factors of success of freshman year students at Portuguese Universities.

This paper focuses on all the freshman year students, approximately 1000 students, of Sciences and Engineering degrees of the Faculdade de Ciências of University of Porto. It examines students' previous preparation in relevant content areas; students' motivation, psychological well-being; students' study methods; and institutional constraints. A questionnaire was developed for these purposes.

Results are discussed in terms of the specificities of Portuguese University students in dealing with the adaptation to College. Special attention is given to the role played by the Portuguese system of application to higher education as well as to the challenges posed by the dynamics of the university learning environment.

**Pruecher, Frank & Hans-Peter Langfeldt**  
How teachers perceive and describe learning disabled children

This paper presents the results of content analyses of reports written by teachers in special education. The reports describe children who were assessed to visit a special school for learning disabled children. 128 reports are explored in this study. The free worded reports were transformed into elementary in-formation units. A cluster analysis of elementary verbal statements in the reports concerning learning disabled children yielded five groups. These five groups differ in their focuses of description. The focuses are: task comprehension, intelligence, attention deficit disorders, academic achievement and speech disorders. Because objective