Big Data Analytics of Socio-Economic Impact on UK University Graduates

Jack Morgan  
BSc Computer Science  
University of WolverhamptonWulfruna Street, Wolverhampton, WV1 1LY  
J.M.Morgan@wlv.ac.uk Kieron Ransley  
BSc Computing and Information Technology  
University of WolverhamptonWulfruna Steet, Wolverhampton, WV1 1LY  
K.D.Ransley@wlv.ac.uk

*Abstract*—The following report details how the socio-economic status of major UK towns and cities affects its universities and the students who are graduating from them. University is the biggest challenge that students will face in their academic careers, and for some, it is also a major financial decision. Students coming from more difficult backgrounds, or a lower financial standing may struggle with the challenges they face in this academic environment.

Utilizing datasets from various sources, which were subsequently read, explored, and visualized using a machine learning model, and then further cleaned and analyzed using a predictive model, demonstrates that students who study in an area with lower socio-economic standing tend to perform at a lower level. This argues that not enough support is given to students or the University institutions themselves by local councils due to insufficient funding requirements or substandard facilities surrounding campuses. Further concerns need to be raised with local councils or the wider government to ensure more awareness and support is raised.

Keywords— socio-economic status, graduating, financial standing, academic environment, machine learning model, predictive model, awareness and support.

# Introduction

## Opening

A big step in any academic career is attending a university. As of 2023, there are currently 166 registered Universities in the United Kingdom, with eleven of which occupying a space on the Times Higher Education[1] top one hundred University rankings. University is frequently a significant personal and financial decision for many students. Given that only a select few institutions exist across the country, students often find themselves having to relocate to attend. This relocation, coupled with course fees, can result in a substantial cost. Some students can often find this a struggle and end up with concerns about finances throughout their degree. While there are options such as the Student Loans Company and other government assistance, concerns can still arise due to the substantial costs associated not only with attending university but also with living and thriving in the nearby campus area. While these costs are increased for the nearly 700,000 international students[2] (data accurate as of 2022), It continues to pose challenges for domestic students, which will be the focus of this report.

## Problem Statement

Approximately one million students in the UK earn some form of an undergraduate degree annually. With a further 400,000 more obtaining a postgraduate degree. However, almost 1 in 10 students who attend University drop out, with one-third of those being first-generation students leaving in the very first year[3]. One might attribute a significant contribution to these statistics to the financial struggles faced by university students. In January 2023, a report stated that 41% of students were considering dropping out of university due to surmounting financial worries[4]. University life is stressful as is, with assignments, deadlines, and working towards a career. Adding financial stress on top of that can set students on the edge and prove to be disruptive to their academia. However, how much do these financial issues disrupt students, and are the issues self-inflicted, or is it a product of the environment and institution?

## Aims and Objectives

This report aims to research, investigate, and comprehend data and statistics related to UK university graduates, as well as the socio-economic status of each university institution’s geographical location. One will attempt to understand if these standings indeed influence graduation rates and the performance of student’s post-graduation.

The report will assess this hypothesis by acquiring appropriate datasets from various sources and importing said data into a deep learning model. The model will then be manipulated to clean the data, and potentially predict any missing data from the datasets. Conclusions will be provided by visualizing the cleaned data in a suitable format.

## Contribution Statement

### Jack Morgan

### Kieron Ransley

## Report Outline

# Literatre review

## Student Performance in Response to Stress and Other Factors

## Financial Impact and Funding Within University Insititutions

Universities are more than just the buildings the institutions occupy, a University is a sum of its students, but also its faculty and staff, as well as its resources, its equipment and its offerings. Furthermore, a University can be affected by the quality, and sometimes quantity, of what it provides. These can often affect student performance, and potentially graduation rates and post-education performance. But what exactly affects what a University institution provides?

Firstly, one needs to assess exactly how a University receives its resources, and how exactly these resources can affect the institution. Universities tend to get financial funding from three diverse sources, either one, a mixture, or all. These sources could be the private sector through grants or donations, national or regional governments through direct funding or further grants. or directly from its students from course fees (which could potentially be subsidized from government branches, i.e., Student Finance)[5]. The source of financing does indeed have an affect on the University, not directly in the quality of its equipment or the type of staff they can employ, but in its acceptance rates. Articles states that when a University gets its majority of funding from the private sector, it tends to affect interest from students planning to attend that University[6]. One part for this reason is simply, interest from Government financial sources tend to reduce, and this has shown to have a following effect on tuition fees and maintenance loans for students. Students must pay more, receive less, so less students are interested. Universities then lose that source of income. While the same source does tell one that Universities have an increase in funds and do not necessarily suffer, there is a force affecting students, and potentially student performance. Local governments were one’s original theory as to a reason affecting students, but the theory stated socio-economic standing, rather than competition between sectors offering funding. Further research will be made into however socio-economic standings of areas in the UK and monetary impact toward Universities.

As previously explored, University institutions can receive financial support through various sources. The source of income will not always have an effect on performance per se but can have an effect on the behavior and goals of the University. Studies show that various financial sources can affect the behavior and structure of a University, especially when the funding is competitive[7]. Different sources want different results, and often want their own rules, regulations, methods and practices implemented as a result. Essentially, the highest bidder (for lack of a better phrase) can control a University. The public often sees this happen in real-time, there are documented examples of University institutions especially in England and across the UK cancelling course, shutting down departments, changing focus from one subject area to another. University performance is not inherently affected by this, often studies show that there is still a high production of research and articles presented by a University regardless of monetary source[8]. Often, however, students are not considered, especially considering closure of departments. The interests and agendas of investors rarely align with those of students.

So, one has assessed that Universities do not suffer from any performance issues no matter the source of funding. It is obvious a lack of funds will negatively impact a University, it will be inevitable. The original hypothesis was that lack of funding from local governments would be a potential problem for performance within institutions, so organizations situated in a lower standing socio-economic area will have worse performances. However, from research it has shown that private funds are the majority of funding sources, so this may not be the resulting issue.

## Graduation and Degrees Affecting Employability

## University Acceptance and Performance in Relation to Socio-Economic Standing

## Post Study Impact in Response to Socio-Economic Standing

## Summary

# Methodology

# Results

# Further Discussion

# Conclusions

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