Block Teaching and the Transactional Student: A Framework for Understanding Engagement in STEM Education

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Abstract

The increasing adoption of block and intensive delivery models across higher education brings with it concerns about their long-term impact on student attendance and engagement. For commuter students and other non-traditional cohorts, the design of delivery models can significantly shape learning behaviours, not only in how students attend, but in how they prioritise, interact, and navigate their studies. Current pedagogical discourse lacks a structured way to describe or interpret these behavioural patterns within compressed formats. This paper explores transactional and transformational student behaviours in higher education, focusing on STEM disciplines within block and intensive delivery models. Drawing on leadership theory and research on student engagement, it synthesises literature to map observable behaviours across delivery modes. A narrative literature review (2010–2025) informed the development of a taxonomy and proposed model distinguishing extrinsically motivated, assessment-focused behaviours from intrinsically driven, reflective engagement behaviours. The paper highlights how intensive 'block' delivery models may amplify transactional tendencies but also enable transformational learning when designed with autonomy, belonging, and workload transparency. By situating findings within marketisation, widening participation, and non-traditional student realities, it reframes transactional engagement as adaptive rather than deficient. However, such behaviours, while rational, often constrain deeper learning, critical reflection, and the development of disciplinary identity, limiting the transformative potential of higher education. The emergent taxonomy and proposed model suggests a practical framework for inclusive curriculum and pedagogical design in STEM higher education.

Keywords: Intensive delivery; block delivery; transactional behaviour; non-traditional student; student engagement

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Introduction

The increasing adoption of block and intensive delivery models across higher education reflects sector-wide efforts to address flexibility, retention, and widening participation. These compressed formats offer concentrated learning periods, focused curriculum delivery, and timetabling efficiencies. However, as institutions scale up implementation, concerns are emerging about their long-term impact on student attendance and engagement. Dixon & O'Gorman (2020) reported declining student attendance and engagement as time progressed, also noting a subsequent reduction in deep learning and critical engagement. These findings align with broader sector concerns regarding attendance as a proxy for engagement, particularly in compressed formats where workload intensity and assessment pressure may drive strategic, short-term approaches to learning.

Despite growing institutional investment in compressed delivery models, persistent challenges around attendance and engagement remain under-explored, especially within the context of STEM disciplines. These challenges intersect with broader pressures in higher education, including financial precarity, increasing numbers of commuting students, and the widening gap between formal participation and meaningful engagement. For non-traditional cohorts, the design of delivery models can significantly shape learning behaviours, not only in how students attend, but in how they prioritise, interact, and navigate their studies. Current pedagogical discourse lacks a structured way to describe or interpret these behavioural patterns within compressed formats.

This research responds to that gap by proposing a new taxonomy of student engagement behaviours as they manifest within block delivery. Drawing on established constructs from leadership theory, particularly the distinction between transactional and transformational approaches (Burns 1978; Bass 1990), the research aims to map these models onto higher education contexts, where they have been under-applied. Rather than importing definitions wholesale, the paper engages critically with literature from leadership, motivation, and educational engagement to develop a framework grounded in the realities of contemporary HE practices. The objective is not only to offer clarity, but to provide a practical lens through which educators and institutions can recognise and respond to diverse engagement styles in STEM-focused block delivery.

The approach taken is a traditional narrative review of the published literature, supported by the authors' professional insights and situated within the specific policy and demographic context of Welsh Higher Education. This method allows for iterative analysis of published research on delivery models, motivation, student engagement, and behaviour between 2010–2025, with reference to earlier theoretical sources if foundational. The review forms the basis for a new taxonomy of observable student behaviours in block delivery, distinguishing between styles of participation and motivation without pathologising difference.

Ultimately, the research aims to support the more inclusive and effective implementation of block delivery across the sector. By offering a structured way to interpret behavioural patterns and identify potential points of intervention, the taxonomy suggests a tool for designing pedagogies and support systems that move beyond attendance as a compliance measure, and instead promote meaningful engagement, progression, and good graduate outcomes. In doing so, it addresses a key challenge facing higher education today: how to balance flexibility with

depth, and structure with responsiveness, in ways that recognise and support the diverse realities of a changing demographic of modern students.

Methods

This paper adopts a traditional narrative methodology to develop a taxonomy of student engagement behaviours in block and intensive delivery. The aim was to synthesise definitions and behavioural indicators of transactional and transformative engagement, terms rooted in leadership theory (Burns, 1978; Bass, 1990) and apply them meaningfully to higher education contexts, particularly STEM-focused block teaching. Rather than replicating leadership models directly, the objective was to explore how these theoretical distinctions could help educators interpret patterns of student motivation and behaviour in compressed teaching formats.

To support transparency and rigour, the authors undertook a traditional, narrative literature review, offering a flexible yet structured approach suited to the interdisciplinary and evolving nature of the topic. The process began by clearly defining the conceptual focus, mapping transactional and transformational behaviours onto student engagement and setting boundaries in terms of timeframe, disciplinary scope, and relevance to block delivery.

A series of iterative Boolean searches were conducted across academic databases covering the period 2010–2025. Search terms included combinations of: transactional, transformational, student engagement, block teaching, intensive delivery, immersive learning, STEM education, non-traditional students, and commuter students. Inclusion criteria required sources to be peer-reviewed articles or high-credibility reports that explicitly addressed student engagement, delivery formats, or motivational behaviours in higher education. While priority was given to literature within STEM disciplines, broader pedagogical studies were incorporated to ensure conceptual richness. Seminal works published prior to 2010 (e.g. Mezirow, 1991; Freire, 1970; Tinto, 1975) were included to provide theoretical foundations.

Relevant literature was then reviewed and thematically grouped based on recurring patterns of student behaviour and engagement characteristics. From this process, six distinct and practically observable dimensions of student engagement were identified; Motivation, Engagement, Relationship with the Higher Education Institution (HEI), Learning Behaviour, Assessment Orientation, Perceived Value of Education.

These dimensions were critically interpreted in relation to the structural features of block delivery, particularly immersion, intensity, assessment timing, and time constraints, which the literature suggests may amplify or constrain certain engagement styles. The resulting taxonomy is grounded in the behavioural patterns surfaced across the review and shaped by the authors' professional insights into STEM-based higher education delivery.

The authors sought to address two research questions:

- How can transactional and transformational engagement be meaningfully distinguished and mapped to observable behaviours in intensive/block delivery?
- In what ways do features of intensive or block delivery amplify or mitigate transactional patterns of engagement in STEM?

Worked Example and Application

To demonstrate how the taxonomy could be used in practice, the paper presents a worked example in the form of a radar chart (Figures 2-8). This visual model(s) illustrates six hypothetical student engagement profiles derived from the thematic patterns identified in the literature and is contextualised using the authors' experience with STEM learners. These include conceptual archetypes such as the Transactional and Transformational Student, alongside situational personas such as the Commuter Student, Time-Constrained Student, Mature Student, and Highly Engaged STEM Student.

These profiles are not drawn from empirical data but are presented as hypothetical examples intended to highlight variation in student engagement under block delivery conditions. The model serves as a diagnostic and reflective tool to inform teaching practice, support provision, and future empirical validation.

The output is a review of the published literature in this field that offers significant and timely contribution to ongoing research in higher education pedagogy, to consider student engagement in block delivery models.

Discussion

Defining Transactional and Transformational Behaviours

The distinction between transactional and transformational behaviours originates from leadership theory, first articulated by Burns (1978). Burns distinguished transformational leadership, which inspires intrinsic motivation, personal growth, and shared vision, from transactional leadership, which is based on exchanges of rewards for performance or compliance. Bass (1990) expanded these ideas, characterising transformational leadership as involving empowerment and engagement, while transactional leadership relies on contingent rewards and corrective action (Bass, 1990; DuBrin, 2015; Humphrey, 2013; Rafferty & Griffin, 2004).

Applied to education, transformational behaviours are exhibited by students who demonstrate intrinsic motivation, reflective learning, and commitment to deep understanding, often exploring beyond the curriculum. In contrast, transactional behaviours are characterised by extrinsic motivation, where students primarily engage for tangible rewards such as grades, qualifications, or employability prospects (Ahmed & Simha, 2022).

Transactional and Transformational Engagement in Educational Theory

Transactional engagement resonates with Freire's (1970) critique of the traditional model of education, which views students as passive recipients of knowledge. In this transactional exchange, students receive knowledge and return it in the form of grades, often without critical engagement. Freire advocates for dialogic, participatory education, where students and teachers co-create knowledge, fostering transformational learning.

Mezirow's transformational learning theory (1991, 1997) emphasises the importance of critical reflection and perspective transformation, encouraging learners to question assumptions and engage deeply, concluding that transformational students exhibit autonomy, creativity, and

personal growth, whereas transactional students tend to prioritise fulfilling requirements to obtain extrinsic rewards.

Tinto (1975) expanded on the works by Freire (1970) by developing a student integration model that identifies transactional students as those who view education as a contract, whereby effort is exchanged for a qualification or job prospects. Such students often restrict engagement to what is necessary to succeed, which may impede development of critical thinking and problem-solving skills, essential in STEM fields (Moore, 2013; Kuh, 2009). This tendency becomes especially visible in intensive or block delivery settings, where compressed timeframes can exacerbate transactional approaches, focusing narrowly on assessments, but also offer opportunities for immersion that can enable transformational learning if supported effectively.

Fostering transformational experiences for transactional approaches

Deci's Self-Determination Theory (1985, 2000) offers a robust psychological framework for understanding transactional and transformational behaviours. It identifies three innate psychological needs essential for intrinsic motivation and well-being:

- Autonomy: Feeling in control of one's actions
- Competence: Feeling effective in one's activities
- Relatedness: Feeling connected to others

Transactional students often experience deficits in these areas. Their extrinsic focus undermines autonomy, as they conform to external standards rather than pursue personal goals. Competence is narrowly defined by grades, and transactional engagement weakens relatedness by reducing meaningful interaction (Deci & Ryan, 2000).

Transformational engagement supports these needs, fostering intrinsic motivation and proactive behaviours. Institutional strategies that promote autonomy-supportive teaching, mastery-oriented feedback, and community belonging can shift student mindsets from transactional to transformational.

In intensive delivery contexts, this is particularly critical, as the immersive format can either magnify stress and transactional strategies or, with careful scaffolding, provide students with a strong sense of progress, mastery, and immersion that supports transformational engagement.

While these models are well-established in leadership studies, their application to student engagement, especially in block or intensive modes of delivery in STEM education, remains under-explored.

The Impact of Neoliberal Marketisation on Student Behaviours in STEM

The increasing marketisation of higher education frames education as a consumer good, positioning students as customers purchasing a service. Consequently, student behaviour often reflects transactional attitudes that emphasise return on investment, measured by employment outcomes, salaries, and satisfaction metrics (Souto-Otero et al., 2023; Sparks, 2023).

Giroux et al. (2011) argue that commodification transforms the student-institution relationship into a transactional exchange, where learning is primarily viewed through an economic lens.

Institutions prioritise student satisfaction and measurable outcomes over intellectual curiosity or transformational learning (Naidoo & Jamieson, 2005; Molesworth et. al, 2009).

This consumerist mindset is especially pronounced in STEM education, where degrees are often seen as tickets to high-skilled jobs rather than opportunities for personal and societal development (Berglund & Andersson, 2012). STEM disciplines pose unique challenges due to their technical complexity and demand for mastery and innovation. Biggs and Tang (2011) conclude that transactional engagement in STEM often results in surface learning, where students focus on memorisation to achieve high grades rather than on conceptual understanding or application. This limits the development of creativity and problem-solving skills vital to advancing STEM sectors. Conversely, transformational engagement fosters intrinsic motivation and lifelong learning attitudes, enhancing adaptability and creativity. Given the societal and economic importance of STEM education, this distinction is critical, as these fields require not only technical proficiency but also ethical reasoning and innovation.

Changing Student Demographics in Welsh Higher Education

Higher Education (HE) in Wales has experienced a significant demographic shift in recent decades, characterised by a growing proportion of students who fall outside the traditional student age bracket 18–21 and/or enter university through non-linear pathways. These so-called 'non-traditional students' often include mature learners, part-time students, carers, students with disabilities, and those from lower socio-economic backgrounds or first-generation university attendees (Thomas, 2002; Wong, 2018).

While HE across the UK is undergoing transformation, the Welsh context is particularly distinct due to its bilingual, devolved educational policy landscape and a strong focus on widening access. In 2023/24, 20% of all HE enrolments in Wales were students with a disclosed disability, and a notable proportion of undergraduate and postgraduate students studied part-time, suggesting a system increasingly accommodating of diverse learner needs (Medr, 2024).

The age profile of students in Welsh HEIs further illustrates this shift. Recent data reveals that 42,510 students aged 30–59 were enrolled in Welsh institutions in 2022/23, alongside over 19,000 part-time students aged 25–39 (StatsWales, 2023). This demographic trend reflects broader socio-economic and labour market shifts, with adults returning to education for upskilling, reskilling, or career transitions, often driven by automation, industry shifts, and regional economic redevelopment. Moreover, the growing presence of mature and part-time students highlights the increasing importance of flexible, modular, and work-integrated learning opportunities (Bamber & Tett, 2000). These trends also point to a changing conception of the traditional student, demanding that institutions rethink curriculum delivery, student support structures, and engagement strategies to suit diverse learner identities and life circumstances. One such response has been the adoption of intensive and block delivery models, which aim to provide flexible study structures for students balancing employment, caring responsibilities, or other commitments. These models have the potential to reduce barriers for non-traditional learners, but they may also amplify transactional behaviours if curriculum design emphasises speed and efficiency over reflection and depth.

Welsh policy developments have played a crucial role in supporting these demographic changes. The formation of CTER (Commission for Tertiary Education and Research) in 2024

consolidated the Welsh Government's commitment to a more integrated and inclusive tertiary education system (Welsh Government, 2024). CTER's remit includes ensuring equitable access, promoting lifelong learning, and aligning provision with local and national needs.

Despite these positive developments, significant challenges remain. Non-traditional students often face barriers in progression and completion, particularly when balancing study with employment, caring responsibilities, or health issues (Reay, 2003). These external pressures can limit the time and cognitive space available for broader academic exploration, community engagement, or co-curricular involvement, hallmarks of what might be termed transformational learning experiences. Instead, students may adopt a more instrumental or transactional approach to their studies, engaging primarily with what is necessary to meet assessment requirements and progress through their programme (Kandiko & Mawer, 2013). This behaviour is not necessarily reflective of lower motivation or ability but rather a strategic adaptation to constrained circumstances. In this context, the student experience is often shaped less by a desire for intellectual growth and more by a need to efficiently manage competing demands, a phenomenon particularly relevant to institutional efforts aimed at fostering inclusive, engaging learning environments for diverse student cohorts.

Implications beyond Wales

Shifts in student demographics, the growing prevalence of commuter and non-traditional learners, and the adoption of block and intensive delivery models are evident beyond Wales and across the wider UK higher education sector and internationally. Institutions in diverse contexts face similar pressures to offer attractive provision to recruit students in a competitive sector, widen participation and support mature and part-time students.

The challenges faced by commuter and non-traditional students, including time poverty, competing responsibilities, and limited opportunities for integration, resonate in many higher education systems. These conditions frequently encourage transactional forms of engagement, and therefore the need to design curricula and support structures that mitigate these pressures extends well beyond Wales. Likewise, the dual potential of block delivery models to create conditions of immersion and focus that enable transformational learning, or conversely to amplify stress and encourage surface strategies applies across institutional and national settings. The taxonomy of transactional and transformational student characteristics developed in this paper, together with the accompanying design principles, is intended to offer a flexible and adaptable framework for understanding and responding to these dynamics in varied contexts

Policy drivers also reveal important parallels. While CTER reflects the devolved governance of education in Wales, many systems are undertaking similar reforms aimed at promoting tertiary integration, lifelong learning, and new forms of credentialing. The tensions identified in this paper between efficiency and depth, or between flexibility and inclusivity, are therefore not bound to the Welsh policy environment but resonate globally. Furthermore, the increasing marketisation of higher education and the attendant construction of students as consumers is a challenge shared internationally, underscoring the value of reframing transactional engagement not as a deficit but as an adaptive and rational response to structural conditions.

Furthermore, the demographic profile of students in higher education is undergoing continual change, with a noticeable increase in the number of commuter students (Singh, 2025). This shift is driven in part by the rising costs of tuition, accommodation, and living expenses, which make attending university away from home financially untenable for many. As a result, a growing proportion of students, particularly those from lower socio-economic backgrounds, are choosing to live at home and commute to campus as a means of reducing financial pressure and managing existing responsibilities (Thomas & Jones, 2017; Office for Students, 2019).

The Unique Experience of Commuter Students and Transactional Engagement

Commuter students, defined as those who travel daily rather than live on campus, face distinct challenges that predispose them to transactional engagement. Balancing work, family, and study often limits their time and energy for full engagement with campus life and learning opportunities (London, 1992; Salinitri, 2005).

This dual burden often leads commuter students to adopt pragmatic, transactional approaches, focusing narrowly on passing assessments and obtaining qualifications for career advancement (Reason, 2009). Long commutes, limited access to facilities, and reduced social integration weaken their sense of belonging and reduce immersive learning experiences.

Zhao & Kuh (2004) found that commuter students report lower social and academic integration, correlating with transactional mindsets and higher attrition rates. However, commuter students also demonstrate resilience and motivation in managing competing demands (Lau & Brickman, 2020). Institutional support such as flexible scheduling, online learning, and targeted engagement can mitigate transactional behaviours and foster transformational experiences. Block delivery models can also play a role here: by condensing study into focused periods, these models reduce weekly travel demands for commuter students, though they may simultaneously heighten workload pressures that risk transactional engagement.

Identifying transactional behaviours in HE

Before transactional behaviours can be effectively measured, it is essential to clearly identify observable or self-reportable indicators that reflect this mode of engagement. These indicators serve as foundational traits or markers that differentiate transactional students (those prioritising minimal compliance and outcome-driven strategies) from their more transformational peers (Kahu & Nelson, 2018; O'Donnell et al., 2020).

Measuring transactional behaviours in HE is complex because such behaviours often appear subtly and vary across contexts (Mercer-Mapstone & Bovill, 2021). Many indicators of transactional engagement such as strategic effort, minimal participation, or focusing solely on assessments are indirectly captured by institutions.

Attendance records remain a common proxy, where low attendance in non-mandatory sessions can suggest transactional tendencies (Wladis, Hachey & Conway, 2018). Similarly, assessment submission timing and patterns provide insight: students who habitually submit just before deadlines or selectively engage only with grade-impacting tasks demonstrate outcome-focused, transactional behaviours (Krause, 2018). Student surveys, including institutional course evaluations and national surveys like the National Student Survey (NSS), reveal motivations

and study habits that help distinguish transactional priorities from deeper engagement (Coates, 2019; Chalmers, 2017). Learning analytics from digital platforms have become increasingly critical, with data such as login frequency, time spent on resources, forum participation, and quiz attempts providing nuanced profiles of engagement depth (Tempelaar et. al., 2021; Ferguson et al., 2020). Engagement in optional activities such as extracurricular clubs and enrichment opportunities often correlates with transformational engagement; conversely, low involvement may indicate transactional approaches (Palmer et al., 2022). Communication analysis of email interactions and discussion posts can reveal transactional language, characterised by explicit exchanges ("I complete this, I get that"), illustrating transactional mindsets (Nelson & Kahu, 2020).

It is important to note that many methods measure proxies rather than direct indicators of transactional behaviour. Fluctuations due to time, context, or external factors complicate interpretation, requiring triangulation of data and nuanced understanding of student circumstances (Kahu & Nelson, 2018; O'Donnell et al., 2020).

Developing a Taxonomy of Transactional Student Characteristics

Drawing from the literature, this paper proposes a taxonomy of Student Engagement (Table 1) along six key dimensions. These represent behavioural traits distinguishing transactional from transformational student identities.

Table 1: Taxonomy of Student engagement

Dimension	Transactional Student	Transformational Student
Motivation	Extrinsic (grades, job prospects)	Intrinsic (curiosity, self-growth)
Engagement	Strategic, attendance-focused	Deep, reflective, participatory
Relationship with Higher Education Institution	Consumer-provider	Partner, co-creator
Learning Behaviour	Minimal effort, grade optimisation	Seeks feedback, explores beyond curriculum
Assessment Orientation	Output-driven (grades)	Process and development
Value of Education	Investment return	Personal or professional transformation

The six behavioural dimensions that constitute the taxonomy; motivation, engagement, relationship with the institution, learning behaviour, assessment orientation, and value of education, were derived through iterative mapping based on a narrative literature review. These categories were selected for their relevance, theoretical grounding in existing engagement and leadership models, and their applicability to observable behaviours within block delivery.

The inclusion of motivation reflects distinctions established in leadership theory and motivational psychology. Burns (1978) and Bass (1990) describe transactional relationships as driven by extrinsic motivators (e.g. compliance, performance-based exchange), while transformational approaches are underpinned by intrinsic motivation and shared purpose. Within higher education, this aligns with distinctions drawn by Mezirow (1997) and Tinto (1975), where intrinsic, self-directed learners exhibit higher-order engagement, in contrast to students primarily motivated by grades or credentials (Ahmed, 2022).

Engagement was included as a dimension based on its consistent appearance across models of transformative learning (Mezirow, 1991; Kuh, 2009) and its susceptibility to transactional narrowing in compressed formats. As highlighted by Dixon and O'Gorman (2020), block delivery structures may inadvertently promote strategic, attendance-based engagement over time, diminishing opportunities for deep or critical learning. In this way, the taxonomy differentiates between attendance-focused, strategic engagement and deeper, participatory forms of involvement.

The relationship with the institution draws from the growing body of literature on marketisation and consumerism in higher education. Students increasingly view education through a transactional lens, expecting a return on investment (Souto-Otero et al., 2023; Giroux et al., 2011). In contrast, transformative engagement positions students as co-creators or partners in learning (Naidoo & Jamieson, 2005; Molesworth et al., 2009), a relationship that has implications for identity development and institutional belonging.

Learning behaviour reflects how students operationalise their engagement strategies. Transactional students tend to focus on minimal compliance, doing what is necessary to pass, while transformative learners actively seek feedback, explore beyond curriculum boundaries, and engage reflectively (Biggs & Tang, 2011; Moore, 2013). These behaviours are particularly visible in compressed STEM curricula, where workload intensity may restrict opportunities for exploratory learning unless intentionally scaffolded.

Assessment orientation builds on literature distinguishing outcome-driven behaviours from process-based engagement. Transactional students are more likely to engage selectively with assessments that hold weight, demanding model answers and avoiding non-graded tasks (Kandiko & Mawer, 2013; Wladis et al., 2018). In contrast, transformative students engage with formative assessment, reflective activities, and learning for mastery, patterns supported by Nicol & Macfarlane-Dick (2006) and Carless & Boud (2018).

Finally, the perceived value of education reflects how students conceptualise the purpose of their studies. Transactional students often view education as a means to a financial or professional end (Berglund, 2012; Sparks, 2023), while transformative learners associate value with personal growth, identity formation, and disciplinary belonging (Thomas, 2002; Baxter Magolda, 2004). This distinction is especially relevant for non-traditional students, who may

experience structural pressures that shape their orientation toward education (Reay, 2003; Thomas & Jones, 2017).

Each of these dimensions emerged through thematic synthesis of the literature and were refined through multiple iterations to ensure they were conceptually distinct and practically observable within compressed delivery settings. Together, they offer a suggested framework for interpreting the complexity of student engagement in higher education, particularly as it manifests in block and intensive teaching contexts.

This taxonomy is not binary but rather operates as a spectrum (Figure 1). Students may shift between modes depending on context, curriculum, support, and institutional culture. Importantly, the taxonomy also provides a useful lens to interpret behaviours in block and intensive delivery contexts (table 2), where time pressure, immersion, and workload intensity may amplify some transactional traits (such as assessment-driven focus) while also opening pathways for transformational traits (such as deep immersion in project-based STEM learning).

Figure 1: Spectrum of Student Engagement

(ROI: return on investment)

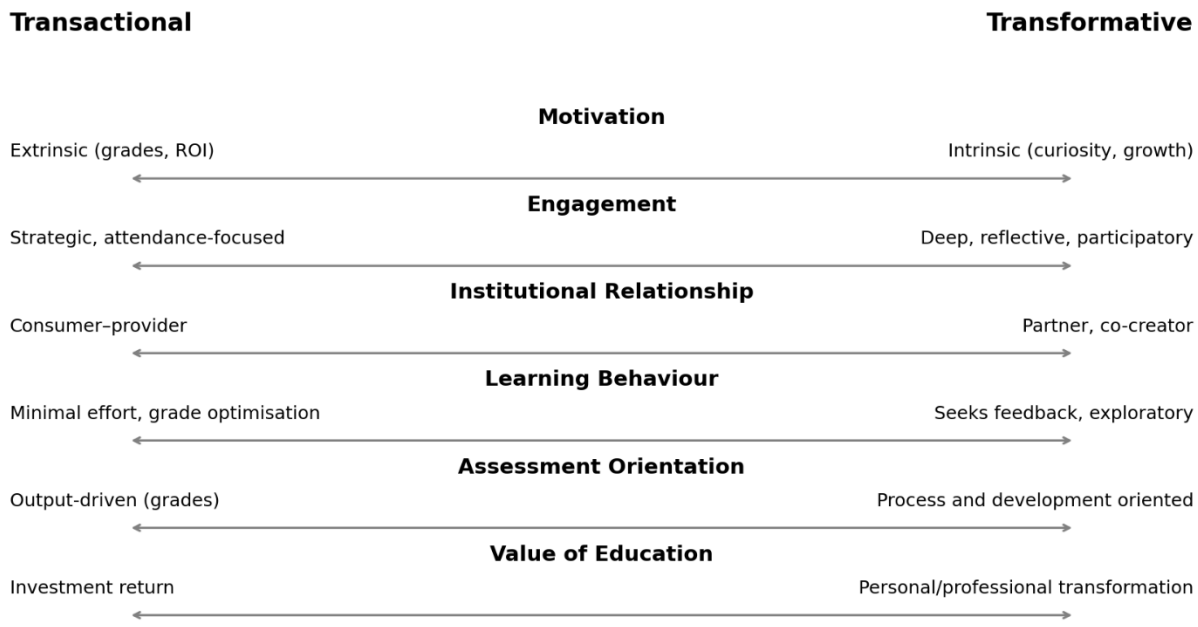


Table 2: Taxonomy of Student engagement in Block/Intensive STEM Delivery

Dimension	Illustrative Indicators in Block/Intensive STEM Delivery
Motivation	Emails or discussions focussed on marks or grades vs. opportunities for self-growth and future development
Engagement	Sporadic or last-minute Virtual Learning Environment logins vs. sustained use; surface-level forum posts vs. peer explanations and dialogue
Relationship with Higher Education Institution	Requests framed as entitlements and low involvement in co-creation vs. active participation in module design activities and wider institutional activities
Learning Behaviour	Submits only final version just before deadline vs. use of draft windows and office hours Minimal use of optional activities vs. engagement with extension materials
Assessment Orientation	High demand for model answers and marking schemes vs. reflective self-evaluation sections. Task selection based on lowest effort vs. opportunities for developmental value Non-engagement in formative assessment vs. Full engagement in formative assessment and activities to inform summative assessment
Value of Education	Module evaluations referencing employability and return on investment vs. identity growth or disciplinary belonging

This taxonomy and accompanying spectrum offer a valuable framework for academic staff, support services, and curriculum designers seeking to understand and effectively respond to diverse student behaviours in higher education. By categorising patterns of engagement, it provides a lens through which educators can tailor their approaches to better meet student needs.

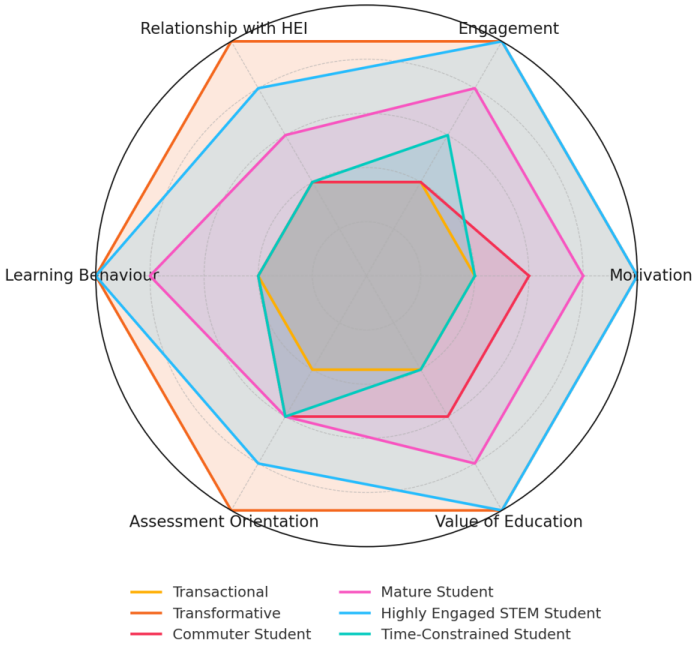
Visualising Variants of Engagement in Block Delivery Contexts

To illustrate the behavioural diversity within block and intensive delivery formats, Figure 2 presents a radar chart mapping six student engagement profiles across the key dimensions of the proposed taxonomy. These suggested profiles - Transactional, Transformative, Commuter Student, Mature Student, Highly Engaged STEM Student, and Time-Constrained Student, highlight how individual circumstances, motivations, and institutional policy shape student behaviours. For example, commuter and time-constrained students may exhibit more pragmatic, outcome-focused engagement patterns, often associated with transactional tendencies, while mature and highly engaged students display stronger alignment with transformative traits such as deep learning, intrinsic motivation, and proactive participation. The radar chart offers a comparative visual of how engagement manifests differently depending

on contextual factors, reinforcing the need for nuanced pedagogical strategies that respond to this spectrum of behaviours rather than relying on deficit models. This typology serves as both a conceptual framework and a diagnostic tool for institutions implementing block delivery, enabling targeted support and curriculum design that acknowledges and supports varied learner identities.

However, as a conceptual tool, these profiles require empirical testing to explore how students may adopt, oscillate between, or integrate characteristics across multiple engagement types in response to personal, disciplinary, or institutional variables. Future research could validate the taxonomy in live learning environments, examining how engagement behaviours develop over time and how tailored pedagogical interventions might support students in transitioning toward more transformative engagement.

Figure 2: Variants of Student Engagement in Block Delivery – A Worked Example



Variants of Student Engagement in Block Delivery

To support the practical application of the proposed taxonomy of student engagement, a visual model was developed that profiles six distinct student types. These profiles: transactional student, transformative student, commuter student, mature student, time-constrained student, and highly engaged STEM student, are presented as conceptual illustrations of how student behaviours might be distributed across the six dimensions of engagement. They serve as worked examples to show how the taxonomy could be used to interpret, visualise, and respond to the diverse behavioural adaptations observed within block and intensive delivery models. These six profiles are not intended to be exhaustive or mutually exclusive and in future research, these illustrative profiles can be tested and refined through empirical studies, offering higher education practitioners a language and lens through which to identify and respond to the complex realities of student engagement in block and intensive STEM education.

The Transactional Student

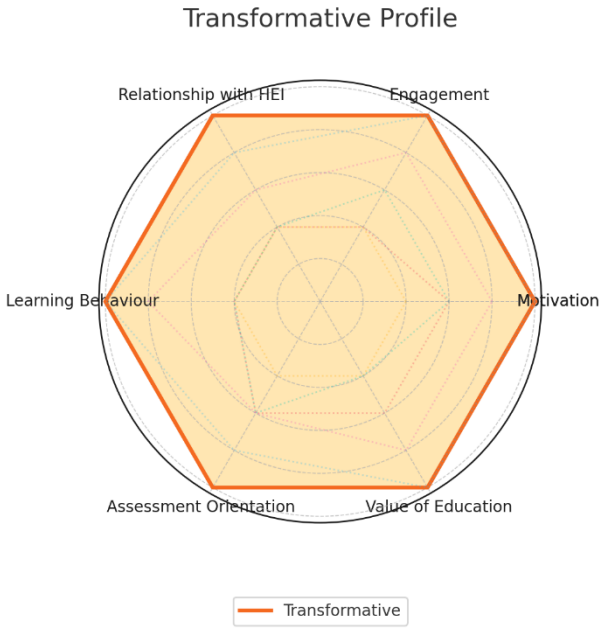
This profile exemplifies a student who adopts a strategic, compliance-oriented approach to learning, often motivated by external outcomes such as grades, credentials, or employability. The transactional student exhibits behaviours aligned with surface learning (Biggs & Tang, 2011) and instrumentalism (Ramsden, 2003), and is likely to focus on minimum effort required to pass, attend only when necessary, and prioritise assessment outputs over developmental processes. These behaviours are well documented in critiques of marketised higher education (Giroux et al., 2011; Souto-Otero et al., 2023), where students increasingly perceive themselves as consumers seeking return on investment. Freire's (1970) critique of the "banking model" of education also aligns with this engagement style, which positions the learner as a passive recipient rather than an active participant.

Figure 3 – The Transactional Student

The Transformative Student

In contrast, the transformative student profile reflects deep learning, intrinsic motivation, and active, reflective engagement with both content and the broader educational experience. This profile draws on Mezirow's (1991; 1997) transformative learning theory, Burns' (1978) and Bass's (1990) transformational leadership concepts, and contemporary engagement research (Kuh, 2009). Transformative students seek personal and professional growth, value the process of learning, and engage in co-creation with peers and educators. They often view their relationship with the institution as collaborative rather than transactional, aligning with student-as-partner models (Bovill et al., 2016). Their behaviours include seeking feedback, exploring beyond curricular boundaries, and integrating learning with their evolving sense of self.

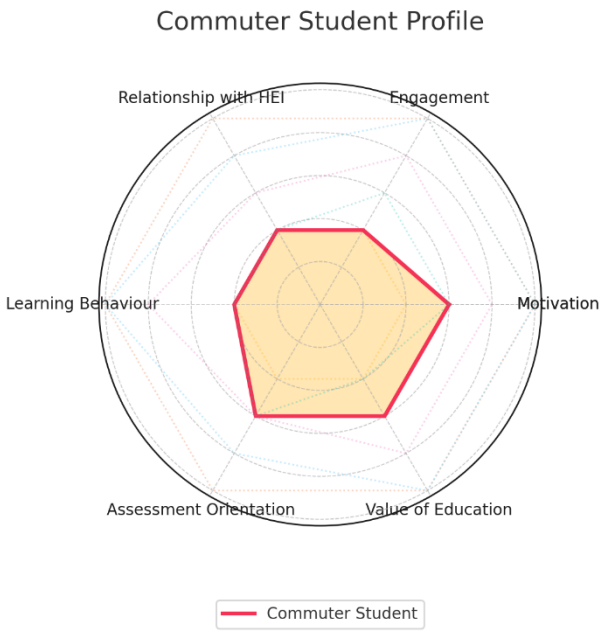
Figure 4 - The Transformative Student



The Commuter Student

The commuter student profile is grounded in research exploring the challenges faced by students who live at home and travel to campus, often due to financial constraints or caregiving responsibilities. This group has been under-represented in student engagement literature, despite their increasing prevalence (Thomas & Jones, 2017; Office for Students, 2019). The literature suggests that commuter students may demonstrate pragmatic or strategic behaviours, attending only necessary sessions, focusing on assessment, and disengaging from co-curricular or informal learning opportunities. These behaviours often stem from logistical limitations rather than lack of motivation. Reason (2009) and Lau & Brickman (2020) note that reduced institutional integration among commuters can lead to surface learning patterns. In this model, the commuter student is not framed as disengaged, but as adaptively transactional.

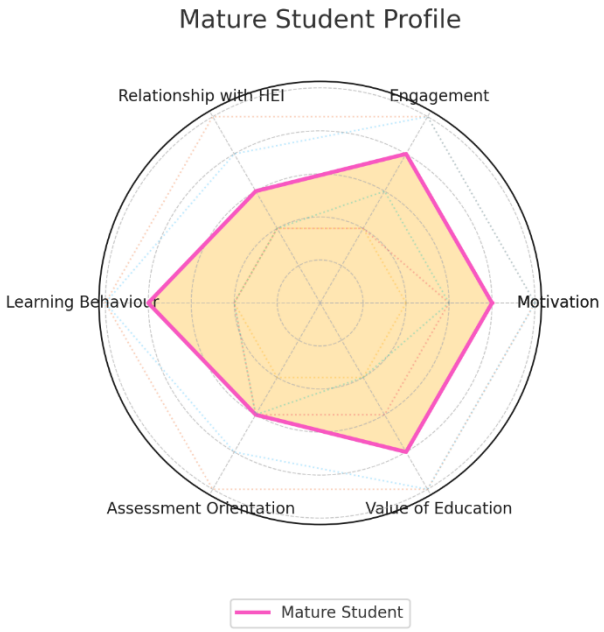
Figure 5 - The Commuter Student



The Mature Student

Mature students, typically aged 25 and above, represent a growing demographic in higher education, particularly in post-1992 universities and regional institutions. Their engagement behaviours are shaped by a range of factors including work, family responsibilities, and a return to learning after significant time away. Literature suggests that mature students are often highly intrinsically motivated and demonstrate strong academic commitment (Bamber & Tett, 2000) but may engage selectively with institutional structures due to time constraints or previous experiences of education (Reay, 2003). Their behaviours may overlap with those of the transformative student, particularly in terms of learning orientation and motivation, but with lower engagement in extra-curricular or institutional partnership roles. This profile reflects findings from Welsh higher education demographics, which show significant mature student participation in STEM programmes (StatsWales, 2023).

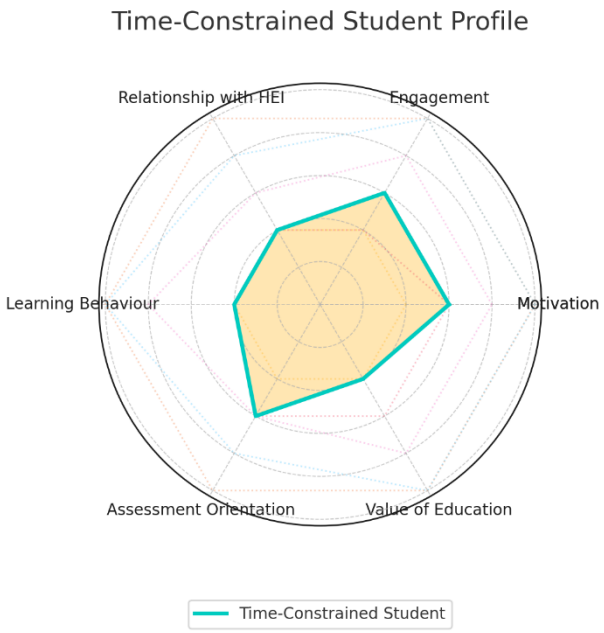
Figure 6 - The Mature Student



The Time-Constrained Student

This profile represents students balancing multiple external responsibilities, such as employment, caring duties, health needs, or economic hardship, which limit their capacity to engage fully with institutional life. Research by Thomas (2012) and Yorke & Longden (2008) identifies this group as particularly vulnerable to strategic, surface-level engagement due to structural pressures. Time-constrained students may prioritise essential tasks, focus on graded outputs, and adopt coping behaviours such as cramming or absenteeism. Like the commuter student, they are not necessarily unmotivated, but often unable to participate in deeper or more sustained engagement due to factors beyond their control. This reinforces the need for pedagogical models that distinguish between disengagement and adaptation, particularly within compressed delivery contexts.

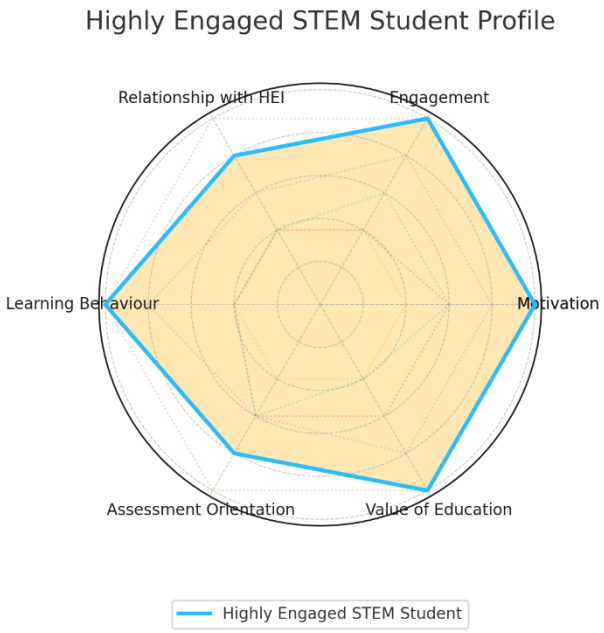
Figure 7 - The Time-Constrained Student



The Highly Engaged STEM Student

This profile illustrates a student who thrives under the demands of STEM disciplines and demonstrates high levels of engagement across all six behavioural dimensions. While sharing many traits with the transformative student, this profile is situated within the context of STEM programmes delivered in block formats. Literature suggests that when supported appropriately, block delivery in STEM can foster focused, applied learning, critical thinking, and project immersion (Davies & Hough, 2017; Phillips & Bailey, 2015; Seymour & Deane, 2016). The highly engaged STEM student is motivated by curiosity and personal development, engages deeply with feedback and learning processes, and values both the structure and flexibility offered by intensive modes. However, they still require supportive environments to avoid burnout or over-assessment, particularly where delivery is compressed.

Figure 8 - The Highly Engaged STEM Student



The Complexity of Transactional Engagement in Higher Education

The concept of transactional engagement among students in HE often carries a negative connotation, implying a surface-level relationship with learning that prioritises outcomes over process, and compliance over curiosity (Kahu, 2013; Entwistle, 2009). However, this binary perspective oversimplifies a more complex reality. Transactional behaviours are neither inherently bad nor uniformly detrimental; rather, they represent a pragmatic and sometimes necessary strategy employed by students navigating diverse and demanding educational landscapes (Baxter-Magolda, 2004; Kahu & Nelson, 2018).

Transactional engagement typically manifests as a focus on measurable outcomes such as grades, credentials, or employability prospects (Ramsden, 2003; Meyer & Land, 2005). Students exhibiting transactional behaviours may engage minimally, completing only the required work to pass assessments, adopting surface learning approaches, or limiting participation to activities that directly affect their academic progression (Biggs, 1999; Marton & Säljö, 1976). From a traditional pedagogical viewpoint, these behaviours can inhibit deeper cognitive engagement, critical thinking, and the holistic development of knowledge and skills (Prosser & Trigwell, 2014). Educators aiming to cultivate transformational learning experiences and an environment that fosters self-reflection, intellectual curiosity, and personal growth may see transactional engagement as a barrier to these outcomes (Mezirow, 1991; Kember, 2009).

Nonetheless, transactional engagement often reflects rational and adaptive responses to external pressures and constraints. Many students face competing demands including financial responsibilities, employment, family commitments, and personal wellbeing challenges (Thomas, 2012; Yorke & Longden, 2008). For these individuals, a transactional approach provides a manageable framework to prioritise limited resources towards achieving clear, goal-oriented outcomes (Kuh et al., 2007). This pragmatic engagement does not necessarily indicate a lack of motivation but rather a different motivational orientation rooted in necessity and survival within the higher education system (Deci & Ryan, 2000; Vansteenkiste et al., 2006).

Furthermore, the transactional approach exists along a spectrum rather than as a fixed or static state. Students may oscillate between transactional and transformational engagement depending on context, subject area, delivery mode, and support structures (Kahu & Nelson, 2018; Trowler, 2010). Recognising this fluidity challenges educators and institutions to avoid deficit narratives and instead consider how learning environments can be designed to accommodate diverse engagement styles while promoting opportunities for deeper involvement (Bovill, Cook-Sather & Felten, 2016).

By understanding transactional behaviours as complex and context-dependent, higher education practitioners can better tailor curricula, assessment strategies, and support mechanisms. For example, flexible delivery models, transparent assessment criteria, and clear relevance to career pathways may validate transactional students' goals while gradually encouraging more integrative and self-directed learning (Biggs & Tang, 2011; Entwistle, 2018). Rather than dismissing transactional engagement, the goal should be to create inclusive educational spaces that meet student needs, fostering progression toward transformational engagement through support, scaffolding, and relevance (Lizzio & Wilson, 2013; Kahu, 2013).

Institutional Responses: Challenges and Opportunities

Institutions face complex challenges addressing transactional behaviours in block delivery, especially in STEM, where technical rigour and assessment demands are high. Curricula often prioritise measurable outcomes aligned with employability, potentially reinforcing transactional attitudes (Tomlinson, 2017; Archer & Davison, 2008). However, integrating active learning, formative assessment, and reflective exercises can encourage deeper engagement (Nicol & Macfarlane-Dick, 2006; Boud & Falchikov, 2007). Flexible delivery models such as block teaching and hybrid learning accommodate diverse needs, benefiting non-traditional students by addressing external commitments (Wilson et al., 2024; Barnett, 2011; Tight, 2019). In addition, embedding ethical reasoning, social context, and interdisciplinary problem-solving in STEM curricula aligns with transformational educational goals and societal challenges (Sheppard et al., 2009).

In curriculum design, embedding practices such as co-creation, problem-based learning, and flexible assessment strategies can actively promote transformational engagement, encouraging students to move beyond surface approaches and develop critical thinking, self-reflection, and deeper intellectual involvement (Bovill, Cook-Sather and Felten, 2016; Biggs and Tang, 2011). Such pedagogical innovations recognise the heterogeneity of student motivations and foster environments conducive to personal and academic growth.

Within student support services, recognising transactional behaviours as rational responses to systemic or personal challenges is crucial. Students juggling commuter status, part-time employment, caring responsibilities, or financial constraints may adopt pragmatic strategies focused on clear, goal-oriented outcomes rather than holistic engagement (Thomas, 2012; Yorke & Longden, 2008). Understanding transactional engagement in this context reframes it not as a deficit but as an adaptive coping mechanism that reflects the complex realities many students face within the higher education system (Deci & Ryan, 2000; Kahu & Nelson, 2018). This recognition can inform more empathetic and flexible support frameworks that accommodate students lived experiences.

Engagement strategies can further benefit from aligning motivational approaches, such as feedback literacy development and partnership pedagogy, with students' evolving identity formation as learners (Carless & Boud, 2018; Kahu, 2013). By fostering authentic partnerships and transparent feedback processes, institutions can scaffold student agency and encourage shifts toward transformational engagement. The transactional student model thereby challenges deficit narratives by acknowledging the influence of structural factors including tuition fees, widening participation policies, credentialism, and employability discourses, which shape student behaviours and aspirations (Baxter-Magolda, 2004; Kahu and Nelson, 2018).

Naming and classifying transactional behaviours within the authors' taxonomy enables institutions to devise more inclusive, supportive strategies that guide students toward deeper, more integrative learning experiences. However, this framework also raises important critical questions for further exploration: At what point does a student's engagement become predominantly transactional? Is transactional engagement a fixed identity, or do students oscillate along a spectrum of engagement types depending on context? Furthermore, what institutional practices might reinforce transactional identities, and conversely, which strategies can effectively encourage transformational shifts in student engagement? Addressing these

questions is essential to developing pedagogical and support models that not only acknowledge student realities but actively facilitate their progression toward meaningful, transformational educational experiences.

Transactional Behaviours in the Context of Block Delivery

Block and intensive delivery models refer to curriculum structures in which students engage with fewer modules at a time over shorter, more concentrated periods. Unlike traditional semester-long formats that distribute workload across multiple subjects, block models typically involve full-time focus on a single module. These formats offer flexibility and immersion, which can benefit students balancing study with other commitments. However, the intensive nature of these models also introduces risks, including increased workload intensity, time pressure, and limited reflection opportunities, factors which may amplify transactional behaviours if not appropriately scaffolded.

Block and intensive delivery models are increasingly adopted in higher education to accommodate diverse student needs, particularly among non-traditional and commuter learners. Research demonstrates that such models can both alleviate and exacerbate transactional engagement, making them a valuable context in which to explore student behaviours along the transactional–transformational spectrum.

Evidence suggests that intensive delivery can offer distinct advantages. Condensed formats provide opportunities for immersion and sustained focus, as students can concentrate on a smaller number of modules at any one time. Studies report higher levels of attendance, participation, and satisfaction in block-delivered courses, with students valuing the ability to focus deeply on a single subject area (Pollard & Hillage, 2001; Seymour & Deane, 2016). In STEM disciplines, intensive formats appear particularly effective for laboratory-based and project work, where continuity and immersion are essential for skill development (Davies & Hough, 2017). These findings indicate that intensive models may support transformational engagement by creating conditions that foster focus, persistence, and deeper interaction with learning materials.

However, the compressed timeframe inherent in block delivery also carries risks. Several studies have documented increased stress, cognitive overload, and a tendency toward surface learning in block courses (Phillips & Bailey, 2015; Johnson et al., 2019). When faced with heavy workloads and looming deadlines, students may adopt pragmatic, outcome-driven strategies, completing only what is necessary to pass assessments. Such behaviours closely align with transactional engagement, where extrinsic motivators and efficiency considerations outweigh reflective or exploratory learning. For some students, particularly those with limited time due to employment or caring responsibilities, this transactional orientation represents an adaptive response to structural pressures (Nieuwoudt & Stimpson, 2021).

The dual potential of block delivery, to either encourage transformational immersion or reinforce transactional strategies, highlights the importance of curriculum design and pedagogical support. While the format itself provides structural flexibility, the quality of engagement depends heavily on whether students are supported to manage workload, reflect on learning, and make meaningful connections between theory and practice. Without such scaffolding, intensive modes risk amplifying transactional traits such as assessment-driven

focus and strategic compliance. With effective support, however, they can be powerful vehicles for transformational engagement, especially in STEM contexts where extended concentration on complex, applied tasks is essential.

From this perspective, the taxonomy of transactional characteristics developed in this paper provides a useful framework for examining how student behaviours manifest within block delivery. For instance, reduced timetables may heighten indicators such as deadline-driven effort or selective engagement with assessed tasks, while simultaneously opening opportunities for transformational indicators like sustained collaboration and immersion in problem-solving. Recognising these patterns allows educators to design interventions, including formative assessment, reflective practice, and autonomy-supportive teaching that mitigate transactional tendencies and promote deeper, more meaningful engagement.

Conclusion

While block and intensive delivery models are increasingly adopted for their potential to enhance flexibility, retention, and participation, they also present new and under-explored challenges for student engagement. Attendance and surface-level engagement remain persistent issues in block delivery, with studies suggesting that the structure of block teaching may amplify strategic, outcome-driven behaviours over time (Dixon & O'Gorman, 2020). These patterns are particularly relevant in the context of widening participation, where increasing numbers of non-traditional and commuter students are navigating higher education while balancing employment, caring responsibilities, and financial pressures.

Emerging literature further highlights how the design of compressed learning formats can exacerbate transactional tendencies. Shortened timelines, heavy cognitive demands, and continuous assessment structures may encourage students to adopt surface strategies—such as attending only required sessions, focusing narrowly on assessed content, or avoiding deeper engagement activities (Phillips & Bailey, 2015; Biggs & Tang, 2011). In STEM disciplines especially, the pressure to master dense content within limited periods can incentivise efficiency over reflection (Moore, 2013; Ahmed, 2022). For students with limited time or resources, such as commuters or mature learners, these challenges are magnified, leading to pragmatic, outcome-driven engagement that may be misunderstood as disinterest or disengagement (Kandiko & Mawer, 2013; Thomas, 2012). Without intentional scaffolding, block models risk reinforcing transactional approaches that, while adaptive, may hinder long-term development and disciplinary identity.

Despite the growing sector shift to block delivery, there has been little conceptual development to support understanding of how student behaviours manifest differently in different delivery models, or how educators might recognise and respond to this variation. There is a need to move beyond attendance as a proxy for engagement and towards more nuanced, inclusive frameworks that take into account motivation, context, and identity.

This review responds to that need by proposing, for the first time, a conceptual taxonomy of student engagement behaviours within block delivery. Drawing on leadership theory, specifically the distinction between transactional and transformational modes of interaction (Burns, 1978; Bass, 1990), the taxonomy applies these constructs to the higher education context in a grounded and critically adaptive manner. Rather than framing student behaviours

as either ideal or deficient, the taxonomy positions engagement along a spectrum, recognising that transactional tendencies often represent pragmatic and adaptive responses to personal and institutional conditions.

The methodology employed a traditional review of the literature complemented by professional insights and contextualised within the Welsh higher education landscape. This enabled the authors to identify and iteratively refine behavioural indicators across six key dimensions: motivation, engagement, relationship with the institution, learning behaviour, assessment orientation, and perceived value of education. These dimensions formed the basis of the taxonomy and its application to block delivery in STEM contexts.

To illustrate how the taxonomy can be applied in practice, the paper presents a worked example using radar charts to visualise behavioural profiles of different student types. These include the archetypal transactional and transformative students, as well as more contextually grounded variants founded in the literature such as commuter students, mature learners, highly engaged STEM students, and time-constrained students. Each profile exhibits a unique pattern of engagement behaviours, reflecting the complexity and diversity of student experiences within compressed delivery formats.

Ultimately, the taxonomy and accompanying visual framework aim to support more inclusive and effective implementation of block teaching across the sector. By making visible the behavioural adaptations students employ in response to compressed formats, this research offers a way to diagnose, interpret, and respond to different forms of engagement without reverting to deficit narratives. This contribution is particularly significant in light of ongoing sector-wide debates around retention, progression, and graduate outcomes, challenges which cannot be met through structural change alone but require a deeper understanding of how students navigate, resist, and adapt to institutional demands.

In recognising the transactional approach as a rational and sometimes necessary strategy, the framework opens new avenues for institutional empathy, pedagogical design, and policy reform. It invites educators and leaders to think critically about how curriculum design, assessment practices, and student support can promote progression along the engagement spectrum, from transactional compliance toward transformative learning. In doing so, this research supports the creation of more responsive, equitable, and meaningful learning experiences for all students in an increasingly compressed and complex higher education environment.

Future work

Further research could meaningfully extend this work by applying the taxonomy and associated behavioural profiles in STEM courses, enabling a deeper exploration of how engagement styles manifest in real-world teaching and learning contexts. By operationalising the taxonomy through student surveys, learning analytics, and observations, researchers could evaluate its utility in informing curriculum design, shaping formative and summative assessment strategies, and tailoring pedagogical interventions within block delivery models.

Empirical application of the model would also provide valuable evidence on how student engagement styles interact with delivery structures, institutional support systems, and individual learner identities. This could help identify which curriculum features, such as

scaffolding, co-design, and structured peer interaction are most effective in shifting engagement from transactional to more transformative modes, particularly for non-traditional student populations.

Additionally, future studies could compare engagement patterns across disciplines and delivery modes (e.g., block versus traditional semester formats), allowing the taxonomy to serve as a comparative tool in educational evaluation. For instance, applying the model in STEM and non-STEM courses could test whether certain behaviours are discipline-specific or more widely applicable. Researchers could also use the taxonomy to develop practical instruments such as diagnostic tools or engagement audits, that guide institutions in designing inclusive, engagement-enhancing learning environments.

By grounding future empirical studies in this conceptual framework, the taxonomy can evolve into a robust, evidence-based model with wide applicability across higher education, supporting improved retention, progression, and graduate outcomes for diverse student cohorts.

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