

ICTMT10 workshop

A web-based learning support system to help secondary school mathematics learners construct geometric flow-chart proofs

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This workshop provides the opportunity to try some of the geometrical proof problems that we have designed to support secondary school mathematics students as they build their knowledge of mathematical proof. Our web-based learning platform uses flow-chart proofs and includes both open and closed problems involving the properties of parallel lines and congruent triangles. By using Adobe Flash-based technology, learners complete proofs by dragging sides, angles and triangles to cells and our system automatically transfers figural to symbolic elements so that learners can concentrate on logical and structural aspects of proofs. The system identifies errors by referring to a database of acceptable answers classified into four categories. Learners receive relevant feedback in accordance with the four types of error.

In the workshop, participants have the opportunity to experience our system by working on various geometric proof problems. For example, an introductory problem by which the user can construct four different proofs, another open problem but this time with two steps to the solution, and a proof problem involving the base angles of an isosceles triangle.

The workshop provides the chance to discuss interface design, the use of open and closed problems in the teaching and learning of proof, the effectiveness of feedback given by web-based systems, how to internationalise such a system, and so on. Video clips of learners using our system are also available.
