

Is student achievement really immutable?

**A study of cognitive development and student achievement in
an Oregon school district**

Thesis submitted

by

Lorna Christine ENDLER BSc(Hons), PGCE, MEd(Hons)

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STATEMENT ON ETHICS

DECLARATION

The data for this thesis were collected as part of the regular operations of the Molalla River School District, Oregon, USA. Ethical considerations concerning the project therefore rest properly in the hands of the administrators of the Molalla River School District. The data were subsequently provided to me by the Director of Instruction of the Molalla River School District, and further analyses have been stored as anonymous records.

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**STATEMENT ON THE CONTRIBUTION OF OTHERS
INCLUDING FINANCIAL AND EDITORIAL HELP**

IRA grants from James Cook University provided funding for travel in 2000 and 2001 to Portland, Oregon, from my home in California for seminar presentations and data collection. I was also awarded a JCU Completion Scholarship in September 2003. There was no other financial support for the study. Further contributions by others to this work are acknowledged overleaf.

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ABSTRACT

In the educational climate of the USA, where many question the possibility of effecting genuine change in national achievement outcomes, the Scientific Thinking Enhancement Project (STEP) was delivered to three cohorts of students from 1999 to 2002 in Molalla, Oregon. At the start, the mean age of Cohorts A, B, and C was 11+, 12+, and 13+ years. The purpose of my study was to investigate whether the STEP had enhanced these students' cognitive development and school achievement. The STEP incorporated strategies from a British intervention that had been shown to have a substantial effect on children's cognitive development and school achievement. Different test instruments were employed from those used in the British intervention, and the results of all tests were Rasch scaled. Cognitive change was estimated using *Bond's Logical Operations Test*, with pre-intervention performance profiles serving as cross-sectional controls. Statistical analyses revealed some enhancement of cognitive development compared with controls, with cognitive gains across the spectrum of starting level, irrespective of starting age and level of parent education. Statistically significant overall cognitive gains were found for Cohorts B (0.27 SDs) and C (0.55 SDs). Data from state-mandated tests in Mathematics revealed significant overall gains against controls for Cohorts A (0.51 SDs) and B (0.19 SDs). Cohort B students also made late-onset significant gains over peers who missed the STEP in 8th grade (BLOT 1.01 SDs and Mathematics 1.09 SDs). Cohort B females showed a significant overall gain in state Reading & Literature tests. There were no significant achievement gains against populations from non-project schools. A teacher survey showed general satisfaction with the STEP, but also revealed misconceptions about the intervention. Given that these teachers received little professional development, and did not deliver the entire intervention program, it is not surprising that the STEP did not yield results as strong as the original projects in the UK.

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