0229

Mon 06 Dec 2021

12:35 - 12:55

The Difference Index: A Novel Quantitative Measure of Module Mark Differences Between Student Groups

Kathryna Kwok[1], Siân Alsop[2]

[1]Oxford Brookes University, Oxford, United Kingdom [2]Coventry University, Coventry, United Kingdom

Research Domain: Management, leadership, governance and quality (MLGQ)

Abstract: The Black and minority ethnic (BAME) awarding gap—the lower rate of first or upper second degrees awarded to BAME students relative to White students—is a persistent issue in UK higher education. Although the importance of clear, granular institutional data in understanding and addressing the awarding gap has been noted (UUK & NUS, 2019), little is known about how academic practices at specific levels (e.g. course or module) impact this gap. This paper introduces the Difference Index (DI), a novel quantitative measure of module mark differences between two groups that uses data already routinely collected by universities. Regression modelling conducted in a post-92 university enabled exploration of the relationship between module characteristics and module mark gaps between student ethnic groups (Kwok & Alsop, 2021). We propose use of the DI to investigate awarding gap patterns at module level to facilitate the design of targeted interventions within and across institutions.

Paper: Introduction

The lower rate of 'good' (i.e. first or upper second) degrees awarded to Black and minority ethnic (BAME) students is a longstanding issue in UK higher education (HE). Recent data from the Higher Education Statistics Agency (HESA) showed that in the 2019/20 academic year, 81.6% of White UK-domiciled first degree qualifiers received a 'good' degree, compared to 63.7% of Black qualifiers and 72.4% of Asian students (HESA, 2021). These figures are not dissimilar to those in past years, suggesting that interventions to address the awarding gap are not working.

While earlier research into the awarding gap tended to focus on student-related factors such as financial barriers and attitudes to HE (e.g. Ball et al., 2002; Bamber & Tett, 2000; Thomas, 2002), more recent work has focused on the impact of institutional practices and the university environment (e.g. Bunce et al., 2019; Madriaga & McCaig, 2019; Richardson et al., 2015). There is now some recognition that universities are responsible for addressing the awarding gap. However, institutional responsibility tends to be viewed holistically, and still little is known about how academic practices at specific levels (e.g. course or module) are linked with the awarding gap. In line

with the UUK and NUS's (2019: 56–7) call for universities to make use of granular data to understand and address the awarding gap, the method of analysis introduced here offers a straightforward yet nuanced way to investigate awarding gap differences.

Method

The Difference Index

The overall method involves the calculation of a Difference Index (DI) which reflects the module mark difference between two student groups (e.g. two self-identified ethnic groups) scaled to group size and score variation. As the DI compares two groups' scores, one DI must be calculated for each module in each comparison (e.g. White v Black, White v Asian, etc.). A regression analysis can then be used to investigate the relationship between DI and module characteristics (or any other suitable set of predictor variables) for two particular student groups. The calculation of the DI is straightforward and requires three figures for each group in the comparison: the number of individuals (n), the group's mean module mark ($\bar{x}$) and the standard deviation (s) (see Equation 1). Where appropriate, it is recommended that the same baseline group (Group A in the formula below; e.g. White students) is used for all comparisons to aid interpretation.

$$DI = \frac{\bar{x}_A - \bar{x}_B}{\sqrt{\dfrac{s_{pooled}^2}{n_A} + \dfrac{s_{pooled}^2}{n_B}}}$$

$$s_{pooled}^2 = \frac{(n_A - 1)\, s_A^2 + (n_B - 1)\, s_B^2}{n_A + n_B - 2}$$

Equation 1. Formula for calculating DI

As the formula shows, DI is the difference in group means after taking into account group size and module mark variation (note that the DI is calculated the same way as the t-statistic). The DI offers a more nuanced representation of module mark gaps compared to a simple difference of means. A larger absolute value indicates a larger difference in module mark between the two groups. Positive values indicate the baseline group outperformed the comparison group on average, while negative values mean that the comparison group outperformed the baseline group on average. It should be noted that the DI is not directly interpretable in terms of actual module mark differences. However, as an illustration, for two groups each with 10 students and an equal spread of scores (SD = 10.00) a difference of 5 marks would give DI = 1.12 and a difference of 10 marks would give DI = 2.24.

Using the DI to explore module level awarding gaps

The DI can be used as an outcome variable to investigate granular relationships between institutional practices (e.g. curricula features) and the awarding gap. We used regression modelling to investigate the relationship between module characteristics (e.g. level, credit value, learning outcomes) and DI for a sample of 59 modules (2015/16 academic year) across two broad faculties in a post-92 university. We examined four comparisons in total (White v Black, White v Asian, White v Mixed and White v Other) and were able to identify particular areas for targeted intervention (see Kwok & Alsop, 2021).

Conclusion

There is a need to make full use of the data streams available to institutions to understand the awarding gap on a granular level. The DI offers a way to investigate module mark differences between student groups in a nuanced way, using data that are already being routinely collected by universities. We conclude that using the DI to investigate awarding gap patterns at module level is a helpful tool for facilitating the design of targeted interventions both within HE institutions and across the sector.

$$DI = \frac{\bar{x}_A - \bar{x}_B}{\sqrt{\dfrac{s^2_{pooled}}{n_A} + \dfrac{s^2_{pooled}}{n_B}}}$$

References:

$$s^2_{pooled} = \frac{(n_A - 1)\, s^2_A + (n_B - 1)\, s^2_B}{n_A + n_B - 2}$$

Equation 1. Formula for calculating DI.

References

Ball, S., Reay, D., & David, M. (2002). 'Ethnic choosing': Minority ethnic students, social class and higher education choice. Race Ethnicity and Education, 5(4), 333–357. doi:10.1080/1361332022000030879

Bamber, J., & Tett, L. (2000). Transforming the learning experiences of non-traditional students: A perspective from higher education. Studies in Continuing Education, 22(1), 57–75. doi:10.1080/713695715

Bunce, L., King, N., Saran, S., & Talib, N. (2019). Experiences of black and minority ethnic (BME) students in higher education: Applying self-determination theory to understand the BME attainment gap. Studies in Higher Education. doi:10.1080/03075079.2019.1643305

HESA. (2021). What are HE students' progression rates and qualifications? Retrieved July 9, 2021, from https://www.hesa.ac.uk/data-and-analysis/students/outcomes

Kwok, K., & Alsop, S. (2021). Access to attainment: What are the responsibilities of universities towards their diverse student communities? An exploration of the relationship between module characteristics and module mark differences between student ethnic groups. Society for Research into Higher Education. Retrieved from https://srhe.ac.uk/wp-content/uploads/2021/07/Kwok-Alsop-SRHE-finalreport.pdf

Madriaga, M., & McCaig, C. (2019). How international students of colour become Black: A story of whiteness in English higher education. Teaching in Higher Education. doi:10.1080/13562517.2019.1696300

Richardson, J. T., Rivers, B. A., & Whitelock, D. (2015). The role of feedback in the under-attainment of ethnic minority students: Evidence from distance education. Assessment & Evaluation in Higher Education, 40(4), 557–573. doi:10.1080/02602938.2014.938317

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. Journal of Education Policy, 17(4), 423–442. doi:10.1080/02680930210140257

UUK & NUS. (2019). Black, Asian and minority ethnic student attainment at UK universities: #closingthegap. London: Universities UK.