National Teacher Research Panel
engaging teacher expertise

This summary was commissioned by the National Teacher Research Panel for the Teacher Research Conference 2004, which explored and celebrated teacher engagement in and with research. All conference materials are available at www.standards.dfes.gov.uk/ntrp

Using data to ensure gifted and talented students achieve their full potential in Design and Technology

Aims of project

The research set out to look into the provision for Gifted and Talented pupils within Design and Technology at Key Stage 3 in a Hartlepool school, which was currently using a standardised ability test known as Middle Years Information System (MidYIS). Two questions were considered:

- are test results from MidYIS a reliable indicator for technology GAT pupils? and
- does a more creative delivery encourage GAT pupils to produce higher-level ideas and to be more satisfied with their projects?

Context

The project looked at the effectiveness of identification data across one-year group of 230 students in an 11-16 comprehensive school. The study then continued through action research involving two groups of approximately 22 mixed ability students, one acting as a control group and one as the test group.

Summary of main findings

Identifying gifted and talented pupils in Design and Technology. Evidence indicated that:

- the MidYIS testing was a useful general tool for initial identification of GAT pupils;
- individual components of the overall grade needed to be considered - particularly non-verbal, maths and skills - for identification within D&T;
- analysis of the MidYIS data was very useful when considering underachievement;
- clear guidelines were essential to help identify GAT subject specific talents; and
- reference to professional judgements helped to ensure that special talents were not missed in the identification process.

Implications for delivery of the curriculum were that:

- an emphasis on creativity and individual choice could help to stimulate the interest and motivation of GAT pupils;
- strategies to teach and develop creativity were of benefit to GAT pupils;
- ability grouping appeared to help in creating a climate conducive to stimulate the imagination as part of the design process; and
- pupils needed a ‘safe’ environment in which they can be encouraged to demonstrate innovative ideas in D&T without fear of ridicule and failure.

Background

High Tunstall School is an 11-16 comprehensive with 1150 students on roll. It is part of Hartlepool Excellence in Cities action zone but does not have a high proportion of disadvantaged families. Prior to the research, identification of GAT pupils in school was carried out by teacher nomination. Within the D&T department, staff used professional judgement, based on pupils' class work, when identifying individuals as GAT, with little reference to performance data. This led to a large number of pupils being nominated with little coherence of standards across the department.

To address such discrepancies the school introduced the Middle Years Information System [MidYIS] - a standardised ability test carried out within four areas; vocabulary, maths, non-verbal and skills - for the 2001 Year 7 cohort. Through analysis of these results, pupils could be sorted by rank order and a quantitative measure applied to identify the relevant GAT pupils. The author was keen to discover whether these general tests accurately reflected D&T ability and talent.

In addition, OFSTED has long reported that 'making is better than designing' in D&T, with pupils being taught practical techniques rather than being encouraged to have innovative ideas. One common factor, firmly established in the many checklists for GAT (George, 2001 p42), is an ability to demonstrate creativity. Hence the author also decided to investigate the effects of a more creative delivery method.

Teaching processes and strategies

The author made a simple modification to the delivery of the next textile project by introducing a group design exercise in the first session, prior to any specific material knowledge being taught. She was keen to explore whether this produced more creative designs than the previous technique of designing at a later stage. This exercise was intended to create a non-threatening environment in which pupils felt comfortable to take risks and not to be too concerned with the practicalities of construction. The opinions of the test group were then compared with a control group who had had a 'teacher led' delivery [traditional emphasis on making] to examine if the more creative delivery [stressing experimentation and discovery] encouraged GAT pupils to produce higher-level ideas and to be more satisfied with their projects.

Findings

Results of identification by current staff nomination system

Staff nominations of GAT pupils after each project					
	Autumn	Spring	Summer	Consistent nominations in same category	Total of different pupils nominated
Top 5%	16 total 12 Girls 4 Boys	17 total 13 Girls 4 Boys	13 total 9 Girls 4 Boys	5	
Top 10%	22 total 20 Girls 2 Boys	24 total 23 Girls 1 Boys	19 total 9 Girls 10 Boys	1	
Top 20%	16 total 14 Girls 2 Boys	20 total 13 Girls 7 Boys	34 total 23 Girls 11 Boys	2	
Total [Cohort 219 pupils]	54[23.4%] 46 Girls 8 Boys	61[26.5%] 49 Girls 12 Boys	66[28.6%] 41 Girls 25 Boys	8	107[48.8%] 70 Girls 37 Boys

Table 1

Different teachers have identified almost half the cohort as Gifted and Talented over the course of the year; clearly there was a problem with the current system. The author reflects that this could be due to:

- the lack of agreed detailed criteria or baseline assessments;
- pupil's individual preferences for different themes;
- staff personality differences; or
- undue influence of attractive presentation may also have influenced nominations, as it does not necessarily reflect ability.

Other factors could be pressure of work on staff leading to lack of quality time for assessment of potential, lack of differentiation or challenge in the curriculum, emphasis on 'making' rather than creativity and national assessment criteria not being sufficiently rigorously applied.

Identification according to MidYIS test results

Summary of ranked MidYIS test results							
				Number of pupils not in overall top 50 MidYIS group but in top 50 of individual test areas			
	Total size	20%	Top 50 pupils ranked by MidYIS overall score	Vocabulary	Maths	Non-verbal	Skills
Year 7 2001 cohort	219 total 105 Girls 114 Boys	44 total 21 Girls 23 Boys	50 total 25 Girls 25 Boys	15[30%] 4 Girls 11 Boys	10 [20%] 6 Girls 4 Boys	15[30%] 8 Girls 7 Boys	19 [38%] 11 Girls 8 Boys

Table 2

If the GAT were identified as the top 20% of pupils ranked by overall MidYis score, then 44 pupils become the cohort. However, if the GAT were identified using only one individual category such as non-verbal score, a different cohort would be the top 20% as can be seen by the figures in table 2.

Comparison of staff nomination and MidYis testing

Despite 107 pupils of the cohort being nominated as GAT under the current system, 22 of the most able, according to MidYis, were never mentioned. Many factors may have contributed to this including underachievement, attendance, behaviour problems and gender differences. The quiet pupil who does not demand attention (Wallace 2000, p31) and the 'academically able' pupil who may not necessarily be talented in D&T could also have affected nominations. Some pupils may have under/over performed in the Table 2 tests and some may argue that 'pencil and paper' tests do not accurately reflect D&T ability. Nevertheless, on consideration of these various factors, it was decided to identify GAT pupils within the sample groups as those with an overall MidYIS A grade.

Staff nomination of pupils compared to MidYIS testing					
Top 50 pupils in each area	MidYis	Vocabulary	Maths	Non-verbal	Skills
Number of pupils missed by staff nominations	22 total 4 Girls 18 Boys	24 total 6 Girls 18 Boys	20 total 2 Girls 18 Boys	20 total 5 Girls 15 Boys	22 total 5 Girls 17 Boys

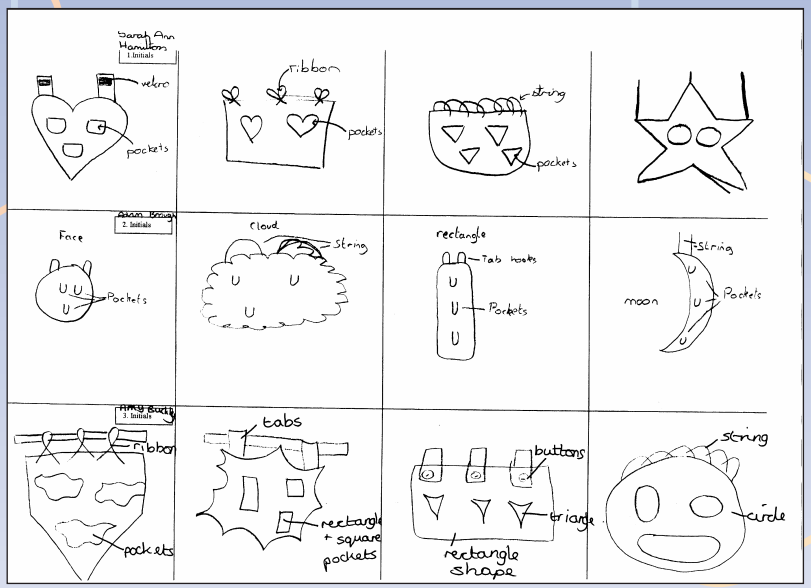
Table 3

Outcomes following a change of curriculum placing more emphasis on creativity

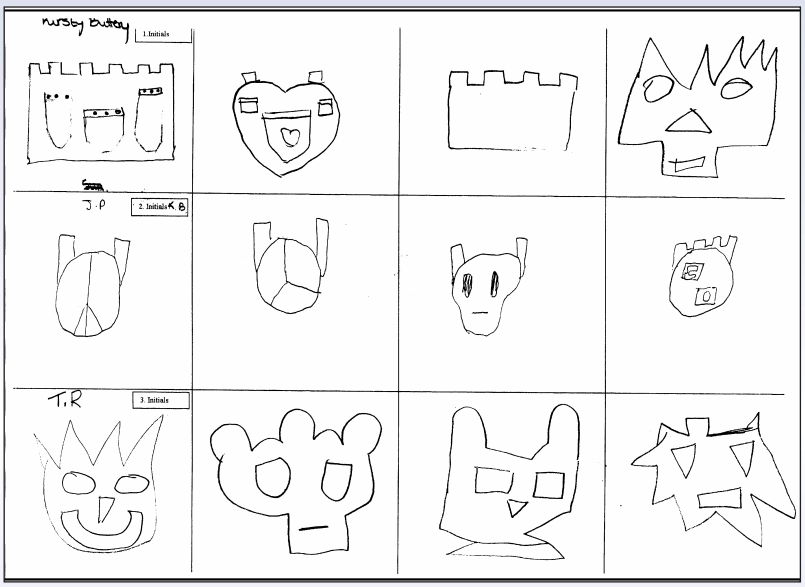
Textiles is a totally new experience for the year 7 D&T groups. The original, teacher-led, control group were provided with experience of materials and equipment prior to producing ideas for a storage hanging [traditional emphasis on making]. With the test group, an ability based group design exercise employing a strong emphasis on 'safe risk taking' was used. Pupils were encouraged throughout the project to investigate and try out the skills necessary to implement their original ideas and discover for themselves which restrictions had to be placed on the construction phase.

The results show the range of ideas produced and, when asked, all pupils agreed or strongly agreed that the exercise had been useful.

Group 1 (most able): coped well and enjoyed the experience. They made use of a good range of diffe.rent ideas and utilised annotation effectively to produce designs that were creative and functional.

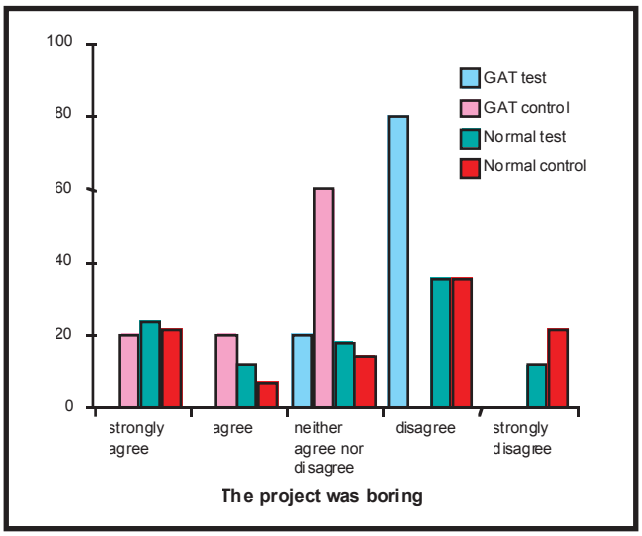


Group 6 (least able): demonstrates the 'developmental' rather than 'new' aspect of designing. No annotation is present and many of the ideas are reworked versions of another. Ths group found the exercise particularly difficult, as they had to think quickly, one minute per idea.



Questionnaire results

A questionnaire, developed from an Australian study by Anne Fritz (1998), was administered to both groups under exam conditions. It was emphasised that there were no 'wrong' answers and pupils were encouraged to be as truthful as possible. Fritz identified three factors that significantly defined the D&T learning experience [satisfaction, ease and independence] and the results were considered in relation to these.



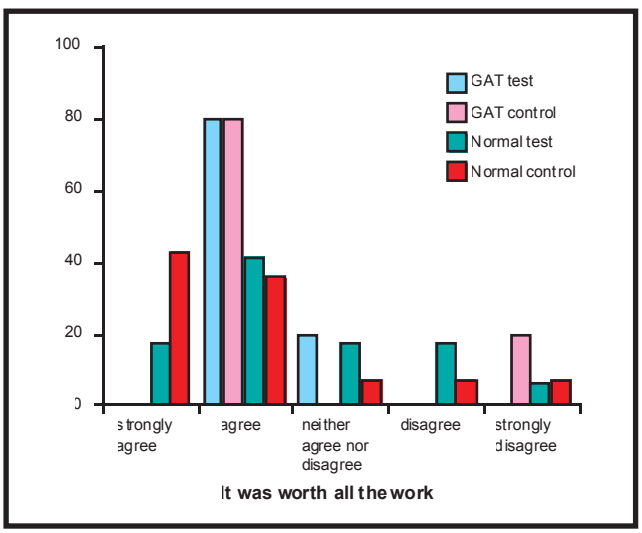
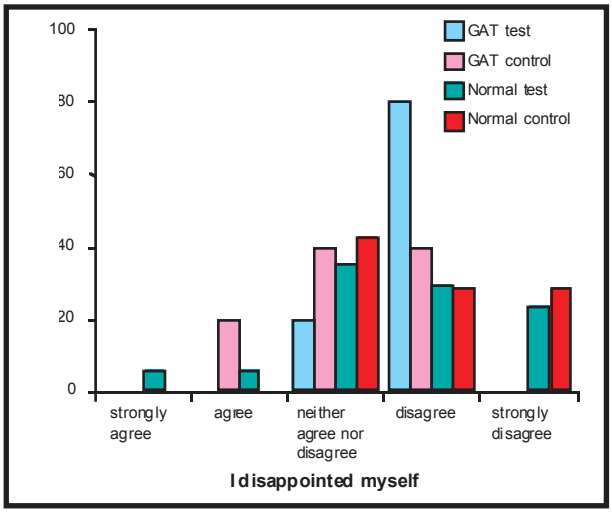


Chart 1: *Satisfaction* – disagreement on 'The project was boring' – agreement on 'It was worth all the work'

When looking at satisfaction in chart 1, the GAT pupils in the test group were more positive than those in the control group indicating a better learning experience for these pupils. However, the non-GAT pupils in the test group were less satisfied than those in the control - perhaps because they were required to do more 'thinking' and make more individual decisions.



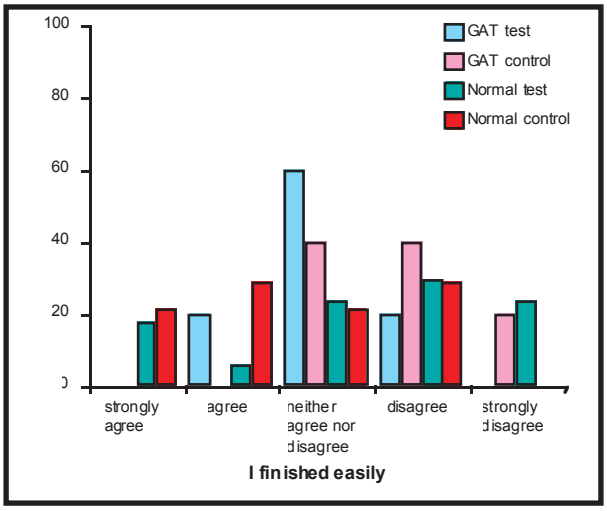


Chart 2: *Ease* - disagreement with 'I disappointed myself' - agreement with 'I finished easily'.

With regards to 'ease' in chart 2, the majority of normal pupils in the control group felt that they had finished the project easily and none were disappointed. However, in the test group, 50% experienced difficulty in completing the work and 10% were disappointed. The author concluded that this was due to the more demanding approach delivered to this group producing a better-differentiated experience for the pupils.

Pupils in the test group felt more independence than pupils in the control group according to chart 3. This demonstrates the individuality of the more creative approach and allows pupils to take more ownership of their work.

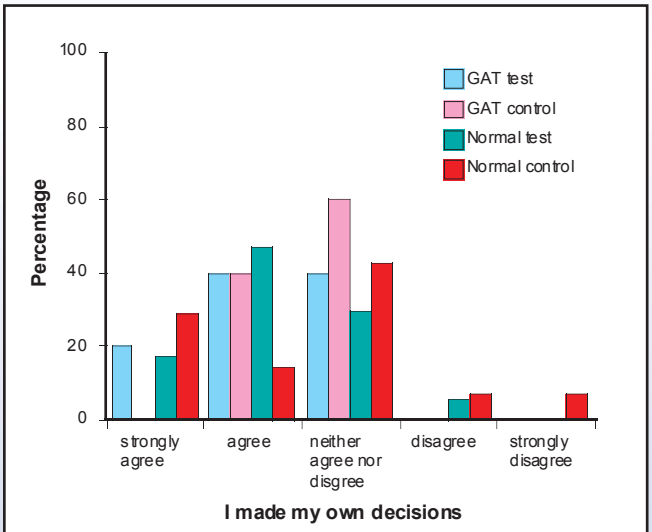


Chart 3: *Independence* - agreement with 'I made by own decisions'

Final outcomes

The final wall hangings that were produced demonstrated the better creativity of the test group. For example, the shape of the backgrounds and number/type of suspension methods was more varied than that of the control group. On comparing the overall outcomes of both groups it is clear that the test group demonstrated more creativity than the control group but that the standard of construction was similar.

These results lead to the conclusion that, by arranging pupils within groups by ability and introducing a simple creative design exercise at the start of the project, GAT pupils were more satisfied with their work and produced higher-level initial ideas.

Research methods

Students take the MIDYIS test on entry to the school and data from these results were analysed to identify prospective Gifted and Talented individuals. Design and Technology staff were also asked to identify GAT students in their teaching groups, under the current system of using professional judgements, at the end of each project session resulting in three sets of identification data for examination. These two sets of identification data were then compared in terms of which students made up the top 20% of the year group, and hence were classed as GAT, to explore if the same students were identified by each method. A questionnaire was then designed, incorporating some features of a study by Anne Fritz (1998) in Australia that compared the views of winners of D&T awards with 'ordinary' pupils. The objective of the questionnaire was to explore the affective responses of students to the different delivery styles used in the test projects.

Conclusion

Identification

This small-scale research project provides evidence to demonstrate inconsistencies resulting from systems of teacher identification of GAT where there are no clear guidelines to work from.

When considering alternative methods of identification of GAT pupils, colleagues may wish to reflect on whether generic tests such as the in-school MidYIS provide an accurate diagnosis of ability in the D& T processes. Nevertheless, it is clear that in this study MidYIS testing did give an independent assessment of general ability against which D&T talents could be assessed and underachievement considered. Through the limited examination of the different test area scores done here, I feel that non-verbal, maths and skills scores of pupils should be taken into account when producing initial ability lists for consideration. I would suggest that the overall top 50 plus 'extras' from these areas form an initial short list from which the top 20% can be selected by specialist D&T staff. This is in line with the DfES (2002) recommendation for use of both quantitative and qualitative methods for identification.

Focus on creativity

The results demonstrated that pupils found the emphasis on creativity to be more challenging and motivating than the traditional style of delivery. The GAT pupils in the test group were more satisfied with their projects than the GAT in the control group. The variety of ideas produced initially by the group exercise showed a good range of imagination, although many of these were later simplified to accommodate production issues. Overall this proved to be a good method of enriching the curriculum for all and in particular for the GAT. With further improvement and development of strategies/resources to extend this focus, the level of differentiation within the group could be additionally enhanced.

However, for this approach to be most successful, it seems to be important that pupils of similar ability work together at the designing stage in order to stimulate more creative ideas. Once the focus of the project has been established, pupils can work effectively in friendship groups with GAT pupils offering support to the less able during construction. This, in turn, helps them to consolidate their own skills.

Suggestions for further reading

Anne Fritz 1998 EXCELLENCE IN TECHNOLOGY: winning attitudes, environments and outcomes. A comparative study of Design and Technology students and the winners of The Minister's Young Designers' Awards. University of Sydney Paper Presented at the European Conference on Educational Research Ljubljana, Slovenia 17 - 20 September 1998

George, David (2001) The Challenge of the Able Child. London: David Fulton

National Advisory Committee on Creative and Cultural Education [NACCCE]. (1999) All our futures: creativity, culture and education. DfEE

Ofsted (2001) Providing for gifted and talented pupils: An Evaluation of Excellence in Cities and other grant-funded programmes. DfEE

Wallace,B, (2000) Teaching the Very Able Child. London: David Fulton
www.standards.dfes.gov.uk/ecellence/policies/giftedandtalented DfEE (2002)

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