The Role of Handwriting in Raising Achievement

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Aim

To establish whether fluent handwriting can be a factor in raising achievement.

Dimensions of this Case Study

The study surveyed the handwriting characteristics of 1,192 students across the 11-16 age range in a large comprehensive school.

Summary of Findings for this Case Study

- Handwriting speed was a factor in student achievement, regardless of ability.
- Students achieving higher-than-expected GCSE English language grades tended to write at a higher speed than those who underachieved (expectation and achievement being related to Year 7 CATS ability tests).
- At all ability levels students who achieved higher-than-expected GCSE English grades had a better handwriting style than those who underachieved. Although this study does not offer evidence of cause and effect, the evidence suggested that handwriting quality and quantity are strongly associated with examination achievement at all but the very highest levels of ability.
- Slow handwriters had problems with poor motor co-ordination, spelling, letter formation, word shapes and discrimination between upper and lower case.
- Over 40% of students in Year 7, reducing only to 20% in Year 11, were writing slowly. Of these, some had great difficulty making what they wrote legible.
- Boys in Year 7 wrote more slowly than girls but increased their speed each year. By Year 11 they were slightly faster than girls. Girls' writing speed increased from Year 7 to Year 8, then stayed constant.
- There was a correlation between speed and Reading/Spelling age in Year 7 for boys and girls. An increase in speed of 3 – 4 wpm corresponded on average to an increase in Reading/Spelling age of 3 – 4 months.
- Boys had a higher frequency of handwriting problems than girls. Failure to join up letters was the problem with the greatest incidence in boys and girls, overall at a higher level in girls. There was no clear link between the frequency of letter-joining as a characteristic and handwriting speed. Hence 'printing' does not necessarily limit handwriting speed.
- The effect of joins is different for boys than for girls. For boys, failure to join up correctly is associated with an average drop of half a grade in GCSE English. For girls it is associated with an average drop of a whole grade.

Conclusions

Further research is required to:

- Establish whether the results of this survey are typical.
- Examine the role of Occupational Therapists in helping schools develop preventative strategies for those with motor co-ordination difficulties. This has implications for schools, in for example, the selection of school furniture, physical education and the creative arts.
- Develop successful whole school handwriting policies set within a framework which recognises the needs of those with motor co-ordination difficulties. In view of the lack of attention currently given to the teaching of handwriting in secondary schools, policy development there should be a priority.

A Note on Methods

Students were tested using a test normally applied by the school's educational psychologist to assess for GCSE. The students were asked to write freely on a subject of their choice for ten minutes with an extra 2.5 minutes for correction. We received 1,273 scripts, representing about 80% of the total possible. Of these, complete background data was available for 1192 students. The remaining 20% were accounted for by 7 classes (3 in Year 8) who missed the test. We were aware of the limitations of the test and of the reservations expressed by, for example, Sawyer, Gray and Champness (1996) and Alston (1994). Nonetheless it seemed appropriate for our purposes, not least because of its closeness to a simulation of an examination setting. The data which the scripts themselves would yield was also important; words per minute was only one category. Despite reservations, the data turned out to be very rich and raised a number of further questions. Hence the choice of test appears to have suited the research aims.

Data Analysis

Readers should refer to our full report for a detailed description of the methodology used in the analysis. Handwriting is notoriously variable and difficult to assess objectively. The criteria chosen for this study were therefore those that could be easily replicated and kept as simple and objective as possible. Note that in Table 1, no distinction is made between boys and girls or SEN and non SEN students. In Figure 1, boys, girls and students with SEN are represented separately.

Further Reading

Alston, J., 'Assessing writing speeds and output: some current norms and issues', *Handwriting Review* (1995).

Connor, M., 'Handwriting performance and GCSE concessions,' *Handwriting Review* (1995).

Dutton, K.P., 'Writing under Examination conditions: Establishing a baseline,' *Handwriting Review* (1992).

Rutherford, S., *Does school accentuate the difficulties of pupils with motor co-ordination difficulties?* MA dissertation, School of Education, Oxford Brookes University (1996).

Sassoon, R., 'A Decade and a Half in Handwriting. How the system has changed and how my attitudes have altered,' *Handwriting Review*, pp. 53 – 60 (1994).

Sawyer, C., Gray, F. & Champness, M.) 'Measuring Speed of Handwriting for the GCSE Candidates,' *Educational Psychology in Practice* ,Vol.12 No.1, pp. 19 – 23 (April 1996).

Thomas, F., 'Une question de writing: A comparative study,' *Support for Learning*, 13, 43-5 (1997).

Background

Current approaches to literacy emphasise reading and spelling with relatively little attention given to the role of handwriting. This study suggests that the connection between handwriting and literacy may also be very significant.

The research set out to examine the overall pattern of handwriting speed and legibility in a large secondary comprehensive school. The study was based on the premise that speed and legibility of handwriting are key factors in a student's capacity to do well at school, particularly in public examinations. A previous study in the school, of students with motor co-ordination difficulties, had shown that those with severe difficulties were very concerned about the appearance of their work and were under-achieving (Rutherford, 1996). More detailed information about the writing habits of the whole student body was needed to help the school plan effective teaching strategies which would both overcome these particular difficulties and have more general applicability across the school.

The research was also influenced by a recent study of the approach to the teaching of handwriting used in France where, according to Thomas (1997), "... by contrast [to the UK] handwriting, particularly flowing joined-up handwriting, is considered fundamental, a physical skill that, once mastered, unlocks the mind". In French schools the teaching process begins at age 3 and goes on until the age of 8 or 9. It takes precedence over reading "because writing is considered more demanding". Thomas remarks that the result indicates that, "It is as though, having automated the hand, children's minds are liberated to release their ideas more efficiently and creatively on paper". If this is the case it seems possible that difficulties with 'automating the hand' could have a negative effect on achievement. Initiatives to overcome motor co-ordination difficulties might, therefore, through improvements in handwriting, improve literacy and achievement.

The Survey

The English Faculty carried out the survey during the winter of 1996/97. Our starting point was a very simple search for information about three things: how many students wrote slowly, what the average speed was in each age group and what pattern we would find over the school as a whole. If an output of 12 words a minute over ten minutes is regarded by educational psychologists as 'slow', what is 'fast'?

	No of students	Below 5	5-9	10-14	15-19	20-24	24-29	30-34	Over 35
Year 7	275	1%	8%	35%	38%	16%	2%	0%	0%
Year 8	175	0%	3%	17%	38%	28%	9%	4%	0%
Year 9	265	0%	5%	17%	37%	27%	10%	3%	0%
Year 10	215	0%	3%	16%	34%	28%	12%	6%	1%
Year 11	262	0%	2%	17%	23%	35%	16%	5%	2%
Total	1192	4	55	251	404	316	115	39	8
Average		0	5%	21%	34%	27%	10%	3%	1%

Speed of handwriting over ten minutes (free choice of subject matter) in words per minute. Entries are percentages, rounded to whole numbers, and sum to 100 across rows.

Key Questions about Handwriting

To discover how handwriting can contribute to achievement, we set out to explore the following questions:

- *What is the pattern of handwriting speed in the school as a whole?*
  The survey results, illustrated in Table 1, showed a wide range of writing speed in the school as a whole. The majority in each age group wrote at speeds of between 15 and 25 words per minute.
- *How many students produce written work which is challenging to read or illegible?*
  Although very few students in the school as a whole produced illegible scripts, many of them showed problems, particularly with joining up (see Fig.1) .
- *Does the primary school of origin affect handwriting skills?*
  There were no systematic differences among children in Year 7. However in the case of some primary schools, the numbers were too small to be statistically significant.
- *What makes handwriting difficult to read?*
  Poor letter formation, word shape, spelling, confusion of upper/lower case and inconsistent slant were the main problems identified (see Fig.1). These problems increased as students got older and were more common for boys than girls.
- *What makes handwriting a difficult task?*
  Although this study did not specifically address the factors which made handwriting difficult, where problems were noted, the scripts also showed signs characteristic of poor motor co-ordination.
- *Are there any significant age and gender differences in the development of handwriting?*
  Speed increases with age. Amongst younger children, girls write faster than boys but by Year 10 or 11 the boys have caught up. In general, handwriting problems do not decrease with age and some problems, for example word/letter formation, increase with age. More boys exhibit more of the problems of the kind described in this study than do girls.
- *Is there any correlation between poor handwriting and achievement?*
  Amongst Year 7 students there was a small correlation with CATs scores. At GCSE slow writers perform less well in English Language than faster writers, even after adjusting for ability. Furthermore, the effect of joins is different for boys than for girls. For boys, failure to join up correctly is associated with an average drop of half a grade. For girls it is associated with an average drop of a whole grade. Results for handwriting and achievement in GCSE Science were similar to those for GCSE English, but the differences were not as pronounced as in the English examination. Disentangling the best predictors of success at GCSE is not straightforward because the different aspects and measures of legibility are inter-related, and because of their different incidences for boys and girls. However, speed still has a small estimated effect on GCSE English grade. This study did not explore the nature of the relationship between spelling and joining, but the findings suggest that further work in this area would repay investigation.
- *Is there a connection between writing speed and legibility?*
  There was no general association between speed and legibility except that those that joined up wrote faster. There was a correlation between speed and National Curriculum levels for writing, possibly because 'joining' is an element in the NC levels.
- *What implications will the results of the survey have on our teaching methods?*
  These emanate from three sources of information. First, the likelihood that a number of students in each class have writing difficulties means that teachers need to consider the demands they make on students' ability to write clearly and quickly and need to develop strategies to help them record their work. Secondly, the evidence showing that problems increase with age suggests that students with handwriting problems should receive more attention. Handwriting should be taught throughout the years of secondary education and this may be particularly important for boys. In this respect the findings support the work of Connor (1995)

who suggests that '...among boys, there appears still to be scope for maturation and improvement in writing performance from Year 10 onward.' Thirdly, the data show that generally, among students with SEN, a higher proportion are slow writers and have poor handwriting. However these problems were also identified among those not identified as having SEN. This suggests that handwriting is a general problem amongst students and is therefore a matter for all teachers not just SEN specialists.

Ways Forward

The implications of this study turned out to be more far reaching than anticipated. Although the questions raised are complex, the message is clear. Continued attention to handwriting throughout the school years is essential and an early start with joined-up writing will aid a process that is far more than purely physical. The survey drew attention to a number of issues:

- *Students' written work as a source of reading matter.*
  For students, their own work is a prime source of reading matter. Those who are unable to read what they have written cannot gain much satisfaction or improvement from their own key source material. It is in this area that the full significance of the survey is most apparent. If a quarter of the students struggle, for whatever reason, to write fluently and legibly about a subject of their own choice, how do they fare when the subject matter is unfamiliar? The survey results show that most students' handwriting does improve between Years 7 – 11. This suggests that by helping students develop fluent, legible, joined-up handwriting, teachers in secondary schools play a significant role in improving literacy. This has implications for whole school curriculum planning and staff development.
- *The connection between spelling, handwriting and reading.*
  Multi-sensory approaches to the teaching of literacy suggest that encouraging secondary school students to write legibly and fluently will improve reading and spelling. There are implications however in terms of teacher and student time. The findings suggest that the connection between accurate spelling and joined handwriting may be a key element, which therefore needs to be explored in greater detail.
- *Students with problems of speed and/or legibility.*
  Students (25% in this study) unable to write faster than 15 words per minute will be struggling in all lessons where a lot of writing is required. Alternative strategies are required to minimise the loss for those who cannot cope with the writing 'input' and 'output' demanded of them. If asked to copy from the board, their notes are likely to be illegible and/or unfinished. Furthermore, although the majority of children write at a reasonable speed by the time they reach Year 8, their handwriting is still developing. If asked to write too much, too often, too fast, before they have settled to a mature hand, their writing will deteriorate and bad habits become entrenched.
- *The writing demand across the curriculum and the age range.*
  Study of the total amount of written work expected of students could lead, for example, to a reduction in writing demand in favour of teaching methods less dependent on written work, or the use of alternatives such as prepared worksheets or IT. There could also be an enhanced role for subjects such as Science, Geography, Technology, Languages and Maths to teach handwriting skills more explicitly in its different registers, for example, scripts suitable for maps and diagrams, and numbers. In those lessons where the pressure on writing speed is less severe (Languages, Technology, Science) there could be an expectation that what is written must be of a very high standard. Most students can and should be expected to write their name and address legibly on an envelope. If they can do this they can do other equally short written tasks legibly too. This would have the effect of raising expectations and giving opportunities for practising and improving on previous best. A by-product of helping poor spellers and readers to write well enough to make reading their own work a possibility, would be that their notes could be used for revision.

Figure 1 (a): Percentage of non-SEN boys and girls in each year group who wrote slowly (less than 15 words per minute)

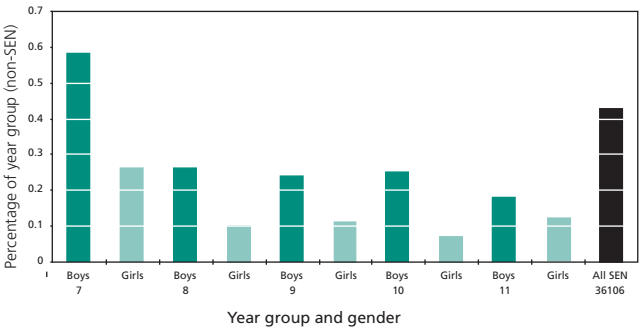


Figure 1 (b): Percentage of non-SEN boys and girls in each year group with handwriting at National Curriculum Level 2 only.

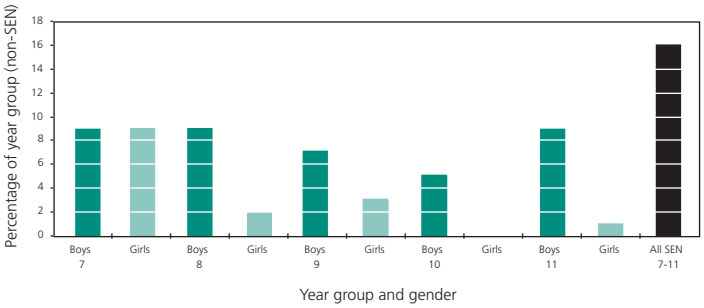


Figure 1 (c): Percentage of non-SEN boys and with lack of joining-up as a handwriting feature. girls in each year group

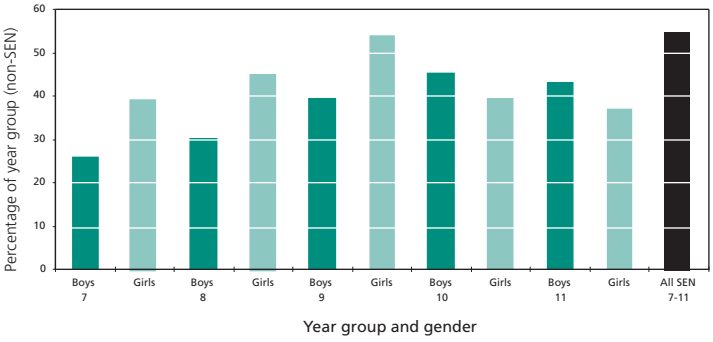


Figure 1 (d): Percentage of non-SEN boys and girls in each year group with word- or letter-formation problems as a handwriting feature.

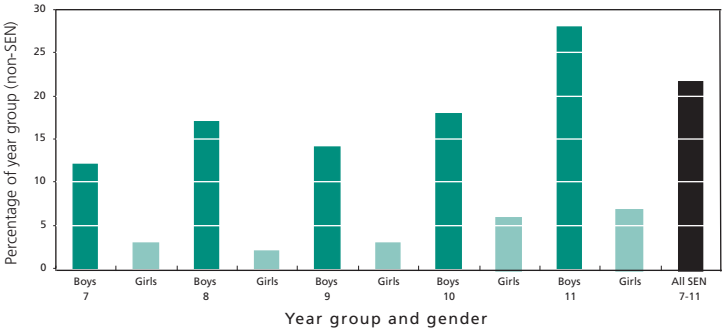


Figure 1 (e): Percentage of non-SEN boys and girls in each year group with letter size as a problem in handwriting.

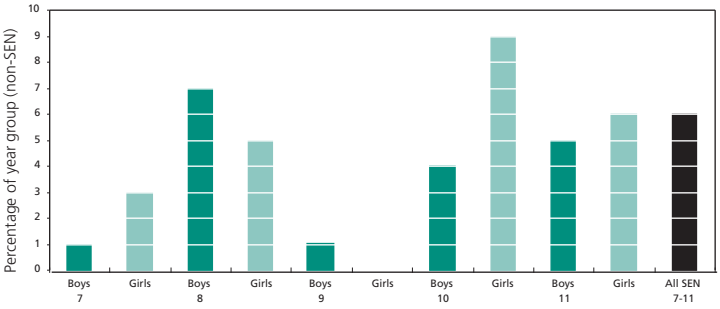
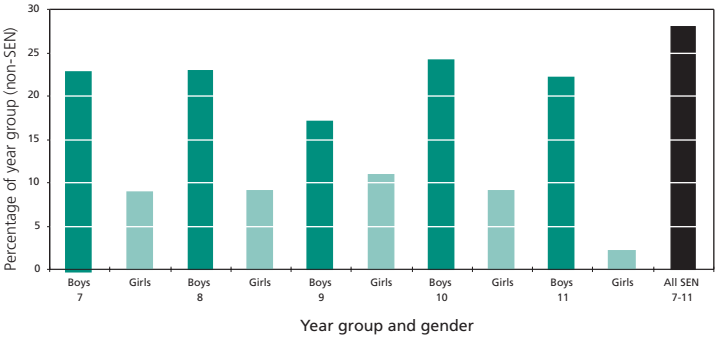


Figure 1 (f): Percentage of non-SEN boys and girls in each year group with letter slant as a handwriting problem.



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