

Contemporary Approaches to Teaching Sport Science in Higher Education: Challenges, Innovations, and Future Directions

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Abstract

Sport science higher education has experienced substantial growth internationally; however, concerns persist regarding student engagement, transition, and retention, particularly during the first year of study. This review synthesises contemporary literature examining teaching and learning approaches within sport science programmes, with a specific focus on student expectations, pedagogical practices, and emerging challenges shaping the student experience. Evidence indicates that misalignment between students' expectations on entry to higher education and the academic, self-regulatory, and disciplinary demands of sport science curricula contributes to disengagement and non-continuation. While lectures remain an expected and familiar teaching method, student engagement is enhanced when teaching integrates applied, experiential, and relational approaches aligned with professional practice. The review further highlights the importance of explicitly developing self-regulatory skills, fostering meaningful student-staff relationships, and ensuring curriculum relevance to diverse career pathways. Technological innovations offer potential benefits but appear insufficient in isolation without strong pedagogical intent and relational support. Overall, the findings emphasise the need for pedagogically intentional, student-centred programme design that balances scientific rigour, applied learning, and relationship-rich education to support student engagement, retention, and graduate readiness in sport science higher education.

Keywords: sport science education, higher education pedagogy, student expectations, teaching and learning

1. Introduction

Within higher education, teaching and learning in sport science and exercise science (SES) take place within an increasingly complex educational landscape. A substantial body of research demonstrates that student expectations are multifaceted constructs shaped by prior educational experiences, disciplinary norms, and perceived career relevance (Tomlinson et al., 2023). When expectations related to teaching, learning, and assessment are met, students are more likely to demonstrate sustained engagement, attendance, and academic achievement (Byrne et al., 2012; Hibbs et al., 2024; Voss et al., 2007). Conversely, misalignment between student expectations and institutional practices has been associated with disengagement, underachievement, and discontinuation of studies (Tomlinson et al., 2023; Turner et al., 2017).

Evidence consistently suggests that students enter higher education with limited understanding of academic expectations and the demands of independent learning (Gill, 2020; Lowe & Cook, 2003). Compared with secondary and further education, university learning environments are typically less structured, more student-directed, and characterised by larger cohorts and reduced tutor contact (Belfield et al., 2017). As a result, many students report difficulties with self-regulation, workload management, independent learning, collaborative engagement, and critical thinking, particularly during the transition into higher education (Farhat et al., 2017; Hayman, 2017; Hockings et al., 2018; Jonker et al., 2011; Pather & Dorasamy, 2018). Despite these challenges, formal lectures remain the most expected teaching method among university students, highlighting a potential tension between traditional pedagogical expectations and contemporary learning demands (Maloshonok & Terentev, 2017; Sander et al., 2000).

These challenges are particularly salient within sport science and EXSS programmes. Over the past two decades, sport-related degree offerings have expanded substantially, with large student cohorts enrolled across undergraduate and postgraduate programmes (Universities UK, 2024). Despite this growth, sport programmes demonstrate lower completion rates than national averages, suggesting systemic challenges related to student engagement, transition, and learning design (HESA, 2022). Research focusing on sport and exercise students indicates that while learners often anticipate academic challenges, they frequently feel underprepared for the teaching approaches, assessment

demands, and independent learning expectations encountered at university (Gill, 2017, Gill, 2019, Gill, 2020; Hayman et al., 2022). However, sport students consistently report higher engagement when teaching approaches incorporate discussion, problem-solving, and opportunities to connect theoretical concepts with lived sporting experiences (Groves et al., 2010; Hayman, 2017; Peters et al., 2008).

Globally, EXSS programmes share a common structure grounded in scientific disciplines such as physiology, biomechanics, psychology, and research methods, alongside applied units in exercise testing and prescription (Kittel et al., 2023; Suchomel & McMahon, 2024). While many students enter these programmes driven by an interest in sport rather than clearly defined career outcomes (Spittle et al., 2021), graduate employment pathways are diverse and increasingly shaped by professional accreditation requirements and evolving industry expectations (ESSA, 2022; Stevens et al., 2018). This dynamic has intensified calls for pedagogical approaches that enhance the transferability of university learning to professional practice, support student retention, and align curriculum design with both student and industry perceptions of relevance (Lane & Whyte, 2006; Penney, 2013).

Despite a growing body of work examining student transitions, expectations, and curriculum content in sport science and EXSS, the literature remains fragmented with respect to teaching and learning approaches, pedagogical innovation, and future-focused curriculum design. Accordingly, the aim of this review is to synthesise contemporary research on teaching and learning in sport science higher education, with a particular focus on pedagogical challenges, innovative educational practices, and future directions for enhancing student engagement, learning, and graduate preparedness.

2. Literature Review

2.1 Student Expectations, Transition, and Engagement in Sport Science Higher Education

Student expectations in higher education (HE) are complex, multidimensional constructs shaped by prior educational experiences, institutional culture, and disciplinary norms (Tomlinson et al., 2023). A substantial body of literature indicates that student engagement, attendance, and academic achievement are more likely to be positive and sustained when teaching and learning experiences align with these expectations (Byrne et al., 2012; Hibbs et al., 2024; Voss et al., 2007). Conversely, misalignment between student expectations and institutional realities has been consistently associated with disengagement, underachievement, and non-continuation, particularly during the first year of study (Tomlinson et al., 2023; Turner et al., 2017).

Students entering HE commonly reports an incomplete or unrealistic understanding of academic expectations, especially regarding independent learning, workload management, and assessment demands (Gill, 2020; Money et al., 2017). Prior educational settings tend to be more structured, tutor-led, and relationally familiar, with smaller cohorts and higher levels of direct contact time, which contrasts sharply with the autonomy and self-regulation expected at university (Belfield et al., 2017). Research has repeatedly shown that newly arrived students often lack key self-regulatory skills, including effective time management, independent learning strategies, and academic confidence (Jonker et al., 2011; Pather & Dorasamy, 2018; Rowley et al., 2008). These challenges are compounded by limited experience in collaborative learning, critical thinking, and communicating in large academic settings (Hayman, 2017; Hockings et al., 2018).

Formal lectures continue to be the most expected teaching method among university students, despite ongoing debate regarding their pedagogical effectiveness and declining attendance (Dolnicar, 2005; Maloshonok & Terentev, 2017; Sander et al., 2000). While lectures remain familiar and reassuring to students, their effectiveness appears contingent on integration with more active, applied, and relational learning approaches (Loughlin & Lindberg-Sand, 2023).

2.2 Teaching and Learning Challenges in SES Programmes

SES, also referred to as exercise science, kinesiology, or human movement science, is offered globally and typically combines scientific foundations with applied professional competencies (Suchomel & McMahon, 2024). Students are often attracted to SES programmes due to an interest in sport rather than a clear understanding of the scientific rigour and academic demands of the curriculum (Spittle et al., 2021). This misalignment can contribute to early disengagement, particularly when students encounter substantial theoretical content in physiology, biomechanics, psychology, and research methods (Kittel et al., 2023).

Across international contexts, SES programmes have been characterised as “foundation” degrees, with many students intending to pursue postgraduate study or alternative professional pathways rather than direct entry into the sport industry (Dawson et al., 2013; Spittle et al., 2021). This creates pedagogical tension between preparing students for diverse career trajectories while maintaining disciplinary coherence and applied relevance. Evidence suggests that students are more likely to remain motivated and engaged when they perceive clear links between curriculum content and future career opportunities (Pedler et al., 2022).

Research focusing on sport students' transitions into HE consistently highlights difficulties with workload management, assessment literacy, independent learning, and confidence in seeking academic support (Gill, 2019; Gill, 2020; Hayman et al., 2022). However, sport students tend to engage positively with pedagogies that emphasise discussion, problem-solving, and reflection on personal sporting experiences, suggesting the value of applied and experiential learning approaches (Groves et al., 2010; Peters et al., 2008). These findings align with broader critiques of over-reliance on didactic teaching in applied disciplines.

2.3 Pedagogical Innovation, Technology, and Relational Learning

Despite increased institutional investment in online learning technologies, evidence regarding their pedagogical effectiveness in sport science education remains mixed. Studies indicate that online delivery can reduce student-staff interaction, limit peer learning opportunities, and hinder the application of theoretical concepts to real-world practice (McCulloch et al., 2022). Blended learning approaches are not always perceived favourably by students, particularly when they lack clear pedagogical purpose or relational engagement. Similarly, while simulation and virtual reality technologies show promise in health professions education, their application within sport science remains limited by cost, accessibility, and uncertain educational value.

Recent pedagogical scholarship has emphasised the importance of relational, student-centred approaches that prioritise belonging, connection, and meaningful academic relationships (Felten & Lambert, 2020; Gravett, 2023). Relationship-rich education has been shown to support student engagement, particularly for those from widening participation backgrounds who may lack familiarity with dominant academic cultures (Chung et al., 2017; Reay, 2018). Embedding self-regulatory skill development across curricula, providing peer-assisted learning opportunities, and maintaining approachable, consistent academic support have all been identified as effective strategies for improving student transition, retention, and success (Bjork et al., 2013; Hayman et al., 2022; Hattie, 2013).

2.4 Implications for Contemporary Sport Science Education

Collectively, the literature highlights persistent challenges in aligning student expectations, pedagogical practices, and disciplinary demands within sport science HE programmes. While students value structured teaching and accessible staff, contemporary sport science education increasingly requires autonomy, critical thinking, and applied competence. Addressing this tension requires pedagogical approaches that integrate scientific rigour with relational support, applied learning opportunities, and explicit development of self-regulatory skills. Understanding student perceptions of curriculum relevance and teaching practices remains critical for designing programmes that are engaging, inclusive, and responsive to evolving professional contexts.

3. Methodological Approach

This study adopted a narrative review design incorporating systematic search elements to synthesise contemporary literature relating to teaching and learning in sport science higher education. While the review did not aim to meet the full methodological requirements of a systematic review, structured search, screening, and selection procedures were implemented to enhance transparency, consistency, and methodological rigor.

3.1 Search Strategy

For this literature review, a systematic electronic search was conducted across multiple academic databases, including Google Scholar, Taylor & Francis Online, ScienceDirect, EBM Reviews, CISTI Source, and Current Contents. The search focused on peer-reviewed articles published between 2000 and 2026 that addressed teaching, learning, and assessment practices within sport science or related higher education disciplines.

Keywords and search terms included combinations of: "*sport science education*," "*higher education pedagogy*," "*teaching methods*," "*learning strategies*," "*assessment techniques*," "*formative assessment*," "*summative assessment*," "*student engagement*," "*innovative teaching*," and "*curriculum design*." Boolean operators (AND/OR) were applied to refine results and ensure relevance to contemporary teaching approaches.

3.2 Exclusion Criteria

Articles were excluded if they did not meet the inclusion criteria. This included duplicate records across databases, publications for which the full text was not accessible, and studies published outside the specified timeframe of 2000-2026. Additionally, articles that did not focus on teaching, learning, assessment, or curriculum practices within higher education, particularly in sport science or closely related disciplines, were excluded. Studies not published in English and those that examined teaching or assessment methods irrelevant to contemporary sport science education or not applicable in higher education contexts were also excluded. This approach ensured that the review included only literature directly addressing the challenges, innovations, and future directions in teaching and learning within sport science higher education. Please see table 1 for the detailed inclusion/exclusion criteria.

Table 1. The inclusion and exclusion criteria applied during the study selection process

Inclusion Criteria	Exclusion Criteria
Peer-reviewed journal articles	Duplicate studies
Published between 2000 and 2026	Non-English publications
Focused on higher education teaching and learning	Studies unrelated to higher education
Focused on sport science, exercise science, or related disciplines	Studies unrelated to sport science or exercise science
Studies examining pedagogy, assessment, curriculum, engagement, or transition	Conference abstracts, editorials, and opinion pieces
Full-text articles available	Articles without accessible full text

3.3 Data Extraction

For each article that met the inclusion criteria, relevant information was carefully reviewed and extracted to support a thematic synthesis of the literature. This included details such as the study context, focus on teaching or learning strategies, assessment practices, use of technology, and reported challenges or innovations in sport science education. Extracted information was then organised according to the main themes of the review, including contemporary teaching approaches, assessment methods, strategies to enhance student engagement, and emerging directions for curriculum and pedagogy in higher education.

This approach allowed the findings to be synthesised in a structured and coherent manner while maintaining the flexibility characteristic of a narrative review. By categorising and comparing insights across studies, the review was able to highlight prevailing trends, recurring challenges, innovative practices, and gaps in the literature, providing a comprehensive overview of contemporary approaches and future directions in sport science teaching and learning.

3.4 Quality Appraisal

Although this review followed a narrative review approach, the credibility and relevance of included studies were considered using principles adapted from the Critical Appraisal Skills Programme (CASP). Studies were evaluated according to clarity of aims, methodological appropriateness, relevance to sport science higher education, and contribution to contemporary pedagogical understanding. Due to the diversity of study designs included in the review, a formal scoring system was not applied. Instead, appraisal informed the interpretation and synthesis of findings

3.5 Findings

The final review included 47 peer-reviewed studies examining teaching and learning approaches within sport science and related higher education disciplines. Analysis of the literature identified four major themes: (1) student expectations and transition into higher education, (2) pedagogical approaches and student engagement, (3) technology-enhanced learning, and (4) relational and self-regulatory learning support.

Theme 1: Student Expectations and Transition

The literature consistently demonstrated that students entering sport science programmes often possess limited understanding of the academic expectations associated with higher education, particularly regarding independent learning, assessment literacy, and self-regulation (Gill, 2020; Jonker et al., 2011). Several studies highlighted that mismatches between expectations and institutional realities contributed to disengagement and adjustment difficulties during the first year of study.

Theme 2: Pedagogical Approaches and Student Engagement

Research indicated that students generally valued structured teaching approaches but demonstrated stronger engagement when pedagogies incorporated experiential learning, discussion, problem-solving, and practical application (Groves et al., 2010; Peters et al., 2008). While lectures remained familiar and expected, evidence suggested that lecture-only approaches were less effective in promoting applied understanding and critical thinking.

Theme 3: Technology-Enhanced Learning

The literature demonstrated mixed perspectives regarding online and blended learning within sport science education. While digital platforms improved flexibility and access to learning resources, concerns were raised regarding reduced interaction, weaker peer learning, and difficulties applying theoretical concepts to practice (McCulloch et al., 2022).

Theme 4: Relational and Self-Regulatory Support

Relationship-rich teaching environments emerged as an important factor supporting engagement, belonging, and persistence within higher education (Felten & Lambert, 2020; Gravett, 2023). Studies further highlighted the

importance of embedding self-regulatory skill development, peer mentoring, and accessible academic support within sport science curricula.

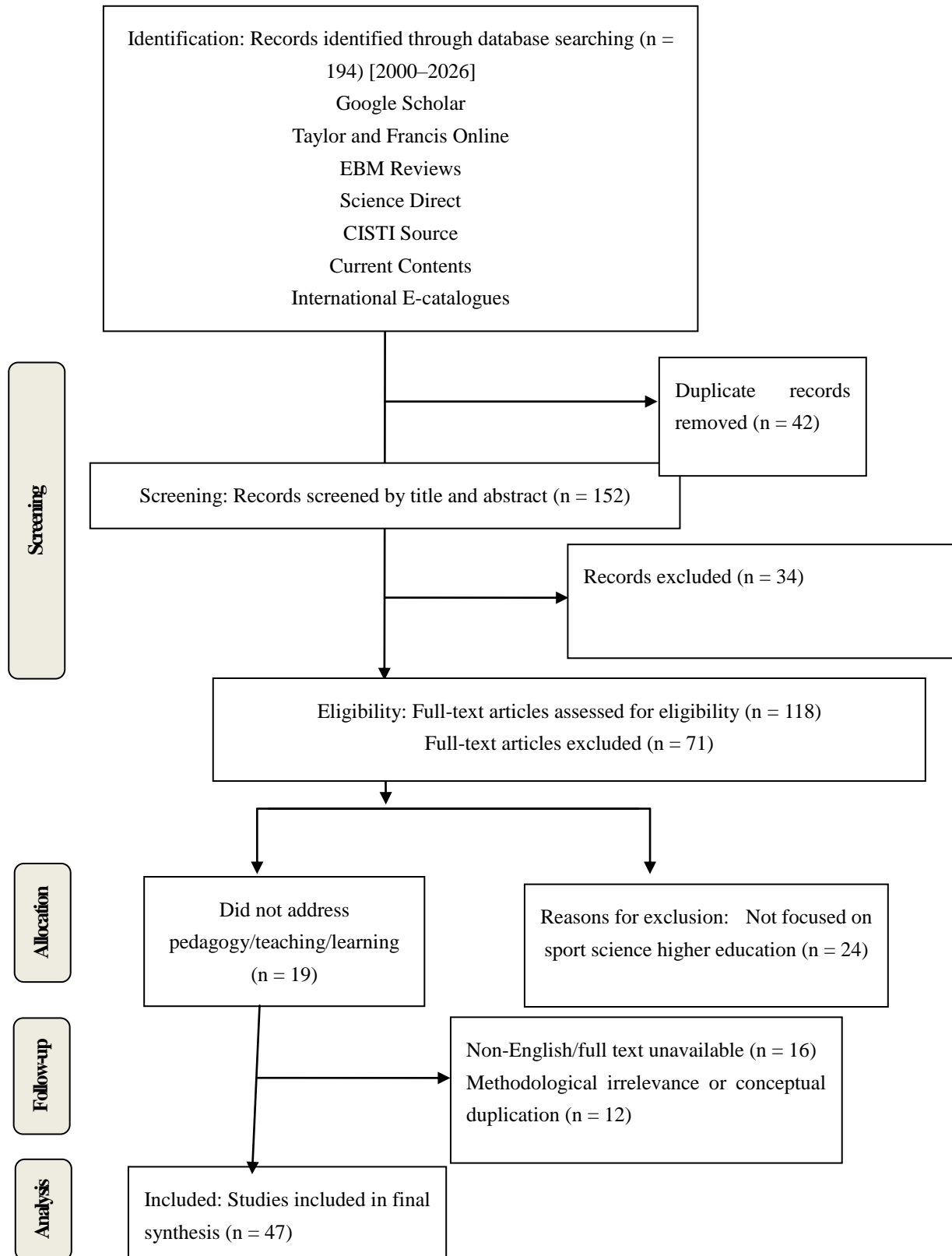


Figure 1. PRISMA flow chart of the study selection process

4. Discussion

This review synthesised contemporary literature on teaching and learning in sport science higher education, with particular attention to student expectations, pedagogical practices, and emerging challenges shaping student engagement and retention. Consistent with broader higher education research, student expectations were found to be central to engagement, persistence, and academic success (Byrne et al., 2012; Hibbs et al., 2024; Tomlinson et al., 2023). However, the evidence also highlights a persistent mismatch between what students expect on entry to university and the realities of academic study, particularly during the transition into the first year (Gill, 2020; Turner et al., 2017).

Across SES programmes, students commonly enter higher education with limited understanding of independent learning, assessment literacy, and the self-regulatory demands of university study (Jonker et al., 2011; Pather & Dorasamy, 2018). While students increasingly recognise the importance of time management and self-responsibility for learning, this awareness does not necessarily translate into effective self-regulated learning behaviours (Christie et al., 2013; Hockings et al., 2018). The literature therefore reinforces the view that transition to higher education is not a linear or short-term process but an extended period of adjustment requiring deliberate pedagogical support (Dinsmore et al., 2008; Gill, 2020).

Within sport science specifically, pedagogical tensions emerge between students' preference for structured, tutor-led teaching and the disciplinary need to foster autonomy, critical thinking, and applied competence. Although lectures remain the most expected and familiar teaching method (Sander et al., 2000; Maloshonok & Terentev, 2017), their pedagogical value has been increasingly questioned, particularly in applied disciplines such as sport science (Dolnicar, 2005; Loughlin & Lindberg-Sand, 2023). Nevertheless, evidence suggests that lectures continue to be perceived positively by students when embedded within coherent curricula that integrate discussion, practical application, and formative assessment (Hayman, 2017). However, the effectiveness of lectures remains contested within higher education literature. While some studies suggest that students value lectures for structure and familiarity (Sander et al., 2000), others argue that passive lecture-based delivery may limit deep learning and critical engagement, particularly within applied disciplines such as sport science (Dolnicar, 2005). In contrast to traditional lecture-centred approaches, experiential and problem-based pedagogies appear more effective in promoting engagement and applied understanding among sport science students (Groves et al., 2010; Peters et al., 2008).

The literature also demonstrates that sport science students engage more strongly with pedagogical approaches that emphasise experiential, problem-based, and practice-oriented learning, particularly when teaching draws on students' sporting backgrounds and career aspirations (Groves et al., 2010; Peters et al., 2008). This aligns with research indicating that perceived relevance of curriculum content to future careers is a key driver of motivation, engagement, and retention in SES programmes (Pedler et al., 2022; Spittle et al., 2021). However, variability in programme structures and career pathways continues to create challenges for curriculum coherence, particularly where degrees function as foundational pathways into diverse postgraduate or professional routes (Kittel et al., 2023; Suchomel & McMahon, 2024).

Technological innovations and online learning have become increasingly prominent in sport science education, yet evidence for their effectiveness remains mixed. While digital resources such as e-journals and e-books are widely utilised, fully online or blended learning approaches have been associated with reduced student-staff interaction, weaker peer learning, and difficulties applying theoretical knowledge to practice (McCulloch et al., 2022). Similarly, although simulation-based learning is well established in some health professions, its application within sport science remains constrained by cost, accessibility, and uncertain pedagogical value (Finlay et al., 2022). These findings suggest that technological innovation alone is insufficient to enhance learning without strong pedagogical and relational foundations. Although digital learning technologies provide increased flexibility and accessibility, evidence regarding their effectiveness remains inconsistent. For example, McCulloch et al. (2022) reported reduced student interaction and weaker peer engagement within online learning environments. However, other studies suggest that blended learning can enhance autonomy and access to resources when pedagogically integrated with active learning and staff support. These contrasting findings indicate that technological effectiveness is highly dependent on implementation quality rather than technology itself.

Emerging literature increasingly emphasises the importance of relational pedagogies in supporting student transition, engagement, and belonging, particularly for students from widening participation backgrounds (Felten & Lambert, 2020; Gravett, 2023). Relationship-rich educational environments, characterised by approachable staff, consistent teaching teams, and meaningful academic interactions, have been shown to support student confidence, self-regulation, and persistence (Bell, 2021; Ivemark & Ambrose, 2021). Embedding explicit development of self-regulatory skills

within curricula, alongside peer-assisted learning and early academic support, appears particularly important in sport science programmes where students often enter with enthusiasm for sport but limited familiarity with academic culture (Bjork et al., 2013; Hayman et al., 2022). Although several studies identified self-regulatory skills as important predictors of student success (Jonker et al., 2011; Pather & Dorasamy, 2018), many of these studies relied heavily on self-reported perceptions and cross-sectional designs, limiting the ability to establish long-term causal relationships between self-regulation and academic performance. However, despite these methodological limitations, the consistency of findings across multiple contexts suggests that self-regulation remains a critical component of successful transition into higher education.

Taken together, the literature highlights that contemporary sport science education must balance scientific rigour, applied learning, and relational support to address ongoing challenges of student engagement and retention. A limitation within the existing literature is the predominance of descriptive and context-specific studies, many of which rely heavily on student perceptions rather than objective measures of academic performance or long-term retention outcomes. Consequently, caution is required when generalising findings across institutional and cultural contexts. Aligning teaching practices with realistic student expectations, embedding self-regulation within curricula, and designing learning experiences that are both relational and professionally relevant may represent critical directions for the future of sport science higher education. These findings underscore the need for pedagogically intentional programme design that supports diverse student cohorts while preparing graduates for an evolving and interdisciplinary professional landscape.

4.1 Practical Implications for Sport Science Higher Education

The findings of this review have several important implications for curriculum design and teaching practice within sport science higher education. First, curricula should integrate experiential and applied learning opportunities that connect theoretical knowledge with professional practice, including case-based learning, problem-solving activities, practical demonstrations, and authentic assessment tasks. Second, teaching interventions should explicitly support the development of self-regulatory skills such as time management, independent learning, critical thinking, and assessment literacy, particularly during the transition into first-year study.

In addition, relationship-rich pedagogies should be prioritised through approachable teaching practices, peer-assisted learning initiatives, mentorship opportunities, and consistent academic support structures that foster student belonging and engagement. Staff development programmes should further support educators in implementing student-centred, inclusive, and technologically informed pedagogical approaches that balance academic rigor with relational support.

Finally, institutions should ensure that technology-enhanced learning strategies are implemented with clear pedagogical purpose rather than as standalone innovations. Blended learning environments should therefore promote meaningful interaction, collaboration, and practical application to maximise student engagement and learning outcomes within sport science programmes.

4.2 Integrated Model of Engagement in Sport Science Higher Education

Based on the synthesis of the literature, this review proposes an Integrated Model of Engagement in Sport Science Higher Education. The model emphasises the interaction between four interconnected dimensions:

- (1) Structured Academic Support
- (2) Applied and Experiential Learning
- (3) Relational and Belonging-Focused Pedagogy
- (4) Development of Self-Regulatory Skills

The model proposes that effective sport science education requires balance across these dimensions to support student engagement, retention, academic performance, and professional readiness. Technological innovation is positioned as a supportive mechanism rather than a standalone pedagogical solution.

5. Conclusion

This review examined contemporary teaching and learning approaches in sport science higher education, focusing on student expectations, pedagogical practices, and challenges affecting engagement and retention. The evidence indicates that misalignment between students' expectations and the academic and self-regulatory demands of sport science programmes remains a persistent issue, particularly during the transition into the first year of study. Findings highlight that while lectures remain a familiar and expected teaching method, student engagement is enhanced when teaching is integrated with applied, experiential, and relational learning approaches that reflect the professional

contexts of sport science. Perceived relevance of curriculum content, explicit development of self-regulatory skills, and accessible academic support emerge as critical factors in supporting student engagement and academic success. Overall, the literature suggests that effective sport science education requires pedagogically intentional programme design that balances scientific rigour, applied learning, and relationship-rich teaching practices. Addressing these elements collectively may improve student experience, retention, and preparedness for diverse professional pathways within sport science.

6. Limitations

Several limitations of this review should be acknowledged. First, although multiple academic databases were searched, database selection bias may still have occurred, as relevant studies indexed in other databases may not have been identified. Second, only English-language publications were included, which may have excluded potentially relevant international literature published in other languages. Third, publication bias remains possible, as studies reporting positive or innovative educational outcomes are more likely to be published than studies reporting neutral or negative findings. In addition, the review adopted a narrative approach with systematic search elements rather than a fully systematic review design, which limits the reproducibility and comprehensiveness of the synthesis. Finally, the broad scope of sport science higher education across diverse international and institutional contexts may limit the generalisability of the findings to all educational settings.

7. Disclosure

Conflict of interest: The authors declare no conflict of interest.

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