Assessing the Value of Individualised Academic Support System for International Students using Automated Solutions

Authors:

Dr Stephanie Sandland

Dr Alina Vaduva

Arezou Ghanavat Pour

Anjana Nanayakkara

Professor Kirk

Summary

British universities are seeing growing numbers of international students at postgraduate level and are beginning to adopt automated solutions to deliver sustainable academic support. This study evaluates the efficacy and accessibility of such systems, aiming to develop the understanding needed to create a truly inclusive support system. There are clearly challenges unique to studying in a second language, but little evidence that support systems for international students in universities extend beyond practical issues. Prior studies indicate limited support for neurodiverse individuals beyond childhood and there is also a disconnect between technologists who build platforms and educators who understand the needs of various user types. Consequently, such systems tend to fall short of their aims. This research will facilitate the development of the knowledge base and a model necessary to inform technologists in the development of a truly inclusive system. It will also further the understanding of the demands of inclusive material at postgraduate level.

KEYWORDS: Academic Support System; Automated Solutions; International Student.

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Introduction

Typically, in universities, student academic support is provided through various media such as: one to one support with Academics, Student Mentors and/or Coaches as well as typical in-class support, in language and academic writing classes. Universities are beginning to extend their support using automated solutions.

For example, the chatbot can answer questions related to coursework and guide to identifying resources for study and assist in scheduling sessions with mentors and academic advisors. In addition, it seeks to determine if the form of the chatbot influences the willingness to engage with it.UK universities attract a diverse student population, fostering a rich and multicultural learning environment.

However, their diverse cultural, language and educational backgrounds create challenges when engaging educational system in a different region (Meshram, 2022) especially where English is a second language (ESL) and the approach to learning and assessment differs from prior experience (Xiao, 2021). It is incumbent on universities to ensure that all provision is inclusive. Neurodiversity, the fact that "the brain functions and learns and processes differently" (Henley & Jordan, 2023) creates further complexity. The challenges typically experienced by students encompasses both hard and soft skills, but there is a paucity of research identifying best practice (Scott, 2021). The latest QAA guidance provides a framework for the delivery of inclusive courses, (QAA, 2023) but their materials concentrate more on what should be achieved at a meta-level than at an object level, thus it lacks an explanation of the characteristics required to deliver it.

To address the above gap, our research is expected to reveal a significant breadth of opinion. It has three goals.

Firstly, substantiation of the critical factors, such as culture, prior experience, student ability, including neurodiversity that predicts the need for academic support. Secondly, identification of the critical factors that contribute to student openness to engaging with Automated Support and facilitators to assist such engagement. Finally, development of this understanding of critical factors to establish key criteria about the student body that should be identified to recommend how to develop and provide appropriate and inclusive support.

Literature Review

Academic support refers to resources, services and the system provided to students in order to help them succeed in their educational endeavours. Some examples of student academic support include academic advising (Dumont, 2021) which can take the form of one to one or group support with academics to provide extra help with understanding complex concepts and theories or preparing for assessments. (Dumont, 2021; King, 2023). Alternatively, students can be guided to resources (through libraries or Learning Management Systems) or to textbooks, online databases, research materials, and other resources that can support their learning (Scott & Wilson, 2021; Williams West, 2024). Support can be structured into seminars or workshops that are aimed at developing both hard and soft transferable skills that contribute to academic success. (Scott & Wilson, 2021; Penn-Edwards and Donnison, 2011). Universities also organise peer mentoring programmes (student coaches and mentors) which are programmes that pair students with more experienced peers who can provide advice, support, and

encouragement (Dumont, 2021; Williams West, 2024). Finally, disability and neurodiversity support services which helps students ensure they have equal access to educational opportunities (King, 2023).

The perspective of international students

According to a recent study (Buchanan, 2018), international students are more likely to experience social and integration challenges when exposed to Masters programmes in the Western countries. Additionally, another study sheds light into language barriers (Moorhouse & Wan, 2023). The same study discusses differences about academic systems in terms of assessments (examinations). Further, cultural issues and prior learnning patterns create additional barriers to learning (Xiao, 2021). Adapting to these differences can be difficult and affect academic performance. Furthermore, embedding multiculturalism is considered to be good practice to overcome the challenges that come with cultural transition (Wilson, 2010). Multiculturalism focuses on important issues related to social inclusion and decolonisation of the curriculum (Torres and Tarozzi, 2020) and makes a significant difference in improving the GEM performance gap, but ignores the other challenge, that of adapting to a different education system and consequently is not a complete answer (Universities UK and National Union of Students, 2019).

Gaps in the new technological developments for academic support

The current landscape of apps for academic support is lacking educational apps that integrate support for special educational needs. App provision is limited in scope, primarily focusing on addressing learning disabilities such as reading difficulties and self-management skills, particularly targeting younger children (Gortsema, 2019). Consequently, there is a significant gap in provision for neurodiverse students in universities (Lynn, *et al*, 2020; Evans *et al*, 2023).

Researchers are beginning to assess the utility of artificial intelligence in conjunction with more traditional technological solutions and consider it worth pursuing in order to attain "sustainable education". Termed "intelligent tutoring systems", artificial intelligence is used to curate and deliver personalised support including the use of AI enabled chatbots and algorithms to assess students' needs (Lin, Huang and Lu, 2023). These systems are expensive to set up and fraught with challenges (*ibid*).

While microlearning apps predominantly cater to vocational training designed by HR professionals, there is a dearth of comprehensive platforms dedicated to personalised individual education and self-learning, in part because of a lack of technical ability on behalf of the faculty (Scruggs, 2019).

Notably, app development is vulnerable to bias and lack of integrity because the developers might not be conversant with their use (Xivuri, and Twinomurinzi, 2023). This is critical in the field of education where academics do not necessarily have the technical ability to communicate the specification of the app clearly. Alternatively, they rely on content created by professionals, lacking AI-driven skills and the time to learn, undermining the resultant quality (Shing and Yuan, 2016). Personalised apps for users to self-generate learning content or for AI to generate micro-courses aligning with users' learning objectives are now emerging but their quality is not fully tested (*ibid*). Despite the potential of AI, its utilisation in generating comprehensive micro-courses or tailoring content to suit users' cognitive profiles remains

largely untapped. Moreover, while some apps incorporate neuroscience principles, they often focus on brain-training games rather than educational content integration, and whilst they might support learning, they fail to incorporate the specific needs of the neurodiverse student. (Lynn *et al,* 2020*)*.

Overall, the current level of personalisation in educational and assistive apps falls short of what is potentially possible, with AI primarily employed for adapting lessons based on quiz results rather than tailoring curricula, formats, and teaching methods to individual cognitive capacities and needs (Haleem, Javaid, Qadri, & Suman, 2022).

Towards building a blueprint for inclusive academic support

In tandem with assessing the facility that should be offered and the mode of its delivery, it is necessary to understand the scope of the issues that need to be accommodated. Ridout (2022) argues that student provision should not be differentiated because of any specific disability, and with it, stigmatising the user. There is also a need to consider the undiagnosed or misdiagnosed student. Such adults will not have been trained to use specific tools and consequently would be ill-equipped to engage with the correct technology (Kaplan & Shachter, 1991; Leow & Watson, 2013). This means that any support offered should be universally accessible. Little is written about what constitutes truly inclusive delivery of material. However, the presentation of material alone is not enough. Not everyone can engage with the written word effectively (Embley, 2019). The material itself must be presented in an accessible form. It is also necessary to consider the manner in which it is introduced to students, as this can influence the extent to which it is accepted (Barnett & Vishwanath, 2017; Sahin, 2006).

This review of literature has provided a foundation for determining the scope of academic support that international students need for successful transition to British universities and assessed the complexity of incorporating the needs of neurodiverse students in such a system. It also reviews the difficulties with current automated offerings, substantiating the need for detailed research to be conducted before investing in such support. Further research is needed to critique the range of technologies that can be used to personalize and deliver an effective automated support system and the precise nature of the difficulties facing neurodiverse students.

Research methodology

The research will involve three main activities. Firstly, we will identify and collate the full range of characteristics that a truly inclusive support system should have. This should start with literature and will be augmented by empirical work. Secondly, it will be necessary to identify the types of support that are needed and discover preferences with respect to the interface. Finally, we will review the facilities offered by technology and develop a model that would support the creation of an automated academic support system. We propose a mixed method, combining quantitative and qualitative elements. The research will focus on international students in a British university using mixed methods. We will conduct two studies, a survey aimed at 200 valid responses and an interview for 20 responses from international students that follow from the analysis of the survey.

Study 1: We will conduct a survey using tools such as MS Forms, structured to tailor questions based on the responses provided by students. The objective is to identify the critical

factors that predict the need for academic support among the international student population. We aim for 200 valid responses to ensure sample power, targeting students who are in their first term and consequently experiencing challenges that require academic support. The survey will seek to establish prior educational experience, language proficiency, and specific challenges faced in the first weeks at university.

Study 2: Following the analysis of Study 1 data, we will continue the research by interviewing approximately 20 students, selected from the survey respondents and subject to the principle of data saturation, to gain a deeper understanding of the specific challenges faced by international students. These semi-structured interviews will be designed to explore individual experiences in detail. The interviews will be recorded and transcribed for thematic analysis to identify recurring themes and insights. The expected outcome is a detailed understanding of individual challenges and needs that are not captured in the survey, enriching the overall research findings.

Content analysis of the qualitative data will identify broad themes and highlight the breadth and mix of experiences. Quantitative Data will be analysed using SPSS to identify key predictors. The expected outcome is to identify the student's perception of their need for academic support, its scope and, key predictors will inform the approach that should be taken in order to establish the optimum style of delivery for each user. This will include student openness to automated solutions.

The expected outcomes of this paper are multifaceted, advancing academic knowledge, practical application, and policy development in higher education. Academically, this study will significantly contribute to the understanding of how institutions can effectively provide support tailored to the diverse needs of international and neurodiverse students, filling existing research gaps and offering new insights into the integration of automated solutions in academic support. The research will produce a detailed blueprint for an automated academic support system, adaptable to diverse student needs, which can serve as a foundational document for its implementation in higher education institutions. In the long term, the adoption of these proposed solutions and systems can contribute to systemic changes in higher education policies, fostering a more inclusive and supportive environment for all students.

Dissemination of findings through conference participation and a peer-reviewed journal publication will ensure that the research reaches a wide academic audience, facilitating scholarly discussion and feedback, and empowering international students by incorporating their feedback and experiences into the design of support schemes. Practically, the insights gained will provide actionable recommendations for educators to develop and deliver more inclusive educational materials and support services, while informing higher education policymakers on critical factors influencing student success.

Further development

- March - May: Research initiation and data collection.
- June - July: Preliminary analysis and completion of review of literature.
- August – September: Full analysis of student preferences complete

References

Barnett, G.A., and Vishwanath, A. (2017). Diffusion Theories: logic and role of media. *The International Encyclopaedia of Media Effects.* 1-14.

Buchanan, F.R. (2019). International student perceptions of experience in the West. *Journal of International Education in Business, 12*(2), 147-166.

Dumont, K.C. (2021). *Understanding academic advising practice: Academic advisors' perceived impact of an academic analytics tool on the practice of academic Advising*. Michigan State University.

Embley, C.G. (2019). Coming forward to learn: Compensatory approaches and remedial instruction integration for adults with dyslexia. *Journal of Thought*, *53*(1/2), 55–72.

Evans, D., Granson, M., Langford, D. and Hirsch, S. (2023). Autism spectrum disorder: reconceptualising support for neurodiverse students in higher education. *Journal of Higher Education Policy and Management, 45*(2), 243-257.

Gortsema, J., (2019). *Using app-based organisational strategies to promote neurodiverse and typical students' success*. (Doctoral dissertation, The Florida State University).

Haleem, A., Javaid, M., Qadri, M. A., and Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*(1)*,* 275-285.

Henley, R., and Jordan, J. (2023). Local Government Association. Available at: https://www.local.gov.uk/lga-libdem-group/our-press-releases/neurodiversity (Accessed 25 February 2024).

Kaplan, C.P., and Shachter, E. (1991). Adults with undiagnosed learning disabilities: Practice considerations. *Families in Society, 72*(4), 195.

King, P.A. (2023). *Improving career preparation practices for neurodiverse students in higher education.* Northeastern University.

Lin, C. C., Huang, A. Y., and Lu, O. H. (2023). Artificial intelligence in intelligent tutoring systems toward sustainable education: a systematic review. *Smart Learning Environments*, 10(1), 41.

Loew, S.J., and Watson, K. (2013). The prevalence of symptoms of scotopic sensitivity/meares-irlen syndrome in subjects diagnosed with ADHD: Does misdiagnosis play a significant role. *Hrvatska Revija za Rehabilitacijska Istrazivanja, suppl.Supplement, 49*, 64-72.

Lynn, C., Mehmet, K., Alessia, C., Ferreyra, M.V., Fierros, G.A. and Rojo, P. (2020). Neurodiversity in higher education: a narrative synthesis. *Higher Education, 80*(4), 757-778.

Meshram, T.D. (2022). *Why is there a gap between policy, implementation, and intended outcomes? A comparative case study of implementation of the right to education act in two school districts in India.* Brandeis University, The Heller School for Social Policy and Management.

Moorhouse, B.L., and Yuwei, W. (2023). Students' experiences of english-medium instruction at the postgraduate level: Challenges and sustainable support for success. *Sustainability, 15*(4), 3243.

Penn-Edwards, S., and Donnison, S. (2011). Engaging with higher education academic support: a first-year student teacher transition model. *European Journal of Education*, *46*(4), 566–580.

QAA (2023). New framework for inclusive higher education. Available at: https://www.qaa.ac.uk/news-events/news/new-framework-for-inclusive-higher-education (Accessed 12 January 2024).

Ridout, S. (2022). Working toward a destigmatized and inclusive approach to university support provision. *The International Journal of Interdisciplinary Social and Community Studies, 17*(1), 165-183.

Sahin, S. (2006). A detailed review of rogers' diffusion of innovations theory and educational technology-related studies based on rogers' theory. *The Turkish Online Journal of Educational Technology, 5(2).*

Scott, F.J and Willison, D. (2021). Students' reflections on an employability skills provision. *Journal of Further and Higher Education*, *45*(8), 1118-1133.

Scruggs, A.M. (2019). *A case study investigating teachers' use of technology in higher education classrooms,* Northcentral University.

Shing, S., and Yuan, B. (2016). Apps developed by academics. *Journal of Education and Practice, 7*(33).

Torres, C. A. , and Tarozzi, M. (2020) Multiculturalism in the World System: Towards a Social Justice Model of Inter/Multicultural Education. *Globalisation, societies and education 18(*1) 7–18.

Universities UK (2019) Black, Asian and Minority Ethnic student attainment at UK Universities: #closingthegap [online] https://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2019/bame-student-attainment-uk-universities-closing-the-gap.pdf (Accessed 28.6.24)

West, C.W. (2024). *A narrative case study: The role of culturally responsive mentorship to navigate, empower, and level the playing field for black and brown students in higher Education.* (Doctoral dissertation, Molloy University).

Wilson, J. A. J. (2010). When in Britain, do as the British do: if anyone knows what that means: Multiculturalism in a "British" university business school. *Multicultural Education and Technology Journal*. *4*(4), 220-233.

Xivuri, K., and Twinomurinzi, H. (2023). How AI developers can assure algorithmic fairness. *Discover Artificial Intelligence, 3*(1), 27.

Xiao, M. (2021). Chinese international graduate students at Canadian universities: language barriers, cultural identities and perceived problems of engagement. *International Journal of Inclusive Education*, *28*(5), 491–508. https://doi.org/10.1080/13603116.2021.1941318