ABSTRACT. This paper examines the nature of the problems posed, the processes by which their solutions were made public, their structural contribution to a lesson and the opportunities they offered for the learning of mathematics in Budapest, Hungary. The problems were derived from observations, the processes of which were informed by various comparative studies, of 94 mathematics lessons in the 10–14 age range. Problems, the analysis and categorisation of which were informed by the literature, tended to fall into two categories – single response with high levels of cognitive demand and multiple response with high levels of cognitive demand. Structurally lessons fell into a well practised pattern of classroom behaviour. They began with a public review of homework, comprising two or three multiple response problems which were solved collaboratively. This was followed by a ‘warm-up’ period involving the oral setting and mental solving of a few single response problems. Lastly, the main body of the lesson involved several cycles in which a multiple response problem was posed, attempted individually before solutions were shared publicly. Lessons ended with homework being set. The discussion of the findings is framed by Hungary’s variable performance on recent international tests of mathematical attainment.

KEY WORDS: comparative education, Hungarian mathematics, learning opportunities, lesson structures, pedagogy, problem types

This paper categorises the mathematics problems offered to students in the upper primary age range (10–14) in Budapest, Hungary and then analyses them in respect of the opportunities they present for the learning of mathematics and their structural significance in a ‘typical’ lesson. By way of introduction, a summary of the role of comparative research in mathematics education, a review of the Hungarian educational tradition and a framework for describing mathematical problems are presented. These are followed by an account of the research undertaken, drawing on both quantitative and qualitative records of the problems posed in more than ninety lessons, which is then discussed in relation to earlier work in the area.

OVERVIEW OF COMPARATIVE RESEARCH

Generally, comparative research adopts one of two approaches – large-scale and quantitative or small-scale and qualitative (Kaiser, 1999). The former explore the interaction of systemic educational, political, social or...
economic orders (Kaiser, 1999). They are often “frustratingly deficient in
detail” (Theisen & Adams, 1990, p. 278) and little more than “attempts
to quantify the unquantifiable” (Jenkins, 2000, p. 137). They are costly
and difficult to manage, with problems of comparability of data, validity
and reliability, scale construction and ethnocentric bias in the management
and dissemination of the study (Wiliam, 1998; Prais, 2003). Significantly
“cross-national comparisons . . . run the risk of being interpreted as simple
competitions with winners and losers” and devalue the broader contribu-
tion such work can make to education (Schmidt & McKnight, 1995,
p. 337).

Small-scale qualitative studies are generally classroom-focused and
hermeneutic in process (Postlethwaite, 1988; Jenkins, 2000). The richness
of their data yields insights unlikely with large-scale studies (Theisen &
Adams, 1990; Kaiser, 1999; Postlethwaite, 1988). They seek to account
for the influence of context (Schmidt & McKnight, 1995) although they
are prone to problems of reliability and unacknowledged cultural influ-
ences (Theisen & Adams, 1990), particularly when researchers are from
within a system itself (Schmidt et al., 1996). At their worst they may lead
to “unwarranted correlation” and “unfounded speculation” (Jenkins, 2000,
p. 137).

HUNGARY AND THE TEACHING OF MATHEMATICS

According to internal commentators, universal education is a long-
established Hungarian tradition (Szebenyi, 1991), with mathematics
perceived as “a worthwhile and necessary part of . . . culture” (Szalontai,
1995, p. 152). Hungary’s mathematical achievements are well known
through its success in international comparisons (Hajdu, 1992), mathe-
matical olympiads and the disproportionate number of Hungarian math-
ematicians working abroad (Szalontai, 1995). However, a perception has
developed that Hungary’s international standing is in decline due to a de-
crease in curriculum time (Szalontai, 2000), a fall in the birth rate lead-
ing to unviable schools (Nagy, 1998a), a diminution of state influence
linked to the opening of the educational provision market and an increasing
americanisation of Hungarian culture (Vári, Tuska & Krolopp, 2002).

Such problems are set against ongoing curricular change. Current Hun-
garian curricula appear to be a compromise between traditional expecta-
tions that all children should learn the instrumental skills of number and
measurement (with an elite minority experiencing formal algebra, geom-
etry and number theory), reformers’ arguments that all children should
learn an intellectually honest mathematics (Varga, 1988; Szalontai, 1995,