

The association between teachers' leadership style and student performance

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Introduction and background

The positive impacts of inclusive leadership in different educational and workplace settings have attracted increasing attention in recent years (Moss, 2019). Moss et al. (2016) undertook the first large empirical study examining the effects of managers' leadership styles on employee productivity, wellbeing and motivation across eleven large organisations ($n=966$), and reported a strong, statistically-significant positive correlation (Pearson $r=0.87$). This study was repeated by Moss (2019) in two Higher Education Institutes (HEIs), one in the UK and one in Norway ($n=183$), examining the association between the leadership style of employees encountered by students at different levels within the HEI and self-evaluated student performance, reporting a very similar finding ($r=0.82$). However, the impact of inclusive leadership on students within a secondary education environment has not previously been investigated in the UK or internationally. Thus, this research aimed to (a) examine whether the strong correlations between leadership style and performance observed in industry and HEIs also exist within Sevenoaks School, and (b) provide meaningful insights into how evidence-based teaching practice within the School may be enhanced. The previous edition of *Innovate* outlined the proposed study and plans for analysis; in this article, the results are presented and discussed.

Materials and methods

The same validated survey instrument used in the Moss et al. (2016) and Moss (2019) studies was used, which took the form of an online anonymous multiple-choice questionnaire that students completed either at the start of lessons or as homework. The survey collected demographic data on students' gender, nationality, year group and ethnicity, as well as asking 34 questions regarding students' assessments of their mathematics teachers' inclusive leadership styles (with teachers' inclusive leadership score being defined as the sum of the scores across all 34 questions) and 12 self-reflection questions about their own productivity, wellbeing and motivation in mathematics as a result (with student performance defined as the sum of the scores across all 12 questions). The responses to the 46 non-demographic questions were on a Likert scale and student participation was on a parental opt-out basis. Ethical approval for the study was obtained from

Buckinghamshire New University Ethics Committee on 11th January 2019. Data collection commenced on 26th March 2019 and completed on 3rd August 2019.

Results

Two parents opted-out of the study, which resulted in a population of 1090 students. In total, 721 students completed the questionnaire (response rate = 66.1%) with a mean time for questionnaire completion of 10.7 minutes. Thirty-two students did not complete one or more questions in the questionnaire and these surveys were subsequently removed, resulting in 689 students being included in the final analysis. The response rate by year group and demographic characteristics of respondents are shown in Figures 1 and 2, respectively, while the best scoring and worst scoring questions across all respondents are listed in Box 1.

Figure 3 shows a scatter plot of student performance, the dependent variable, against teachers' inclusive leadership score, the independent variable; both variables were treated as continuous and a clear linear relationship is evident from the scatterplot. Outlier analysis identified 12 student surveys and all statistical analysis was subsequently undertaken including ($n=689$) and excluding ($n=677$) these responses to assess the sensitivity of statistical inference to the presence of outliers. Student performance scores were not normally-distributed, although teachers' inclusive leadership scores were normally-distributed upon removal of outliers, and hence both Pearson r and Spearman p correlation coefficients were calculated for comparison. These were found to be $r=0.84$ and $p=0.82$ when outliers were included in the analyses, and $r=0.81$ and $p=0.81$ when outliers were excluded, indicating a strong positive correlation; teachers that adopted more inclusive teaching styles saw improved student performance, and these results were found to be statistically significant at the 1% level. It was also found that there was very little difference between r and p values throughout the correlation analyses, and the impact of outliers was furthermore found to be very minimal; hence, only values of r with outliers removed will be reported hereafter in the interests of brevity.

Given that student performance was found to be very strongly positively correlated with inclusive teaching styles, this association was further analysed by the three components of student performance; productivity ($r=0.72$), wellbeing ($r=0.75$) and motivation ($r=0.76$) were also all individually strongly positively correlated with teachers' behaviours. Table 1 shows a further stratified analysis of these correlations according to the four demographic variables, with all r -values found to be statistically significant at the 1% level.

		<i>Performance</i>	<i>Productivity</i>	<i>Wellbeing</i>	<i>Motivation</i>
Gender	Male	0.81	0.71	0.73	0.74
	Female	0.82	0.73	0.77	0.77
Nationality	Non-British	0.81	0.72	0.71	0.78
	British	0.82	0.73	0.76	0.75
Year Group	Lower School	0.87	0.80	0.84	0.81
	Middle School	0.80	0.73	0.74	0.74
	Upper School	0.77	0.66	0.69	0.72
Ethnicity	White	0.82	0.72	0.75	0.76
	Black/Black British	0.89	0.74	0.82	0.91
	Asian/Asian British	0.76	0.73	0.68	0.71
	Mixed	0.83	0.75	0.78	0.79

Table 1: Pearson correlation coefficients quantifying the association between student performance, productivity, wellbeing and motivation and teachers' inclusive leadership score, stratified by gender, nationality, year group and ethnicity. Values are based on the dataset with outliers removed ($n=677$) and all values are statistically significant ($p<0.01$).

Overall student performance and its three components were also analysed to assess any differences between students' self-ratings by demographic variable. Given that all four variables are not normally-distributed, non-parametric hypothesis tests were run to investigate the differences in mean ranks between the groups. Applying the Mann-Whitney U test showed that male students self-reported higher levels of productivity, wellbeing and motivation compared to female students; at a component level, this difference was only statistically significant for wellbeing ($p=0.003$), but when all three components were taken together, male students self-reported significantly higher scores ($p=0.023$). No significant differences were found between British and non-British students.

Applying the Kruskal-Wallis test revealed that although student sensitivity to teachers' inclusive leadership behaviours reduces as they progress through the school, this reduction was not significantly different in terms of overall student performance or its three components between lower, middle and upper school students, nor students of different ethnicities. Furthermore, a linear regression analysis showed that female students were consistently more sensitive to teachers' leadership behaviours throughout the School and this was found to be the case for productivity, wellbeing and motivation. Overall, around 65% of the variation in student performance was explained by differences in the behaviours and attitudes of students' mathematics teachers.

Conclusions

The 15 components of inclusive leadership (individualised consideration, idealised influence, inspirational motivation, intellectual stimulation, unqualified acceptance, empathy, listening, persuasion, confidence building, growth, foresight, conceptualisation, awareness, stewardship and healing) have been shown in industry and HEIs to strongly influence employee and student performance, respectively. In this study, a similarly strong, statistically-significant positive association ($r=0.81$) was found between mathematics teachers displaying these inclusive behaviours and student performance in mathematics, and these correlations did not differ between male and female students, nor between students of different nationalities. However, the strength of these correlations was found to significantly decrease as students progressed through the school, indicating increased self-motivation and independence as students mature (e.g. $r=0.87$ for lower school students versus $r=0.77$ for upper school students; $p=0.008$). Analysis of student responses to the 34 questions evaluating teachers' inclusive leadership behaviours reveals that the Mathematics Department is strong at allowing students to display authentic behaviours, serving the broad needs of students and operating on the basis of fairness, while areas of potential development include further encouraging students to express their concerns, creating an environment for minority voices to be heard and implementing further strategies to improve student



confidence. Overall, this research provides valuable insights into the impact of inclusive teaching styles on student performance that can and should be translated into practical classroom-based teaching strategies, and illustrates the role and importance of evidence-based teaching.

References

Moss, G. (2019) *Inclusive Leadership*. London and New York: Routledge.

Moss, G., Sims, C., Dodds, I. and David, A. (2016). *Inclusive leadership...driving performance through diversity*. London: Employers Network on Equality and Inclusion.

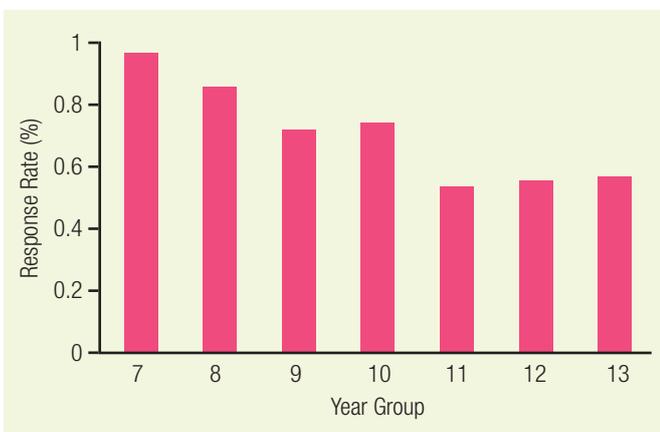


Figure 1: Survey response rate by year group.

Box 1.

Best and worst scoring questions from students' assessments of mathematics teachers' inclusive leadership styles across n=689 students included in the final analysis. The scores in brackets represent a measure of the extent to which teachers displayed these inclusive behaviours, where the maximum score per question is 3445.

Best scoring questions:

1. The leadership shown by maths teachers allows us to be our real selves. (3014)
2. The leadership shown by maths teachers serves the needs of the pupil body as a whole. (2849)
3. The leadership shown by maths teachers operates on the basis of fairness, rather than favouritism or bias. (2820)

Worst scoring questions:

1. The leadership shown by maths teachers would not encourage pupils to come forward and express their concerns. (1979)
2. The leadership shown by maths teachers gives minority voices the confidence to contribute to important decisions. (2074)
3. The leadership shown by maths teachers gives me the confidence to know that I can succeed in my studies. (2192)



Figure 2: Demographic characteristics of the $n=689$ respondents included in the final analysis according to gender, nationality, year group, and ethnicity.



Figure 3: Scatterplot of student performance versus teachers' inclusive leadership score for the $n=677$ students included in the statistical analysis (with outliers removed).