Institute of Education

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Best Practice in Grouping Students?
Characteristics of students in English and mathematics 'ability' set groups in English secondary schools

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What does the research say?

- Educational attainment and socio-economic background are closely correlated

- Segregation by 'ability' *within* schools exacerbates wider social inequalities

- Disadvantaged students are disproportionately concentrated in low sets and streams

- Students in lower sets and streams have poorer attainment outcomes

Best Practice in Grouping Students Project

- Seeks to answer three questions about grouping
  - What is the impact on achievement for students in low sets if detrimental setting practices are mitigated?
  - What actually constitutes good practice in mixed-attainment teaching and grouping?
  - Which of the good practice alternatives is more effective in improving the attainment of low-achieving students?
- Focuses on Key Stage 3 English and mathematics
- Funded by the Education Endowment Foundation

The interventions

- **Best Practice in Setting**

- Best Practice in Mixed Attainment

- Each includes
  - Organisational elements
  - CPD to address specific issues

Each school's commitments

- Set/class organisation

- Teaching and learning

- Professional development

- Facilitate data collection

Sept 2014-July 2015	Pilot study and intervention development
Sept 2015-July 2016	RCT Best Practice in Setting (126 secondary schools, Yr 7 English and Maths). Feasibility Study, Best Practice in Mixed Attainment Grouping (13 schools, Yr 7 English & Maths).
Sept 2016-July 2017	RCT Best Practice in Setting (126 secondary schools, Yr 8 English and Maths). Feasibility Study, Best Practice in Mixed Attainment Grouping (13 schools, Yr 8 English & Maths).
Aug 2017 – Jan 2018	Data analysis, writing up, dissemination

So far…

- 126 schools (BPS)

- 13 schools (BPMA)

- 13 000+ responses to initial student questionnaire

- 700+ responses to initial teacher questionnaire

- Interviews, focus groups and observations in our mixed-attainment schools

Is there a difference in the composition of set levels (top, middle and bottom) in English and mathematics in terms of student characteristics?

Variable	Levels	Source
Set level	Top/middle/bottom	School
Household social class	Lower/middle/higher	Student questionnaire Based on parental occupation
Parental education	Left at or before 16/FE/university	Student questionnaire
Number of books at home	None + very few/one shelf/one bookcase full/more than one bookcase full	Student questionnaire
Free school meals	Not ever FSM eligible/FSM eligible	EVERFSM_ALL from NPD
Gender	Girl/boy	NPD
Ethnicity	White/Asian/Black/Mixed	Student questionnaire
EAL	Not EAL/EAL	Student questionnaire
KS2 reading & maths	High/Medium/Low tertiles	NPD
Intervention	Intervention/control	Project randomisation

		English (n=3880)	Maths (n=7634)
Household social status	% Higher % Intermediate % Lower	47 35 18	50 34 17
Parent education	% Left school at or before 16 % Further education % University	26 32 42	24 29 47
Books at home	% None or very few % One shelf % One bookcase % More than one bookcase	12 20 22 47	10 20 21 49
FSM eligible	% Yes	25	23
Gender	% Male	54	51
Ethnicity	White Asian Black Mixed	79 8 5 8	77 9 6 9
EAL	% Yes	9	9
KS2	Below level 4 Level 4 Level 5 or above	7 42 51	5 38 56

'Set level'

- Included BPS schools (intervention and control) that reported they had 3 or more set levels.

- '**Top**' is the set (or sets) reported as highest in each school

- '**Bottom**' is the set (or sets) reported as lowest in each school

- '**Middle**' is all other set levels

Number of set levels	Frequency	
	English	Maths
1	-	-
2	2	3
3	15	22
4	16	35
5	6	13
6	4	4
7	2	3
8	1	2
9	2	-
10	1	-

Household social class: English

- 38% of students from higher social class backgrounds are in the top set in English, compared to 26% of students from lower parental occupation backgrounds

- $\chi^2(4)=97.8$, $p<0.001$

	% Top	% Middle	% Bottom
Lower	26	59	15
Intermediate	31	57	12
Higher	38	50	13
All students	30	56	14

Parent/carer education: English

- Proportion of students in the top set increases as parental level of education increases; 25% of students whose parents left school at or before 16 years are in the top set in English, compared to 37% of students whose parents went to university. Opposite pattern for the bottom set. $\chi^2(4)=56.5$, $p<0.001$

	% Top	% Middle	% Bottom
At or before 16	25	59	16
FE	30	56	14
University	37	52	11
All students	32	53	15

Number of books: English

- Students with high numbers of books in the home more likely to be in top set. Low numbers of books – more likely to be in middle or bottom English sets. $\chi^2(8)=236.5$, $p<0.001$

	% Top	% Middle	% Bottom
None/few	15	63	22
1 shelf	24	60	17
1 bookcase	30	57	13
>1 bookcase	41	48	11
All students	32	55	14

Free school meals: English

- Students in receipt of FSM under-represented in top sets and over-represented in bottom sets; opposite pattern for non-FSM. $\chi^2(2)=138.5$, $p<0.001$

	% Top	% Middle	% Bottom
No FSM	34	54	12
FSM	22	61	17
All students	30	56	14

Gender: English

- 32% of girls are in the top set, compared to 28% of boys
- 16% of boys are in the bottom set, compared to 12% of girls
- Boys over-represented in low sets and under-represented in high sets ($\chi^2 = 28.1$, $p < 0.001$)

	% Top	% Middle	% Bottom
Girls	32	57	12
Boys	28	56	16
All students	30	56	14

Ethnicity: English

- White students are over-represented in top sets (33% vs 31% overall). All other ethnic groups are under-represented in top sets and over-represented in bottom sets. $\chi^2(6)=22.5$, $p=0.001$

	% Top	% Middle	% Bottom
White	33	54	13
Asian	28	55	17
Black	26	59	15
Mixed	25	57	18
All students	31	55	14

EAL: English

- Students with EAL are under-represented in top sets and over-represented in bottom sets. $\chi^2(2)=20.0$, $p<0.001$

	% Top	% Middle	% Bottom
Not EAL	32	54	14
EAL	23	60	18
All students	31	55	14

KS2 results: English

- The relationship between KS2 attainment and set membership is as expected. $\chi^2(4)=2506.3$, $p<0.001$

- Some high attainers in low set and vice versa.

	% Top	% Middle	% Bottom
Lowest tertile	7	64	29
Middle tertile	25	68	7
Highest tertile	63	34	3
All students	30	56	14

Household social class: Maths

- 39% of students from higher social class backgrounds are in the top set in maths, compared to 27% of students from lower parental occupation backgrounds. Opposite pattern for middle and bottom sets. $\chi^2(4)=235.7$, $p<0.001$

	% Top	% Middle	% Bottom
Lower	27	56	16
Intermediate	32	54	14
Higher	39	51	9
All students	32	54	14

Parent/carer education: Maths

- Proportion of students in the top set increases as parental level of education increases; 26% of students whose parents left school before 16 years are in the top set in maths, compared to 40% of students whose parents went to university. Opposite pattern for the bottom set. $\chi^2(6)=182.7$, $p<0.001$

	% Top	% Middle	% Bottom
At or before 16	26	56	17
FE	30	56	14
University	40	50	10
All students	34	53	13

Number of books: Maths

- Students with high numbers of books in the home more likely to be in top set. Low numbers of books – more likely to be in middle or bottom English sets. $\chi^2(8)=394.6$, $p<0.001$

	% Top	% Middle	% Bottom
None/few	18	57	25
1 shelf	27	57	16
1 bookcase	32	56	12
>1 bookcase	41	50	9
All students	33	54	13

Free school meals: Maths

- Students in receipt of FSM under-represented in top sets and over-represented in bottom sets; opposite pattern for non-FSM. $\chi^2(2)=272.5$, $p<0.001$

	% Top	% Middle	% Bottom
No FSM	35	53	11
FSM	24	57	19
All students	32	54	14

Gender: Maths

- 34% of boys are in the top set, compared to 29% of girls
- 56% of girls are in the middle set compared to 52% of boys
- Boys over-represented in high sets, girls over-represented in middle sets. $\chi^2(2)=34.8$, $p<0.001$

	% Top	% Middle	% Bottom
Girls	29	56	14
Boys	34	52	14
All students	32	54	14

Ethnicity: Maths

- Asian students are over-represented in top sets (40% vs 33% overall). Black and mixed ethnic groups are under-represented in top sets and over-represented in bottom sets. $\chi^2(6)=38.9$, $p<0.001$

	% Top	% Middle	% Bottom
White	33	54	13
Asian	40	49	11
Black	25	59	16
Mixed	30	55	15
All students	33	54	13

EAL: Maths

- No relationship between English language status and maths set. $\chi^2(2)=3.5$, NS

	% Top	% Middle	% Bottom
Not EAL	34	53	13
EAL	31	55	14
All students	33	54	13

KS2 results: Maths

- The relationship between KS2 attainment and set membership is as expected. $\chi^2(4)=7098.4$, $p<0.001$

- Some high attainers in low set and vice versa.

	% Top	% Middle	% Bottom
Highest	76	19	4
Middle	18	45	37
Low	3	13	84
All students	35	33	33

English (42 schools)	Not including KS2 Reading score			Including KS2 Reading score		
	Coef. (RSE)	RRR	*p*	Coef. (RSE)	RRR	*p*
Bottom set (compared to top set)						
Intercept	.058 (.331)	1.060	.860	**1.566 (.509)**	**4.785**	**.002**
Intervention	.185 (.416)	1.203	.656	.268 (.549)	1.308	.625
SES lower	0			0		
SES intermediate	-.158 (.148)	.854	.286	.057 (.174)	1.059	.742
SES higher	-.171 (.133)	.843	.197	.156 (.160)	1.169	.327
Parent left school at or <16	0			0		
Parent - further education	-.141 (.158)	.868	.371	-.139 (.175)	.870	.426
Parent - university	-.303 (.183)	.739	.098	.039 (.235)	1.040	.861
No/few books	0			0		
One bookshelf	**-.733 (.215)**	**.480**	**.001**	-.219 (.272)	.804	.421
One bookcase	**-1.139 (.248)**	**.320**	**<.001**	-.384 (.300)	.681	.201
More than one bookcase	**-1.532 (.293)**	**.216**	**<.001**	-.367 (.322)	.693	.254
Girl	0			0		
Boy	**.382 (.140)**	**1.466**	**.006**	.196 (.164)	1.22	.233
Non-FSM	0			0		
FSM	.092 (.176)	1.097	.601	-.256 (.186)	.774	.169
White	0			0		
Asian	-.002 (.279)	1.002	.993	-.151 (.316)	.860	.632
Black	.234 (.361)	1.264	.516	.287 (.407)	1.332	.481
Mixed	.166 (.229)	1.181	.468	.284 (.275)	1.328	.302
Not EAL	0			0		
EAL	.437 (.254)	1.548	.085	.274 (.293)	1.315	.321
KS2 low	-			0		
KS2 mid	-			**-2.756 (.393)**	**.064**	**<.001**
KS2 high	-			**-4.752 (.602)**	**.009**	**<.001**

RSE = Robust standard error
RRR = Relative Risk Ratio

English (42 schools)	Not including KS2 Reading score			Including KS2 Reading score		
	Coef. (RSE)	RRR	*p*	Coef. (RSE)	RRR	*p*
Middle set (compared to top set)						
Intercept	**2.027 (.477)**	**3.614**	**<.001**	**2.373 (.449)**	**10.727**	**<.001**
Intervention	-.131 (.202)	.877	.516	-.105 (.271)	.900	.698
SES lower	0			0		
SES intermediate	-.004 (.137)	.996	.976	.134 (.146)	1.143	.359
SES higher	-.169 (.136)	.845	.215	.001 (.138)	1.001	.996
Parent left school at or <16	0			0		
Parent - further education	-.029 (.091)	.971	.749	-.039 (.094)	.961	.676
Parent - university	**-.209 (.100)**	**.811**	**.036**	-.009 (.123)	.991	.939
No/few books	0			0		
One bookshelf	**-.367 (.182)**	**.693**	**.043**	-.087 (.225)	.917	.700
One bookcase	**-.556 (.206)**	**.574**	**.007**	-.095 (.250)	.909	.703
More than one bookcase	**-.987 (.221)**	**.372**	**<.001**	-.302 (.256)	.739	.237
Girl	0			0		
Boy	.047 (.151)	1.048	.755	-.095 (.171)	.909	.577
Non-FSM	0			0		
FSM	.182 (.099)	1.199	.067	.018 (.101)	1.018	.861
White	0			0		
Asian	.037 (.185)	1.038	.840	.008 (.220)	.1008	.972
Black	.127 (.154)	1.135	.411	.124 (.537)	1.133	.537
Mixed	.123 (.162)	1.131	.446	.210 (.186)	1.233	.260
Not EAL	0			0		
EAL	.285 (.201)	1.330	.156	.199 (.243)	1.221	.413
KS2 low	-			0		
KS2 mid	-			**-1.136 (.264)**	**.321**	**<.001**
KS2 high	-			**-2.760 (.302)**	**.063**	**<.001**

RSE = Robust standard error
RRR = Relative Risk Ratio

Maths (71 schools)	Not including KS2 maths score			Including KS2 maths score		
	Coef. (RSE)	RRR	*p*	Coef. (RSE)	RRR	*p*
Bottom set (compared to top set)						
Intercept	**.681 (.238)**	**1.976**	**.004**	**2.272 (.405)**	**3.926**	**<.001**
Intervention	-.021 (.200)	.979	.913	-.156 (.302)	.856	.607
SES lower	0			0		
SES intermediate	-.193 (.125)	.825	.123	.067 (.140)	1.069	.631
SES higher	**-.513 (.129)**	**.599**	**<.001**	-.132 (.150)	.876	.378
Parent left school at or <16	0			0		
Parent - further education	-.167 (.105)	.846	.114	.037 (.157)	1.038	.809
Parent - university	**-.500 (.110)**	**.606**	**<.001**	-.012 (.119)	.988	.919
No/few books	0			0		
One bookshelf	**-.701 (.140)**	**.496**	**<.001**	.029 (.152)	1.029	.851
One bookcase	**-1.043 (.147)**	**.352**	**<.001**	-.254 (.158)	.776	.108
More than one bookcase	**-1.493 (.154)**	**.225**	**<.001**	**-.402 (.161)**	**.669**	**.013**
Girl	0			0		
Boy	**-.314 (.103)**	**.730**	**.002**	**.308 (.150)**	**1.361**	**.039**
Non-FSM	0			0		
FSM	**.332 (.107)**	**1.394**	**.002**	-.012 (.148)	.988	.935
White	0			0		
Asian	**-.590 (.227)**	**.554**	**.009**	-.484 (.258)	.616	.061
Black	**.548 (.225)**	**1.729**	**.015**	.266 (.319)	1.305	.403
Mixed	.112 (.148)	1.118	.452	.083 (.198)	1.087	.675
Not EAL	0			0		
EAL	.015 (.171)	1.015	.930	.017 (.229)	1.017	.941
KS2 low	-			0		
KS2 mid	-			**-3.216 (.439)**	**.040**	**<.001**
KS2 high	-			**-5.975 (.731)**	**.003**	**<.001**

RSE = Robust standard error
RRR = Relative Risk Ratio

Maths (71 schools)	Not including KS2 maths score			Including KS2 maths score		
	Coef. (RSE)	RRR	*p*	Coef. (RSE)	RRR	*p*
Middle set (compared to top set)						
Intercept	**1.464 (.219)**	**4.323**	**<.001**	**2.621 (.419)**	**13.745**	**<.001**
Intervention	-.145 (.169)	.864	.389	-.234 (.231)	.792	.310
SES lower	0			0		
SES intermediate	-.184 (.093)	.832	.050	-.005 (.098)	.995	.958
SES higher	**-.259 (.094)**	**.771**	**.006**	-.031 (.110)	.970	.781
Parent left school at or <16	0			0		
Parent - further education	-.015 (.072)	.771	.838	.066 (.094)	1.069	.481
Parent - university	**-.284 (.085)**	**.752**	**.001**	-.006 (.103)	.994	.955
No/few books	0			0		
One bookshelf	**-.310 (.109)**	**.733**	**.004**	.146 (.116)	1.157	.208
One bookcase	**-.453 (.125)**	**.635**	**<.001**	.016 (.123)	1.016	.895
More than one bookcase	-.742 (.122)	.476	**<.001**	-.058 (.130)	.944	.657
Girl	0			0		
Boy	**-.244 (.073)**	**.783**	**.001**	**.191 (.095)**	**1.210**	**.044**
Non-FSM	0			0		
FSM	.080 (.072)	1.083	.267	-.115 (.095)	.891	.209
White	0			0		
Asian	**-.390 (.126)**	**.677**	**.002**	**-.374 (.162)**	**.688**	**.021**
Black	**.403 (.135)**	**1.450**	**.003**	.249 (.161)	1.282	.124
Mixed	.089 (.119)	1.093	.457	.053 (.139)	1.055	.701
Not EAL	0			0		
EAL	.182 (.121)	1.200	.130	.199 (.160)	1.220	.214
KS2 low	-			0		
KS2 mid	-			**-1.094 (.295)**	**.335**	**<.001**
KS2 high	-			**-3.529 (.350)**	**.029**	**<.001**

RSE = Robust standard error
RRR = Relative Risk Ratio

Some key references

Boaler, J., & Wiliam, D. (2001). Setting, streaming and mixed-ability teaching. In J. Dillon & M. Maguire (Eds.), *Becoming a teacher* (2nd ed., pp. 173-181). Maidenhead: Open University Press.

Boaler, J., Wiliam, D., & Brown, M. (2000). Students' experiences of ability grouping-disaffection, polarisation and the construction of failure. *British Educational Research Journal, 26*(5), 631-648.

Dracup, T. (2014) The politics of setting. Retrieved 6th March 2015. https://giftedphoenix.wordpress.com/2014/11/12/the-politics-of-setting/

Dunne, M., Humphreys, S., Sebba, J., Dyson, A., Gallannaugh, F., & Muijs, D. (2007). *Effective teaching and learning for pupils in low attaining groups*. London: DCSF.

Francis, B., Archer, L., Hodgen, J., Pepper, D., Taylor, B., & Travers, M-C. (2016). Exploring the relative lack of impact of research on 'ability grouping' in England: a discourse analytic account. *Cambridge Journal of Education*, 1-17.

Higgins, S., et al. (2015). *The Sutton Trust - Education Endowment Foundation Teaching and Learning Toolkit.* London, Education Endowment Foundation.

Ireson, J., & Hallam, S. (2001). *Ability grouping in education*: London: Paul Chapman.

Kutnick, P., Sebba, J., Blatchford, P., Galton, M., Thorp, J., MacIntyre, H., & Berdondini, L. (2005). The effects of pupil grouping: Literature review. London: DFES.

Muijs, D. and M. Dunne (2010). "Setting by ability–or is it? A quantitative study of determinants of set placement in English secondary schools." *Educational Research* 52(4): 391-407.

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