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ABSTRACT

This document is a report of the first year's findings (grade 1) of a longitudinal 3-year study of achievement differences between students in new open plan schools and those in existing "conventional architecture" schools. When tests of reading and mathematics achievement were administered in two open plan and nine "conventional architecture" schools, the mean scores attained were not significantly different, although the marginal differences tended to favor the open plan schools. (Author)

Achievement of Grade 1 Pupils in Open Plan and ARCHITECTURALLY Conventional Schools

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SYNOPSIS

When a standardized test of reading and mathematics achievement was administered to grade 1 pupils in two open plan and nine "control" (conventional architecture) schools, the mean scores attained were not significantly different, although the marginal differences tended to favour the open plan schools.

DETAIL

(a) *Purpose of this Study.*

Since 1968-1969, when the County's first open plan elementary schools began operation, five interrelated studies have been launched in an attempt to assess the educational effectiveness of the new schools in comparison with existing "conventional architecture" schools.

The first study, reported in the spring of 1970, found that pupils (all elementary grade levels) in open plan schools were more likely to be allowed to initiate learning activities, to be given (and put to good use) responsibility for their own learning, and to participate in cooperative planning with staff than were pupils in schools wih conventional architecture with which they had been matched. The study (published in *growth points 70* as "York County's Open Plan Elementary Schools, a Comparative Study") showed that many "open concept" goals and practices were, however, included in the programs of schools with conventional architecture.

In the autumn of 1970, the Board authorized further investigations: (i) into differences in creativity and curiosity (intrinsic motivation); (ii) into differences in pupil's human (moral) values; and (iii) into differences in expectations held by pupils and staff, between open plan and control schools. These studies were mainly about the grade 5 level. Also authorized was a longitudinal study (minimum of three years) of achievement. This is a report of the first year's findings (grade 1) of achievement differences. Reports of the other studies will be published in the future.

(b) *Limitations of this study.*

It cannot be over-emphasized that any single study in this series touches upon only one aspect of matters vital to a successful educational program. Reading and mathematics achievement is not necessarily the highest priority for grade 1 teachers: personal and social development, for example, are commonly seen as more important for some six-year-olds.

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In addition, some grade 1 teachers, as well as psychologists and test publishers, concede that group tests of achievement in the early grades are, for some pupils, more like tests of perseverance because the length of the batteries may exceed the child's attention span. This may be a factor in this study as pupils were also given a learning capacity (IQ) test in conjunction with the achievement batteries.

(c) *Method.*

Two tests were selected:

(i) The Canadian Cognitive Abilities Test (1970), Primary 1, Form 1 (CCAT),

(ii) Metropolitan Achievement Test (1970 ed.), Primary 1, Form G (MAT).

Both are group ("paper-and-pencil") tests. As new tests, untried locally, and possibly subject to the usual dangers of such instruments when intended for very young pupils, they were carefully checked out. The achievement test was screened twice for suitability, the first by test experts from the Ontario Institute for Studies in Education and the Research Office, and secondly by committees of grade 1 teachers and Board resource people (mainly Master Teachers). The reading and mathematics committees each selected the Metropolitan Achievement Tests as the most suitable of the various tests considered for this project.

Because there were no Canadian norms available for this new achievement test, it was decided to establish a York County mean for it and also for the CCAT. After a preliminary analysis of the MAT by teacher committees and a trial run in one school, both tests were administered in May 1971 to 47 classes (22 schools, including three separate schools). In all 1,097 pupils completed the test, including 514 pupils in the two open plan and nine control schools in this study.

The conventional architecture control schools were selected giving due regard to such factors as comparability (e.g., school enrolment, socio-economic nature of the communities) and proximity (seven of the nine controls shared an attendance boundary with an open plan school in the study). Matching on more than two or three characteristics is rarely possible. While everything feasible was done to reduce the number of factors which might account for differences in achievement, it cannot be said, in the strictest sense, that important variables such as teacher competencies can ever be matched. Random assignment of pupils to the two environments, which would control such variables, is not practical for York County.

(d) *Findings.*

It was decided to treat each open plan school (identified as "A" and "B" in the accompanying table) and its controls separately. The test results, as it came out, would not be significantly (indeed, scarcely) changed if the schools had been lumped together, however.

The cognitive abilities (IQ) results were not significantly different, all falling within one four-point score band (104-108) when the controls were averaged (See Table 1). The scores by schools were slightly below the

County mean (109) but compared favourably with the Canadian norm (100).

The expected grade equivalent for the achievement batteries was 1.8 (i.e., the mean average score anticipated when the test is administered in May is 1.8). The actual mean scores across the County were Reading = 1.81, Mathematics = 1.79, and both are rounded to 1.8. Both open plan schools met or surpassed this standard in reading while both control groups, when averaged, fell about .1 (i.e., one month) below that mark. The average mathematics achievement for all 11 schools in this study falls just below 1.8, with open plan school "B" and three controls exceeding the norm.

Taken all-in-all, this distribution of scores is completely normal, conforming very closely to expectations, if one accepts either the U.S. or the tentative York County means.

The mathematics' results may have been contaminated in two ways. The use throughout the battery of U.S. terminology (which differs somewhat from local patterns) and use of U.S. coins in three illustrations may have made it more difficult for Canadian pupils to respond. Also, the mathematics battery was normally the last to be administered (usually the fifth sitting in perhaps 10 days) and a pall effect may have been present.

(c) *Conclusion.*

An analysis of variance was performed. No significant differences were found between any of the results attained in either open plan school and its controls (.05 level). Consequently, there is no basis provided for the belief that achievement in these basic skills insignificantly affected by the differences to be found in these two environments when pupils were exposed to them for their first two years of schooling.

TABLE 1: **SUMMARY OF RESULTS OF STANDARDIZED TESTS**

School	Number Tested	Mean IQ	Mean Reading Grade Equiv.	Mean Math. Grade Equiv.
Open Plan "A"	69	106	1.8	1.6
"A's" Controls	210	105	1.7	1.7
A–1	98	101	1.5	1.5
A–2	34	110	2.2	2.0
A–3	27	110	1.7	1.5
A–4	51	107	1.9	1.8
Open Plan "B"	20	108	1.9	2.0
"B's" Controls	215	105	1.7	1.7
B–1	32	97	1.3	1.4
B–2	45	99	1.5	1.7
B–3	48	108	2.1	1.9
B–4	50	108	1.7	1.6
B–5	40	108	1.8	1.8
Test Norms		100	1.8	1.8
County Means*		109	1.8	1.8

* Derived from 1097 administrations to grade 1 pupils in 47 classes (22 schools, including 3 separate schools), May 1971.