

Blended Learning in Practice

Autumn 2023

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Editorial

Welcome to the Autumn 2023 edition of our e-journal Blended Learning in Practice. In this edition we have eight research articles from participants on the Post Graduate Certificate in Learning and Teaching in Higher Education Programme at the University of Hertfordshire.

In this edition:

Claire Carter explores the challenges faced by Midwifery students studying anatomy and physiology, which are generally taught during the early months of an undergraduate degree and is typically difficult to master. Claire collaborated with students and lecturers from two different schools at the university, conducting focus groups in a small-scale research project, to gather data to create a novel pedagogical intervention.

Chandravali Tester carried out a literature review to investigate the plagiarism policies of UK Higher Education Institutions. She discusses this complex and multidimensional issue and also considers the further added complexity that Artificial Intelligence will bring.

Kathleen Tripp carried out a literature review explores critical issues in supporting neurodivergent Students on a BA Education Programme. She also carried out a small-scale anonymous study of current students on the programme. The aim being to develop supportive approaches and accommodations for the programme.

My-Hanh Doan investigates and evaluates theories in Decoding the Disciplines and threshold concepts in relation to assignment writing on the Bachelor of Education programme, with a small case study focussed on a group of Level 6 students. Findings include bottlenecks in procedural knowledge and Hanh suggests adaptations to curriculum and assessment design to mitigate this.

Melissa Cummings discusses the use of authentic teaching methods in tourism higher education. Her study used a Scholarship of Teaching and Learning (SoTL) philosophy to engage Level 6 university students who had experienced an authentic teaching method.

Poppy Hawkins looks at the barriers and solutions to developing academic literacy skills in nutrition and dietetics undergraduate students. Poppy carried out primary research to explore the student experience of perceived barriers and facilitators to academic literacy skills (reading, writing and critical thinking) development, to better support students in developing the necessary skills and promote an inclusive and equitable learning environment.

Matthew Stannard aims to identify effective pedagogical strategies or mechanisms with which to improve the teaching of scientific language to students on an undergraduate radiography course. The literature review carried out will aim to recommend techniques to be implemented and suggest further study of said techniques to evaluate their efficacy and contribute to the literature.

Larry Bethany investigates how higher education students' having a sense of belonging has been shown to correlate with social fulfilment, well-being, cognitive agility, and academic success. Sense of belonging includes feeling cared about, valued, respected, welcome, and safe to be oneself. He conducts a critical exploration of sense of belonging and some approaches to fostering it. Concepts and models, which include multi context, pedagogical partnership and decolonising the curriculum, are examined. Larry's study concludes that to promote sense of belonging, a multi-faceted approach must be taken, which includes fully informed, sensitive, and appropriate design of learning and social spaces; positive, in-class, teacher behaviours and inclusive pedagogies; and a range of out-of-class social opportunities both with peers and teachers.



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Contributor Profiles

Claire Carter



Claire Carter is a Senior Lecturer in Midwifery is the School of Health and Social Work. Claire is returning to Doctoral studies following resting during the pandemic to explore midwives' experience of providing care that aims to prevent sudden infant death syndrome (SIDS) to mothers who live in an area of socio-economic deprivation. Claire's background is in nursing and midwifery, specialising in bereavement in maternity prior to starting at UH in Mary 2022. She is Module Leader on the BSc (Hons) Midwifery, and the Master in Midwifery programmes, and is the Clinical Lead for Midwifery.

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Chandra Tester has been a lecturer since 2017 and a programme leader since 2018, teaching various business modules from Level 4 to Level 6 in Human Resources, Employment Law, Ethics, and Work-Based Projects. Chandra completed her Master's in Global Corporations and Policy from the School of African and Oriental Studies, University of London. Her interest lies in policy impact on the student experience.



Kathleen Tripp



Kathleen Tripp is a Lecturer in SEND and Inclusion on the BA (Hons) Education programme and has been at the University of Hertfordshire since 2021. She was previously an autism advisory teacher and special needs teacher for over 30 years. She has an MA in Education Planning, Economics, and International Development and a MSc in Development Studies. Alongside education in an international context, current interests revolve around looking at the Neurodiversity

paradigm in relation to social justice and the social model of disability.

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Hanh Doan joined the University of Hertfordshire in 2022 and is an Academic Skills Advisor in the Learning Teaching and Innovation Centre and a Visiting Lecturer in Initial Teacher Education, currently leading Secondary Music. Hanh is also a widely published freelance music educator and is the A Level Music Expert for the OCR Exam Board. Having spent 19 years in state and non-selective secondary education, Hanh is passionate about decoding academic skills to ensure that they are accessible to students of all backgrounds, abilities, and dispositions.

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Melissa Cummings

Mel is a lecturer in tourism at the University of Hertfordshire. She is also an alumna of the University, graduating from the MSc International Tourism and Hospitality Management. She worked in industry for a number of years at several tour operators before her passion for tourism studies brought her back to academia to study for her PhD. Mel joined the tourism team at University of Hertfordshire in September 2021, and hopes to encourage students to think more about the impacts of tourism on local communities and cultures and inspire them to be active participants in a diverse and multicultural world.

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Poppy Hawkins is a Lecturer in Nutrition and Dietetics at the University of Hertfordshire, where she co-leads the module Research Methods for Nutrition. Poppy holds a BSc. in Nutrition and an MSc. in Nutrition for Global Health from the London School of Hygiene and Tropical Medicine She is pursuing a PhD at the University of Hertfordshire, where her research focuses on exploring the role of diet in the management of psoriasis. As coleader of the Research Methods for Nutrition module, Poppy aims to support all students in developing their academic skills, to reach their full potential.



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Matthew Stannard is a Senior Lecturer in Diagnostic Radiography and Imaging. Matthew graduated from Exeter University and has practiced as a Diagnostic Radiographer since 2010. In order to extend his clinical practice, Matthew completed post graduate studies in Clinical Reporting at Canterbury Christ Church University between the years of 2013-2019 and practices part-time as a Reporting Radiographer at Barking, Havering and Redbridge University Trust.

Larry Bethany

Larry Bethany has been a visiting lecturer at the University of Hertfordshire in the Centre for Academic English since 2009. He teaches academic English and study skills in pre-sessional and foundation programmes, workshops, and one-to-one drop-in consultations. As well, he has been a lecturer in Hertford Business School in the Academic English for Business programme since 2018 teaching and developing materials to support business modules. He obtained his MA in Foreign Languages at West Virginia University where he also taught English in the ESOL program and English for International Teaching Assistants.



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What is the relevance of Anatomy & Physiology? An intervention tool to foster perception of relevance in undergraduate students.

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Abstract

Anatomy and physiology (A&P) education and knowledge underpins midwives' ability to clinical assess women while making clear judgements based on interpretation and understanding. This is vital for the safety and positive experience of women and their babies in midwives' care. A&P is generally taught during the early months of an undergraduate degree and is typically difficult to master. Research indicates that to boost the intrinsic desire of the student to learn for life; the teacher must help learners see the relevance in the content they might not find inherently interesting or easy to master. This small-scale research project collaborated with students and lecturers from two different schools by conducting focus groups to gather data to create a novel pedagogical intervention. Creation of this intervention tool for undergraduate students aims to engender and foster focus on what is relevant for the student on the programme. This collaboration and co-creation was in alignment with the Scholarship of Teaching and Learning (SoTL) principles.

Background and Literature review

Human Anatomy and Physiology (A&P) is a core module in pre-registration midwifery and other undergraduate healthcare programs. The knowledge gained from A&P modules provides a solid foundation for clinical practice. Underpinning skills such as critical analysis, conducting physiological assessment, implementing clinical interventions, evaluating effectiveness of treatment and clinical decision-making requires a thorough understanding of human A&P (McVicar et al, 2014 & Barton et al, 2021). For instance, to facilitate a human birth, a practitioner must have comprehensive knowledge of the anatomy of the maternal pelvis, the uterus and the fetal skull and the physiology of the mechanics of birth (Mhlongo, 2020). Yates (2017) asserts that a broad understanding of human A&P is equally as important as any of the 6Cs (Appendix 1) to enable provision of expert patient care. In essence, A&P provides the scaffolding for students to understand the biological mechanisms which underpins all clinical work and judgement (Brown et al, 2017). Importantly, the Nursing & Midwifery Council (NMC) clearly anticipates applicants at registration having met competencies that include a sound understanding of biosciences which includes A&P (McVicar et al, 2014 & NMC, 2009).

However, many students have difficulty successfully learning and understanding the oftencomplex systems (Johnston et al 2015), frequently in a short period of time. McVicar et al (2014) suggest that this is not a new phenomenon and that A&P subjects have been causing difficulties for healthcare students for over 20 years; yet the problem remains. For some students in the allied health, nursing and midwifery disciplines, the transition from secondary to tertiary education can be extremely challenging (Ruttenberg et al, 2022). Coinciding the transition with studying A&P early in the programme can only compound the students' ability to master this aspect of bioscience (Rutenberg, 2022). Interventions to support engagement have been developed over the years are often not successful and according to Johnston et al (2015), students continue to typically perform poorly in A&P modules. Students can find A&P concepts so challenging and problematic, that this topic may have the highest failure rate of all the undergraduate modules (Vitali et al, 2020. & McVicar et al 2014).

In 2023 the A&P module lead on the pre-registration midwifery programme received an email from the cohort representative reporting negative views of the A&P module from over 30% of the cohort which included feelings of "deflation", "set up for failure", "let down", "upset", and "questioning their capability on the course". A Mentimeter was then administered to the whole cohort to explore their feelings more deeply with the question: **"What challenges did you face on this A&P module?".** Out of a cohort of 88, 20 people responded and themes that emerged were that of **relevance** and **feeling overwhelmed**.

This article will begin with a review of the literature to explore the current issues with students' perception of what is relevant when studying on an undergraduate programme and to provide a synopsis of the literature in relation to relevance in the teaching and learning process. There will also be an exploration into what is relevant within the students' journey to becoming a midwife and how to authentically facilitate life-long learning by helping students to identify what is relevant to them on the pre-registration midwifery degree. This will be achieved by placing students themselves as co-creators and by working alongside a colleague to collectively co-create a questionnaire.

Literature review.

There is much in the literature over the last couple of decades regarding ways to improve student engagement and motivation (Kember et al, 2008) and part of this research has explored relevance in relation to motivation. Relevance as a construct has been gaining momentum within the pedagogical literature (Albrecht & Karabenick, 2018) and Blue (2022) holds the view that if the student understood that what is being learnt is relevant to the ultimate long-term goal, then there is more likelihood of the student becoming emotionally invested in the lesson and the content. Blue (2022) attributed this to students feeling that learning the content is more relevant to them if the value, utility, purpose, and meaning are explicitly stated and explained (Blue, 2022). Blue (2022) asserts that this is the role of lecturers to help learners understand and see the relevance in content they may not find inherently interesting by making lessons meaningful and contextual.

Keller (2009) proposed an instructional design theory which addressed learner motivation. The model proposed four motivational principles: namely Interest, Relevance, Expectancy and Satisfaction. In the relevance principle, Eagleton (2015) asserted the importance of learners perceiving information to be relevant to their own goal for learning, as this perception will motivate the learner to invest in understanding the concept. Keller (2009) also held the view that teaching students abstract theory alone, without application of theory to practice, could prove to be demotivating particularly for subjects such as A&P. The model has subsequently been changed to the ARCS model (Keller, 2009) based on the acronym; attention, relevance, confidence, and satisfaction (Kember, 2008).

Another aspect of relevance in the literature pertains directly to healthcare practitioners learning the biosciences. Andrew et al (2015) explored UK nursing, midwifery and allied health students' self-efficacy for biosciences and the perceived value of biosciences to their studies in a prospective correlational survey. Andrew et al (2015) explored how the importance that a student assigned to a subject area, in particular science, could impact on a student's engagement with the content. Findings of this study found a relationship between a student's self-efficacy, relevance, expectation, and success and this relationship became even stronger as the student progressed through their programme. Furthermore, students with a strong belief that they will have academic success recognise the relevance of bioscience to their course. These students are reported to have higher self-efficacy, which extrapolated to increased confidence completing various science tasks than students who have lower expectations for academic success.

In 2019, Montayre et al examined students' overall perception of biosciences within terms of relevance to practice, teaching delivery, self-competence and challenges encountered. A cross-sectional survey was administered to n=1890 nursing students in New Zealand and had a response rate of 29%. The study found that while the student nurses considered biosciences to be important to learn for their future practice, it was never easy. This study also found that nurses reported increased level of confidence following completion of the course – despite the degree of difficulty. An important finding in this study was that the key for nursing students to appreciate bioscience concepts was the linking of theory with clinical application – in essence the relevance of the concepts to nursing practice. Student nurses positively reported the connection of theory with practical application which contextualised the relevance. Interestingly, this study found a difference in perception with regard to level of maturity and stage of course completion. Mature students, who were more accustomed to self-directed learning perceived the biosciences to be less challenging. And students in their final year had more positive perceptions of the relevance of biosciences, regardless of their level of maturity, which results are comparable to those of Andrew et al (2015).

More recently, Barton et al (2021) conducted a sequential mixed method study in two phases. Phase one, a qualitative focus group informed the phase two a quantitative questionnaire to assess nursing students' perception of engagement with biosciences and their perception of the clinical relevance of biosciences for their role as registered nurses. There was strong agreement that biosciences provide useful knowledge for competent and safe nursing practice (Barton et al, 2021). An important finding of this study was that as students progressed through their levels of study, they were significantly more likely to agree that nursing care requires a great deal of bioscience knowledge which corroborates with both Andrew et al (2015) and Montayre (2019).

Given that the literature supports education being made relevant to students, it would be helpful to clarify the meaning of relevance at this juncture. However, to complicate matters, Albrecht & Karabenich (2018) suggest that there is little consensus on what making education relevant to students means. Priniski et al (2018) define relevance in teaching and learning as "a personally meaningful connection to the individual." – highlighting two elements: personal relevance and meaningful relevance. The definition of having personal and meaningful relevance to the students' long-term goal will be used for this essay.

Not all research supports the importance of relevance. In his essay, Against Relevance, Braswell (2017) discusses how 'relevance culture' only benefits those who are already successful, and who are instrumental in promoting the dominant understanding of what is relevant at any particular moment. Essentially Braswell (2017) argues that ideas that challenge tradition (or educational philosophies) will have a more difficult time being cultivated, aired, and debated in a society occupied with the pursuit of relevance (Braswell, 2017). But this view does not consider the problems that can thus arise when educational relevance is framed to focus solely on society's broader agendas at the expense of students' goals and interests (Albrecht & Karabenick, 2018). Whatever the consideration, Albrech & Karabenick (2018) suggest each perspective should essentially derive from a common question: "What purpose does, and should education serve?". Albrech & Karabenick (2018) summarise with the hope that relevance may serve as a bridge that unifies different theoretical perspective in biosciences. This could also align with broader studies, such as the Dearing's Report on Higher Education (HE) (1997).

To conclude this section, it is evident the literature identifies the importance of the perception of relevance in relation to motivation. Students typically find biosciences challenging and at times irrelevant, but importantly, the evidence suggests that the further the students progress in their programme, the more their perception of relevance increases. Research indicates that it is the role of the teacher to help with engendering this perception of relevance, particularly in the early stages of their programme, but there appears to be a significant gap in the research regarding pedagogic intervention tools to foster this perception.

Methods

Research question

How can we improve students' lifelong learning within the context of relevance on the preregistration midwifery degree?

Objectives

The aim of this small study was to:

- 1. Explore students' perception of the relevance of bioscience (A&P) for their role as a registered midwife.
- 2. Co-create a meaningful questionnaire: a novel pedagogical intervention to help foster undergraduates' focus on what is relevant.

Methodology

Design

As the purpose of this small-scale research project was to seek the views of students, the data required was qualitative. Individual interviews could have been selected as an appropriate data gathering approach, however this can be very time consuming (Barbour, 2014), therefore the focus group was selected. The focus group offered a more time efficient way of exploring views and may provide an arena that offers individuals an opportunity to reflect as a group (Green & Thorogood, 2018). The focus group was facilitated by the author and the data were analysed using thematic analysis (Braun & Clark, 2015). Some students were unable to attend the focus group due to the short turnaround and their programme demands, however some did submit responses to the questions posed at the focus group via email. These have been analysed thematically alongside the data from the focus group.

Prior to contacting the students, a connection was developed between the author (from the School of Health and Social Work) and a lecturer from the School of Creative Arts. It was identified that students reported very similar challenges faced on the respective modules, essentially an element of student non-engagement and concerns over motivation, secondary to relevancy perception. The data gathered from both focus groups was integrated with the purpose of creating a tool that can be used across schools.

Sampling

This small-scale research project was based at the University of Hertfordshire. The purposive sample was drawn from different year groups on the pre-registration midwifery degree who had completed the anatomy and physiology module. The focus group was comprised of student midwives who had completed a bioscience module.

The Scholarship of Teaching and Learning (SOTL)

The innovation of student-faculty partnership has recently been gaining in popularity (Felton et al, 2014) with rising interest in research and practice about 'students as partners' and co-created learning and teaching (Bovill, 2020). Katz, (2021) describes co-creating with

students as a process by which lecturers collaborate with students when designing the learning and assessment experience. This is based on the constructivist learning theory, with the emphasis being on the student perspective; as such learners construct knowledge and meaning from their own experiences rather than from passively absorbing information from traditional lectures (Katz, 2021). The SoTL model is a pedagogic approach to enhancing curricula, developing teaching practice and improving student learning. At the heart of this approach are key principles of good practice: 1. Inquiry focused on student learning, 2. Grounded in context, 3. Methodologically sound, 4. Conducted in partnership with students and 5. Appropriately public (Felton, 2013). Thus, it could be argued that the purpose of SOTL is the co-creation and exchange of ideas in teaching and learning on a large scale.

According to Gilpin & Liston (2009), SOTL has great scope to serve those who were previously least served by curricula enhancement, as SOTL addresses the teaching and learning community as a whole, rather than change management benefitting the few. Bovill (2020) supports co-creation, as there is a similarity with the concept of active learning, which aims to support the student moving from passive learning to taking an active role, with interaction between lecturers and students, and between students and students (Bovill, 2020). A&P is often taught using traditional teaching practices that emphasises rote learning and minimises student participation (Jensen et al., 2018 & Anderton et al., 2016), thus, by creating and exchanging of ideas within the teaching and learning arena, it enables a move towards A&P being taught within the SoTL framework. Learning and teaching becomes jointly negotiated and responsibility is shared which implies a greater level of student agency and empowerment (Bovill, 2020).

In order to facilitate a meaningful collaboration between staff and students, Bovill et al (2016) suggest occupying the space between student engagement and partnership by constructing resources with academic staff. Initially a student survey (Table 1) was created by the two lecturers to administer to students in the focus group to stimulate thought and discussion.

Table 1. Student survey

What matters to you in your chosen discipline?
What matters to you on this degree programme?
What do you want to learn?
What is a midwife?
What skills are necessary in your discipline?

What personal attributes are necessary for a qualified clinician?

Discussion of findings

The findings drawn from the student focus group can be summarised as the following themes:

- 1. Relevance
- 2. Questionnaire

Students views of the relevance of A&P

Students in general said they felt that had a good understanding of what was important and relevant to their degree. However, two students voiced that "they had expected to have been given more information on what to revise for the exam" and "it would have been more helpful to have a better indicator of exact chapters included in the exam – we just don't have time to learn it all". This view typified the initial feedback received from the Year 1 cohort, with the emphasis firmly on passive inactive learning. This appears to be some students placing value purely on the immediate goal of passing the exam rather than lifelong deep learning in the context of midwifery. When examining students' perception of the blended approach to teaching A&P, Eagelton (2015) reported similar findings: students were "grade oriented" rather than "learning oriented". The results of a questionnaire revealed students were more concerned about results than "owning" the content of the module (Eagleton, 2015).

This did not form the majority of comments though, as the conversation shifted to recognition that understanding A&P plays a fundamental part of being a midwife. When questioned "What do you want to learn?" a student replied, "I want to learn how to be a midwife and I think it's important to realise the long-term importance of learning A&P. Connecting with and understanding how the body works is fundamental to being a good midwife" and another "I want to learn what is important to enable me to be safe midwife".

Students were presented with the questions (Table 1) and were invited to review and refine these questions to capture their view on what the intervention tool should look like. This approach of inquiry being conducted in partnership with students is the fourth good practice principle, as recommended by Felton, (2013). The following questionnaire was refined and developed:

Questionnaire

What matters to you in your midwifery degree?

What do you want to learn?

What is a midwife?

What skills and personal attributes are necessary for midwifery?

It is proposed to administer the above questionnaire via Mentimeter to the students during induction week. Induction week was chosen to support the student focus on what is relevant to them early in their undergraduate programme. It will be anonymous, and the results will be sent to the student and published on the student web-based software, which will allow the student to refer to results if required. It is recommended that this questionnaire is also administered at the commencement of semester B. This incremental, 2nd administration scaffolds the students' focus on what is relevant to them in their educational development and reorientates the student to their goals – reinforcing their perception of relevance.

Conclusion and recommendations

This article explored the challenges that students can face on a bioscience module, often early in the first year of their undergraduate programme. It is not uncommon for students learning biosciences on a healthcare programme, specifically midwifery in this context, to experience feeling of overwhelm, low self-esteem, difficulty in subject mastery and a sense of deflation. These feelings can lead to a perception that bioscience does not have any relevance. There is a dearth of research on how educators can help instil or foster this perception of relevance in learners, but studies do point to the importance of students regarding perceiving their studies as relevant, due to motivating the student to invest in engagement, which was corroborated by the authors' anecdotal experience.

This small-scale research project responded to this by surveying a small group of students who had completed a bioscience module with the intention of exploring their perception of relevance, and to co-create an intervention tool to help foster relevance amongst students commencing on the programme. Current and previous students reflected on their experience using a focus group to gather data, however due to the students' upcoming summative assessments, not all attended the focus group. Despite this and in addition to written feedback, sufficient data was gathered to create a rudimentary questionnaire. Although in its early stage of development, the questionnaire has the potential to be administered to students, at the beginning of semester A & B to engender and focus the students' perception of relevance of biosciences on their programme; ultimately facilitating life-long deeper learning.

This work was completed in collaboration, primarily with a colleague lecturer from The School of Creative Arts, but also with students. This is in alignment with SoTL philosophy which supports transforming the curricula within higher education by providing a space for collaboration across fields. It also illustrates an example of the SoTL recommendation of 'students as partners' which was evidenced by both The School of Health and Social Work and the School of Creative Arts and was woven into existing module activity.

Recommendations from this research:

There is considerable potential for further research into how to foster students' perception of relevance.

Due to the questionnaire being highly adaptable and versatile, it has the potential to be utilised by other module leaders, different schools within the university and other higher education institutions.

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An Investigation of Plagiarism Policies in UK HEI (Higher Education Institutes)

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Abstract

The impact of plagiarism policies in UK Higher Education Institutes (HEI) has been a topical debate for over 20 years. Research demonstrates that plagiarism policies are complex in general and do not reflect the subject, nor the student body and that the pedagogical approach is not consistent. A holistic approach is needed to address all the variables, for example, a creative English writing course and a business course would need different policies to reflect the programme.

Academic misconduct can have severe consequences for learners and investigating it is a time-consuming process. As research highlights, what is needed is less ambiguity and more clarity so that all parties impacted (students, teachers, policy makers and institutes as a whole), comprehend what plagiarism and academic misconduct mean.

The gap in research is that it is a very broad topic and needs to be scaled down. For example, if there is more plagiarism with international students on a particular subject, this needs to be investigated and compared to other universities to see whether they have the same issues as this would allow universities to understand whether this is because of the student body perhaps, or the way the information is delivered or that assessments allow for academic misconduct.

The aim of this research was to critically analyse and evaluate the literature on this topic and to identify some recommendations. No primary research was conducted as it is a literature review. The findings from the literature review are that plagiarism is still a major issue and although AI has added another dimension, the key issues many academics have identified is that plagiarism is not something that can be dealt with in isolation.

Introduction

Goh (2015:80) states "...plagiarism is a problematic academic issue that has always been lingering in the academic arena and has been a constant battle between academics and students in higher education".

As technology and artificial intelligence (AI) has developed, this has allowed students to plagiarise and commit academic offences more easily (Mindzak and Eaton, 2021). However, it has also allowed for academic institutes to identify plagiarism faster (Anney and Mosha, 2015:203). The complexity arises because penalties given will depend on the severity and level of study depending on whether it is undergraduate, postgraduate, developmental stage and/or dissertation (Badge and Scott, 2008).

Issues arise because there is variation in severity and extent of plagiarism. For example, there is a difference between a bought piece of work and large chunks of copied work that is not cited and/or paraphrased correctly (Attwood, 2010). The type of work completed also has an impact because there may be differences between a piece of coursework that is required for progression or that counts towards a final module mark, for example (Tennant et al., 2007).

According to Fatemi and Saito (2020:1305), it is imperative that HEI develop 'new pedagogical strategies' in order to support home and international students' understanding of the policies of plagiarism and academic misconduct. Their article highlights that if plagiarism policies are not communicated in a way that (in this case with a focus on international students) students understand, it can decrease their confidence.

Literature highlights that there are implicit assumptions that both students and academic lecturers understand what plagiarism and academic misconduct means in UK HEI as well as the potential consequences. Roig's (1997:2) study which is 26 years 'old' demonstrates that issues highlighted above are still prevalent:

"...more than half of the students in their study could not identify clear examples of plagiarism, indicating that, whilst policy may exist, students have little knowledge or understanding of it".

The problem with plagiarism is that it cannot be resolved by tackling one problem alone, it needs an integrated holistic approach. Joyce (2004) cited in Relph and Randle (2006), identified nearly 20 years ago that a three-pronged method was and is needed where 'education, detection, and institutional responses' work collaboratively. Relph and Randle (2006) added another element of "addressing teaching and learning strategies".

This is further supported by Price (2002:89) who states:

"A significant obstacle to resolving this dilemma is our desire to avoid complications, to present plagiarism as something fixed and absolute".

In her article Price further discusses that plagiarism has many facets and is *"part of an ongoing, evolving academic conversation"* (2002:90). Like Relph and Randle, she identifies that to 'solve' this issue, what needs to be understood by both teachers, policy makers and students is clarity. Price (2002:92) writes that what academic institutions deem common knowledge does not need to be cited, for example, 2x2=4.

However, what home and international students understand to be 'common knowledge' and/or 'meaning' will vary. This reiterates the issue that plagiarism policies are a complex issue in HEI and the pedagogical approach to teaching and educating students about it needs to reflect the variety of cultural contexts both domestically and internationally.

This article will illustrate that plagiarism policies are still ineffective and still a problem. As evidenced so far, there is an urgent need for academics, policy makers, students, and support agents to work collaboratively to ensure policies and the language used to communicate information about plagiarism are disseminated in a language that all students (whether domestic or international) understand and comprehend (Brooks et al., 2022).

Rationale

The rationale for this research is that plagiarism has been an ongoing topic for over 20 years and that there is still no clear solution that is being implemented UK wide in HEI. I will be systematically reviewing the literature on this topic and not conducting any primary research. This is because I did not get any responses to the different faculty members I reached out to before the undertaking of the project. No ethics approval was necessary as I have not undertaken any primary research.

Literature Review Discussion

There is a vast amount of literature on the topic of plagiarism. A literature review was used to investigate whether plagiarism policy in UK HEI is still as prevalent an issue today, as it appears to have been over 20 years ago.

The literature review also considered the following problems:

- Plagiarism as a term has different meanings and contexts (Council of Writing Programme Administrators, 2019).
- The impact of academic misconduct and offences in terms of time, resources, and wellbeing of students/teachers (QAA, 2022:2).
- Are assessments designed in a way that 'allows' plagiarism to occur (Munoz et al., 2019).

The review also critically analysed and evaluated the following:

- Why do students plagiarise?
- Detecting plagiarism.
- Types of plagiarism.
- Student understanding of plagiarism.

These points were used to reflect on whether plagiarism policies are effective in the UK.

Why do students plagiarise?

As academic literature demonstrates, there are many variables as to why students plagiarise (Khasseh et al., 2020):

Time management: As Gullifer and Tyson (2010), discussed 13 years ago, many students find it difficult to manage their time effectively, leaving assignments until the last minute and feeling pressured to submit something quickly that does not have academic evidence cited and referenced correctly, rather than requesting more time or putting in an extenuating circumstances form. This is further supported by Jiang and Huang (2022:107), who draw attention to the fact that lack of time management can entice students who have poor study skills, and/or any of the reasons identified below to 'cheat'.

Lack of understanding of academic writing: Some students may not have a strong grasp of academic writing conventions, including how to properly cite sources, paraphrase, and summarise ideas. They may also struggle with language barriers or difficulties understanding complex material. Although Ng, and Yip's (2019:1) article is focused on nurses and healthcare professionals, they point out that blended learning could provide a pedagogy to support students' understanding of what plagiarism, academic integrity and misconduct means, what paraphrasing is and how to cite and references correctly.

Fear of failure: Some students may feel overwhelmed by academic expectations and fear that they will fail or receive a low grade on an assignment. They may resort to plagiarising as they believe it to be a way to ensure they pass or get a higher grade. Anne (2019) writes that students fear of failure can stem from being challenged outside of their comfort zone(s) and that there is a direct correlation between this, and the methods learners use to attain their goals (Michou et al., 2014).

Pressure to excel: In some cases, students may feel pressure to excel academically and may resort to plagiarising in order to meet high expectations from themselves or from others. Michou et al., (2016:272) discuss motivation to achieve, and students desire for academic satisfaction. Owen (2021), extrapolates on a similar point to Michou et al., stating that external pressures such as family, societal, and the pressure to maintain certain grades, 'motivates' and drives students to plagiarise to maintain a certain standard (for example needing to attain certain grades for a scholarship or potential job).

Laziness or apathy: Some students may simply be lazy or apathetic towards their studies and may not see the value in doing the work themselves. This is shown by the growth of 'contract cheating' in the UK (Medway et al., 2018:393). As the authors write, plagiarism involves "...copying some or all of the work of another without crediting the original source", which links to the lack of academic integrity and plagiarism which contract cheating falls under as the student submits work without crediting the original author (2018:394). Selemani et al., (2018), in their research found that 84.9% of their postgraduate students plagiarised because of 'laziness and poor time management'. This is further supported by Southworth (2015:12) who writes that for some learners it is "easier to plagiarize off the internet than to do the work". It is important to note that while these factors may contribute to why students plagiarise, it is never an acceptable or ethical practice. Students are expected to uphold academic integrity and honesty in their work, and there are serious consequences for those caught plagiarizing.

Detecting students' plagiarism

In a globalised educational world where international borders no longer impact knowledge sharing, plagiarism and academic misconduct harms the integrity, quality, and credibility of university graduates (Anney et al., 2015:205). Detecting academic plagiarism can be undertaken in the following ways:

- Manual detection
- Google searches
- Citations/reference checks
- Plagiarism detection software
- Peer review

Although it may appear that there are already several ways to identify plagiarism and academic misconduct, it needs to be taken into consideration that this is a huge task for academic staff who may teach on cohorts with hundreds or potentially even thousands of students. As Weale (2023) writes, although universities seem to have robust policies in place, plagiarism is complex, and students do not always understand what they are and are not allowed to do. This has culminated in some universities being *'reprimanded over unfair treatment of students accused of misconduct'* (Weale, 2023).

For example, universities in developing countries where they may not have software that detects plagiarism it would be time consuming and uneconomical. This would also apply to manual detection and offers another issue; it cannot establish or provide the reader with a similarity report that shows whether the similarity is acceptable or unacceptable (Anney et al., 2015:205).

A further problem with being able to detect plagiarism as Nurlybayeva et al., (2021:154) identify, is when text is not directly copied but re-written, sentences re-organised or summarised and different words used to make it harder for plagiarism software to detect if any plagiarism has occurred. ChatGPT is an example of software students can use to generate work and paraphrase work already written (Hern, 2022).

Bailey (2011), argues that plagiarism detection has limitations and as already discussed, needs to be used in a holistic way. He argues that machines and AI need to be used in

conjunction with 'human judgement and discretion', in order to support both teachers and students.

Types of plagiarism

According to the University of Hertfordshire's 'Academic Integrity and Academic Misconduct' policy, plagiarism is:

2.2 Plagiarism 2.2.1 Plagiarism is presenting another person's work as your own work (whether deliberately or upintentionally) without acknowledging the source fully. To a

deliberately or unintentionally) without acknowledging the source fully. To avoid plagiarism, you must always include referencing and citations for all the material you used in producing your assessment.

(Table from: Academic Integrity and Academic Misconduct – V16.0 UPR AS14 Appendix III - Effective: 1 September 2022)

The policy also states that plagiarism includes the following:

- Self-plagiarism/ duplicate submission
- Collusion
- Contract cheating
- Misappropriation of material submitted for assessment
- Fabrication or Falsification of Data
- Fake referencing
- Making your work available for others to copy

When compared to other explanations of plagiarism, this is where the issue becomes apparent because there is an exhaustive range of examples, which is argued makes it challenging for students and lecturers to be clear on what plagiarism is (Malik et al., 2021:14).

The table below is from an assignment brief. When compared to the table above, although there are similarities, I would argue that students' understanding and/or interpretation of these could be very different. For example, I have an international student who thought citations had to state exactly the same as what she was writing.

Academic Integrity, Plagiarism and Essay Mills

- You are NOT allowed to copy any information into your assignment without using quotation marks and a reference this is 'plagiarism' (a type of academic misconduct).
- You are NOT allowed to copy from other students (or allow other students to copy from you) this is 'collusion'.
- You are NOT allowed to copy from your own assignments on other modules this is 'self-plagiarism'.
- You must NEVER buy assignments from websites (essay mills) this is called 'contract cheating' and it is
 now illegal in the UK.
- If you commit academic misconduct, your mark will be reduced, and you will face disciplinary action for repeat offences.

Contact <u>academic-skills@herts.ac.uk</u> if you are unsure of the rules or how to avoid academic misconduct, and you will receive help.

Self-plagiarism is complicated because depending on assessment type and topic, students may need to include a statement of compliance for example in Assignment 1 and Assignment 2. When TurnitIn detects this, a tutor needs to understand and take this into consideration, as well as the student who may submit their work to check their score.

As Research Square (2022) acknowledges, plagiarism detection and consequences vary because teachers are not always well informed, it is someone else's responsibility to deliver it, or they direct learners to websites, so the information delivered (or lack of) is unclear because you have a class of mixed cultures, understanding and it 'depends on who you ask'.

Student understanding of plagiarism

Gullifer and Tyson (2013:1202) start their article with the opening statement:

"Research has established that the term plagiarism is open to different interpretations, resulting in confusion among students and staff alike".

This statement, although 10 years old, is still valid as research demonstrates that it is an ongoing issue that has still not been resolved. A statement by the QAA in February 2022, discussing academic integrity from the student's perspective found:

From our own research we found that students in essence think [cheating is] conditional, it really depends on if the institution has provided them with the ability to cheat - their words, not mine - or if there were preventative measures to keep them from cheating.

The QAA article poses some interesting questions in regard to addressing how to create originality and creativity when it is not encouraged, because it is based on the idea that it comes from an already conceived idea that if not cited would be classed as plagiarism and academic misconduct. This example further highlights how complex this issue is for students and it could be argued, a stifling process that extinguishes imagination, creativity, and original thought.

A study conducted by Arsyad et al., (2022:5-8) looked at the following three issues:

- 1. Students' awareness of dishonesty and plagiarism
- 2. Students' attitudes towards plagiarism
- 3. Students' experiences with plagiarism

The authors found that in all three sections that students (undergraduate and postgraduate) overall, had some understanding of what plagiarism was and what was and was not acceptable. However, the results indicated that some students were not clear on whether "...buying others' work is unacceptable or completely unacceptable" (Arsyad et al., 2022:6).

The following table from Arysad et al. (2022:7-8) supports factors already addressed, about why students' commit academic offences:

No	Statement	Undergraduate		Postgraduate Students	
		Stu	dents	_	
		Agree	Disagree	Agree	Disagree
1.	Time pressure	99%	1%	79%	21%
2.	Weak possibility of sanction	60%	40%	57%	43%
3.	Weak possibility of being	71%	29%	60%	40%
	reported				
4.	To obtain good grades	74%	26%	59%	41%
5.	A very common act today	88%	12%	64%	36%
6.	Lack of lesson comprehension	88%	12%	74%	26%
7.	Hard to do works without	66	34	59	41
	plagiarism				
8.	Original texts are too good to	70	30	74	26
	paraphrase				
9.	Lack of paraphrasing skills	84	16	93	7
10.	Lack of learning motivation	77	23	77	23

Table 4. Factors affecting students' plagiarism

This table demonstrates that there are multi-factors driving students to commit academic offences. Although (using this research as an example) students may have theoretical knowledge and understanding of what plagiarism is, this does not prevent them from plagiarising (Bašić et al., 2019:1479).

Research Findings

What academic research has demonstrated is that there is no 'one solution' to a multifaceted issue. The impact of academic misconduct is also not simple because it effects students, teachers, administrators, departments, and universities (Martin, 2018), further highlighting the complex nature of plagiarism policies in HEI.

A main theme that has run throughout all the research conducted for this paper, is that a holistic approach is needed to tackle this issue. Collaboration between students, universities, policy makers and clear pedagogy is what is needed to drive change. For example, using Felten's (2013:121) five principles of good practice in SoTL could facilitate the development of better practice, communication, assessment design and policy dissemination on plagiarism:

Felten's 5 Principles	Application to Plagiarism Issues
Inquiry focused on student learning.	Students should broadly understand plagiarism not just from disciplinary knowledge and theory perspective but from cultivation of understanding and application that is connected to their learning.
Grounded in context.	This needs to be both scholarly (policy) and from a local context (domestic and international students). Students need a firm foundation in understanding plagiarism in context to what they are studying and the country and university hey are studying at.
Methodologically sound.	Standardisation in policy across disciplines would support students in clarity of what plagiarism means, how to avoid it and where to get support.
Conducted in partnership with students.	Students need to be involved in developing better practice regarding designing impactful plagiarism policies as this will create a community of shared responsibility.
Appropriately public.	By going 'public' this will support the topic and (hopefully) the development of designing policy that is reflective of its audience and stakeholders.

Felten's principals are interesting because it embodies what much of the literature concludes, that to encourage ethical academic writing and dissuade malpractice, there needs to be engagement from everyone involved (students, teachers, policy makers etc). This is supported by Gullifer and Tyson (2013:1203) who state:

"The confusion surrounding the term 'plagiarism' may also be experienced by academics, therefore contributing to the inconsistencies students are exposed to".

If teaching staff are not clear on plagiarism policy, how can they disseminate this information accurately? Geach and Henry (2021:56) discuss how authentic assessment can enhance academic integrity (with a focus on law students) but not on its own, further supporting the argument that "...authentic assessment design in and of itself does not guarantee that students will not cheat".

What is clear from all the research is that blended learning is a needed pedagogical approach to reduce plagiarism through, for example, knowing your learners, having face-2-face contact, and a relationship between students and lecturers. Singer (2010:11) identifies this in her report and cites Davis (2007) who states that there "..*is not a single solution"* and the need for "...*an integrated approach"*.

Having worked with both domestic and international learners, my own experience reflects much of what research has analysed and discussed. Domestic and international students disclosing that they have not really understood what plagiarism means and not had the confidence to enquire further in class. I have also had learners, whom I have taught and explained what plagiarism means and how to avoid it, state that they thought citing meant that the work had to state exactly what they were stating.

This illustrates that even if information is being discussed and taught, that it may not be clearly understood and if lecturers are teaching on large cohorts how can they ensure students really understand? Or that a lecturer discussing this to a huge cohort is stating the same as a seminar lecturer with a smaller group, or a personal tutor. These issues have been highlighted throughout and further highlights the need for clear communication across all groups that are involved.

Conclusion and Recommendations

As research has demonstrated, plagiarism policies in the UK are not effective in HEI because they are not representative of all the internal and external factors that impact the process and application of the policies. For example, plagiarism policies on a creative writing course cannot be the same as policies for a Law course.

Pedagogical approaches like Felten's 5 principals are a good example of how HEI can design and embed policy that supports students, lecturers, policy makers and institutions. By using pedagogical methods, it will provide clarity to everyone involved and (hopefully) reduce academic misconduct/offences, encourage authentic assessment designed to prevent plagiarism and ultimately encourage original work by students.

The limitations of this review are that it is solely based on a literature review and very broad in scope. To add validity primary research would have strengthened the report and potentially supported what has already been discussed.

Recommendations

My recommendations are based on embedding Felten's 5 Principles:

- 1. Research to be conducted with students on plagiarism policy and students understanding of this.
- Research conducted with student support can also encourage research activities and support academics in their own research providing context to the scholarly topic in a manner appropriate to the context. For example, teachers using quantitative methods on large cohorts working with teachers using qualitative methods on smaller cohorts will add validity to the research.
- 3. The methodological approach needs to reflect the discipline. For example, there may be more plagiarism cases on business courses than creative writing because of the way assessments are designed and what is expected. The research methods used need to connect the "...heart of a particular inquiry to student learning" (Felten, 2013:123).
- 4. By engaging students and keeping them at the centre of this research it encourages a culture of shared responsibility between teachers and students. This has a ripple effect on many issues such as a reduction on cases, time resources, well-being and stress reduction because students understand what plagiarism is for example and take responsibility for their learning.
- 5. Engaging everyone involved that is impacted by plagiarism policy, will ultimately lighten the burden for everyone and provide more robust and supportive guidance.

Primary research conducted in different schools (Business vs Sound Technology) would strengthen the argument that plagiarism policy needs to be reflective of the subject. It would also strengthen the argument that to reduce plagiarism, all groups impacted need to work collaboratively taking a holistic approach in order for the policies to be effective.

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Critical Issues in Supporting Neurodivergent Students on a BA (Hons) Education Programme

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Abstract

Supporting neurodivergent students in higher education is driven by legislation such as the Equality Act 2010 to ensure inclusion and success in their studies as well as the social justice imperative which includes the Neurodiversity movement. However, fear of discrimination often prevents disclosure and therefore support for students with these hidden disabilities is sometimes lacking. In this paper, recent literature was analysed alongside a small-scale anonymous study of current students on the BA (Hons) Education programme at the University of Hertfordshire. The aim is to develop supportive approaches and accommodations for the programme. It was found that using Universal Design for Learning guidelines alongside individualised support strategies such as coaching and mentoring can support students on the programme and may be an effective model for other programmes. This must be informed by training for staff that includes neurodivergent trainers with lived experience as well as an understanding of the sensory needs of pupils.

Introduction

With increasing numbers of neurodivergent students in university education it is crucial to support them within a BA (Hons) Education programme at the University of Hertfordshire effectively in line with the Equality Act 2010 as well as the ethical, moral, and social justice imperatives embraced in the University's Equalities and Diversity Policy (University of Hertfordshire, 2022). Evidence suggests that academic attainment for many neurodivergent students (e.g., autistic, dyslexic, with ADHD) can be as good as their peers if well supported in their studies. (Richardson, 2009; Fabri and Andrews, 2016; Richardson, 2017 in Hamilton and Petty, 2023) Therefore, it is important that this ethical and legal imperative is strengthened to ensure that students are able to reach their full potential through effective support processes and procedures on the programme. An education programme is inherently interested in pedagogical matters, therefore this inquiry's aim is to improve the pedagogical approach of the programme through further understanding the needs of neurodivergent students. However, it was discovered that many supportive structures lie outside of the remit of the programme itself and are embedded in the wider processes and drivers in the university.

The Double Empathy Theory and the Social Model of Disability are important to reference as guiding principles here. In the Double Empathy Theory, Milton posits that there is a need for the neurotypical majority to understand the autistic neurotype rather than teaching autistic people to conform and understand the neurotypical majority (Milton, 2012). As autistic people are often met with immediate misunderstanding and lessened desire to interact by

neurotypical people it is important to develop a sensitive and compassionate approach to supporting neurodivergent students to redress this balance (Crompton et al., 2020 and Hamilton and Petty, 2023). The social model of disability states that the barriers for disabled people are created by society rather than trying to identify and change the so-called deficits in the disabled person themselves. (Charlton,1998) The research and recommendations below put the onus on the design of the environment and the attitudes of students and staff to overcome these barriers for neurodivergent students.

In this article, supporting neurodivergent students on the programme will be explored through two research methods: a literature review and a small-scale research method of an anonymous questionnaire given to the current students on the programme.

The principles related to the Scholarship of Teaching and Learning (SoTL) have been used to inform the approach to this study. They are as follows:

Principles of Good Practice in SoTL Inquiry, (Felten, 2013)

- Focused on student learning
- Grounded in context
- Methodologically sound
- Conducted in partnership with students
- Appropriately public

Investigating strategies to support neurodivergent students in higher education and contextualising this to the BA (Hons) Education programme has been the focus of the inquiry. The questionnaire is designed to elicit responses from students on the programme regarding what supports or inhibits their learning in general and on the programme specifically. The design of the research will attempt to bridge the contexts of the experiences of neurodivergent students expressed in the literature and the local context of the those on the BA (Hons) Education at the University of Hertfordshire (UH). By including a questionnaire to gain the views of students, the inquiry will endeavour to pursue a partnership with students. However, there are limitations to this as the questionnaire was not co-constructed with students.

The thrust of the research is in relation to the literature review related to supporting neurodivergent students in higher education. In particular, making the article appropriately public through sharing the results and recommendations with colleagues aims to improve the practice on the programme. To address the principle of 'methodologically sound', the small-scale research project involving students on the programme was conducted anonymously and was constructed to ensure that the questions were relevant and sensitive (Bell and Waters, 2018) in line with SoTL principles. However, the limited sample size of
students indicates that further research needs to be done in terms of multiple methods and or deeper qualitative research to develop more robust data.

The enquiry into one's own teaching inherently creates a bias that needs to be identified. Although the issue of bias, whether it is innate or can be managed, in the researcher is a contentious point, my enthusiasm and interest in the subject is undeniable (Cohen et al., 2013). Some would argue that education is never a neutral process, so the study of education without subjectivity can only be managed by an attempt at honesty and transparency (Shaull, 1970/1999 as cited in Freire, 1970/1999, p. 16). Therefore, throughout the research, I endeavoured to critically reflect on the information to minimise my own bias and confront uncomfortable truths about my own practice (Bell and Waters, 2018).

Background

Neurodivergence and Higher Education

Neurodiversity is a term that originated in the 1990s and is linked to the social justice movement and the social model of disability. Walker (2014) defines neurodiversity as '... the diversity of human minds, the infinite variation in neurocognitive functioning within our species.' The term neurodivergent is used to describe those that diverge from the neuro-majority. This is an attempt to identify and describe the experiences of those with hidden neurological disabilities, usually associated with autism, ADHD, dyslexia, etc. (Walker, 2014)

Statistical analysis by the Higher Education Statistics Agency (HESA) allows for some more specific information related to particular forms of neurodivergence. HESA has compiled data regarding UK domiciled student enrolments by disability for academic years 2014/15 to 2021/22. This data is put into sub-sections of disability including physical and various neurodivergent categories. This allows for greater nuance when attempting to understand access to higher education. Those who self-reported as having a specific learning difficulty (SpLD) including dyslexia and ADHD was 6% while those self-reported as having autism/Asperger's Syndrome is approximately .9%. Further data collection and analysis regarding outcomes needs to be developed nationally as well as within institutions to provide more granular information regarding specific disabilities as the strengths and needs of disabilities are so varied.

Neurodivergent Students on the BA (Hons) Education Programme

Some features that are particular to the programme may lend themselves to access and continuation for neurodivergent students. As an education programme, lecturers are experienced with inclusive practice as most are former schoolteachers. All modules are assessed through100% coursework and access to the course requires less UCAS tariff points than the Bachelor of Education Honours Degree Primary with Qualified Teacher Status. (Currently, the BA requires 104–112 while B.Ed requires 120-128). Class sizes are small,

always under 30 students, and a commitment to personal tutoring has always been present in the programme.

As some modules are dedicated to inclusive practice and supporting neurodivergent people there is conscious modelling of inclusive strategies throughout some modules. (The Inclusive Approaches to Education module has developed into Learning for All in the new revalidated programme as well as Autism and the Human Experience has developed into Neurodiversity and Autism.) Alongside inclusive strategies outlined in the Guided Learning Journey (University of Hertfordshire, 2023b), some lecturers use pen-portraits to get to know the learning styles of students and participation cards are used as a visual indicator by students the level of participation they would like to engage with for that lesson. A quote from one student in their mid-module feedback was, *"The participation cards - absolutely adore them."*

However, many structures on the programme are challenging for neurodivergent students on the programme and these challenges are replicated throughout the university. Lack of consistency of strategies amongst lecturers and understanding of neurodivergent conditions and how to support those with specific relevant strategies is not embedded. Lack of flexibility as well as rigid timeframes for assessments are part of the operational framework of any university. The Student Success and Engagement Team for the School of Social Sciences, Humanities, and Education has supported students with individualised support, however at this point it is not clear how this team will engage with pupils in the future as this team becomes centralised for the whole university. The system of Study Needs Agreements (SNAs) provides some framework for accommodations but lacks specificity in terms of strategies to support particular types of neurodivergent learners.

Looking at the data in Table 1 regarding the enrolment on the BA (Hons) Education programme (previously Education Studies) of neurodivergent students, the data roughly matches enrolment nationwide. Looking specifically at continuation (flowthrough) data, neurodivergent students on the programmes have continued and completed successfully over the past 3 years.

Disability	BA Education Studies Programme 2019-20		BA Education Studies Programme and BA (Hons) Education Programme Combined 2020-21		BA Education Studies Programme and BA (Hons) Education Programme Combined 2021-22	
	Number of Students	Flowthrough As %	Number of Students	Flowthrough As %	Number of Students	Flowthrough As %
Specific Learning Disability (ADHD, Dyslexia)	16/204	100	11/152	100	8/127	100
Social Communication – Autism or Asperger's Syndrome	0	n/a	1/122	100	1/68	100

Table 1: Students on UH BA Education Studies and BA (Hons) Education Programmes

(Information accessed from University of Hertfordshire, 2023 – Tableau)

Yet it is difficult to know if all students have declared a disability and their neurodivergence in relation to the accuracy of these statistics. More detailed and continued analysis needs to be made in terms of employment and award outcomes in relation to neurodivergent students on the programme to fully understand the long-term outcomes for these students.

Survey of prior research

A literature review has identified many key themes regarding barriers for neurodivergent students in Higher Education. To add focus to this assignment it considered only students and those with Specific Learning Disabilities and Autism as these are the most common neurodivergent conditions other than mental health issues. (Hubble and Bolton, 2021) Specific Learning Disabilities were further narrowed to ADHD and Dyslexia as the research in dyspraxia and other Specific Learning Disabilities did not yield sufficient results in the literature searches.

Research was conducted in a systematic way (Bell and Waters, 2017) using the following search terms including material from the last 5 years: variations of neurodiversity and autism, dyslexia, and ADHD cross-referenced with university and higher education. In further research older relevant material was occasionally used when referenced as part of

the original research within the 5-year timeframe. There were gaps in the literature that were recognised in the literature itself (Serratt, 2017).

As universities operate within a unique system of cultural and national drivers and situations, more country-specific research is needed in the UK regarding neurodivergent students. Information regarding disabled students is tracked in accordance with the Equality Act, but more needs to be done to understand and analyse data for specific categories of neurodivergent students to truly understand impact of targeted programmes and outcomes. Research needs to be done with neurodivergent students to target meaningful outcomes and conduct research framing neurodivergence in a positive way (Botha and Cage, 2022). Intersectional aspects in terms of ethnicity and sexuality need to be explored as this a major gap in the literature and a nuanced understanding is needed (Serrat, 2017).

Key Themes

It is important to preface this discussion with an understanding that there was reference made to shame, stigma, and low self-esteem throughout the literature. Previous experiences at school were often negative in relation to achievement, relationships, and incidences of bullying due to student's learning difference was a common experience (Clouder et. al, 2020, Hamilton and Petty, 2023). Therefore, the requirement to disclose to seek reasonable adjustments was seen as a barrier that some students were unwilling to engage with. Many lecturers refuse to implement individual reasonable adjustments, and there is sometimes a cognitive dissonance regarding lecturer's understanding of autism and ability to use this understanding by implementing inclusive practice (Sarrett, 2018, von Below, 2021). Thus, it is crucial to implement strength-based strategies and approaches based on the concept of designing for inclusivity from the outset instead of implementing individualised changes that required disclosure (Anderson et al., 2017). Rather than focusing on the deficits of the neurodivergence and trying to fill in the gaps, strengths in neurodivergent learning styles need to be recognised and developed.

Universal Design for Learning (UDL)

The Universal Design for Learning (UDL) provides a set of guidelines to improve and optimise teaching and learning approaches to meet a range of needs by design throughout the curriculum at the outset (CAST, 2018). Cipolla (2018) advocates for the use of UDL for dyslexic students which is replicated in other studies of autistic and students with ADHD (Clauder et al., 2020). These principles can be used to develop support for neurodivergent students without the need to disclose their neurodivergence and can be used to develop a strength based, flexible approach (Hamilton and Petty, 2023). Guidelines are framed into 3 areas: Engagement, Representation, and Action and Expression. (CAST, 2018) A key theme running throughout the UDL guidelines is that of making things explicit and flexible. As students are novices with the material and need guidance on how to access and prioritise information, an emphasis is put on systems of repetition and rehearsal that reinforce

concepts such as constructive alignment and Bruner's spiral curriculum (Biggs, 1996, Bruner, 1977, CAST, 2018).

Strategies for student support related to UDL guidelines were echoed in the research as follows:

Engagement	Representation	Action and Expression
Outlining clear written roles in group work and offering a range of scaffolded opportunities for discussion such as pairs and small groups (Burgstahler and Russo-Gleicher, 2015).	Detailed course syllabus with clear written expectations and deadlines, and a course calendar prepared well in advance (Von Below et al.,2021). Providing material and instructions in printed form and orally (Serratt, 2017). Slides published in advance of the class as well as recording the class (Williams, 2019). It is important to note that Jacobs et. al, (2020) found that dyslexic students felt that lecturers did not realise the importance of the need to have access to slides in advance. Task checklists and rubrics to break down assignments with clear success criteria (Burgstahler and Russo-Gleicher,2015).	Options for assignments in terms of allowing a range of opportunities to express meeting the learning outcomes (Williams, 2019).

These strategies align with the University of Hertfordshire's Guided Learner Journey principles (University of Hertfordshire, 2023b). However, the recording of classes and providing slides to students to preview and review is a contentious issue in academia. Skead, et al. (2020) found that if students know that lectures are being recorded this will negatively affect attendance. However, ensuring neurodivergent students' access to a needed accommodations such as recordings without needing to disclose via a personal reasonable adjustment is vital.

Individualised Support

Individualised pastoral support is crucial to success in education for all students with neurodivergent disabilities (Clauder et al., 2020). Support can be in the form of peer support, coaching or academic tutoring. In fact, Thompson et al. (2019) would advocate a more specialised peer support programme that provides more training and ongoing support to be effective for autistic students. Coaching was proven to be successful for student support for those with ADHD as well as for autistic students (DuPaul, 2017 and Van Hees et al. 2015).

In this context, a student's individual strengths and needs can be identified to enable them to access a personalised ongoing support programme with a trusted individual in a safe environment. For example, learning strategies such as note-taking, reading, and asking for help can be developed to encourage autonomous learning skills (Richardson, 2015). Support can also come in the way of support with digital or computer applications (Hillier et al.,2018). Constructing a detailed personalised diary as part of induction with realistic timings is recommended to support organisational skills for disabled students but would benefit all students (Coghill and Coghill, 2020).

Most importantly, the model of support needs to shift towards a strength-based approach to offer support in line with building self-esteem and autonomous strategies for learning (Hamilton and Petty, 2023). Adopting a capabilities approach that incorporates the strengths of neurodivergent students rather than looking at filling their deficits is needed (Pellicano, 2022).

Training for Staff

Interestingly, training for staff around these three areas of neurodivergence was highlighted as an area necessary for an inclusive educational environment. Staff training about autism and reasonable adjustments as well as peer awareness was suggested by Serratt (2018) and was corroborated by other neurodivergence linked studies such as dyslexia and ADHD (Ryder and Norwich, 2019 and Sedgwick-Müller, 2022). Training would need to have neurodivergent students directly involved to ensure a person-centered and flexible approach (Chown and Beavan, 2012).

Safe Spaces

Sensory needs both in and out of the classroom need to be considered as this a crucial but often misunderstood area of need. Not only quiet spaces are necessary but also "chill out" physical spaces with sensory equipment need to be available to students (Sarrett, 2017). The normalisation of sensory equipment and tools for self-regulation, such as movement breaks or the use of fidget equipment in class could support the development of a safe space in the classroom.

The classroom as a safe space, in a broader sense, needs to encompass an ethos of universal compassion to increase a feeling of connection and belonging (Hamilton and Petty, 2023). This could mean approaching issues regarding non-engagement in class discussions, lack of eye contact, or attendance in a compassionate way. Burgstahler and Russo-Gleicher (2015) also mentioned cultivating an environment of respect for all learners as an important aspect of an inclusive learning environment. Other examples of a compassionate approach could be the of use participation cards for students to indicate their level of participation to

decrease anxiety and encourage self-regulation (Farahar, 2021). A variety of ways to communicate can then be used to facilitate participation; for example, students can write rather than contribute to class discussions.

Social Support

The need for social support including a neurodivergent only space was mentioned frequently throughout the literature (Clauder et al., 2020, Serratt, 2017). The desire for scaffolded social support and developing common interests is highlighted for autistic students (Serratt, 2017). The social aspect of university life is important for academic success and is often overlooked. This is often a major component of university life that autistic students in particular request support for due to the social interaction differences (ASAN, 2020). For neurodivergent students this barrier needs to be specifically addressed.

Research Design

The BA (Hons) Education programme is currently a small programme of approximately 75 students, only 5 answered the questionnaire which means that the results are rather anecdotal and limited in scope. However, some interesting comments were made that add relevant detail to recommendations for the programme in the future.

The small-scale qualitative research method was designed to complement the review of prior literature and took the form of an anonymous questionnaire given to neurodivergent students; either those with an official diagnosis or self-identified with autism, ADHD, or Dyslexia. This anonymous design was chosen to attempt to defuse some of the power structure in the student-teacher dynamic. The questions were constructed carefully to ensure that they were not too onerous or insensitive, and that there was an amount of open-endedness due to the probability of a small sample (Cohen et al., 2018).

The questionnaire was devised in consultation with an autistic lecturer at UH. The individual's role as a lecturer with lived experience aided in developing relevant and insightful questions, with prompts to add clarity. Students were asked about their previous educational experiences to widen the opportunity of sharing helpful strategies that might not have been replicated in their experience at UH. Students were also asked about their current experience and recommendations for future changes in the programme with specific prompts related to strategies and learning tools used currently on the programme. (See Appendix 1 for Questionnaire)

In line with the Equality Act, students are entitled to ask for reasonable adjustments to ensure equitable access all programmes including the BA (Hons) Education. Reasonable adjustments are obtained through a system of students disclosing to the Disability Services and then a student receives a Study Needs Agreement (SNA) to outline their needs that is shared with relevant lecturers (UH Disability Support, 2023a). However, the study was designed to capture the views of those that identify with neurodivergent disabilities

regardless of whether they had an SNA due to issues regarding the desire to disclose. It is important to recognise those that self-identify alongside developing support for those that have a diagnosis and do not feel comfortable to disclose. Interestingly, one student mentioned that the SNA was supportive in their education experience.

Results of the research

Previous Education

Three students mentioned that a flexible approach to the assignment format, i.e., verbal and creative as well as flexible and supportive staff and modelling by staff were helpful strategies. Also, extra time for examinations and individualised support from teachers were stated. This speaks to the literature in terms of individualised academic support as well as the UDL principle of allowing students a choice of action and expression for assignments.

One student mentioned staff had frightened them, and another mentioned the formality of academic tasks and time constraints as inhibiting factors. This reinforces the emotional experiences that influence a lack of desire to disclose and again, offering a range of option for action and expression in tasks.

Current Education at UH

Supportive strategies on the programme mentioned were options of participation depending on the day as sensory overload is often an issue. Flexible amounts of tutorials, engaging online quiz formats as well as hybrid learning were mentioned as supportive as well. However, one student mentioned that formative assignment deadlines being "flexible" was frustrating.

Environment issues were reported as below:

- Other students on their mobile phones was distracting.
- Not being allowed to eat in class as eating helped with concentration.
- Sensory issues in class; temperature, lighting, changing of rooms.

Future Recommendations

Results for future recommendations from current students reinforce the prior research in terms of the need to use UDL strategies as well as attending to the sensory environment and consistent strategies and deadlines.

More consideration to the sensory environment in classrooms as well as timetabling.

Neurodivergent students find it difficult to have long days and need frequent breaks.

Printed copies of material in dyslexia supported formats.

Individualised learning strategies that include a variety of teaching formats to keep it stimulating.

Use of participation cards and consistent honoring of these requests for a certain level of participation.

Recommendations

The research findings outline the need for support for neurodivergent students to be built upon the concept of the social model of disability.

Some of the recommendations below are within the control of the programme in terms of inclusive teaching pedagogy, while others are outside the control of the programme and sit within the responsibility of the School/Strategic Business Unit (SBU) and/or the University. It is recognized that the complexity of supporting neurodivergent students relates to wider arenas of support needs that cannot be done in isolation within a programme. (Serratt, 2017, Hamilton and Petty, 2023) An ethos that incorporates wider drivers for change is needed that must be led and supported by senior leadership looking at barriers in protocols and systems throughout the university (Serratt, 2017, Hamilton and Petty, 2023, Clauder et al, 2020). Changes are also needed in the physical environment, and many changes may have financial implications in terms of staffing costs as well as training and environmental changes.

Recommendations suggested are interlinked, for example inclusive teaching and individualised pastoral support would need to be informed by staff training. Sensory support needs to be considered throughout all aspects as this needs to be considered both inside and outside of the classroom. The following model could aid in understanding how to begin to construct recommendations for the programme. (Figure 1)

Figure 1: Model for Supporting Neurodivergent Students



Employment of principles of UDL diminishes the need of disclosure and reasonable adjustments which may be inconsistent amongst lecturers as the design of the module and course implements inclusive teaching principles at the onset by design rather than making accommodations for specific students (Spaeth and Pearson, 2023). Operationally, it is argued UDL is more efficient to employ than individualised reasonable adjustments (Williams, 2019). In this model, the use of SNAs is not included but is replaced by an individualised support model where disclosure is not necessary. However, there are other issues at play. SNAs place a legal requirement on the module leader to implement reasonable adjustments in line with the Equality Act 2010. Some would argue that a supportive ethos needs to be in place so that disclosure is declared and the system of using SNAs is therefore more effective. This will enable targeted support and accommodations alongside enabling tracking of neurodivergent students to ensure parity and comparison of markers of success such as completion and award grades.

Training for Staff

Training about neurodivergent disabilities for all staff can encourage the development of compassionate understanding and insight. This would need to be developed and implemented alongside neurodivergent students and von Below et. al. (2021) suggested that following this with co-teaching sessions using a reflective cycle could ensure impact.

Inclusive Teaching

This is an area that can be an in-programme development, not necessarily reliant on university or School/SBU level support. Hogg and Yates (2013) have identified the

effectiveness of modelling teaching strategies for future educators to impact their future teaching. Therefore, ensuring inclusive practice as below is implemented and modelled in class is paramount. Design principles would need to input from neurodivergent students in an ongoing basis (Hamilton and Petty, 2023).

In Class Strategies

Strengths and Needs Approach – an ethos that encourages this approach to learning where individuals are encouraged to recognise and respect each other's and their own strengths and needs. Pen-portraits could be shared on platforms such as Padlet or in person to support the development of meta-cognitive skills. Potential conflicting needs such as eating in class could be negotiated as well as identifying common learning strengths to develop in teaching (Spaeth and Pearson, 2023).

Clear assignment deadlines published well in advance with rubrics for success criteria and breakdown of assignments.

Clear written instructions for tasks including clear roles for group work.

Multi-modal teaching strategies such as PowerPoints, videos, podcasts, pictures, quizzes etc.

Breaks, timings of classes are clear, predictable and adhered to.

Lectures recorded and PowerPoints posted 24 hours before the lecture.

Flexibility in terms of choice of assessment and group discussion. Offer a range of opportunities for engagement and feedback and specify clear roles for group work (Spaeth and Pearson, 2023).

Clear expectations for behaviour including attendance, eating in class, use of phones, self-regulation strategies, etc.

Use of Self-Regulation Strategies - Sensory equipment used in all teaching sessions as well as explicit commitments to students for honoring need for movement breaks and the use of participation cards to normalise self-regulation strategies (Farahar, 2021).

(Many of these design principles are embedded in the University of Hertfordhire's Guided Learning Journey principles such as the recording and pre-posting of lectures, clear written guidelines and multi-modal teaching.) (University of Hertfordshire, 2023b)

Induction

Induction could include a variety of **scaffolded social activities** alongside detailed organizational support. This could include getting to know interests through games or scaffolded social activities as well as detailed diary planning and an outline of strengths and needs profiles for all students (Anderson et al, 2017 and Clauder et al, 2020).

Personalised Induction programme could include **individual tours of the Campus and classroom** to degrease anxiety.

Individualised Support

Individualised academic support can take the form of academic tutoring, peer tutoring, or coaching with an underlying strength-based approach. This is a key area of development supported by a range of literature. For some neurodivergent students, especially those with autism, this would go beyond the academic realm and also encompass social support (Van Hees et al, 2014). However, with changes at the University of Hertfordshire in terms of student support on the programme as well as the overall squeeze in finances in higher education the capacity of development of this type of support is unknown at the present time. Individualised and extended induction programmes would also need to be implemented (Weston, 2023. Anderson et. al, 2017 and Clauder et al, 2020).

A clear attendance protocol would be beneficial for staff and students alike with supportive strategies based on compassionate support to decide what is needed. Hamilton and Petty (2023) reported that there is poorer attendance from neurodivergent students. Uncovering the reasons behind poor attendance and offering peer support, academic support, flexile study options, or support with cost of transport for example can lead to better attendance and outcomes for students (Roberts-Grmela, 2023). This would need to be explored in a compassionate and supportive way as engagement in neurodivergent students looks different than in others (Spaeth and Pearson, 2023, Hamilton and Petty, 2023). However, the use of flexible study options is a contentious issue at the moment and the impact on disabled students will need to be explored in the future.

Next Steps in the Research

Arguably, academia is inherently ableist for neurodivergent students who may struggle to reach attainment levels through necessary exams and coursework to enter university. The current structures of the education system can be seen as part of a broader oppressive system for marginalised groups including the neurodivergent in a world lacking social justice (Walker, 2013, Freire, 1970). Until the systemic inequity issues of Higher Education related to social justice and equality are addressed, some would argue that using UDL or a set of

strategies to support neurodivergent students could be construed as just 'tinkering around the edges' rather than getting to the heart of true power dynamics in higher education (Maguire, F. and Hall, R., 2018). The legal imperative of the Equality Act offers a minimum standard and has not been enough to level the playing field for neurodivergent students (Hamilton and Petty, 2023, Clauder et al 2020). UDL could be construed as a distraction from the inherent ablest structures of society and higher education's part in it.

Therefore, further research would need to be developed on a broader scope than just one programme. The most obvious next step in the research would be to work collaboratively with neurodivergent educators and students to look at their experiences at the university and use this to shape policy and practice through a variety of organizational and representational forums. While advocacy is important, allyship is not enough, disabled and neurodivergent students and staff need to be drivers of the agenda and have access to leadership and decision making positions (Hamilton and Petty, 2023). Discussion and change would need to be implemented with humility and honest dialogue (Freire, 1970). This would ensure that collaborative work would align with Felten's (2013) SoTL principle of ensuring that research is developed with students as partners. The limited sample in this study would need to be addressed and ensure a wider sample across more programmes was included that was more representative and research could be generalizable across the university (Cohen and Morrison, 2018).

It would be reasonable to suggest a university-wide commitment, which includes awareness and resources from senior leaders across the university to support neurodivergent staff and students regarding neurodiversity affirmative practice would be necessary. This would need to encompass looking at institutional opportunities and practice to ensure systems of redress are in place to access positions of power and influence (Rawls, 1999). This could include using Disability Critical Race Theory (DisCrit) to ensure intersectional issues and policies for neurodivergent students and staff are addressed alongside those of ethnic minorities (Annamma and Connor, 2018). Linking to decolonising practices that contradict assumptions about normative ideas of development and being offer an exciting opportunity to link to a broader social justice agenda in practice (Speath and Pearson, 2023). This could lead to the development of systems that recognise power structures and try to redress this through a system of student voice of neurodivergent students and staff and move towards the development of a strength-based approach to learning and teaching as well as access to higher level positions in the university (Rawls, 1999).

Reflective questions could be asked in student and staff surveys, programme review mechanisms, revalidation cycles, and monitoring and evaluation systems to uncover and understand the experience of neurodivergent staff and students. These could highlight valuable themes for next steps in the research across the university as a whole. (See Appendix 2 for adapted questions from Aron Verma's (2022) work on a reflective approach to antiracist pedagogy in higher education.)

Currently, there are pockets of practice focusing on supporting neurodivergent students. There is a Neurodiversity Reference Group and there was a Disabled Student Champion in place in the School of Social Sciences, Humanities, and Education previously that could be expanded as a model throughout the university and into the newly formed School of Education and School of Law. These could be developed to question and drive the research in ways that are enabling and driven by neurodivergent members of the university, "nothing about us without us."

Summary and Conclusions

Developing education programmes with a social justice agenda for future educators to teach neurodivergent students is fraught with conflicts. Teaching future educators to be subversive and challenging of ableist education structures alongside giving them the skills to operate in the very real world of employment is a difficult balance (Connor, 2013). Developing critically reflective tools for neurodiversity affirming practice throughout the university that are integrated into the design of programmes is necessary to ensure that pedagogical processes are being examined and developed to support students and staff.

It is essential that neurodivergent students are supported in the programme not only to ensure their inclusion and progress in the programme, but to also access employment in the future to contribute to neurodiversity affirmative practice in educational establishments.

For lecturers, this responsibility goes beyond the granting and implementation of accommodations, to changing the way learning and teaching activities are designed, developed, and gets to the heart of their pedagogical values. The imperative is to use the lens of the social model of disability and Double Empathy theory to critically confront one's own ableist practice and ensure the inclusion of neurodivergent students.

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Appendix 1: Student Questionnaire

The following questions were included in an anonymous Microsoft form.

In your previous educational experiences at A levels/college how did the design of the programme help you learn? The following prompts may help you but please put anything else you think of in the "other" section at the end.

- Strategies:
- People:
- Delivery of curriculum:
- Engagement:
- Environment (including sensory):
- Other:

In your previous educational experiences at A levels/college how did the design of the programme inhibit your learning?

- Strategies:
- People:
- Delivery of curriculum:
- Engagement:
- Environment (including sensory):
- Other:

In the BA (Hons) Education programme, how has the design of the programme helped you to learn?

- Strategies (including personal accommodations through an SNA and/or class strategies):
- People (including understanding of staff about neurodivergence and accommodating difference):
- Delivery of Curriculum (including the times of classes, CANVAS page, rules):
- Engagement:
- Environment (including sensory, for example allowing others to eat in class):
- Other:

In the BA (Hons) Education programme previous how did the design of the programme inhibit your learning?

- Strategies (including personal accommodations through an SNA and/or class strategies):
- People (including understanding of staff about neurodivergence and accommodating difference):
- Delivery of Curriculum (including the times of classes, CANVAS page, rules):
- Engagement:
- Environment –(including sensory, for example allowing others to eat in class):
- Other:

Thinking about the design of the BA (Hons) Education programme in the future, how can we design the programme to be more inclusive of neurodivergent students?

- Strategies (including personal accommodations through an SNA and/or class strategies):
- People (including understanding of staff about neurodivergence and accommodating difference):
- Delivery of Curriculum (including the times of classes, CANVAS page, rules):
- Engagement:

- Environment (including sensory, for example allowing others to eat in class):
- Other:

Appendix 2: Adapted questions from Aron Verma

How do you measure that you are promoting a neurodiversity affirmative organization?

Whose voices are heard in your institution?

Do neurodivergent staff feel valued and safe?

With regards to wellbeing and belonging, which students feel a sense of belonging? Why?

Is student wellbeing seen as a priority?

What are the links between neurodivergent students and wellbeing in your institution?

When thinking about community, what is the local history in your area? How can you use it to discuss protests, struggles or campaigns led by neurodivergent and/or disabled communities in your area?

What neurodiversity affirmative pedagogical strategies are you using?

Is your curriculum predominantly White, Western, Eurocentric or ethnically neutral?

Do you engage in or feel able to discuss ableism in the classroom environment in relation to classroom dynamics and/or placement environment and/ or learning materials and/ or study skills support?

Decoding Bottlenecks in Assignment Writing in Bachelor of Education (BEd) Level 6

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Abstract

This article investigates and evaluates theories in Decoding the Disciplines and threshold concepts in relation to assignment writing on the Bachelor of Education (BEd) programme, with a small case study focussed on a group of Level 6 students. In many cases, the written work that students have submitted has not always demonstrated the understanding of topics that they have demonstrated in lectures and seminars. These bottlenecks and how to address them will be identified using the theories of threshold concepts and the seven steps to Decoding the Disciplines, with a focus on steps 1-4. Findings include bottlenecks in procedural knowledge with suggestions for adaptations to curriculum and assessment design.

Introduction

Having taught the Level 6 BEd Professional Learning and Development (PLD) modules this year, I had noticed a bottleneck in the students' assignment writing. Their summative essays did not reflect the understanding they could demonstrate in seminars or even accompanying video presentations. There was a general pattern of students not being able to link theory to practice and combine this with evidence of critical reading and writing. Teaching these skills (beyond basic essay planning) explicitly within modules is not regular current practice, mainly due to time constraints. To address this issue, this article uses the framework of Decoding the Disciplines (Middendorf & Pace, 2004). The examination of threshold concepts (Meyer & Land, 2003) and the connection to the bottlenecks in question will also inform the recommendations for future practice.

Why decoding?

The seven-step process of Decoding the Disciplines (Middendorf & Pace, 2004) provides a logical process in which the students can be helped to learn *how* to think instead of *what* to think in order to make progress through their barriers to learning (bottlenecks). This is apt for the nature of the bottleneck in question, given that reading and writing critically are types of procedural knowledge (Middendorf, Shopkow et al., 2017). This process also provides a framework on which to hang learning and teaching activities, as will be seen in step 3 in particular. Sturts & Mowatt (2012) suggest that the historic teaching of lecture-reading-instructor-led discussion-test is no longer suitable for today's generation of learner, having been characterised as being more tech-savvy, team-oriented, confident, and most importantly, having a need for instant feedback (Griffin, 2002). Whilst the description of our students could be considered a generalisation, it cannot be denied that increased active student engagement during 'lectures'/taught sessions has resulted in a greater

understanding on the students' part (Biggs & Tang, 2011). When implemented effectively, Decoding the Disciplines gives an opportunity for the expert to address the barriers of today's students.

Decoding the Disciplines: a summary

Developed by Middendorf & Pace (2004) and documented widely (Middendorf & Pace, 2004; Middendorf & Shopkow, 2017; Pace, 2017; Pace, 2021), the following seven steps form the framework and process through which to work in order to overcome barriers to learning:

- 1. Identifying the bottleneck to student learning, where students encounter obstacles to mastering material or concepts;
- 2. define the "mental operations" (Pace, 2017) required to get past the bottleneck;
- 3. model these mental actions;
- 4. give students opportunities to practise and obtain feedback;
- 5. motivate the students;
- 6. assess how well the students are mastering these mental operations;
- 7. share what you have learned about the process.

Middendorf et al. (2017) make connections between bottlenecks and 'ways of thinking', encouraging teachers to move their focus away from content and consider what the students will need to *do* with the content itself, often referred to as 'mental operations' (Pace, 2017) or 'habits of mind' (Middendorf et al., 2017). Considering the nature of this investigation, this procedural bottleneck (i.e. ways of thinking and doing) seems to be central to obstacles the students face when preparing their written assignments.

Step 1: Identifying the bottleneck

I was interested in the Level 6 students' own perception of their strengths within these academic skills, thus in the spirit of Decoding 2.0 (Pace, 2021) and one of the key principles of the Scholarship of Teaching and Learning (SoTL) (Felten, 2013), I have involved and collaborated with students in identifying bottlenecks.

Method

I chose a small-scale study comprising a focus group of 4-5 students in which we discussed their barriers to assignment writing, and together we created a questionnaire which would then be given to 10-15 students in Level 6. Working with perceptions of their own ability on this small scale led me to take a mainly qualitative approach with a small element of quantitative analysis in order to look for the main bottlenecks in assignment writing.

Together, the students and I broke down general assignment planning into the following mental actions:

- Reading
- Referencing
- (Action) planning the assignment
- Planning the essay itself

The students were keen to focus on action planning as they felt that it was at this hurdle which many students (including some of this focus group) fell:

- Understanding the question and the intended outcomes of the assignment
- Breaking down the success criteria
- Compiling a reading list
- Reading and note-taking
- Finding key themes in literature

The students also wanted to ask their peers about the essay itself and broke the skills down into the following actions:

- Writing the introduction
- Writing the conclusion
- Being critical of the literature
- Analysing literature
- Linking literature to School Based Training (SBT) experience
- Synthesising ideas/pulling them together

These skills are core to conveying understanding and writing effectively, and of course, assignment success. These identified sticking points can be thought of as threshold concepts, a term developed by Meyer & Land (2005). It is defined as a kind of gateway, which if crossed by students, opens them to new, transformational knowledge, or new 'ways of thinking' (Donald, 2002, cited in Timmermans & Meyer, 2019:4). It is knowledge without which a learner cannot progress, and also irreversible in its nature. Certainly, the sticking points of finding key themes in the literature and then being critical and analytical of them are keys to unlocking understanding and writing effectively. Other characteristics of a threshold concept is its integrative nature into a discipline, its potential not to have

definitive boundaries, as well as overlapping with other concepts (Meyer & Land, 2003). Again, this is true for many of the skills above, where the skills are integral to essay writing, and boundaries blurred, e.g., in order to read critically and write critically, it is essential to take notes effectively and find key themes.

Also coined as troublesome knowledge (Perkins, 1999), the overlap with Middendorf & Pace's (2004) decoding the disciplines emerges in the different types of troublesome knowledge and what they refer to as bottlenecks. These 'stuck places' (Shopkow & Middendorf, 2019) can be potentially separated into different types of troublesome spaces or concepts. Meyer & Land (2003) survey different types of knowledge, including:

- Ritual knowledge
- Inert knowledge
- Conceptually difficult knowledge
- Alien knowledge
- Tacit knowledge
- Troublesome language

Similarly, Middendorf et al., 2017 describe bottlenecks as potentially being cognitive, procedural, or affective. The terminology within 'stuck places' do overlap but have nuanced differences. Pace (2017) gives essential differences:

- First, the bottlenecks at the start of the decoding progress occupy a larger space than the threshold concepts. In fact, there is a potential for a bottleneck to be formed of a number of threshold concepts. Whilst all threshold concepts are bottlenecks, the reverse is not necessarily the case.
- A concept often focuses on what students should know, whereas the decoding process (as will be seen below) focusses on what students and experts should do in order to move through the bottleneck.
- A bottleneck is the first step in the decoding process, whereas a threshold concept must "turn elsewhere" (Pace, 2017:23) for steps to address the problem, though it is possible that decoding steps may be used here.

Thus, the focus group found the overarching bottlenecks to be assignment planning and essay planning, each with their own groups of 'mental actions' (or threshold concepts), including reading skills, finding key themes among others cited above.

Findings

In discussing and co-creating the questionnaire, the limitations of methodology became apparent. First of all, the small numbers in the focus group would only give a sample of threshold concepts and the questionnaire itself would only reveal students' perceptions of their own ability, which might not always be reliable. However, Griffin (2002) notes today's student as investing in a process to which they have contributed and their opinion sought, an outcome of which they would be more engaged in the process. There is no doubt that this study should form the beginning of a larger-scale investigation, potentially across all three years of the BEd, and across modules (not just PLD).

The measurement of self-efficacy in the questionnaire itself where the students were asked to rank their mental actions (a process about which the focus group felt strongly) also poses limitations, in that there is no clear way of expressing how much more confident they were in one mental action over another. This is something which is worth considering in further study.

The questionnaire was sent to 14 students, with 14 returns. Initial questions indicate lacking in confidence in the action planning of the assignment as opposed to the planning of the essay itself. Figure 1 demonstrates students being least confident in finding key themes in the literature, while Figure 2 shows a lack of confidence being critical of the literature. Figure 3 shows the most popular recommendations selected, with breaking down and highlighting the question coming out on top.

Figure 1:

3. Action Planning: how confident do you feel about the following skills?

More Details

Compiling a reading list	
Reading and note-taking	
Breaking down the success crite	Finding key themes in the literature
Understanding the question an	1st choice: 2 (14%)
Finding key themes in the literat	2nd choice: 1 (7%) 3rd choice: 2 (14%)
N/A I am strong at all of these t	4th choice: 3 (21%) 5th choice: 5 (36%)
7 Other (please state in comment	6th choice: 1 (7%)

Figure 2:

4. What about the essay itself? Please rank in terms of most confident to least confident.

More Details



Figure 3:

5. Which recommendations do you think would help others planning assignments? Select all that apply.

More Details



It is not surprising that this questionnaire illustrates a number of bottlenecks within the umbrella of assignment planning and writing; layers of bottlenecks (Shopkow & Middendorf, 2019). Here, within the overarching bottleneck of assignment planning, a sub-bottleneck can be identified in the reading, with specific threshold concepts including identifying key themes, as well as being critical of the literature. This bottleneck of assignment writing also falls under the more frequently used term of 'academic skills', often central to debates within higher education as to how to approach them and whether to integrate them into the curriculum or provide separate 'bolt-on' sessions.

Recommendations

Given the integral nature of these threshold concepts and their importance in assignment writing, this author recommends integrating the teaching of these skills into curriculum time, devoting sessions in each module with activities based on steps 3 and 4 of the decoding process. These recommendations focus on the two specific outcomes of the

questionnaire (finding key themes and being critical of the literature), which can be used as a model to address other threshold concepts as identified by the student focus group.

While the study is focussed on Level 6 students, assignment writing starts at Level 4 and thus the implementation of this teaching into the curriculum should begin at Level 4. Time within each module gives an opportunity for the expert to help the students contextualise the skills in question. The repeated nature of this will encode this procedural knowledge into the long-term memory, from which it can be retrieved into the working memory when required (Willingham, 2017). Given that these are only two of the threshold concepts with which the students struggle, adaptations could be made over the three years, focussing on different skills each time.

Step 2: defining "mental operations"

Before teaching these skills, the expert must be able to articulate how they get past this bottleneck. In this case, how does an expert find themes in literature and what does it mean to be critical of the literature, and how do experts go about this? Middendorf & Pace (2004) suggest a decoding interview, in which the expert is asked to make explicit the mental actions required to overcome this barrier. Here, metacognition is required from the expert as they are asked to analyse the ways of thinking and mental moves they make in order to overcome a barrier (which they do not necessarily perceive as a barrier). Originally, in what Pace (2021) refers to Decoding 1.0, the decoding interview was conducted by another expert in a different discipline, with potential activities including the decoding through nonverbal modelling, through reflective writing and through analogies (Middendorf et al., 2017). Since then, not only has the interview process been dissected in more detail, but the involvement of students in this process has become a key feature of Decoding 2.0 (Pace, 2021).

This conceptual knowledge will be approached (and therefore modelled – Step 3) by every expert in a different way. At the start, finding themes is something which often can be found in the title and brief of an assignment. It may be that students are able to choose themes which emerge from their reading. The order of mental actions here could be:

- Highlight key words or ideas from the assignment title.
- Highlight key words or ideas from the assignment brief.
- Look at the contents of a seminal text or the abstract of a key article.
- Identify and write down a maximum of three key themes.

Writing critically of the literature is something which experts often assume undergraduates can do but do not make explicit what this means for them. Again, the expert needs to decode their own process. How does the expert do the following:

- record what they have read in a systematic fashion
- bring together and compare what authors have written on chosen themes
- make a comment on/argument about the point above?

Perhaps the mental actions here might be:

- create a table with rows for the themes and columns for different articles and books
- make notes from reading according to theme
- bring together and compare what authors have written on chosen themes
- analyse/critique the above point.

Whether or not an actual interview is needed here would be down to the expert. Some will struggle to break down mental actions, in which case another party (be it colleague or student) might be able to ask pertinent questions which will elicit the appropriate details. There will, however, be plenty of experts who can break down and define their mental operations without an interview.

Step 3: modelling mental actions

The following two steps are where time in taught sessions is required. Here, an expert will begin to move students into a liminal space (Cousin, 2006; Meyer & Land, 2006) where students can begin to enter the process of mastering these actions. Demonstrating to students what success looks like (in this specific instance) is essential if we are expecting them to begin mastery of the action (Fletcher-Wood, 2018). A suggestion for modelling here, would be to walk through the steps clearly with the students (Middendorf & Pace, 2004); thinking aloud with clear and detailed broken down instructions (Sherrington, 2019) - one of the four strands of Rosenshine's Principles of Instruction (Rosenshine, 1983). What this potentially might look like in practice could be an exploration of the mental process with the students:

- Together with the students, the expert should analyse the assignment brief and pull out any key themes
- Make a suggestion as to how to take notes from reading according to key themes (for example, using a table to collate reading)
- Talk through and demonstrate the skill of paraphrasing and deciphering what an author is saying about a particular theme.

Involving the students in this process (via questioning and collaboration) is good practice (as identified by Chickering & Gamson (1991) and Felten (2013)) and gives them an opportunity

to begin the process themselves. Considering the 'mental model of the learner' (Willingham, 2017) is also essential if this knowledge is to be sustained by the students over time. In recent years in education, there has been a huge focus on cognitive science and how pupils learn, indeed the ITT Core Content Framework (DfE, 2019) (a document on which Initial Teacher Training curricula should be based) devotes a whole section of which cognitive science is at the heart. There is no reason why higher education learners are any different, and so considering even the fundaments of the cognitive process (including working and long-term memories, learning, and remembering). In his model of the mind, Willingham (2009) makes us aware that it is the long-term memory which holds factual and procedural knowledge, the latter of which is our bottleneck and threshold concept in question.

If the aim of this process is to encode this procedural knowledge into the long-term memory, then recognising the limitations of the working memory is key to successful teaching and learning (Rosenshine, 1983). Breaking down the process into small and manageable steps is key to effective learning and encoding (Sherrington, 2019), and the use of analogies to 'undress' the discipline also has potential to engage and motivate the learning (Middendorf, Shopkow et al., 2017). " Isolating the mental action" also makes clear to the students the focus of each action (Middendorf, Shopkow et al., 2017:66). However, Rosenshine (1983) makes clear that in order for learning to be as effective as possible (in this case, a student learning this procedural knowledge and encoding it into the long-term memory), this modelling is best combined with the opportunity for students to practise each of these steps (Rosenshine, 1983; Sherrington, 2019), also known as Step 4 in the Decoding process (Pace, 2017).

Step 4: giving opportunities for students to practise and obtain feedback

After modelling, giving the students the opportunity to practise is key to their understanding of the actions required, along with the processing into the long-term memory, locking in these skills for future assignments. The active nature of the students *doing* the skill also increases learning (Hake, 1998; Hoellwarth & Moelter, 2011), leads to students retaining information for longer (Fink, 2013), and better exam performance (Yoder & Hochevar, 2005). The type of practice must be aimed at the specific mental action and these, in turn, should be planned sequentially (as opposed to a holistic exercise which needs to be decoded by the student) (Middendorf, Shopkow et al., 2017). Below are six principles of practice as defined by (Middendorf, Shopkow and Bernstein, 2017) combined with practical suggestions from Cottrell (2001) as to the type of activity to address this bottleneck:

• **Practice Principle 1**: create practice for component skills. A structured reading activity (in the appropriate topic or discipline) with a set of questions for half the class, with a quiz at the end about the passage they have read. Comparisons between those with the questions and those without, focussing on the importance of orientating to reading (Cottrell, 2001).

- Practice Principle 2: providing repeated practice for difficult mental actions. This is
 essential, as the repetition of the skill will ensure that it becomes automatic
 (Middendorf, Shopkow & Bernstein, 2017). The scope for varying and scaffolding the
 above activity (in order to maintain engagement) is huge. Students need to practise
 reading for meaning as well as exploring methods of effective notetaking.
- **Practice Principle 3**: bring the component skills back together. Contextualising the mental action will lead to a better understanding of how to apply this skill in the future for students.
- **Practice Principle 4:** match practice methods to mental actions through Bloom's typology (Middendorf, Shopkow & Bernstein, 2017:82). Being clear about the type of actions involved (in this case, understanding, analysing and applying) ensures that both expert and novice teach and learn these skills effectively.
- **Practice Principle 5:** metacognition. Tying in with principle 4, students need to be aware of their own thought process in order to replicate them.
- **Practice Principle 6:** design effective feedback after practice. For the practising to have a positive impact on students, teachers must check the students' understanding and make suggestions/interventions for improvements.

This final principle also links to Step 6 of the decoding process (assessing how well students are mastering these mental operations), a type of formative assessment which is integral to and embedded in primary and secondary classroom practice, but not replicated in higher education.

Thus we have established the following bottleneck with some recommendations:

- Threshold concept of identifying key themes and being critical of literature
- Expert identifying mental operations and modelling them to students
- Opportunity for students to practise operations with feedback.

Limitations

Given the small-scale study, it is acknowledged that outcomes from the co-creation of the questionnaire may have varied, and the means by which questionnaire respondents were asked to rank their confidence in skills may have differed. The small number of respondents gives an indication of threshold concepts to be explored, but this study could be extended by widening the responses.

This study draws mainly upon what Pace (2021) refers to as Decoding 1.0, which he himself admits is restricted in some ways. While the seven-step process is logical, a key consideration not factored in Decoding 1.0 (or this study) is the different starting points of

students in higher education, along with their diverse backgrounds. Student engagement requires further study, with much of this being tied up developing a response to emotional bottlenecks which students have, something which investigated by Middendorf et al. (2015). The way that modelling and practising is presented to students in terms of learning and teaching activities would also warrant more exploration in order to address student engagement and potential emotional bottlenecks.

Conclusion

The implication of these recommendations comes in two parts: curriculum time and the role of the higher education lecturer in teaching this kind of procedural knowledge (i.e.,academic skills). In order to implement these recommendations, those in charge of curriculum design need to convince the faculty that these skills need addressing and that it should be the role of the expert to deliver this. Separating curriculum content from instructional methods is not effective (Wingate, 2006; Sherrington, 2019) students require skills and procedural knowledge to be contextualised and relevant to the discipline of study. This means making time for these recommendations in as many modules as possible, especially in the first year of undergraduate study. The focus group had mentioned the fact that if they had been taught these skills in their first year, it would have improved their understanding and grades for the duration of their degree. Making time for checking learning and providing prompt feedback (Chickering & Gamson, 1991) will require adaption in curriculum time and of course in approaches and attitudes of the faculty, many of whom may not see delivering this knowledge as their responsibility. Indeed, perhaps further study is required to persuade faculty of the value of embedding academic skills into their curriculum time.

Given the fact that these skills are integral to higher education study, adapting the means of assessment could also be appropriate. In order for students and faculty to be convinced of the value of this kind of knowledge; is it best, therefore, to wait until a piece of work has come to its conclusion (usually in the form of a termly summative assessment, something we typically see in higher education), or should there also be a more formal means of assessment within these skills-based stages of a module? In an age where feedback in all its forms is instant, perhaps higher education needs to make steps towards providing more timely and formative feedback, something on which the students can act within the module, not just for the next. Procedural knowledge is key to student success and requires great consideration for future curriculum planning.

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The use of authentic teaching methods in tourism higher education: A case study of Level 6 university students.

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Abstract

Tourism, Hospitality, and Events (THE) higher education has often been criticised for graduates who are poorly prepared for realities of the workforce. Authentic teaching is one method in which it is argued instructors can balance theory with practical application. This study used a Scholarship of Teaching and Learning (SoTL) philosophy to engage Level 6 university students who had experienced an authentic teaching method. The survey was conducted between 22nd February 2023 - 19th April 2023. The results showed that the majority of students felt authentic teaching was beneficial to their understanding of course content, whereas 100% of students enjoyed the task and would like to see more similar tasks applied in the future, indicating the overall benefit of authentic teaching.

Introduction

Introduction

Institutions of higher education are faced with growing pressure for excellence in performance measures such as research impact and teaching evaluation, that deliver on diverse goals such innovation, institutional competitiveness, and educating students to better fill employment gaps (Dredge and Schott, 2013). The traditional, didactic approach to teaching has largely been employed in undergraduate instruction because it efficiently communicates large volumes of information to numerous students (Smith et al., 2015). However, these practises prioritise the dissemination of knowledge and centre educators in the methodology, restricting the level of interaction between lecturers and students (Hsu and Li, 2017).

The scholarship of teaching and learning (SoTL) is a model of research grounded in practice within higher education (Hubball and Clarke, 2010). It highlights the concept that good practice is rooted in the confluence of academic and local contexts (Felten, 2013), and through partnership with students. There has been a recent focus in higher education scholarship towards authentic practices in teaching (Kreber et al., 2007). It has been argued that authentic methods are important to 'good' education delivery, and there is a growing expectation for educators to subscribe to authentic pedagogy, and provide authentic learning environments (Bialystok, 2015). This is particularly important in Tourism, Hospitality and Events (THE) study, which as a vocational-based subject, is faced by the challenge of balancing theory with practical application (Smith et al., 2015). There have been calls for THE programmes to create closer links between the scholarship and industry
requirements (Arcodia et al., 2020; Steriopoulos, Goh, and Harkinson, 2022), through methods such as authentic teaching.

This article highlights previous research that investigates the importance of SoTL in higher education, as well as what is meant by authentic teaching practices, and the reasons for the growing interest in their application. It discusses THE higher education and the employment of authentic teaching practises to enhance the skills and experiences for tourism students. The research study is outlined, including philosophy, methodology, and implementation, before presenting the findings and accompanying discussions, conclusions, and recommendations.

Aim(s) and Objectives

Aims

- 1. To identify the application of authentic teaching practices and their use in THE higher education
- 2. To assess student experiences of an authentic teaching method and use these insights to make recommendations for future applications in THE teaching practice

Objectives

- 1. To review literature of SoTL, authentic teaching practices, and their relationship to THE education
- 2. To conduct a survey of tourism higher education students who have been exposed to authentic teaching practices
- 3. To identify codes within student responses to provide insight for future THE education and delivery

Literature Review

Scholarship of Teaching and Learning (SoTL)

There has been growing recognition of the role of academics in the facilitation of broad, meaningful education (Dredge and Schott, 2013). SoTL is a research practice which focuses on teaching and learning in higher education. It is primarily grounded in individual disciplines and is classroom based but addresses complex concerns facing practice in the real-world through working cooperatively with students (Deale, 2010). The partnership with students in particular is rising in priority as a central element to effective SoTL (Felten, 2013), alongside enabling disciplinary teachers to reflect upon their educational practice and positively adapt their teaching and learning techniques (Hubball and Clarke, 2010), subsequently sharing those insights for the public and fellow scholars to review (Deale, 2010). This process can be 'transformative' for both students and lecturers, and there is growing evidence to show that this collaboration with students positively impacts motivation, self-esteem, and feelings of intellectual agency for both parties (Felten et al., 2013).

Scholars of SoTL employ diverse tools, methods, and approaches to assessment (Deale, 2019), with importance placed on the methodology being intentional and applied with precision in order to meet the needs of the research question (Felten, 2013). This permits practitioners to investigate their disciplines using the most appropriate tools, as effective methods may differ from discipline to discipline (Deale, 2010). It is however important to also recognise the criticisms of SoTL, including an apparent focus on teaching, and a lack of empirical data to measure the extent to which learning has occurred. This is particularly important considering SoTL enquiry often takes place within the classroom, and as such opens itself to accusations of a lack of rigour compared to other research disciplines (Deale, 2010; Deale, 2019). Furthermore, there is a tendency for SoTL scholars to default to familiar disciplinary methodological tools, which may not necessarily answer the research question in the most effective manner (Hubball and Clarke, 2010).

Authentic Teaching

The traditional approach to university learning centres the teacher and prioritises the dissemination of knowledge but involves limited student participation (Deale et al., 2010; Hsu and Li, 2017). Assessments and learning activities are also often abstract and decontextualized from industry (Herrington and Herrington, 2005), leading to possibly superficial comprehension (Smith et al., 2015). This presents problems for vocationally-based subjects such as THE in the transferral of understanding from the classroom to real-world practice (Darling-Hammond and Snyder, 2000), where students may have no authentic experience and may struggle to apply what they have learned in their field of work (Ruhanen, Axelsen, and Bowles, 2021). As such, there has been an ideological shift towards greater interactivity and personalisation (Dredge and Schott, 2013).

Authenticity is rising in popularity as a higher education philosophy (Bialystok, 2015). A constructivist approach with real world value (Ruhanen, Axelsen, and Bowles, 2021), the aim of authentic pedagogy is then to require students to learn by putting knowledge into practice, applying it in context outside of the lecture hall (Smith et al., 2015) and thereby bridging the gap between the classroom and the workplace (Steriopoulos, Goh, and Harkinson, 2022). It should involve tasks that stimulate the integration and analysis of knowledge (Ruhanen, Axelsen, and Bowles, 2021), such as internships, discussions, or group projects (Smith et al., 2015). This can increase greater appreciation of course content (Kreber et al., 2007), as well as fostering critical skills including teamwork, problem-solving, decision making, and creativity (Ruhanen, Axelsen, and Bowles, 2021).

However, authenticity is hard to define, and there are numerous definitions evident in the scholarship (Kreber et al., 2007). There is also criticism that due to the nature of the

concept, it is hard to actively design 'authentic' practices into education (Herrington and Herrington, 2005). There are further challenges in implementing authentic teaching as it requires an investment of time and close collaboration between educators to continually develop and adapt techniques over time (Darling-Hammond and Snyder, 2000).

THE Higher Education

The higher education study of tourism primarily developed in response to the need to educate graduates to meet growing industry demands between the 1980s and 1990s (Dredge and Schott, 2013). However, criticism has been levied that tourism graduates are poorly prepared and lacking in knowledge, skills, and practical application (Ruhanen, Axelsen, and Bowles, 2021). Nevertheless, university-level education is a component of the THE sector which could elicit an effect on the whole THE industry, directly or indirectly (Ayikoru, Tribe, and Airey, 2009). This is especially important given the capacity of the sector's recognised contribution to social change, and thus, there is a need for modern educational and research practice that positively impact societal issues and produce members of the workforce who are motivated and have the skills to create a better world (Dredge and Schott, 2013), and who demonstrate higher levels of professionalism (Edelheim, 2020).

A historical challenge of THE higher educational programs is the connection between communication of theory and the practical application of that knowledge (Ruhanen, Axelsen, and Bowles, 2021). The needs of the industry are practical, but traditional techniques such as lectures, essays, and tests may not be the most effective approaches in fostering students' learning (Deale, 2008). THE education has therefore also begun to shift towards authentic teaching methods (Steriopoulos, Goh, and Harkinson, 2022) that facilitates student experience of real-world problems and encourages deeper understanding (Smith et al., 2015). Such modes of learning are considered pertinent to the operational nature of THE sector, as well as encouraging students to develop higher cognitive skills and critical thinking (Steriopoulos, Goh, and Harkinson, 2022).

Authentic teaching practices can therefore become an important approach to aid students in developing their THE competency, through methods such as active learning opportunities (Steriopoulos, Goh, and Harkinson, 2022), where students engage in activities such as discussions, and problem-solving that encourage practical skills development. This may require time and effort on the part of educators to prepare THE graduates for the multifaceted demands of the workplace (Ruhanen, Axelsen, and Bowles, 2021), but should lead to a positive engagement and impact on social concerns such as oppression and injustice, displacement, and marginalisation (Dredge and Schott, 2013). Students also found that through authentic teaching, they had increased agency in the problems they were solving, as well as increased motivation for their learning as a result (Ruhanen, Axelsen, and Bowles, 2021).

Methodology

Research Design

The research paradigm that this study subscribes to is that of constructivism. Simply put, constructivism is the search for the meanings of both the researcher and research subject (Glaser, 2007). It is a theory regarding how people learn, through the process of bringing our own contexts into the participatory educational space with other learners (Splitter, 2009). Constructivism places focus on encouraging student understanding through active engagement in a social environment (Hyslop-Margison and Strobel, 2007), which closely aligns to the aims of authentic teaching. According to Splitter, 'Only when student-generated inquiry meets key standards for disciplinary content and disciplinary process can that inquiry qualify as authentic' (2009, pp.140).

This study also employed an abductive approach to data. Abduction is a process which is grounded in existing theory, knowledge, or clues (Bajc, 2012; Tomasella, 2022) that inform the context of the findings and provide structure, whilst also allowing the flexibility to produce emergent insights (Hadjielas et al., 2022). It is a method which is appropriate for a small-scale, exploratory study such as the current one, as it facilitates the construction of new theories and ideas (Hadjielas et al., 2022). It is also consistent with SoTL ideology, as it is argued that only through collaboration with, as opposed to observation of, research subjects (such as students in pedagogical research) can creative thinking and discovery be achieved (Magnani, 2005; Bajc, 2012).

Data collection

Sampling

Purposive sampling was the technique employed for this study. It is the deliberate selection of subjects due to their possessed traits (Etikan, Musa, and Alkassim, 2016) such as knowledge or experience, who are able and willing to inform research objectives (Tongco, 2007). In this case, tourism students in their final year of study (Level 6), who have experienced an authentic teaching method in the classroom were selected as they were judged to be the best placed to provide information that met the aims of the study.

Study Implementation

The study recruited Level 6 students at the University of Hertfordshire (UH) on a Tourism Planning module during Semester A of the 2022-23 academic year. The students had, as a part of the course, engaged in an authentic teaching task that was designed to illustrate the theories of the tourist gaze (Urry, 1990) and the circle of representation (Jenkins, 2003) in practice.

The task asked students to position themselves as tourists to the UH's De Havilland campus, and within a 30 minute period, take 5-6 photos which they perceived to be a typical tourist photo. These photos were uploaded to Google Jamboard and shared with the class. These photos were then compared to photos obtained by the lecturer from social media, marketing, and the University website, to see whether and to what extent, the content of these photos was similar. The aim of this task was to demonstrate the real-world replication which tourists engage in through socially and technologically constructed patterns in which the tourist gazes on a location or object they have already consumed through images (Larsen, 2014).

A questionnaire survey hosted by SurveyMonkey (Appendix 1) was sent out via the 'Announcement' tool, which is disseminated to all student emails on that course. It was explained to students that the purpose of the questionnaire was for providing feedback on the task in order to inform future module development. As the data collection was expressly related to module improvement and development, the University of Hertfordshire did not require ethical approval in this instance. The questionnaire was opened on 22nd February 2023, and closed on 19th April 2023. Responding to the questionnaire was voluntary. However, due to a lack of initial engagement, a follow-up announcement was sent to remind students of the questionnaire, and the researcher also spoke to some students in person whom they were teaching in Semester B, after the classes.

Findings and Discussion

A total of 7 students out of 36 completed the questionnaire, representing a 19.4% response rate. This limitation will be addressed later. All the questionnaires returned were valid and have therefore been included in the study.

Figure 1 shows students' primary understanding of the meaning of the word 'authentic'. Four student responses include the perception of verisimilitude, citing words such as 'real,' 'genuine,' 'true,' and 'pure.' Two responses mention factors of originality, and two discuss lack of copy/replication. This is consistent with definitions of authenticity which is '*the quality of being real or true*' (Cambridge Dictionary, n.d., no pagination), demonstrating an overall good understanding of the concept. In addition, there was mention of being grounded in evidence, which may be linked to concepts of academic/scientific authenticity. One student (Student 7) also highlighted 'being active or taking action' as a facet of authenticity, which does not fit with the standard definition. However, this notion of proactivity is consistent with the aims of SoTL research, and with authentic teaching insofar as the practice involves active participation of both staff and students in order to proactively improve teaching and learning.

Student	What is your understanding of the word 'authentic'?
1	worthy of acceptance or belief as conforming to or based on fa $\overline{\mathbb{C}}$
2	pure
3	Something real
4	Not <u>copie</u> , genuine
5	Original not a copy
6	True, original
7	An aspect that involves being active or taking action

Figure 1: What is your understanding of the word 'authentic'?

When asked, 57% of students stated that they were familiar with the term 'authentic teaching', whilst 43% of students had not (Figure 2). This is surprising insofar as students are typically expected to be more interested in the content that will form part of their examinations, as opposed to the pedagogical modes of delivery. However, with rising interest in authentic assessment and teaching, and positive student perceptions including greater professional relevance and deep learning (Nyanjom, Goh, and Yang, 2020), perhaps it should not be shocking that students are taking greater interest in the teaching practices employed.



Figure 2 Have you heard of authentic teaching?

When asked for students' understanding of 'authentic teaching' (Figure 3), two students correctly identified that it is an instructional approach, but one did not attempt to explain the nature of the approach. Of the students who described their understanding, there are three mentions of truthfulness/veracity, which is consistent with the definition of 'authenticity' we have previously discussed. Two students also correctly linked authentic practices to real-world concerns, and the same student (Student 7) mentioned active participation, both of which are congruent with goals of authentic teaching as discussed in the literature review. There are three mentions of academic discussion, which again highlights student participation and greater interactivity than didactic teaching methods.

Most notably, there are two responses regarding authentic teaching topics being those of most interest to the student. Kreber et al. (2007) have argued successful authentic teaching

is that which engages students more impactfully. As such, it can be argued that student interest should be a core consideration when designing authentic teaching tasks, alongside their real-world applicability.

Student	How would you define 'authentic teaching'?
1	In education, authentic learning is an instructional approach that allows students to explore, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant to the learner
2	pure and truthful teaching
3	Academic discussions are genuine
4	instructional approach
5	Allowing students to research, discuss, and construct ideas and concepts and lets the learner work real world problems that are of interest to the student
6	something that gives space for interesting debates and conversations
7	A type of teaching that involves learning through real/active activities

Figure 3 How would you define 'authentic teaching'?

100% of the students surveyed responded that they enjoyed taking part in the authentic teaching task (Figure 4). This supports the previously discussed notion that tasks which actively engage students are viewed more positively and can, as a result, increase student motivation (Felten et al., 2013). It is recommended that in future research investigates in greater detail the reasons for this favourable response, for example through a focus group or interviews, in order to gain a deeper understanding of student motivation.



Figure 4 Did you enjoy this task?

Responses show that 86% of students thought that the task was helpful in illustrating the theory topic of the tourist gaze (Urry, 1990). Yet 14% of students stated that they felt the task did not increase their understanding (Figure 5). This was also reflected in the number of students (86%) who felt that the task facilitated their understanding of the links between

the tourist gaze (Urry, 1990) and the circle of representation (Jenkins, 2003), compared to 14% of students who felt it did not facilitate this understanding (Figure 6).

It is important to highlight that in both cases, the respondent who did not feel it was helpful was the same student (Student 3). This could highlight a lack of individual understanding or engagement with the content, or it could be indicative of a greater trend of overall task effectiveness. However, additional research would be required to see if there was a consistent, replicable percentage in both positive and negative responses.



Figure 5 Do you feel this task helped you understand the tourist gaze better?



Figure 6 Do you feel the task explained the link between the circle of representation and the tourist gaze?

When asked whether they would have known if the task was an authentic teaching task (Figure 7), less than half (42%) said they would have been able to identify it, whereas 58% of students said they would not have been able to recognise it. There is some question of hindsight bias (Roese and Vohs, 2012) given the nature of the questions in the survey, however, as we have already discussed, more than half (57%) of students stated that they were familiar with the concept of authentic teaching. As such, it is also worth considering that although students said they were aware of the practice, fewer students were able to recognise it in action. This suggests that despite familiarity with the theoretical concept, students are perhaps unable to link this with practical application.



Figure 7 Would you have known that this task was an authentic teaching task?

Lastly, 100% of students stated that they would prefer to see similar authentic teaching tasks employed in future studies (Figure 8). This is interesting insofar as, as previously highlighted, there were 14% of students who did not feel that the task was beneficial to their understanding of the theory applied. However, the response to this question indicates that despite a perceived lack of benefit to theory cognition, students still valued the task, supporting the assertion that authentic teaching can result in greater enjoyment and engagement with the course overall (Kreber et al., 2007).



Figure 8 Would you like to see more tasks like this included in future lectures?

Conclusion and Limitations

There were some limitations to the current study, primarily in terms of sample size and selection. The study participants were Level 6 students in the final semester of their university careers. Elston (2021) states that the timing of data collection can impact willingness to participate, and this was reflected by a small sample size despite numerous attempts to contact and recruit students. It was initially planned that a follow-up focus group would be conducted after the survey, however due to lack of engagement this was not possible. The challenge of engaging participants is most likely to be due to the perceived pressure of upcoming final assessments and exams, which have a strong contribution to the final degree result. It could also be the result of a value-judgement that due to students'

degrees coming to an end, the results of this study would not have impacted their learning experience and thus was not worth the effort expended.

It is also likely the students who self-selected to participate had an existing rapport with the researcher or were already engaged in their education process. As such, this could have resulted in individuals disproportionately volunteering themselves as participants leading to self-selection bias, which can result in bias within the data (Bethlehem, 2010).

Both of these limitations bring into question generalisability, reliability and consequent validity of results. However, this was designed as a small-scale case study to gain the opinions of students within a single class group, and highlight their experiences in order to make recommendations for future practice and research. So, while generalisability of results will be limited, it is hoped the findings are useful to inform further study and application.

The results showed that students had a good understanding of the term authenticity and were largely able to apply this to their understanding of authentic teaching. More than half (57%) were aware of teaching as a pedagogical practice, but fewer (42%) would have been able to recognise the activity they engaged in as authentic teaching. This indicates that there may be greater need for explanation and signposting to ensure students are more aware of the aims and activities they are participating in. Recommendations could be made to include a reflective task at the end of the assignment in order to increase recognition and bring it to a more rounded conclusion.

The majority of students also stated that they felt the authentic teaching task aided in their understanding of the course theory. However, students' enjoyment of the task was unanimous, as was their desire to see similar activities included in future lectures. Therefore, despite a small percentage (14%) of students not finding that the task deepened their understanding, students still found gratification in taking part. Thus, it can be argued that despite the learning gained, authentic teaching tasks can provide a positive impact by impacting student engagement and motivation.

However, given the small sample size and exploratory nature of the study, it is recommended that a larger study be conducted to increase reliability and generalisability of results. It is also recommended to follow up with a focus group, to gain deeper insight into student's understanding of authentic teaching and further delve into some of the reasoning behind responses.

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Appendices

Appendix 1 - Participant Questionnaire

1. What is your understanding of the word 'authentic'?

- 2. Have you heard of the term 'authentic teaching'?
 - Yes
 - No
- 3. How would you define 'authentic teaching'?

 In the module 6BUS1212 Tourism Planning, Unit 8 - The Tourist Gaze, you were given a task in groups to treat yourselves as tourists to the University of Hertfordshire and take 5-6 'tourist' photos of De Havilland Campus. These photos were then compared between the groups and against social media and marketed images.

4. Did you enjoy this task?

Yes

No

5. Did you feel this task helped you understand the tourist gaze better?

Yes

No

6. Do you feel the task explained the link between the circle of representation and the tourist gaze?

Yes

No

7. Would you have known that this task was an authentic teaching task?

Yes

No

8. Would you like to see more tasks like this included in future lectures?

Yes

No

9. Do you have any other comments or recommendations about the task?

.....

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Thank you for filling out this survey.

Identifying the barriers and solutions to developing academic literacy skills in nutrition and dietetics undergraduate students: Exploring the student perspective

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Abstract

Academic literacy, the ability to read, interpret, critically evaluate evidence and communicate understanding, forms the foundation of understanding and underpins many graduate attributes. Developing these skills are important for Nutrition and Dietetics (N&D) professionals to understand and keep up to date with current research. However, many students start higher education with limited knowledge or experience in academic literacy skills. N&D students' express anxiety about having to use these skills in assignments, and struggle to develop the necessary academic skills, represented by lower grades in academic literacy focused assignments, especially writing. This study aims to explore the N&D student experience to identify the perceived barriers and facilitators to academic literacy skills (reading, writing and critical thinking) development, to better support students in developing the necessary skills and promote an inclusive and equitable learning environment. An anonymous online survey was used. A total of 14 N&D students across all year groups participated. The majority reported that they felt capable of developing academic literacy skills. However, the common barriers to academic literacy development were difficulty understanding terminology used, research methodologies and structuring writing assignments. Students frequently reported that having more in-class activities to go through examples of academic texts and writing in detail to ensure understanding of terminology and concepts, and to showcase structure used in the discipline would be useful to help them to develop these skills. These findings may inform the design of future learning activities for N&D students and future academic literacy research and practices.

Introduction

Developing strong academic skills and behaviours are seen as key to a successful and engaging student experience, particularly in higher education (Bowles et al. 2014; Bury and Sheese 2016). The term academic literacy is often used to describe these skills and is predominantly focused on academic writing ability. However, Wingate (2018) states that academic literacy is much more than academic writing and defines academic literacy as "*the ability to communicate competently in an academic discourse community; this encompasses reading, evaluating information, as well as presenting, debating and creating knowledge through both speaking and writing.*" These skills form the foundation of learning (Jefferies et al. 2018), are vital for students to be able to communicate their understanding (Klarare et al. 2022), and underpin many higher education institution's (HEI) graduate attributes. The current literature suggests that many students start higher education courses with limited knowledge or experience in academic literacies (Jefferies et al. 2018). This means they must adapt to completely new ways of understanding, interpreting, and communicating knowledge (Lea and Street 2006), which can be a stressful experience for students (Palmer et al. 2023). Many students struggle to develop strong academic literacy skills and studies have highlighted that international students particularly struggle with achieving expectations for academic literacy and interpreting text in higher education settings where the language is not their first language (Pourfarhad et al. 2012; Kaur and Singh 2019).

The work of Lea and Street (1998) and later Wingate and Tribble (2012) have increased the understanding of academic literacy development, especially regarding an increasingly diverse student population, and led to a recognition that "writing and reading are understood as social and context-dependent practices that are influenced by factors such as power relations, the epistemologies of specific disciplines and students' identities" (Wingate and Tribble 2012). This suggests that the difficulties students have with developing academic literacy skills may be predominantly epistemological rather than linguistical and occur because of a disconnect between academic expectations of lecturers and student interpretations of what is involved in academic writing or discourse in specific disciplines (Lea and Street 1998; Wingate and Tribble 2012). Educational background, time away from education and cultural background can all impact learning and academic literacy skill development (Calvo et al. 2019).

Nutrition and dietetics professionals work in a rapidly evolving field that requires them to stay up to date with current research. The Association for Nutrition (AfN) and the British Dietetic Association (BDA) require nutrition and dietetics professionals to demonstrate a range of academic literacy skills. These include the ability to understand and evaluate relevant literature; critically appraise and synthesize evidence; and communicate research findings and recommendations to a range of audiences (Association for Nutrition, 2017; The British Dietetic Association, 2020). Therefore, it is important for nutrition and dietetics (N&D) students to develop and possess strong academic literacy skills, including the ability to read, write, and critically evaluate scientific literature to be effective in their job roles. However, it has become apparent that N&D students struggle to develop and strengthen these skills. Therefore, understanding and identifying ways to improve academic literacy skill development in N&D students is an important area of research.

Following Felten's (2013) principles of good practice in the Scholarship of Teaching and Learning (SoTL) this study aimed to inquire into student learning by exploring the perceived barriers to developing academic reading, writing and critical thinking skills among undergraduate Nutrition and Dietetics students at the University of Hertfordshire (UH). In order to understand the student perspective and inform context-specific solutions to enhance academic literacy. In particular, this study investigates: (1) student attitudes towards their ability to develop these skills (2) the perceived barriers and facilitators to developing these skills; and (3) the perceived support needed to help improve academic reading, writing and critical thinking skills of N&D students. This study focuses on academic reading, writing and critical thinking skills development, as these three skills are often shown to be linked and play a key collaborative role in developing academic literacy skills and "active, engaged and purposeful" learners (Maguire et al. 2020).

Methods

A cross-sectional online questionnaire was developed using Qualtrics[™] software. The questionnaire included open-ended questions with free text boxes and multiple-choice questions. It was developed through consultation with teaching staff on the Nutrition and Dietetics degree programme at UH, alongside reviewing the literature on barriers to developing academic literacy skills in undergraduate students. The questionnaire was promoted via an announcement on both the Nutrition and Dietetics BSc. canvas pages at the University of Hertfordshire and was open to students across all three years of each degree programme. All answers were anonymous, and participation was optional. No ethical approval was required. Frequencies and thematic analysis of the answers given for the free-text box questions using NVivo software were used.

Results

Overall, 14 students completed the survey (n=9 Dietetics students and n=5 Nutrition students). The majority of students (n=8) had an A-level or equivalent as the highest level of education completed before starting the Nutrition or Dietetics course. The participant characteristics of those who completed the questionnaire can be seen in Table 1.

Characteristic	Total Number			
Total number of participants	14			
Current course of study				
Nutrition BSc.	5			
Dietetics BSc.	9			
Current Year of study				
L4 (first year)	4			

Table 1. Participant characteristics

L5 (second year)	5			
L6 (third year)	5			
Highest level of education completed prior to starting current degree				
GCSE or equivalent	0			
A-level or equivalent	8			
Undergraduate degree	4			
Master's degree	2			
PhD	0			
First language is English				
Yes	13			
No	1			

Attitudes on Ability to Develop Academic Literacy Skills

When asked whether students felt capable of developing their academic literacy skills, the majority answered positively. All participants (n=14) felt capable of developing their academic reading skills, 13/14 participants felt capable of developing their academic writing skills and 10/14 participants felt capable of developing their critical thinking skills. However, 4 participants reported that they did not feel capable of developing critical thinking skills.

When asked about which skill they found the most difficult, the majority (n=8) perceived critical thinking as the most difficult. Academic writing was perceived by 5 participants to be the most difficult and only 1 participant found academic reading to be the most difficult. The participant that found academic reading to be the most difficult was the only participant for which English was not their first language.

Academic Reading

Barriers

The three most common barriers to developing academic reading skills were perceived to be:

- Difficulty understanding the terminology used in academic writing
- Difficulty understanding the academic writing style
- Lack of time to read academic texts

Perceptions on support received to develop academic reading skills

The most useful support received by students was perceived to be; time to do your own reading, reading for assignments and reading activities done in class.

Perceived ways to enhance academic literacy skills

Students were given free text boxes to provide what they perceived would be useful to enhance their academic reading ability, 10 participants gave suggestions. The majority of responses (60%) mentioned having more in class activities that focused on reading and summarizing academic texts.

"More tasks using academic reading in lectures/workshops."

"Workshops in class - I think we did the most helpful set of class activities in Research Methods in Year-2."

Students believed that doing these activities in class would increase opportunities to read, alongside receiving guidance from lecturers on meaning and instant feedback on whether they had understood the texts. Additionally, students thought that specifically breaking down academic texts, to better understand style and terminology used as part of these inclass activities would be most beneficial to help them to develop their academic reading skills.

"Time in lectures to read and then discuss/ go over and summarise the reading. So we know what it is actually saying and we know whether we understood it or not."

"More activities in class and breaking down papers or academic style writing to help with reading."

"More classes on dismantling research papers and articles and interpreting them (p values and stuff). This can help students familiarise with frequently used scientific terminology which can help their academic reading."

"Potentially terminology quizzes/ definitions at the beginning or end of lectures."

Students felt that academic reading support provided earlier on in the course would also be beneficial.

"I felt that the sessions on reading and deciphering scientific papers came too late in semester A of year 2, as we had already completed assignments which needed evidence from the literature."

"Going through academic texts we have read in class earlier in the course, so we know what to look out for in the articles we read to use in assignments and writing. I feel as though this didn't really happen in first year."

Academic writing

Barriers

The three most common barriers to developing academic writing skills were perceived to be:

- Difficulty understanding the terminology used
- Unsure of how to structure academic writing assignments
- Lack of opportunities to practice academic writing before assignments

Perceptions on support received to develop academic writing skills

Reviewing example answers questions during revisions periods and formative assignments to practise writing were perceived to be useful in improving academic writing.

Perceived ways to enhance academic literacy skills

Students were given free text boxes to provide what they perceived would be useful to enhance their academic writing ability, 12 participants gave suggestions. The majority of responses (67%) mentioned having more chances to practice academic writing in class.

"Structured writing activities in sessions, potentially around assignment..."

"Workshops in class that demonstrate ideal writing structure."

"More writing exercises in class."

"...some more writing opportunities, that are not marked or can be done in class."

"More chances to read and write in class or with guidance from examples/ lecturers."

Specifically, students thought that more examples of how to write in an academic style and structure an academic text would be useful as part of the in-class writing activities.

"Making this part of the course, a specific module or more focus on this throughout. Going through papers and looking at writing styles and how to word things. More chances to practice writing" "....some good examples of writing and going through these to explain what is good/bad about the writing style. The academic writing style isn't very well explained."

"some more understanding of how to structure and write research type work. The wording and how to make it more clear."

Students also felt that more feedback on written work would help them to develop their academic writing skills.

"I think small writing activities would be useful and then getting feedback on them would help me to understand if what I am doing is right."

"Getting specific feedback on what is good or bad and why"

"Good feedback on completed assignments."

Critical thinking

Barriers

The three most common barriers to developing critical thinking skills were perceived to be:

- Difficulty understanding the terminology used
- Difficulty understanding the strengths and weaknesses of types of evidence and methodologies in research
- Unsure of how to structure critical appraisals and arguments

Perceptions on support received to develop critical thinking skills

The recommended reading provided for individual modules were perceived to be useful to help students improve their critical thinking skills.

Perceived ways to enhance critical thinking skills

Students were given free text boxes to provide what they perceived would be useful to enhance their critical thinking skills, 12 students gave suggestions. The majority of responses (67%) mentioned having more examples of how critical thinking is used in academic writing to work through in class, to learn how to structure an argument.

"More example papers and research interpretations in class to get used to critical thinking"

"More in class workshops and experiences like the Research Methods viva in year-2."

"More in class activities to know whether we are doing it right. Giving more examples of how you would do this, what are good examples in the papers or the reading. So letting us practice this type of thinking and writing more."

"More practice because the Critical Appraisal we carried out in Year-3 was almost the first example of this in an assessment."

"Some more examples of how to write your argument, the structure to follow"

Being able to understand the different types of methodologies used in the research and the strengths and weaknesses of these were also mentioned by 58% of respondents as ways that could help them to enhance critical thinking skills.

"Potentially workshops that require critical thinking to determine benefits and limitations of taught ideologies"

"Workshops on critical analysis and how different research methods affect credibility/quality"

"Understanding how you criticize something using evidence. Also knowing which evidence to use and what is good or bad about it."

Students believed that having more information on where to find information to enable them to construct evidence-based arguments would also help them to develop their critical thinking skills.

"Key trusted sources as it feels like I've wasted so much time reading endless reports when I could spend time focusing on my writing skills and reasoning skills."

"How to present and form an argument, like knowing what to read to be able to include to back up the argument. Also, how to summarise evidence in a way that makes sense."

"Sometimes it's hard to know which papers to use to make recommendations or weigh up evidence."

"More information on what level of detail about the study to include and what evidence to include for critical appraisal."

Discussion

This study explored the perspectives of undergraduate Nutrition and Dietetic (N&D) students on barriers and enablers to academic literacy skill development. The academic literacy skills explored in this study were academic reading, academic writing, and critical thinking. The findings suggest that overall, most students perceived that they are capable of developing these skills and have had the opportunity to develop them. However, the

findings also highlight that students face barriers to developing these skills. Across all three skills, the most common barrier reported was difficulty understanding the terminology used. Additionally, students also perceived that not understanding key concepts such as the strength and weakness of types of evidence or research methodologies, and how to structure academic writing assignments were also barriers to developing academic literacy skills. Overall, there were no differences between nutrition and dietetic students or level of previous education, in barriers faced. Regarding what students thought would help them to develop these skills, the opportunity to practice each of these skills in class, with guidance from teaching staff was the most frequent answer given.

For the majority of students who took part in this study, the highest level of education that they had achieved prior to starting the Nutrition or Dietetics course was A-level or equivalent. Studies have shown that students who come straight from A-level or equivalent usually have limited knowledge and experiences in academic literacy skills (Roald et al. 2020) which could explain the barriers highlighted in this study. However, even those that had completed a previous undergraduate or postgraduate degree still experienced the same barriers. This may be a result of the different writing styles, experiences, and academic literacy skills both between and within disciplines (Becher and Trowler 2001). This also highlights the importance of including discipline specific academic literacies in course curriculums, rather than implementing a general study skills model that can be applied to all contexts, as these general skills are not always transferable, as highlighted by the research of Lea and Street (1998).

Difficulty understanding the terminology used was perceived by N&D undergraduate students to be the most common barrier to developing all three of the academic skills explored in this study. Like most disciplines, N&D has subject-specific terms that are important to understand to be able to fully engage in the discipline. In the N&D discipline understanding discipline specific terminology, common research methodologies used and the strength and weakness of these would be considered threshold concepts (Meyer and Land, 2005). The understanding of which is key to transforming the way students understand the subject, allowing them to move on in their learning (Meyer and Land 2005).

Not understanding key terms and language used may also be linked to other perceived barriers to academic writing and critical thinking, such as not understanding research methodologies and strengths and weaknesses of types of evidence, and difficulty structuring academic writing assignments and arguments. Language and conceptual understanding are intertwined (Wellington and Osborne 2001) and understanding discipline-specific terminology helps to better understand discipline-specific concepts (Fang 2005; Zukswert et al. 2019). Finding solutions to this is another aspect explored in this study, and participants provided suggestions for what they perceived would be helpful.

Overall, students perceived that more assistance in understanding the fundamental skills and concepts in N&D would improve their academic skill development. A framework that

may be useful to help students is one that puts an emphasis on accessibility to discipline specific knowledge. Gimenez and Thomas (2020) provide a framework for usable pedagogy for academic literacy development which aims to address accessibility, criticality and visibility within educational practices and academia. The framework puts an emphasis on accessibility, with language development and analytical tools as the foundation of academic literacy development (Gimenez and Thomas 2020).

However, providing excessive assistance to students, especially in higher education, has been criticized in the literature as "spoon-feeding" which stifles independent learning and deeper thinking (Dehler and Welsh 2014). Both of which are important aspects of higher education and academic literacy skill development. Research has illustrated that transparency is not spoon-feeding and instead helps with a transformative approach to learning in higher education, which can improve accessibility (Jönsson et al. 2018). Therefore, using learning activities which help students to understand key terms and empower them to use them appropriately may be a beneficial way of incorporating terminology learning into course structure, without "spoon-feeding". The flipped classroom is an approach suggested in the literature that may help with troublesome knowledge within disciplines, without excessive assistance (Olaniyi 2020). Although, there is a need for a variety of teaching approaches to support a diverse group of learners (Awang-Hashim et al. 2019; Sanger 2020).

Students also perceived that being able to practice more reading, writing and critical thinking tasks in-class, with guidance, would enable them to know whether they had understood language and key concepts. Increased experience with concepts leads to a deeper understanding of associated language, vital for supporting academic literacy and learning (Salamonson et al. 2010; McKay and Devlin 2014).

In-class activities offer lecturers opportunities to clarify students' understanding of terminology and key concepts (Olaniyi 2020). Practicing using terminology and concepts in a low-stakes environment (classroom rather than in assignments) has been shown to improve student confidence, by solidifying knowledge and providing immediate feedback on challenging concepts and understanding (Rausch and Mckenna 2009; Schrank 2016). Providing individual feedback can be a time-consuming process for lecturers, especially when there are vast amounts of content to cover in-class. However, research has shown that writing tasks in class can be quick and informal, and do not need to be graded or be followed by individual feedback in order for students to benefit (Drabick et al. 2007). A short group discussion after each task has been shown to be beneficial by providing important feedback and clarifying misperceptions (Drabick et al. 2007; Elton 2010). Additionally, this type of activity may help staff to identify bottlenecks in understanding, where knowledge may have been assumed, and be able to clarify understanding as they work through examples (Elton 2010; Schrank 2016).

An interesting finding of this study was that academic reading was perceived to be the most difficult academic skill by only one participant, the only participant for which English was not their first language. However, this was based on one participant's answer and further research is needed to fully understand the barriers faced by N&D students at UH whose first language is not English, to create an inclusive learning environment.

Limitations of this study

The main limitation of this study was the small sample size. Additionally, for the majority of participants English was their first language, hence it is difficult to generalise these findings. It is also important to note that students who completed the survey may have more of an interest in developing their academic literacy skills than those who did not take part. Having a larger study sample, which better represents the diversity of the N&D undergraduate courses would provide more insight into the barriers faced, and support needed for all students. Furthermore, understanding the perspective of the academic teaching staff would provide further insight into the barriers and facilitators to developing academic literacy skills on the N&D course at UH.

It should also be recognised that digital literacy plays a key role in modern higher education (Nikou and Aavakare 2021) and is an area that was not explored fully in this study. The ability to access digital content plays a key role in student learning and digital skills have been shown to have a positive impact on academic achievement (Pagani et al. 2016; Ma and Nie 2022). Further exploration into how digital literacy impacts the development of academic literacy skills could provide insight into how best to support all students.

Conclusion

Overall, this study has identified several common barriers to developing academic literacy skills in Nutrition and Dietetics undergraduate students. These findings suggest that understanding discipline-specific language used in N&D could enable students to form a deeper understanding of the course material and enhance development of all three academic literacy skills explored in this study. Therefore, this should be considered when developing learning activities for N&D students. Further study into the perspectives of academic teaching staff within N&D could provide insight into academic literacy models that could provide useful frameworks for developing these skills in the N&D courses. This study also highlights the need for further investigation into the barriers faced by students for which English is not their first language, in developing these academic literacy skills. Alongside further study into a more representative population of students. Learning is a multifactorial process and there are most likely variations in perceptions and experiences in the N&D, and wider undergraduate population, that have not been captured by this study.

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The effect of language on science teaching: a review of pedagogical approaches to enhance science literacy.

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Abstract

Language plays an important role in the teaching of science concepts. Not only is there a significant "load" of new technical jargon but there is also a repurposing of everyday language. This represents a potential barrier to learning for students of all backgrounds however there is the potential for a disproportionately negative impact on those students who have English as a second language or who are unfamiliar with the use of "professional language" which is closely associated with middle class culture.

This article aims to identify effective pedagogical strategies or mechanisms with which to improve the teaching of scientific language to students on an undergraduate radiography course. The literature review will aim to recommend techniques to be implemented and suggest further study of said techniques to evaluate their efficacy and contribute to the literature.

Introduction

"The limits of my language mean the limits of my world." (Ludwig Wittgenstein)

The topic for this article was selected after considering the anecdotal experiences of students on the 1st Year Radiography program at the University of Hertfordshire. The radiography program covers several different scientific disciplines, similar to other vocations allied to medicine, including physics, anatomy, physiology etc. This review of literature intends to highlight the role language plays in the teaching of science, the aim being to highlight pedagogical approaches to influence course design and content to generate the best outcomes for a diverse cohort of students; with international students, students with English as a second language and students from traditional areas of socio-economic deprivation. This loosely fits with the decoding methodology (Pace, 2017), to improve students' experience of studying while on the program and establish expert knowledge in graduates; technical language and the repurposing of everyday language should be considered the tacit knowledge required to access the discipline in this example.

A proper understanding and appreciation of science requires the ability to converse fluently not only with the ideas but also with the scientific community (Norris and Phillips, 2003). Conversely the inability to fully converse using scientific language is a significant barrier to learning science (Feez & Quinn, 2017). Therefore, the ability of learners to access knowledge is contingent on their possession of the appropriate language skills (Patterson Williams, 2020). It has been observed that there is similarity between the learning of science and that of a new language given the significant quantity of new vocabulary generated by technical jargon (Rosenthal, 1996; Lee, 2021). This is equally true for students upon leaving education and entering the workplace.

Conversely, the learning of language can be considered as learning new ways to express familiar knowledge whereas the learning of novel science language often takes place at the same time as learning new facts and/or concepts (Brown & Ryoo, 2008). This highlights the additional burden many students experience when studying in science disciplines. This is compounded in the context of learners who have English as an additional language.

Background

Many of the studies reviewed in this article relied on a Hallidayan view of learning; that learning any discipline is inherently relatable to learning language which is the primary semiotic process within humans. In his work, 'Towards a language-based theory of Learning' (1993), Halliday highlights the different modes of language that are developed or necessitated by the need for learners to engage in direct experiential grammar during speech and abstracted metaphorical grammar when engaging in written form (Halliday, 1993). In fact, specialised technical language, which was initially developed by the physical sciences, has become a mainstay within professional disciplines throughout everyday life. This highlights a problem area for further consideration; those who already have competency with language in this form have a head start.

There is wide discussion around the language barriers presented to those learners who have less exposure to 'the synaptic mode of the elaborated written grammar' (Halliday, 1993). It is arguable that those learners who have experience of this mode of language in another dialect are at greater advantage than those learners of the same dialect without. This is to be expected to some degree given that scientific language not only includes new jargon but also new ways of applying everyday vernacular (Williams, 1999).

Teacher's Disciplinary literacy

Despite the well identified difficulties language poses to science learning (Snow, 2010; Markic and Childs, 2016), there is little literature on the pedagogical approaches of science teachers to teach scientific language (Monch and Markic, 2022). Teacher's knowledge can be divided into three categories, content knowledge, pedagogical knowledge and pedagogical content knowledge (PCK) (Shulman, 1987). This emphasises a requirement of integrating established pedagogies and the teachers expert subject knowledge.

Freebody et al (2008) note that disciplinary knowledge is a relationship between the curricula content and the language of that content. Galguera (2011) describes this using the terminology introduced by Shulman (1987) by suggesting that as part of PCK teachers establish a pedagogical language knowledge (PLK). Bunch (2013) asserts that this PLK is

separate to PCK of language teachers and is specific to each discipline. Markic (2017) phrases this as pedagogical scientific language knowledge (PSLK) in their own context of Chemistry but indicates the wider application across all science disciplines. This development of PSLK is of vital importance if there is to be meaningful progress in science education. This is an area of reading that will be disseminated to teaching staff on the author's module irrespective of any pedagogical strategies identified later in this study.

The experience of science learners

It has been identified in a number of studies that student learning is improved when it takes place in a culturally and linguistically relevant context (Stoddart & Mosqueda, 2015). This emphasises the sociocultural component of language and learning and the need for content to be well considered to maximise positive outcomes and reduce the negative effects manifested due to historic neglect of this consideration.

Brown and Ryoo (2008), through a thought experiment suggest that unless there is a shared cultural understanding of the subject being discussed, then regardless of whether the language used is vernacular or technical, there will always be difficulty in communicating. This suggests a significant cultural component to all learning and agrees with a number of studies which highlight the need to consider the background of students when tailoring content (Kim, 2002). In Kim's article they discussed the very different cultural attitudes towards talking and the link to thinking. In the west it is almost axiomatic to suggest that discussion is a key component to learning yet this may be causing disengagement for students from an Asian cultural background (Kim, 2002). This highlights the need to be cognisant of students who do not engage in the ways we expect or prefer.

Further to this, another study asserts that the process of acquiring disciplinary literacy in science can produce negative emotions in learners (Patterson Williams, 2020). Halliday and Martin (1994) argued that students can be alienated by scientific language. Gee (2004) argued that students are required to leave their 'lifeworld'. The degree to which this is alienating is determined by the familiarity with the scientific academic language which has a greater association to middle-class cultural values (Gee, 2004). This resonates with work done applying Bordeau's concept of cultural capital to the field of science education; It has been argued that the "habitus of students from the dominant cultural elite...have a privileged access to the institutionalized capital that school sciences offer" (Claussen and Osbourne, 2012:60).

Referencing Brown (2011), Patterson Williams (2020) argues that due to the inextricable connection between language and identity, students adopting new language are enacting an identity. Therefore, in requiring those students to take on a new language we are requiring them to give up part of their identity even momentarily (Patterson Williams, 2020). Patterson Williams (2020) goes on to ask the question of whether educators have the right to ask this of students. Understandably the author provides no answer to this rhetorical
question however this has greater importance than a philosophical curiosity. A negative would require a complete change in educational practice and would have long-term significance for the use of scientific language throughout professional life.

Taibu & Ferrari-Bridgers (2020) found that a relatively large proportion of physics students experienced anxiety specifically relating to the terms used. While this study did not find anxiety to be proportional to student performance there was some correlation between anxiety and negative test results. Previous studies have shown a varied relationship between anxiety and performance, despite this it is reasonable to conclude that the use of jargon negatively affects the experience of learners irrespective of their ultimate achievement. Interestingly, and in opposition to widely held opinions, this study found no correlation in the anxiety felt between native and non-native English speakers; this could be due to a lack of anonymity in the data collection method allowing students to be influenced by the fear of negative perception. Nevertheless, it is evident that the anxiety experienced by physics students and, in all likelihood, science students in general is not uniquely an issue of non-native English speakers.

Deficit to asset focus

This tension between the need for a disciplinary literacy and the cultural cost to non-middleclass and non-native English speakers is highlighted in Msimanga et al's (2017) review of the pedagogical role of language in science learning in South Africa. While the context is not a direct comparison the principles have external validity. The dichotomy they found was between the potential for the use of home languages as a resource for engaging with science concepts, and the need for learners to engage with the preferred language of teaching and learning, namely English.

There is a changing mentality within STEM subjects away from a traditional deficit-oriented mindset (Lee and Stephens, 2020). In their article, Lee (2021) commented that the traditional deficit orientated view, that students from racial or linguistic minorities lack something and that this situation requires fixing, embodies a marginalising pedagogy. In opposition to this, in the current model of teaching learners with multiple languages look to view the home language as an asset in the semiotic process. This introduces the concept of translanguaging. It should be noted that Lee's article is a piece of supposition drawing inspiration from contemporary literature and should therefore only be used to direct future study.

It has been suggested that in order to establish understanding and interaction with scientific concepts students need to relate abstracted subject content with their everyday knowledge and experience (Wallace, 2004). Translanguaging makes use of the process of making meaning, rather than viewing language as a static thing it becomes a dynamic process (Conteh, 2018). In reference to the Hallidayan theory of learning, translanguaging makes use

of the semiotic process that has already taken place in the student's home language to access new knowledge (Halliday, 1993).

Methodology

Aim

This literature review aims to identify pedagogical approaches to teaching scientific language to influence course design and content to generate the best outcomes for a diverse cohort of students.

Method

A literature search was carried out to identify pedagogical approaches to teaching scientific language and examine their impact on student experience within education. A literature review is useful for identifying areas for further research or to give an overview of current knowledge or theory (Snyder, 2019). In this instance the literature review will use an integrative approach due to the range of sources and disciplines.

Search strategy

The University of Hertfordshire online library was searched to generate data. The following search terms were used: (pedagogy) AND/OR (teaching) AND (science) AND (language) AND (higher education). Terms were required to be present in the title or abstract. The search term for higher education (HE) was subsequently removed due to an insufficient number of relevant results. Some of the articles included discuss the topic in the context of secondary education, this is due to the relative paucity of articles set in the higher education environment; this highlights the need for further contribution on this subject.

Texts had to discuss pedagogies relating to language and the teaching of science to be included; texts discussing the science of teaching language were not included. Sources older than 15 years old were excluded in order to obtain a cross-section of current practice.

A total of 451 titles were reviewed, 53 abstracts were reviewed. 6 articles were found with a practical pedagogical approach. While there were more articles which dealt with pedagogical values these were excluded based on the inability to carry these forward for further implementation.

Data collection

Sources were reviewed using a narrative approach to identify the themes and key findings. Limitations and wider application are dealt with in the discussion.

Ethical statement

Ethical approval was not required. No new data was generated, and no personal data was included.

Results

Author	Title	Aim	Finding		
Brown and Ryoo (2008)	Teaching Science as a Language: A "Content-First" Approach to Science Teaching	Investigate the effect of separating the conceptual and linguistic components of science instruction	Improved understanding shown in test group		
Feez and Quinn (2017)	Teaching the distinctive language of science: An integrated and scaffolded approach for pre-service teachers	Model a scaffolded, enquiry-based pedagogy to pre- service teachers	Pre-service teacher students demonstrated high levels of student satisfaction		
Wiggins et al, (2020)	Less Text, More Learning: A Modest Instructional Strategy That Supports Language- Learning Science Students	To explore the effect of reduced linguistic complexity in teaching science to English language learners	International students completing the low-complexity worksheet demonstrated better outcomes		

Ariely et al., (2019)	Analyzing the Language of an Adapted Primary Literature Article: Towards a Disciplinary Approach of Science Teaching Using Texts	To analyse the features of an adapted primary literature article for use as a tool for promoting disciplinary literacy in students	The complexity of language was reduced without compromising the integrity of the scientific writing	
Karlson et al., (2019)	Multilingual students' use of translanguaging in science classrooms	To investigate whether a translanguaging classroom benefits learning	Students' ability to use first and second languages is an important resource which helps develop a deeper understanding	
Licona & Kelly. <i>,</i> (2020)	Translanguaging in a middle school science classroom: constructing scientific arguments in English and Spanish	Teacher translanguaging was examined for pedagogical opportunities to support scientific argumentation	The creation of a third-space was of the highest importance in the teacher supporting scientific argumentation	
Felton et al., (2022)	Scientific argumentation and responsive teaching: Using dialog to teach science in three middle-school classrooms	Observe the dynamic change in a teacher's pedagogical approach to achieve their lesson goals	This study highlights the benefits of dialogic teaching for engaging in authentic learning	

Discussion

In their article, Brown and Ryoo (2008) tested whether there was an improvement in absorption and retention if scientific concepts were introduced initially in plain English prior to the students learning the discipline specific terminology. The findings of this study showed that students taught with a concept centred approach showed significantly improved understanding in contrast to students taught in the normal style. The study further showed that those students who were taught concept first showed greater command of scientific language after (Brown & Ryoo, 2008). This is likely due to the reduced cognitive load students experience at the introduction of novel content. The potential for further application of these findings appears considerable however it should be noted that these findings, while statistically significant, were generated from a small sample size and therefore have reduced predictive value outside of their immediate context.

Additionally, the authors acknowledge that they were unable to account for individual ability among students in either test group therefore it is plausible that the content first cohort were more able language users/learners prior to this study. In any case it is obvious that there are grounds for investigation into this pedagogical change and may provide the basis for future primary research. Lastly, this research was carried out in the setting of secondary education; although it's wider application to a higher education context may be limited, there is clear utility when considering access courses or at level 4 when there is a broad range of entry backgrounds.

In a similar study Feez and Quinn (2017), developed a scaffolded pedagogy aimed at improving scientific literacy in Australian schools; the pedagogy combines the 5 Es: Engage, Explore, Explain, Extend and Evaluate into a teaching and learning model with controlled/structured introduction of the technical terms and language in a staggered approach over the learning session. This was an active learning activity delivered to university students training to become primary and secondary teachers. The results reported 'high levels of satisfaction' with improvement on scores from student feedback from previous years however there was no reference to what previous levels of satisfaction were scored. It is unclear if this is a statistically significant finding however the study highlights the potential for novel pedagogical approaches/mechanisms to improve student satisfaction with the learning process.

Wiggins et al.'s (2021) study tested whether reducing the lexical density of written instruction on a worksheet would have a positive effect on the learning of science students from an international background. The study was pitched at undergraduate level utilising a large cohort of 761 students increasing generalisability and external validity. The outcomes of this study showed statistically significant improved knowledge and retention in international students who completed the low complexity worksheet compared to the control group. This study is limited in that there was no differentiation between international students and students with English as a second language, this conflation allows for the inclusion of international students with English as a first language to skew results however there is a clear trend that international students were disproportionally benefitted by the low complexity worksheet. This is a useful finding for those courses with a large cohort of international students and offers opportunity for course re-design to improve learning outcomes. This has application in the author's context where a large minority of the course are international applicants; in this instance, a review of asynchronous study material is the obvious first change however there is opportunity for further application in lectures and course or module notifications.

Ariely et al's paper analysed the language used in an adapted piece of primary literature APL, which was adapted for high school students to read, and found there was a reduction in lexical complexity while retaining the authenticity of scientific writing (Ariely et al., 2019). The authors suggested this could be used as introductory material to the subject for learners promoting their awareness of scientific language and scientific thinking. This study makes an interesting case for using adapted literature as a bridging tool between students' level of science literacy and expert content however it also highlights the potential for reducing the lexical complexity for scientific writing across a wide range of materials including within the teaching environment. Ariely et al used a case study of three articles reducing generalisability. Their methodology required sampling of the data from each article therefore it is possible some incidences of lost meaning were not accounted for. Despite this there is clear justification for further study and a cautious application of principle; a study of the effect of the APL on students understanding and retention would be of considerable benefit.

Karlson et al., (2019) carried out an observational study to assess middle year students use of first and second languages in a science classroom. The study required videographic documentation of interactions and translation to allow researchers to follow the discourse; no participants were directly involved in the observation process to reduce interobserver variance however this does remove the learner's perspective from the study. This method does inherently increase the opportunity for error due to the number of processes being applied however while the recording process introduces its own affect it also permits review for multiple observers over multiple instances and can prevent missed observation. The authors argue their findings clearly indicate that the use of first and second language is an important resource for creating semantic relationships between subject specific words and everyday vocabulary leading to a deeper understanding of the subject. Whilst the students involved made use of their first or second languages to assign meaning no measure of learning was made or control used to quantify the benefit of this pedagogical approach.

Lincona and Kelly's (2020) observational study, like Karlson et al (2019) used video recordings and transcriptions to review teacher student interactions within the science classroom. In this instance the purpose of the study changed over time to observe the teachers use of translanguaging as a pedagogical tool. Both authors are bilingual in English and Spanish removing the need for an external translator and reducing the opportunity for error. The authors note that while translanguaging was employed for multiple purposes it was most important when framing epistemic practices such as constructing scientific explanations. It is clear from this study that there is great utility in using translanguaging where the teacher has a shared language with the class however it is uncertain how significant this effect is as there was no comparison with a control or quantification of outcomes. It would have interesting to poll the student participants to discover whether they felt the use of translanguaging helped their understanding of the subject. While there are limited opportunities to utilise translanguaging from the teachers position there is clear potential for high achieving students to act as mentors for their colleagues.

Felton et al (2022) used a grounded theory approach in their observational study with the initial goal of exploring patterns of discussion in an experienced science teacher's classroom. The study observed the teacher using question and response to move between guiding, facilitating and coaching their students to make use of the learning opportunities that developed over time. The results support the assertion that a dialogic stance and shifting pedagogical approaches can help generate unique and authentic learning opportunities. The study however is rooted in the practice of a single experience teacher meaning the results are not widely generalisable. Additionally, it is not self-evident that what was observed provided better outcomes than a more structured approach to the same lesson; the results are a description of the interactions without any measure or learning or learner experience.

Conclusion and Recommendations

The teaching of science is inextricably linked to the teaching of scientific language, both the in unique terminology and in the manner of using everyday language. It is also true that there is the potential for a disproportionately negative impact for students who have English as a second language or who are unfamiliar with academic writing. This is no less true at the HE level than in compulsory education however there is a clear deficit of literature pertaining to the HE context. Several of the pedagogies discussed in this article were set in the context of secondary education. Despite this there is some external validity to the concepts identified.

The following conclusions have been identified from the sources discussed:

- There is potential for introducing science concepts using everyday language prior to learning the technical jargon as part on an undergraduate program of study. The author intends to test this in their module, providing teaching staff with exemplar resources and a clearly disseminated strategy and then reviewing participant feedback in addition to measurable outcomes to confirm or refute its applicability.
- 2. There is an opportunity to develop scaffolded learning activities in small group sessions in which terminology is introduced in a staggered manner, this may be impinged by staff and room availability and a flexible approach to applying the measure will be necessary.
- 3. There is a clear justification for reducing lexical density across worksheets and resources provided on the undergraduate radiography program (Ariely et al, (2019); Wiggins et al, 2020).

- 4. While there is no opportunity for translanguaging in the lecture environment, there may be opportunity for identifying teachers' second languages as a resource for those students who are struggling with meaning making. This may also be applicable as peer support with students at higher levels of study assuming proper permissions are obtained.
- 5. There is limited opportunity for a dialogic approach in the traditional lecture environment, despite this a flexible approach to teaching in face-to-face sessions may generate positive learning outcomes. Due to this being highly dependent on individual experience this is unlikely to be a useful pedagogy to test in this authors context.

For points 1-3 there is a clear pathway for further study which the author intends to explore going forward. As alluded to previously, this literature review has been an attempt to highlight bottle necks and identify strategies to overcome them. Further progression on the decoding framework will be required when these strategies have been implemented.

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Promoting a sense of belonging in university students

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Abstract

In higher education, students' having a sense of belonging has been shown to correlate with social fulfilment, well-being, cognitive agility, and academic success. Sense of belonging includes feeling cared about, valued, respected, welcome, and safe to be oneself. This paper is a critical exploration of sense of belonging and some approaches to fostering it. Concepts and models, which include Multicontext, Pedagogical Partnership and decolonising the curriculum, are examined. This study concludes that to promote sense of belonging, a multifaceted approach must be taken, which includes fully informed, sensitive, and appropriate design of learning and social spaces; positive, in-class, teacher behaviours and inclusive pedagogies; and a range of out-of-class social opportunities both with peers and teachers.

Introduction

One of the most important elements for students' quality of life and academic success in higher education is having a sense of belonging socially and academically at the institution. MacGregor (2022) notes that in 2022 there were over 200 million students enrolled at over 90,000 higher education institutions worldwide. She estimates this to be over one-third of the segment of the global population which is at average university age. Success at this stage of education is crucial not only to individuals but, given this figure, to humanity at large as well. The university experience is a process of transformation different in each individual, the quality and effect of which varies widely across the world as the understanding and application of how to guide this transformation also varies considerably given the different educational approaches from country to country and the cultures in which they exist. This paper critically explores some of the current thinking on student sense of belonging in higher education: what it is, why it is important, and how to promote it. In the out-of-classroom context, it explores the physical environment, student networks, orientation programs and teacher influence. In the in-class environment, it explores Mulitcontext and Pedagogical Partnership models and decolonising the curriculum. A range of recommendations are made.

What is sense of belonging?

The need to belong is so basic that in Mazlow's Hierarchy of Needs (Appendix 4), it comes directly after safety is established, which comes right after physiological needs such as food and water are satisfied (Maslow, 1943). Baumeister and Leary (1995) hypothesise that humans may have a genetic need for belonging. Stacey concurs with this in his theory of

Complex Responsive Processes of Relating (2001). It posits that interacting is the means through which the illusion of mind is created: '*The feeling we have of a mind inside us is ... an illusion Individual minds/selves ... emerge in relationships between people rather than arising [independently] within an individual' ... (2001:69).* Thus, the impulse for human engagement with one another and of belonging has been the drive behind the survival and advance of civilisation.

Before 1997, academic literature focusing specifically on 'sense of belonging' in higher education was rare (Baumeister and Leary, 1995 in Gopalan and Brady, 2020:134). In 2010, Tovar and Simon noted that the study of the sense of belonging was still in its early stages. Strayhorn (2018:4) offers a definition of it: 'the experience of mattering or feeling cared about, ... valued by, and important to the campus community or [to] others on campus such as faculty, staff, and peers.' Gao and Liu (2021:1012) also include feeling 'welcome, safe, ... [and] comfortable ... [and] free to remain authentic to ... [one's] culture, ... [and that] needs [are] catered for.' Additionally, when students feel that they and the university share the same values, students also feel more committed to it (Tinto, 1993 in Gao and Liu, 2021): thus, 'the need for frequent and ongoing relational interactions to feel ... [oneself] a part of something greater' (Baumeister and Leary, 1995 in Tovar and Simon, 2010:201) in both institution and friends (France et al., 2010 in Tovar and Simon, 2010:201).

Why is sense of belonging important?

The feeling of belonging helps one feel more emotionally balanced and confident (Pittman and Richmond, 2007 in Ahn and Davis, 2020). This helps students feel more valid in their own ideas and in their reactions to the ideas presented to them. Feeling confident can lead to their being more able to ask for guidance, possibly taking steps earlier in their studies to find out about the types of support offered at university (Strayhorn, 2018; Gopalan and Brady, 2020; Kirby and Thomas, 2022) such as asking for help with study skills or accommodation or simply asking lecturers or other staff for further or more clear information. This can help alleviate stress or academic difficulties or avert mental health issues later on (Gopalan and Brady, 2020). All of this helps students achieve more success and find more enjoyment at university (Pedler, et al., 2022; Gao and Liu, 2021), which are crucial boosts to well-being (Brunsting et al., 2021). This all increases students' desire to stay enrolled and complete their degrees, thus overall increasing their and the university's academic success, which is the primary goal of both in this relationship (Ahn and Davis, 2020; Gao and Liu, 2021).

A list of graduate attributes across the higher education sector in 2023 typically includes, but is not limited to, 'professional integrity, ... team working, ... problem solving, ... creativity, ... self-management, ... intellectual rigour, ... innovative thinking, ... [and] empathy' (HBS, 2023). The high significance of the social elements in most of these is obvious; thus, for these to be learned, maintained, and internalised, academic engagement alone is not enough. Students need to feel a sense of social belonging in order to find meaningful, personal expression of these attributes.

Being socially recognised and then accepted are steps in cultivating positive relations and making friends (Freeman et al., 2007 in Ahn and Davis, 2020). Students remark that finding friends who are compatible is one of their first and most important goals when they enter university (Wilcox et al., 2005 in Ahn and Davis 2020). This is the foundation of their social support system, which is essential to having a positive sense of belonging. Conversely, an absence of this can lower one's self-esteem (Hagerty et al., 2002 in Gao and Liu, 2021), and can lead to difficulties performing the academic work (Strayhorn, 2018) which correlates with increased attrition rates (O'Keeffe, 2013 in Gao and Liu, 2021).

Self-esteem, in addition, is seen as a prerequisite for being compassionate and caring for others during the learning process, which has been found to be a catalyst for even deeper learning to occur (Gilbert et al., 2018). Thus, self-esteem is a significant factor in the whole university experience and is a large part of one's sense of belonging. Positive relationships with teachers and other students help foster self-esteem (Van Osch et al., 2018 in Fatima et al., 2020) through 1) feeling adept; 2) seeing how others succeed; 3) being encouraged by others; and 4) one's own positive feelings, emotions, and physical state (Bandura, 2012). These are all cause and result of sense of belonging.

Fostering a sense of belonging

Out-of-classroom support

The physical environment

One of the sense-of-belonging domains which Ahn and Davis (2020) identify is 'surroundings', which includes the buildings, spaces, accommodation, and cultural environment of the university. Designers of all indoor and outdoor spaces on campuses should be guided by this question: What do students need, physically, operationally, culturally, and psychologically? The answers to these questions should be the lens through which all other design and use considerations are taken into account. For instance, students need to connect with other students and with teachers in an adaptable learning context; hence, avoid building large lecture spaces with fixed desks. Instead, equip appropriately sized classrooms with versatile furniture that can be moved to accommodate a range of configurations that help promote students' social and cognitive mobility while learning together (Absi et al., 2018). However, pressures to accommodate larger student cohorts have pushed many universities in the opposite direction.

Student clubs, networks and organisations

Student participation in leadership programs or campus organisations leads to greater student social mobility and enhances sense of belonging (Glass and Gesing, 2018). Given this, campus societies and clubs should be largely under the direction and control of students, not created and dictated from above. Students should be provided with the physical space and all necessary administrative assistance, platforms, furniture, expertise, and funding to organise their own clubs, networks and organisations. For instance, at the University of Hertfordshire, the wide range of such student-created and administered networks include: Black students' network, Mature students' network, Student parents network, Women's network, Artists society, Chess society, DJ society, Fashion society, First love society, Hindu society, Islamic society, Jamming society, Podcast society, Poker society, Salsa society, and Taekwondo society (UH, 2023)

Orientation programs and ceremonies

Students feeling that they matter and that their teachers and the institution care about them personally is paramount in fostering a sense of belonging (Strayhorn, 2018; Gao and Liu, 2021). This is especially true of first-year students. For many, entering a large and busy institution which will have significant control over their lives can feel intimidating. This can be especially daunting before they have made any friends there. Resources need to be focused particularly in the first year 'front-loading ... institutional action' to welcome and orientate students and help them know their environment and the range of help available and to help them feel that they belong before feelings of being lost or alone have a chance to materialise. The first semester and first year is when many students are more prone to leaving (Tinto, 1988:451).

Tinto recommends orientation programs and ceremonies to celebrate the completion of different stages in the students' journey (1988). He refers to the three stages in Van Gennep's Rites of Passage (1960): 'separation, transition, and incorporation' (1988:441). Transition is the stage addressed by orientation programs, which are common in the first days of the semester. Tinto (1988) stresses, however, that such programs need to be continued throughout the first semester and that they should be a part of the daily life of students (Peel, 1999 in Pitkethly and Prosser, 2001).

Many American colleges have freshman seminar courses, often mandatory, with the ultimate goal of helping ensure that students stay enrolled (Hoffman et al., 2002). Hoffman et al. explain that these courses provide information and teach strategies not only for academic success but also for fitting into the university culture and being aware of the facilities and the help available and how to access them. Peel (1999) in Pitkethly and Prosser (2001) recommends that students also have a significant degree of input into these programs. This helps promote sense of agency and of belonging. An example of this input could be students being asked to recommend and design activities for students familiarising

themselves with the campus environment and with each other in a range of events that consider and respect students' cultural sensitivities.

Van Gennep's (1960) 'incorporation' stage represents becoming a member, with its accompanying ceremonies and new ways of relating to the others in the group and of seeing oneself within the fold of the group. This is more than a 'stage', however: it is the ongoing maintenance of belonging. Students, have many rituals for this, for instance, meeting for a meal or a drink to recognise completing a task. Teachers may create a ritual in the form of having students bring something to class to eat to mark the end of term. The institution or student clubs or networks may conduct ceremonies to reward achievements or nominations. These all help create and maintain a sense of belonging.

Teachers' influence outside of the classroom

Multiple classroom and campus communities overlap; thus, teachers' participation is equally important both inside and outside of the classroom. Swail (2003) in Moore (2022) suggests that teacher-student contact beyond the classroom may sometimes have a more significant positive effect on students' sense of belonging than in the classroom. Pascarella and Terenzini (2005) in Moore (2022) argue that out-of-class contact with teachers helps students feel more accepted and included in the university culture. Despite this, Hagedorn et al. (2000) found that, on average, only one in five students have more than one out-of-class interaction with faculty per semester.

In a 2007 study observing student-faculty interactions at regularly scheduled 'teas' held as part of the curriculum at a residential college in a well-established university, Cox and Orehovec categorised the interactions as either 'disengaged', 'incidental', 'functional', or 'personal'. 'Disengaged' meant no interaction between the student and teacher standing near each other. This was the most prevalent. 'Incidental' was 'polite, superficial greetings and waves'; 'functional' marked an academic discussion; and 'personal' marked conversations which went beyond purely academic and had an element of 'camaraderie' (2007:353). Cox and Orehovec note that all of the interactions, except 'disengaged', can have positive effects on students' sense of belonging and that interactions which seem insignificant can lead to more meaningful ones; for instance, incidental can lead to functional, which can lead to personal, which could develop into a mentoring relationship (2007:358). They observed, however, mostly disengagement and almost no mentoring. This result possibly suggests an overall lack of support to faculty for their own out-of-class engagement to help students feel individually relevant in the institution.

In-class support

The classroom is the primary environment through which the university achieves its academic goals and through which students' academic success is measured. These goals cannot be fully realised unless sense of belonging is developed, in large part, in the

classroom through students feeling 'accepted, valued, included and encouraged' by their lecturer and other students (Goodenow and Grady 1993 in Strayhorn, 2018:25).

Sense of belonging in the classroom may be even more impactful on many students' academic achievement than it does around campus (Kirby and Thomas, 2022). This can be especially true of students such as commuter students or older students or others who may not have the time, money, inclination, or situation to connect with others on campus (Tinto, 1998 in Davidson and Wilson, 2013). The classroom environment is where teachers have the greatest opportunity to make a positive difference, not only in academic achievement but also in overall well-being. Feeling respected, appreciated, and valued by the teacher and others in class helps establish and maintain emotional balance, which enhances cognitive resourcefulness and well-being and helps one deal with the range of challenges at university (Petchamé et al., 2022).

One useful tool to advance teaching and learning and promote sense of belonging in the classroom is the Teacher Behaviour Checklist (TBC), originally developed by Buskiest et al. in 2002 (Kirby and Thomas, 2022). The supportive, open-minded, empathetic teaching it guides naturally inspires sense of belonging. The TBC is a concise list of 28 teacher attributes, each accompanied by a one-sentence description of the associated behaviour. It is a very simple and compelling checklist of indisputably positive teacher qualities (Appendix 2). It should be adopted by all teaching institutions as the basis for their teaching values. Aside from being officially adopted, it can be the basis for discussion among teachers or during training or professional development sessions. It could be distributed to all teachers and departments to be displayed as a reminder and to inspire discussion. See Appendix 1 for a sample of the TBC suggestions which particularly help foster sense of belonging. See Appendix 2 for the complete TBC.

Across two studies which differentiate faculty and student perceptions of the top 10 TBC qualities (Appendix 3), the qualities that students chose but the faculty did not were: accessible; encourages and cares; strives for better teaching; understanding; happy/positive/humourous; flexible/open-minded (Groccia et al., 2018). These are all on the TBC Caring and Supportive subscale (Kirby and Thomas, 2022). The difference between the choices of students and faculty confirms that teaching institutions must continually gather and use data on student needs and perceptions. As Noddings (2008) in Kirby and Thomas (2022:369) stresses: 'attend[ing] to students' needs rather than their behaviours' can promote sense of belonging.

Multicontext model

Ibarra's 2001 Multicontext theory respects that students come from a variety of cultures that differ in cognitive and social patterns (Weissmann et al., 2019 in Moore, 2022). Multicontext theory was influenced by E. T. Hall's 1959 *The Silent Language*, which explored how people from different cultures have instilled in them different approaches to learning

(Weissman et al., 2019). Hall (2008) was interested in how teachers can adapt to and use such cultural learning differences in their teaching approaches. Students feeling that their particular learning approach is respected crucially fosters sense of belonging. The theory posits that in what it terms high context cultures, students are more accustomed to collaborating in groups in the spirit of community (Ibarra, 2001, 2005 in Moore, 2022:705). They feel that 'process' is as important as 'task', whereas in low context cultures, students often prefer to work individually, and task is emphasised over process.

It is important, however, to approach the two contexts as equally valid extremes on a spectrum (Ibarra, 2001, 2005; Weissmann et al., 2019 in Moore, 2022) and to vary the teaching approach to ensure that all students across this range can not only leverage their established patterns but also have their boundaries pushed to help them expand their cognitive strengths and social agilities to strengthen their sense of belonging in new directions unique to who they are individually and as a group.

In the true spirit of multicontext, the TBC can be a valuable help to manage the learning experience in a way which is sensitive to the cultural backgrounds and individual personalities of all students (Kramer and Brewer, 1984 in Baumeister and Leary, 1995) and to help everyone enjoy the experience together. It also hinges on the teacher using and modelling compassionate pedagogy (Gilbert et al., 2018) to avoid any possibility of any student disaffiliating out of fear of lack of acceptance (Baumeister and Leary, 1995:20). Compassionate pedagogy in group work emphasises helping others express their ideas through acceptance, compassionate language, and active listening and offers opportunities and motives for helping others (Gilbert et al., 2018). This promotes sense of belonging for both the helper(s) and the one(s) being helped.

Pedagogical Partnership model

Pedagogical Partnership is an approach which has been used in improving the links between nursing education and practice (Watson et al.,2006) and in fostering improved collaboration between technical education and industry (Bridgeford et al. (eds), 2004; Totterdell et al., 2011). This model includes collaboration with students in evaluating, adjusting, and applying pedagogy relevant to their studies (Cook-Sather et al., 2014 in Cook-Sather and Seay, 2021) in the spirit of 'respect, reciprocity and shared responsibility' (Cook-Sather et al., 2014:736 in Cook-Sather and Seay, 2021). Cook-Sather et al. explain that when students are afforded the respect and opportunity to contribute to the curriculum and pedagogy, they feel valued and empowered as 'agents' who can have an impact in their education. Kline (1999:39) stresses that a listener has the power to catalyse or block a speaker's intelligence simply by how they listen: 'Attention, the act of listening with palatable respect and fascination, is the key to a thinking environment. ... When you are listening to someone, much of the quality of what you are hearing is your effect on them' (1999:37).

Given this, it is no surprise that minority students particularly appreciate feeling respected for what they can contribute from their knowledge gained from life experiences (Cook-Sather, 2018a; Cook-Sather and Agu, 2013; Cook-Sather et al., 2019; de Bie et al., 2019 in Cook-Sather and Seay, 2021). On a broader scale, the 'lived experience' (Mpungose, 2020:101) of minorities being invited and welcomed into the narrative can be a central conduit for decolonising the curriculum from the long-established, hegemonic mindset of western educational institutions (Pimblott, 2020:213). However, curriculum and pedagogy are in large part determined outside of this type of student contribution (Bovill et al., 2016; Cates et al., 2018 in Cook-Sather and Seay, 2021). A common reason given for this is that the time and operational constraints on designing teaching content make it difficult to integrate. The result is that often these potential contributions are relegated to limited inclass discussion without enough time to develop or incubate them for inclusion on the more fundamental level of curriculum.

Another explanation for the lack of student contribution here is that the 'highly selective narrative of traditional academia' (Pimblott, 2020:213; Crilly and Everitt, 2021:xxi) is both consciously and unconsciously entrenched. A paradoxical view of this is offered by Adebisi (2019) in Crilly and Everitt (2021:xxi): '*How illogical is it that the structure we are attempting to decolonise is the structure we are attempting to use to decolonise?*' Even within this paradox, decolonising the curriculum is gaining momentum (Tran, 2019). Although Pedagogical Partnership is challenging to apply, the potential benefits warrant the effort of exploring how to introduce it because it can be instrumental in the process of decolonising the curriculum, addressing and evaluating the established sources of expertise and ideas (Meda, 2020), thus helping guide curriculum and pedagogy in directions which can help reflect and build a more eqitable world.

The Pedagogical Partnership and multicontext approaches warrant further consideration in conjunction with each other blending the high context of 'community wisdom [and] storytelling as knowledge and inclusiveness ... [with the] traditional low context system of experts sharing knowledge in a linear fashion' (Chavez and Longerbeam, 2016; Weissmann et al., 2019 in Moore, 2022:716) with the involvement of students in helping inform curriculum and pedagogy. This degree of collaboration can inspire a sense of belonging that can catalyse untapped knowledge and inspiration among both students and teachers. Time, energy, and money are serious considerations, however, given typical teaching workloads. Thus, significant adjustment might be needed to include, reward, and develop this type of approach in the teaching and learning environment (Moore, 2022).

Recommendations

The following recommendations for fostering student sense of belonging are a limited sample of the possibilities. These presented range across a wide spectrum of resource investment. Some of these recommendations may become seen as more and more necessary and viable as different institutions experiment with ways of increasing the

positive impact they have on students and in the world. This has been a slow but continuing paradigm shift from the elite approach of culling out the students who could not conform to rigid standards to a more egalitarian one which is more and more conscious of the need to empower all students, even the ones who appear not to fit traditional models.

Over time, universities have changed their approaches and offerings in line with findings and the needs of what has become a competitive higher education market as well (CITATION). One example of this is that many institutions are currently providing extensive help, in the form of pre-sessionals, in-sessionals, workshops, and f-2-f and online consultations, to students on academic writing, speaking and study skills, whereas in the recent past, this offering was more limited or was not generally provided. An example from business corporations of a similar type of paradigm-level shift is the former approach of servicing mostly shareholder concerns evolving to one which now holds corporate social responsibility as a key point in the business model, aligning more with what the public and customers expect to see in corporate behaviour.

Recommendations for fostering students' sense of belonging

1) Learning and teaching spaces: Design and furnish all learning and teaching spaces for the best individual and group learning outcomes. This means that planning, construction, and maintenance resources should be dedicated to providing more spaces which can be used by small groups. In other words: build more small classrooms, not more large lecture theatres. It also means ensuring that classroom furniture is versatile and can be easily moved by the teacher in the few minutes before class to accommodate students in a variety of configurations, from working in pairs to working in small or medium sized groups or circular or traditional rows or open space as needed for that session and that cohort. As well, teaching room equipment needs to accommodate to the most creative and innovative use of the space, for instance, dual projectors and dual screens/whiteboards in classrooms so that different groups can compare results of discussions at the same time and interact with the projected images, filling in blanks or adding to projected or internet images with coloured pens. This approach also includes internet enabled and interactive screens and pods as well as hybrid classrooms which enable both f-2-f and remote participation.

2) Intersectionality: Centrally provide students with the power and resources to begin and maintain any student society they wish which is not harmful to any campus population. Additionally, to support and celebrate inclusivity and diversity, as international students make up a large part of the student body at many institutions, funds, promotion, and other resources need to be made available centrally for conversation/discussion/cultural discovery lunches/hours/events/clubs to be organised centrally or by schools, programs or individuals ranging from ad hoc to permanent for the purpose of fostering intersectionality helping students and staff understand and appreciate the range of cultures represented at the university helping foster a freer and more open exchange of ideas. As well, conduct regular social gatherings and events that specifically promote out-of-class, student-teacher

interaction. Teaching contracts would need to accommodate this by allowing time, reimbursement and additional training.

3) **Culture**: In a variety of settings and scales on campus (from large to intimate) a range of music and other arts needs to be performed and displayed at least weekly that respects the range cultures, tastes, and perspectives. This would show that the university is in touch with what moves humanity to feel and consider ideas beyond the purely academic. In this same spirit, a more robust program of guest lectures and presentations needs to be mounted throughout a range of daytime and evening timings and spaces. These performances, displays, discussions, lectures, and presentations should also take place in the surrounding community, sponsored by the institution, to help bring the surrounding community and the students into a larger awareness and appreciation of each other.

4) **Orientation programs**: These need to extend throughout the first semester for first-year students and involve students' input in designing activities and events. This needs to be funded centrally and dispersed among the schools so that schools will be more encouraged to provide more comprehensive bespoke orientation relevant to their programs and culture. Consultation on this also needs to flow between the central provision and the schools.

5) **Teaching**: The Buskiest et al. (2002) Teacher Behaviour Checklist should be seriously considered as a guide to structuring the pedagogical relationship across the university. This could be promoted centrally, with discussion of its language, format, tone, and context taking place between the central body and the schools.

- a. Consistent with the multicontext model, vary teaching approaches to respect and extend to where students' cultural contexts and personal characteristics place them on the high/low-context spectrum. This would require additional university-wide teacher training.
- b. Invite all students to collaborate with teachers/programmes on curriculum and pedagogy in forums in settings which truly inspire and empower open, honest, and creative thinking to help all realise that students are agents of knowledge, not simply receivers of learning. This will also help inform and drive the decolonisation of the curriculum.
- c. For assessment briefs, a central quality standard, and associated training, could be established so that briefs conform to a standard of clarity, concision, and completeness.

This limited sample of recommendations, taken all together, could easily be viewed by many as unrealistic given the limited and tightening resources of universities. However, it is hoped that these suggestions are food for thought for ways forward for universities to better serve humanity by extending, further inspiring, and harnessing the positive potential of student-teacher-institution collaboration.

One area not considered in this paper, which is now impacting the HE environment to a great and increasing extent at many levels is artificial intelligence (AI). This is currently impacting how information is created and exchanged, particularly in how assessments are designed and administered. This should be included in future studies on students' sense of belonging. Additionally, a Sense of Belonging Group within institutions needs to be created to explore best practices across the world's universities and liaise with them and the different programs, departments, and schools within the university.

Conclusion

Sense of belonging, the sense of being personally welcome, safe, valued, cared about, included, respected, appreciated, and consulted, is so basic a human need that it has been central in the evolution of civilisation. In higher education, these often-hidden elements enable and drive better quality of experience and greater student and teacher achievement. When students feel they belong, they are likely to be more emotionally balanced and confident, feel valid, be engaged, experience greater well-being, and find more personal and meaningful expression of the graduate attributes which are the goal of the university-student relationship. Given the possibly exponential, enzymatic, positive effects that promoting sense of belonging has, in at least the many contexts discussed in this paper, it does not seem unreasonable that it could eventually become accepted as part of the canon of higher education.

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Appendix 1 : Sample of suggested points on the Teacher Behaviour Checklist which help foster sense of belonging:

Approachable/personable (smiles, greets students, initiates conversations, invites questions, responds respectfully to student comments)

Encourages and cares for students (provides praise for good student work, helps students who need it, offers bonus points and extra credit, and knows student names)

Flexible/open-minded (changes calendar of course events when necessary, will meet at hours outside of office hours, pays attention to students when they state their opinions, accepts criticism from others, and allows students to do make-up work when appropriate)

Enthusiastic about teaching and about topic (smiles during class, prepares interesting class activities, uses gestures and expressions of emotion to emphasize important points, and arrives on time for class)

Sensitive and persistent (makes sure students understand material before moving to new material, holds extra study sessions, repeats information when necessary, asks questions to check student understanding).

Creative and interesting (experiments with teaching methods; uses technological devices to support and enhance lectures; uses interesting, relevant, and personal examples; not monotone)

Accessible (posts office hours, gives out phone number, and e-mail information)

(Buskiest et al. in 2002 in Kirby and Thomas, 2022)

Appendix 2: Teacher Behaviour Checklist

ltem	Teacher Qualities and Corresponding Behaviours
1	Accessible (posts office hours, gives out phone number, and e-mail information)
2	<i>Approachable/personable</i> (smiles, greets students, initiates conversations, invites questions, responds respectfully to student comments)
3	Authoritative (establishes clear course rules; maintains classroom order; speaks in a loud, strong voice)
4	Confident (speaks clearly, makes eye contact, and answers questions correctly)
5	<i>Creative and interesting</i> (experiments with teaching methods; uses technological devices to support and enhance lectures; uses interesting, relevant, and personal examples; not monotone)
6	<i>Effective communicator</i> (speaks clearly/loudly; uses precise English; gives clear, compelling examples)
7	<i>Encourages and cares for student</i> (provides praise for good student work, helps students who need it, offers bonus points and extra credit, and knows student names)
8	<i>Enthusiastic about teaching and about topic</i> (smiles during class, prepares interesting class activities, uses gestures and expressions of emotion to emphasize important points, and arrives on time for class)
9	<i>Establishes daily and academic term goal</i> (prepares/follows the syllabus and has goals for each class)
10	<i>Flexible/open-minded</i> (changes calendar of course events when necessary, will meet at hours outside of office hours, pays attention to students when they state their opinions, accepts criticism from others, and allows students to do make-up work when appropriate)

ltem	Teacher Qualities and Corresponding Behaviours
11	<i>Good listener</i> (does not interrupt students while they are talking, maintains eye contact, and asks questions about points that students are making)
12	Happy/positive attitude/humorous (tells jokes and funny stories, laughs with students)
13	Humble (admits mistakes, never brags, and does not take credit for others' successes)
14	<i>Knowledgeable about subject matter</i> (easily answers students' questions, does not read straight from the book or notes, and uses clear and understandable examples)
15	<i>Prepared</i> brings necessary materials to class, is never late for class, provides outlines of class discussion)
16	<i>Presents current information</i> (relates topic to current, real-life situations; uses recent videos, magazines, and newspapers to demonstrate points; talks about current topics; uses new or recent texts)
17	<i>Professional</i> (dresses nicely [neat and clean shoes, slacks, blouses, dresses, shirts, ties] and no profanity)
18	<i>Promotes class discussion</i> (asks controversial or challenging questions during class, gives points for class participation, involves students in group activities during class)
19	<i>Promotes critical thinking/intellectually stimulating</i> (asks thoughtful questions during class, uses essay questions on tests and quizzes, assigns homework, and holds group discussions/activities)
20	<i>Provides constructive feedback</i> (writes comments on returned work, answers students' questions, and gives advice on test-taking)
21	<i>Punctuality/manages class time</i> (arrives to class on time/early, dismisses class on time, presents relevant materials in class, leaves time for questions, keeps appointments, returns work in a timely way)

Item	Teacher Qualities and Corresponding Behaviours
22	<i>Rapport</i> (makes class laugh through jokes and funny stories, initiates and maintains class discussions, knows student names, interacts with students before and after class)
23	<i>Realistic expectations of students/fair testing and grading</i> (covers material to be tested during class, writes relevant test questions, does not overload students with reading, teaches at an appropriate level for the majority of students in the course, curves grades when appropriate)
24	<i>Respectful</i> (does not humiliate or embarrass students in class, is polite to students [says thank you and please, etc.], does not interrupt students while they are talking, does not talk down to students)
25	Sensitive and persistent (makes sure students understand material before moving to new material, holds extra study sessions, repeats information, when necessary, asks questions to check student understanding)
26	<i>Strives to be a better teacher</i> (requests feedback on his/her teaching ability from students, continues learning [attends workshops, etc. on teaching], and uses new teaching methods)
27	<i>Technologically competent</i> (knows now to use a computer, knows how to use e-mail with students, knows how to use overheads during class, has a Web page for classes)
28	<i>Understanding</i> (accepts legitimate excuses for missing class or coursework, is available before/after class to answer questions, does not lose temper at students, takes extra time to discuss difficult concepts)
(Buskie	est et al. in 2002 in Kirby and Thomas, 2022)

Append	dix 3: To	p ten Teac	her Beh	aviour Ch	necklist	qualities
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Laci Study								
	Ismail (2014)		McConner (2017)		Ford (2016)		Noll (2017)	
Top 10 TBC								
Behaviors	US	Foreign	US	Foreign	Faculty	Students	Faculty	Students
Accessible	х	Х	Х	х		Х		
Approachable/ personable	Х	Х	х	х	х	х	х	Х
Confident		X	Х	X	Х	Х	Х	
Creative/ interesting	х	Х	Х	Х	Х		Х	
Effective communicator	х	Х	Х	Х	Х	Х	х	Х
Encourages/ cares	х	Х	Х	Х		Х		Х
Enthusiastic	Х	Х	Х	Х	Х	Х	Х	Х
Knowledgeable	Х	Х	Х	Х	Х	х	Х	Х
Manages class time	Х	Х						
Prepared			х	Х	Х			
Promotes critical thinking	х	Х	Х	х	Х		х	
Respectful					Х	Х	Х	
Strives better teacher					х			Х
Understanding						Х		Х
Realistic						Х	Х	Х
Promotes discussion	Х							
Presents current Info.							Х	
Happy/positive/								Х
Flexible/ open-minded								х

Table 9.1.	The Top	10 TBC	Qualities	Selected	by	Participants across
	-		Each Stu	ıdy	-	-

Note: X represents aggregated participants' selections of the Top 10 items reflective of excellent teaching for each of the four studies.

(Groccia et al., 2018)

Appendix 4: Mazlow's Hierarchy of Needs



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