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# Using Learning Analytics to Implement Evidence-Based Interventions to Support Ethnic Minority and International Student Social Integrations

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**Abstract.** As universities in the UK become increasingly diverse, one common challenge is how best to socially integrate ethnic minority and international students into the classroom and larger campus. Indeed, research currently demonstrates that students most often form social and learning connections with peers from the same ethnicity or culture, despite the benefits of intergroup connections. However, few studies have looked at student social networks to determine how they influence actual behaviours in group learning activities. In this research, Social Network Analysis and Learning Analytics methods will be used to explore the role of social networks in classroom participation and attainment for ethnic minority and international students, highlighting replicable interventions that can help promote social cohesion in the UK.

**Keywords:** Learning Analytics, Social Network Analysis, international students, ethnic minority students, student diversity, social integration, academic integration

## 1 Introduction

Universities in the United Kingdom are highly multicultural, with over 425,000 international students and 307,000 ethnic minority students registered in 2013 [1]. As higher education classrooms diversify, the need to understand the broader social learning behaviours of students from diverse backgrounds is becoming more important in order to promote equality and inclusivity on campus.

This has meant in practice that many universities have encountered challenges to socially integrating ethnic minority and international students. Studies have shown that ethnic minority students frequently cite being stereotyped, victims of overt racism, or feeling isolated due to their ethnicity [2, 3]. Peacock and Harrison [4] also note a ‘passive xenophobia’ between international students and host students at UK universities. Much further research has documented difficulties faced by international students in forming cross-cultural connections on campus [see, for example: 5, 6].

This lack of social cohesion negatively affects classroom collaboration, particularly in group learning activities. For instance, multiple studies have highlighted that students prefer to work with group members from their own cultural background [7, 8], and that students often generalise group members’ attitudes and behaviours based on cultural stereotypes [9]. However, current research tends to focus on student reflections and perceptions, whereby few studies have looked objectively at actual student behaviour. Therefore, this research project aims to analyse connections between culture, social networks, and classroom behaviours to determine interventions that can help drive cohesion and social integration at UK universities.

## 2 Background

Current research demonstrates that social connections are positive influences on the learning experience, particularly when working with diverse classmates. This notion is best summarised by Tinto [10, 11], who argues that participation in the overall university culture is necessary for success. Severiens and Wolff [12] also found that students who feel they are a part of the university community are more likely to finish their degree. Similarly, Wilcox, Winn and Fyvie-Gauld [13] found students' social networks to be an important influence on first-year attainment and progression. In a classroom context, Levin [14] also argues that cross-cultural collaboration through group work allows participants to encounter and evaluate new ideas and values.

Despite these benefits, evidence suggests that social connections on campus are often between students of similar cultural or ethnic backgrounds. This is well-documented in the case of international students [see, for example: 5, 6, 8]. Relatively little research has explored social networks of ethnic minority students in the UK, prompting the need for further research. Studies in other contexts, however, have highlighted similar divides between minority and majority students. For example, Quillian and Campbell [15] found in the US that students tend to make friends with those from the same ethnic background, particularly when there is a large gap between minority and majority student numbers. However, few studies have analysed actual student behaviours to determine what potential root causes might influence these social divides or how they affect student contributions in the classroom.

There are also relatively few studies that provide evidence-based interventions that demonstrate measurable improvements in social interactions between diverse groups of students. Peacock and Harrison [4], for instance, highlight the importance of group work in 'forcing' diverse students to work with one another. Rienties, Alcott, and Jindal-Snape [16] similarly indicate that assigning students to small groups can lead to increased diverse friendships between international and host students. However, research tends to focus on the international student experience, without considering broader trends of diversity (such as ethnic minority students). More research is needed, thus, to pinpoint actual, replicable solutions that can be implemented by instructors to encourage social cohesion amongst all diverse students in the classroom, thereby encouraging more equal participation in group learning activities.

## 3 Theoretical View on Diversity

Although there is a wide variety of research currently available on social integration of diverse students, research on this topic tends to focus on either ethnic minority or international students. However, this research project focuses on the broader context of diversity, incorporating both groups of students in order to provide a realistic representation of typical higher education classrooms. The idea of diversity adopted by this research project is perhaps best summarised by Kivisto [17]:

'Multiculturalism can be construed as a project – a moral project – with the goal being to learn to live with diversity in ways that promote equality, justice, and expanded levels of social solidarity'

Thus, this project is driven by the process that students and instructors undertake in order to work effectively with one another and support overall learning goals. This research, therefore, brings into the classroom sphere the view of multiculturalism described by Hartmann [18] as ‘the project or movement of dealing with and incorporating the multifaceted social differences that we see in modern nations.’ For this reason, this research project does not single out individual ethnic or cultural groups, but is instead focused on the classroom as a collective whole to determine what interventions influence successful interactions in realistically diverse settings.

Despite this broad approach to diversity, it is also important to keep in mind that students are individuals and cannot be generalised about based on their ethnicity or culture. Indeed, it is a consideration in this research project that group ethnic or cultural identity is flexible – ‘a plastic and changing badge of membership [19]’ -- rather than a rigid code of guidelines for individual behaviour. Although there is a macro-level focus within this research project, the role of micro-level influences will not be ignored when reporting findings.

#### **4 Research Questions**

Keeping in mind the gaps in current knowledge and the theoretical viewpoints driving this research, this project seeks to answer the following research questions:

- Employing Learning Analytics and Social Network Analysis, how do the social and academic behaviours of ethnic minority and international students differ from the behaviours of their peers?
- What types of evidence-based interventions influence social cohesion and more equal participation for ethnic minority and international students in higher education classrooms?

#### **5 Methodology**

In order to understand better the social connections between diverse students, Social Network Analysis (SNA) will be used in this research. SNA provides a set of tools to analyse connections between students, allowing one to discover social and learning relationship patterns [20]. SNA can be used to describe broader trends of interactions between individuals, rather than highlighting individual behaviours [21], which fits well with the broad overarching framework of this research. SNA will be conducted in this research by providing a survey which asks participants to mark classmates they are friends with, work often with, or have learned from. By repeating the SNA surveys with the same group of participants over two time points, both previously existing relationships and newly developed relationships can be analysed, thereby providing good evidence of successful interventions.

However, multiple studies have demonstrated that SNA is more robust when combined with other instruments [22, 23]. Thus, Learning Analytics approaches will also be adopted. In this research project, student-generated behavioural traces, such as log data in online modules or contributions to lab-based activities, and student

performance-related data, such as assignment markings or attendance records, will be analysed in coordination with social networks. In doing so, this research project can capture a more complete picture of how social and learning relationships influence students' academic behaviours, and how this might vary between diverse groups of students. One common critique of Learning Analytics is that it will 'fail to make sustained and meaningful contributions to learning and teaching' [24]. To avoid this, it is important for this research project to move beyond theoretical and predictive measures and aim, instead, to highlight evidence-based and replicable interventions that can drive social cohesion and equal participation in diverse classrooms. These interventions can be considered successful if they lead to measurable outcome improvements, such as more diverse social networks or more equal contributions to group work between diverse groups of students, as measured by SNA and learning analytics.

Although Learning Analytics studies tend to be heavily quantitative, a mixed-methods approach will be adopted in this research project by also conducting interviews with a select group of study participants. After all, Greene, Caracelli, and Graham [25] argue that quantitative research that is informed by qualitative data provides a 'triangulation' of data, which gives a more well-rounded analysis of the problem. These interviews will also help balance the broad-scale, macro view adopted elsewhere within this study by highlighting individual voices and experiences.

## **6 Preliminary Results**

A pilot study was conducted with 58 Master's level business students in a UK module, including international students from 13 countries. In a computer lab environment, students were placed randomly in small groups to work with a Harvard Business School case study using an online chat to communicate with all members of their group. In order to measure participants' cultural traits, demographic information about participants' countries of origin was retained and converted using Hofstede's Cultural Dimensions scales [26], which quantifies cultural traits on a set of six scales. Other data collected include a Social Network Analysis survey, online behavioural traces (such as number of chat submissions and summed word count submitted), and students' end-of-module grades. A Ten-Item Personality Inventory survey [27] was also conducted to control for individual traits.

Bivariate analysis indicated that several of Hofstede's Cultural Dimensions correlated with student behavioural traces in the lab. We also conducted stepwise linear regression and found that Hofstede's Cultural Dimensions could predict students' number of contributions, summed word count submitted, and number of case study information references. In terms of the SNA survey, we found that students were more likely to have friendship and learning relationships with students from a similar cultural background, but that number of connections did not correlate with lab participation or number of contributions. Altogether, this research highlighted cultural background as the most important influence on student contributions to group work, even more than personality, social networks, or end-of-module achievement, providing insights into

potential interventions. However, further research is needed to confirm these findings and to determine how they might apply to ethnic minority students.

## **6 Future Plans**

Two future studies have been planned in order to drive this project forward. Both studies will be conducted with university access modules: one in a traditional face-to-face format and one in an online format. Both modules are highly diverse with a large number of ethnic minority students. In the face-to-face module, SNA surveys and interviews are planned for the current cohort, which will be analysed to determine potential interventions for the 2015-2016 academic year cohort. In the online module, student contributions and behavioural traces in the online environment will be analysed. By simultaneously analysing a face-to-face and an online access course, comparisons can be made to determine if the more informal, social elements of face-to-face learning influence student contributions and participation in different ways.

These two studies, in coordination with the previous pilot study, will provide a good foundation in understanding the types of social networks that exist between groups of diverse students and how these networks, in combination with their ethnic or cultural identities, influence classroom contributions. These initial studies are relatively exploratory in nature, due to the limited previous research in this area. Following the analysis phase, an additional classroom with high numbers of both ethnic minority and international students will be sought. Based on previous findings, a random control experiment with three groups will be devised, with one control group and two additional groups receiving potential interventions with an aim of increasing cross-cultural social networks and more equal classroom participation.

## **6 Contributions to the Field**

This project seeks to close gaps in current research about the role of social networks on classroom participation and attainment for diverse students. It adopts a broader view of diversity than most research in this area, incorporating both ethnic minority and international students, in order to provide replicable interventions and guidelines that can be adopted by practitioners in realistic settings of modern diverse higher education classrooms. The study will also help foster a general understanding of how Social Network Analysis and Learning Analytics can be used to target specific student demographics with personalised, evidence-based interventions that lead to measurable results. The significance of such successful interventions can be seen on both the micro and macro levels, with increases in areas such as social cohesion, student engagement, intercultural awareness, and opportunities for more equal societies.

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