CRITICAL REVIEW OF GEOMETRY IN CURRENT TEXTBOOKS IN LOWER SECONDARY SCHOOLS IN JAPAN AND THE UK

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The purpose of this research is to consider how the design of geometry in textbooks might be improved to develop deductive reasoning more effectively in lower secondary schools. In a previous paper, we argued that the development of intuitive skills is very important to solve geometrical problems, and the notion of the 'geometrical eye', the ability to see geometrical properties detach themselves from a figure, might be a potent tool for building effectively on geometrical intuition (Fujita and Jones, 2002). In this paper, we discuss how we analyse current textbooks designed for lower secondary schools.

In the intensive study of textbooks in the TIMSS countries, Valverde et al (2002) considered that textbooks mediate between intended and implemented curriculum and, as such, are important tools in today's classrooms. Sutherland, Winter and Harries suggest that "pupils' construction of knowledge cannot be separated from the multifaceted external representations of this knowledge which envelope the learning pupil" (Sutherland, Winter and Harries, 2001, p. 155). This implies that textbooks, one such external representation, can influence and 'shape' students' mathematical knowledge (also see, Healy and Hoyles, 1999), and therefore it is important to study them.

The textbooks chosen for our analysis are reportedly amongst the best-selling texts in the UK and Japan. Both of these countries provide interesting and contrasting approaches to school geometry. Our analysis is framed by the following procedure, which is derived from the study by Vervade et al (2002): division of the geometry parts of textbooks into 'units' and 'blocks'; coding each 'block' in terms of content, performance expectations and perspectives (Valverde et al; 2002, pp. 184-7); identifying features of geometry in the textbooks; discussion how these designs would have influences on students' performance in geometry; consideration how these designs could be improved in terms of the 'geometrical eye' (see above). The preliminary results of our analysis will be presented and discussed in our presentation.

References

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