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ORIGINAL PAPER

Engaging the disengaged: investigating the built environment in a secondary FlexiSpace

Suzie Fullerton[1] · **Claire D. Nicholls**[1]

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Abstract
The physical space of learning is an essential part of promoting inclusive and supportive learning environments for all students, becoming even more important when students are at risk of educational disengagement and securing future success in life. This article presents findings from a qualitative pilot case study within a Queensland state secondary school in Australia to highlight the teacher voice around elements of the FlexiSpace built environment viewed as valuable in engaging disengaged youth. The interpretivist research approach included teacher reflection journals and semi-structured interviews. Findings illustrate the significance—both positive and negative—of the FlexiSpace built environment on student engagement. Some elements are valued by participants because they facilitate greater flexible, relational, and digital pedagogy—pedagogies positively influencing student engagement. Other elements are not valued—perceived as restricting teaching practice and fostering greater distraction and dysregulation amongst students. The discussion focuses on the impact of flexible configuration and diversity of furniture; the importance of a sense of belonging; and the effectiveness of built elements to catalyse pedagogical flexibility and enhance student-centred learning. Findings from this case study suggest that the physical FlexiSpace built environments alone do not have a positive impact upon student engagement and that school funding in other areas is also crucial. Moreover, investment into education outcomes must be seen as multifaceted including teacher participation within the design process of facilities and collaboration during the initial teaching and learning phase, ensuring pedagogical practice and spatial possibilities match, is critical.

Keywords Built environment · Disengagement · FlexiSpace · Flexible learning · Innovative learning environment

✉ Claire D. Nicholls
claire.nicholls@unisq.edu.au

[1] School of Education and Creative Arts, University of Southern Queensland, Toowoomba, Queensland, Australia

Introduction

Increasing school capacity to proactively respond to early signs of high school student disengagement is a priority for Queensland Department of Education (DoE) State schools in Australia (DoE, 2022, 2024; Education Council, 2019). One current approach adopted involves teachers designing innovative learning experiences to facilitate flexible learning within built FlexiSpaces.[1] Such environments are thought to provide teachers freedom and opportunity to offer highly differentiated learning environments for disengaged students facing specific personal challenges and foster a sense of value and respect for inclusion and diversity (DoE, 2024). Figure 1 presents the FlexiSpace used in this study noting its spatial, physical, and aesthetic features.

Significant research identifies the increasing need for innovative flexible learning environments in schools (Mahat et al., 2018; Te Riele, 2006, 2007), and emerging data show support for differentiated approaches to re-engaging marginalised youth (Mills & McGregor, 2010; Thomas et al., 2020). However, limited empirical evidence exists to demonstrate the effectiveness of such FlexiSpaces in aiding the delivery of individualised, tailored education to support specific needs of disengaged students. As DoE (2024) commits to investing a further $45.5 million to build 50 additional FlexiSpaces and continues to fund educational delivery within the 52 existing FlexiSpaces, it is imperative that the experiences of teaching and learning within these innovative learning environments contribute to intervention and prevention government initiatives if this significant investment is to prove effective.

This pilot study addresses the gap in evidence of impact by focusing on one secondary school context and investigating physical elements of the built environment, such as décor, space, and furnishings. Data were generated with four teachers using two qualitative data collection methods—semi-structured interviews and teacher journals. These methods capture what elements of the built environment teachers view as valuable in facilitating student engagement, and why these are valued—giving voice to the experiences of teachers working within a FlexiSpace. This study aims to provide empirical data in an under-researched field that will benefit practitioners and policymakers involved in creating FlexiSpaces and designing innovative spaces and teaching solutions to effectively engage the disengaged.

Fig. 1 Initial furniture placement. *Note* Image by Reddaway (2021). Copyright by Reddaway Media

[1] A FlexiSpace is a Queensland Government funded innovative learning environment, in DoE schools, designed to support flexible, tailored intervention to disengaged students. Build of FlexiSpaces is part of the Youth Engagement Education Reform package (The State of Queensland, 2023).

Literature review

Engagement: pervasive and multidimensional

The pervasiveness of school disengagement, feelings of youth marginalisation and reduced school retention rates have been examined by many researchers who outline several causes, including—rigidity and a failure to recognise the complex lives of many individuals, authoritarian structures, curriculum viewed as irrelevant and pedagogical practices perceived as unfriendly and unwelcoming (Brunker & Lewthwaite et al., 2017; Smyth & McInerney, 2012; Te Riele, 2006). Much literature across a range of disciplines outlines benefits of flexible, personalised learning—closing the gap between a learning and assessment culture that falls short of including and engaging diverse learners and fostering 21st-century skills (Burton et al., 2017; Thomas & Dyment, 2019; Thomas et al., 2020). Furthermore, the adoption of a child-centred approach—within both architecture and education disciplines—views the potential of innovative physical designs to boost engagement and facilitate new, innovative teaching practices and learning processes (Stoltz, 2019).

Prominent psychologists theorise that the social-emotional wellbeing of students impacts educational success—aspects of physical safety and a sense of belonging influence engagement, self-actualization—reaching one's full potential, and achieving personal growth (Rogers, 1962). Maslow's (1943) hierarchy of needs states that an individual's basic physiological and psychological needs must be met before higher goals of self-esteem and self-actualization can be achieved. Evidently, the key to engagement is multidimensional and holistic approaches sensitive to students' complex and specific needs are essential (Mills & McGregor, 2010).

Moreover, the term engagement remains somewhat enigmatic due to varying terminology. The importance of student engagement with learning has been explored and has been given many terms: "school bonding" (Eggert et al., 1994, p. 111), "involvement" (Caspi et al., 1998, p. 438), "attachment" (Finn, 1989, p. 123), and "commitment" (Janosz et al., 1997, p. 735). Thomas et al. (2020) outline three interrelated dimensions emerging from literature: affective—the student's attitudes towards school, behavioural—student's actions towards school, and cognitive—the engagement with learning (also identified by Archambault et al., 2009; Fredrick et al., 2004; Reschly & Christenson, 2022).

Research shows a focus on cognitive engagement in a built environment that facilitates flexibility to address students' specific needs, and encourages students' active participation and choice, increases both affective and behavioural engagement (Thomas et al., 2020). According to Archambault et al. (2009), cognitive engagement encompasses investment in learning, and self-regulation of learning. Investment in learning includes students' perceptions of competency and willingness to engage in classroom tasks. Self-regulation is seen through students' willingness to participate in learning experiences and set goals. Therefore, intervention and prevention initiatives, addressing educational disengagement, must consider this multidimensional model and prioritise improving individuals' "perception of competency, their ability to set learning goals, and willingness to engage in learning" (Thomas et al., 2020, p. 814).

Arguably, an essential aspect of the school experience is the space in which students learn and hence their likelihood to continue schooling—a FlexiSpace innovative learning environment is designed to promote inclusion, flexibility, a sense of belonging, and school connectedness. Alongside the provision of such built environments, there should be processes and pedagogies that are sensitive to the complex needs of individuals and

value students holistically—identifying and addressing individual social, emotional, physical, and intellectual needs (Brunker & Lombardo, 2021; Lewthwaite et al., 2017; Mills & McGregor, 2010).

Introducing the FlexiSpace

FlexiSpaces has been offered as one solution to the issue of school engagement and retention—an innovative learning environment, designed to be a flexible, creative space where learning is highly collaborative (Blannin & Mahat, 2019). To address the changing needs of 21st-century learners, new demands experienced by the Australian education system, and increased risk of disengagement through poor retention and engagement, the Australian Government has invested significant public funding in building FlexiSpaces. Within Queensland, first builds occurred in 2018 with the goal of 102 FlexiSpaces established by 2025 (State of Queensland, 2024). This initiative supports priorities laid out in the Melbourne Declaration's reform agenda (Ministerial Council on Education Employment Training and Youth Affairs, 2008).

According to DoE (2004), "FlexiSpaces equip schools with high-quality, bespoke built environments that facilitate flexible learning opportunities by refurbishing existing learning settings into modern, inclusive spaces. These FlexiSpaces deliver individualised, high-quality teaching and learning strategies to support disengaged students". Education must respond to globalisation and economic and technological transformations, reflecting modern influences and instilling necessary future skills. Learning environments and the role of the teacher and students are evolving as scholars' theories of constructivism (Bandura, 1986; Dewey & Small, 1987; Freire, 2009; Vygotsky, 1978) enhance understandings that "learning is critically shaped by its context … it is actively constructed, and collaboratively negotiated" (Mahat et al., 2018, p. 10).

Learning is embedded in social interaction

FlexiSpaces ultimately aim to support pedagogical practices that are student-centred as per the evolving arguments put forward by prominent educational philosophers and child psychologists. Dewey and Small (1897), and Freire (2009), argue that students should not be "depositories [who] patiently receive, memorise, and repeat" (Freire, 2009, pp. 162–163). As such, Dewey (1998) and Piaget (1953) reasoned that active learning experiences in purposely designed environments are critical for consolidating existing understanding and constructing new experiences. It can therefore be argued that all elements of the classroom (i.e. the learning space) including the physical environment become ways of stimulating knowledge and understanding through experiential learning, connecting classroom learning to the real-world and increasing meaningfulness and relevance (Kemp & Lillywhite, 2020; Lombardi, 2007).

Constructivist theory, as espoused by Dewey (1998) and Piaget (1953), further reasons that learners build knowledge through rich, meaningful social interactions within well-planned environments (Brooks & Brooks, 1999). Dewey (1916, p. 22) wrote that "we never educate directly, but indirectly by means of the environment". To cultivate growth teachers should be leaders of constructivist education designing learning environments that foster dynamic interactions amongst students, teacher/s and the physical built environment (Mahat et al., 2018; Niemi, 2021).

In support of these theorists, The Reggio Emilia educational philosophy takes these ideas a step further conceptualising the learning environment as the *third teacher*—alongside the teacher and children—inviting exploration, interactive experiences and promoting belonging and communication (Reggio Children, 2022). Studies by environmental psychologists such as Weinstein (1981) suggest that school learning environments are equally as important as curriculum for influencing learning. Barker's (1968) behaviour settings theory outlines how 'units of the environment' impact the way people behave, with others concluding that architectural design can be critical in pursuing social goals (Bechtel, 1977; Schoggen, 1989) and achieving desired behaviour (Scott, 2005). Space influences "psychological and social practice" (Mahat et al., 2018, p. 14). Adopting practice theory ideologies, it can be further argued that there is a transactional relationship—"the environment shapes the learner, and the learners influence their environment" (Lippman, 2010, p. 1).

Research shows that the learning environment greatly influences a student's learning; however, simply adapting spaces is not sufficient; how the space is used is critical (Woolner, 2010). Moreover, the role of the teacher is central to successfully implementing student-centred pedagogy (Blannin & Mahat, 2019). Baeten et al. (2016) outline five design principles of student-centred learning environments: "stimulated knowledge construction", "teacher as facilitator … of the learning process", "cooperative work", "authentic assignments" and "embedding opportunities for self-regulated learning" (p. 44). Further research is needed to gain understanding about how this occurs and is experienced in practice within FlexiSpaces. Mahat et al. (2018) state, "the transition from design to a functional space has seen many [innovative learning environments] fall short of their initial intention" (p. 18)—to improve effectiveness, educator perspectives should be involved in the design process, and the development of "teachers' spatial competencies" (Blannin & Mahat, 2019, p. 19) should be prioritised.

Lippman (2010) advocated for a 'responsive design approach' that designs innovative learning environments grounded in evidence-based research, analysing the transactional relationships that take place between learners and their learning environment—"rather than dealing merely with aesthetics, the design must begin with an understanding that learning is situated in time and place" (p. 4), and the specific social environment. In this context, the following are also important: research into how specific learning environments function—the interactions and social patterns that occur, and multidisciplinary team collaboration to consider and plan how the physical environment can best be designed to support student learning (Lippman, 2010; Stoltz, 2019).

Research question and context

The guiding question of the research project is: *What elements of the built environment in a secondary FlexiSpace do teachers view as valuable in engaging the disengaged?* A follow-up question is also posed: *Why are these elements of the built environment valued, or not valued, by teachers?* This second question hopes to generate insight into why certain aspects of the FlexiSpace built environment are valued or not, from the perspective of classroom teachers—informing future design, consultation, and activation of such spaces.

The context for this pilot study research involves a state secondary school FlexiSpace designed to support students who have become disengaged with school characterised by poor attendance to school and regularly dropping out of school. The students often present with challenging behaviours that may be the result of psychosocial, poor family history engagement with schooling including lack of trust in schooling, and behavioural

conditioning towards school. As mandated by the state, students receive a normalised curriculum following the national Australian Curriculum, however the pedagogical choices remain the charge of the individual teacher as does the responsibility to differentiate instruction and curriculum for the needs of individual students based on the principles of content, product, process, and of particular interest for this article—the learning environment (ACARA, n.d.).

Methodology and methods

The constructivist theoretical framework outlined in the literature review supports a view of reality as being socially constructed. Adopting an interpretivist and social constructivist epistemology, this pilot research project used a qualitative case study approach, collecting data through intrinsic case study methods, including—teacher reflection journals and semi-structured interviews (Creswell & Creswell, 2022; Punch & Oancea, 2014; Stake, 1995). Ethics were sought and granted by University of Southern Queensland (UniSQ) Human Research Ethics Committee (Project ID ETH2023-0609), and participants were recruited from a Queensland Department of Education secondary school—with written permission from the principal. Table 1 outlines the four participants and the specific method of data collection gathered from each.

Data generation

Each teacher completed a prepared reflection journal over a two-week period. The journal involved 5–10-min written recordings of thoughts, three times per week for two weeks. Participants recorded, including labeling a map, how the teacher and students used the built environment, and provided an interpretation of students' level of engagement. An exemplar was not provided to avoid influencing thoughts or experiences, supporting the interpretivist epistemology adopted—multiple views, experiences, and interpretations are valued. Adam, Ben, and Beth then completed one 40–60-min semi-structured interview to discuss the data generated in their reflection journal and other open-ended questions including what subjects, topics, and types of learning activities students were studying in the FlexiSpace; which areas of the environment they prefer using and those they do not like as much including how this compares to the students' preferences for working; and what impact in the participants' opinion the built environment has on student engagement.

Like many schools in Queensland, there is only one FlexiSpace at the selected research site and, as to be expected, there are a limited number of teaching staff who work with the students. Because of this factor and that the FlexiSpace initiative at this school had only been opened within the past three years, two of the participants participated in the data generation retrospectively and reflected on their past experiences. While retrospective, the journals and interview included set added important lived experience to the data set as well as broadening the number of teacher voices represented. It is interesting that teachers are allocated to the FlexiSpace for shorter periods of teaching, such as single semesters, as represented by Ben, Beth, and Amanda, with Adam being the anomaly who taught in the space for two years. This is an interesting point which, in another study, warrants separate investigation.

Amanda's lived experience as a researcher and teacher brings unique insight to this project as a current practitioner in schools rather than being a university academic as is the case with many of the current studies examined in the literature review. This immediacy

Table 1 Research participants (pseudonyms adopted)

Participant	Description	Instruments collected
Adam	Current teacher of Health and Physical Education to flexi-class in a different learning environment. Former teacher of Mathematics and Science in the FlexiSpace	Retrospective reflection journal (reflecting on learning experiences from Semester 2, 2023)
		Semi-structured interview discussing experiences across 2002–2004 when he taught in the FlexiSpace
Ben	Current teacher of English to flexi-class in the FlexiSpace	Reflection journal (reflecting on learning experiences from Semester 1, 2024)
		Semi-structured interview discussing experiences in 2024
Beth	Current teacher of Mathematics to flexi-class in the FlexiSpace	Reflection journal (reflecting on learning experiences from Semester 1, 2024)
		Semi-structured interview discussing experiences in 2024
Amanda	Researcher. Former teacher of English, History and Geography to flexi-class in the FlexiSpace	Retrospective reflection journal (reflecting on learning experiences from Semester 2, 2023)

of experience, though recorded retrospectively in this project, is valuable for providing the element of reflexivity to the data analysis which was brought about through discussions and reflection sessions with the other author of this paper.

Data analysis

Interview data were transcribed, and thematic analysis was applied to the final transcripts and reflection journals. Inductive initial coding identified points of interest and recorded immediate thoughts, intuitions, and points of interest, serving to enrich the later formal data analysis. This was followed by a deductive bottom-up coding system matching the interview and journal data with each open-ended question to ensure rigour and validity. The data gathered from the four reflection journals also underwent a top-down deductive analysis process calculating the frequency totals for elements of the built environment used across the four participant journals.

Results and discussion

Valued elements of the built environment

Overall, participants of this pilot study valued a large learning space and built environment in which both teachers and students have choice and flexibility. For example, having

space to spread out reduces barriers for marginalized students who lack self-esteem and self-efficacy. As Ben stated, the ability to spread out makes students "more confident to do their work" and that within regular classroom environments students often feel "crammed in and feel like everyone's watching them." Furthermore, Adam explained that feeling less restricted and able to move about helps many students maintain focus and engagement.

Additionally, guiding learning by facilitating student choice about where they sit and how they learn creates more student buy-in and engagement, and builds skills to make responsible decisions. Adam reflected that providing choice and freedom reduces barriers; "I don't really care if they face the wall, face the front, have their side to me … I let students choose, but they need to then be responsible in this position." This leads to instilling agency and responsibility within individuals to make good choices.

Participants acknowledged that the FlexiSpace built environment enables greater teacher flexibility and the ability to facilitate varied learning activities and to be immediately responsive to students' moods and varying levels of engagement. Participants identified the whiteboard desks and walls to be useful tools when engaging students and allowed for flexibility. They all appreciated the cupboard storage space as a means to access additional resources and respond to disengagement. Recordings within the reflection journals, completed by the four participants, validate these elements to be valued physical aspects boosting student engagement.

Adaptions to the FlexiSpace built environment

Data gathered confirm the value of facilitating flexible learning within an open space but that, within this specific FlexiSpace context, furniture and design have changed and been adapted to meet the specific needs of students. For instance, referring to some of the original furniture, Beth described how teachers "chucked it all out because literally none of it was working." Over time, teachers have learnt which furnishings have helped boost engagement and have removed and stored furniture that has hindered.

Participants explained that they experimented using the original furniture across three six-month flexi-class programs, working with three different groups. They tested the use of various furnishings in different locations, trialling and observing impacts upon student engagement. A decision was made that original furniture—high desks and chairs, round tables and curved couches, designed to be centrally located in the FlexiSpace, would be replaced by traditional single classroom desks.

Participants value the positive impact that the introduction of single desks has had upon student engagement and have reflected on why this is the case. Adam stated:

> I really didn't like the high tables…. The horseshoe shapes were well suited for a conference where people are able to sit and engage and listen to one speaker, but I didn't find they were useful for working with flexi-class students at all. I would have much preferred individual desks that you could reconfigure however students want to learn and contribute - everyone gets their own desk. It's your desk, your chair. Where that moves in the space really can change on a day-to-day basis.

Adam explained that the value of everyone having their own desk means that:

> If you need to be working solo, you can spread your desk away from someone else and work. If you need to pair for an activity, you can just pick someone, put your desk together and work. Three, four, whatever. It's much more flexible than two massive big desks that you can't really move, and large couches. Also, I like everyone

> sitting at the same level. You don't have anyone sitting behind anyone else or in front of anyone else. That I really don't like, personally, as a learning space. If everyone's part of a learning, they should be able to see each other and contribute.

Beth noted that the single classroom desks are familiar and comfortable to students, and that having a hard surface to work on, "signals to students that it is time to engage in work."

Additionally, participants viewed the FlexiSpace as too big—the two large rooms, divided by glass and sliding doors, present significant challenges. Participants observed that many students find that there are too many options and find it difficult to self-regulate. A teacher adaptation is to predominantly use one section of the FlexiSpace and limit use of areas, such as the nook, the kitchen, outside areas, the booth-style tables, and collaborative desks with couches. Restrictions are placed on when these spaces can be used and on the number of students working in these areas.

Although participants appreciate the benefits of students having choice and freedom to sit where they identify as best for learning, it is apparent that within this case study context, many flexi-class students struggle to make that responsible choice independently. Teachers will spread students out to reduce distractions and have established firm and consistent expectations. If students do not make responsible choices, they are moved to another area where they may better engage. This element of seating is not valued because they restrict teachers and/or create distraction amongst students, leading to further student disengagement. These perspectives were corroborated within the reflection journal recordings of the four participants.

The FlexiSpace ideal falling short

However, findings of this research reveal that the FlexiSpace design ideal has fallen short within this specific case study. Firstly, flexible configuration and diversity of furniture should not be too great. Greater flexible, personalised learning can occur without the plethora of innovative built elements. Secondly, a sense of belonging, within a classroom and school community, is crucial to engagement. The interrelationship between individual learners, other students, educators, and the physical built environment can increase engagement and boost self-efficacy and self-determination if both classroom pedagogical practice and schoolwide multidisciplinary supports are implemented to meet individual psychological needs of a sense of autonomy, competence, and relatedness (Kariippanon et al., 2018; Niemiec & Ryan, 2009).

Thirdly, built elements can catalyse pedagogical flexibility and enhance principles of individualised, student-centred learning (Mahat et al., 2018). However, teachers must be supported with professional development to upskill in "spatial competencies" (Blannin & Mahat, 2019, p. 19), and be allocated time to plan and reflect upon pedagogical practice—to gain skills and confidence to facilitate, for example, student-centred, personalised learning, and decentralise teaching practices.

Flexible configuration and diversity of furniture

All participants expressed concern that students experience significant challenges adapting to the FlexiSpace—to the plethora of options. They all felt that it is important not to make a flexible, innovative learning environment very different from a traditional classroom because many students require time to adapt, and it makes transitioning out of a flexible

learning program difficult. The diversity of furniture is appreciated, but too much choice has a negative impact upon engagement. Some furniture has been removed or is used sparingly in order to assist students to better regulate both physically and socially/emotionally, and promote engagement.

For example, restrictions are often placed on the use of the collaborative tables and couches. Ben stated that "this whole back desk that's here with that curved couch at the moment, that's like a no-go zone most of the time because if kids are sat there, nothing gets done." He elaborated further saying, "it's more like having a lunch table, a little conversation area." Beth agreed that this furniture fosters distraction amongst students, saying "I think they like to sit and chat to each other, and I think it's easier for them to avoid doing the work."

Additionally, the nook is also an area that teachers avoid because here students do not engage with work. Ben explained that he never lets students sit there because "all they do is hide and muck around" and Beth described the nook as "a hidey hole" in which "nobody works." When discussing the use of the large cushions, Ben said that they stay in the reading nook, often out of bounds because students "just hit each other with them." Beth concurred, stating that students often just want "to sleep on them or use them as weapons." These findings contest views that diversity of furniture, as outlined by Mahat et al. (2018): "heights of tables and chairs, stools, café nooks, bean bag lounge areas, reading coves and soft modular furniture" has a positive impact upon learning and engagement by "creating a multitude of different pockets that accommodate a wide range of learning groups … with different learning styles" (pp. 17–8).

Such findings challenge arguments presented that a FlexiSpace innovative learning environment will provide opportunities for innovative teaching and flexible learning and foster valued 21st-century skills of communication, collaboration, creativity, and critical thinking through the inclusion of particular furniture (Blannin & Mahat, 2019; DoE, 2024; Mahat et al., 2018; State of Queensland, 2024) and calls for more evidence-based research to improve the effectiveness of such built environments.

Pedagogy of belonging

Linked to the participants' concerns around student challenges adapting to the FlexiSpace, the results question the view that physical design can contribute to a safe and secure learning environment (cf. Gad et al., 2022). The study reveals disengaged students have problems regulating themselves emotionally and physically when first introduced to the FlexiSpace. This may be because their psychological need to feel a sense of belonging within a class and/or school community has not yet been realised. Additionally, basic physiological and psychological needs, as outlined in Maslow's hierarchy of needs (1943), might not be met by this FlexiSpace.

Beth stated that when students first joined the flexi-class, "I was doing stupid things, like having to get them to do walking races into the kitchen, around the desks and back again, just to keep them moving and to keep them from not destroying the space." This teacher frequently takes the class to a smaller room with fewer distractions. Strategies to support greater self-regulation and engagement have been to communicate explicit, consistent, and firm expectations and establish routine and structure—this takes time and commitment to instil—teachers expressed concerns that a targeted six-month program does not allow sufficient time for many students to learn how best to regulate and learn within the FlexiSpace.

Beth stated that:

> FlexiSpaces work well for senior students who have the maturity to utilise the space for independent and collaborative learning. I don't think it works well for junior students. I don't think it is effective for our students because they don't respond to change well and it takes a long time for them to settle.

For younger disengaged students, the FlexiSpace has too much variation and the built environment does not instil a sense of security and belonging. The theory of salutogenic design promotes an environment that enhances wellbeing and a "sense of coherence" through "comprehensibility", "manageability" and "meaningfulness"—a world that is understandable, manageable, and with meaning. A secure environment is "decipherable" and "transparent", and requires "orderliness, predictability, and legibility" (Minhas & Nair, 2022, pp. 9; 13). Beth believes that, when working with highly disengaged youth, "a smaller class with more one-on-one support, with a second teacher and an alternative, hands-on curriculum would be more effective than the FlexiSpace".

This study shows that the FlexiSpace built environment alone, does not instil a sense of physical safety or belonging in students—the learning environment is not understandable, manageable and meaningful (Minhas & Nair, 2022). Rather, it is confusing and can contribute to emotional dysregulation. "Teacher mind frames"—thinking and practice around the role of the teacher, curriculum content, pedagogy and thus use of the built environment—significantly influence student wellbeing and ability to engage (Mahat et al., 2018, p. 8). Furthermore, a range of integrated prevention and intervention strategies should be funded in order to identify and address the diversity of student needs and support student wellbeing—leading to increased self-efficacy and engagement. Provision of innovative built environments alone, will not achieve this.

Recommendations and limitations

As this study shows, merely providing innovative physical settings will not automatically change the way in which teaching and learning takes place. As a key finding from this study that in some ways contradicts theoretical research (Bøjer, 2021), this warrants further multi-contextual empirical research. It is also recommended that money destined for creating flexible learning environments also accommodate funded opportunities for teachers to receive professional development and time for collaboration, not just for furniture and aesthetic aspects of design. Involvement of educational policymakers and school management is also essential to ensure that the best structures and supports are available.

The project is intended as a pilot study to build the field of literature and trial research to inform larger research projects. However, the experiences around the effectiveness of FlexiSpace built environments, and elements viewed as valuable in engaging the disengaged, may differ amongst a greater number of teachers and across school contexts and, as such, larger scale projects should be initiated. It should also be noted that over the period of research, some sections of the FlexiSpace were not always available for teaching use—meetings or events sometimes took place based on school space logistics. This may have impacted how teachers and students used the built environment.

Another limitation of this study is the researcher positionality as a former teacher within the FlexiSpace and a colleague of the participants—being open and reflexive regarding existing dynamics and subjectivities throughout the research process is important (Punch & Oancea, 2014). As such, it is recommended that further study be undertaken with the possibility of researchers being entirely external to the research sites selected. Another

interesting perspective that would build on this pilot study would be the inclusion of student voices.

Conclusion

In conclusion, this study highlights from a teacher's perspective that a built environment has a significant impact upon the engagement of students. Results reveal common elements of the FlexiSpace built environment valued by teachers because they help facilitate flexible and relational pedagogy found to positively impact student engagement. However, teachers also viewed some elements of the built environment as restrictive to their teaching practice and ability to engage students. Furthermore, many elements foster distraction and further disengagement. All participants reflected on the significant length of time it takes many students to learn how to regulate themselves within the FlexiSpace and offer insights around aspects of class organisation and pedagogical practice also required in order to increase student engagement—financial funding should also facilitate these provisions. Additionally, the research exposes the importance of better matching pedagogies with the spatial possibilities offered by FlexiSpaces. Expectations that an innovative learning environment will automatically change the way in which teaching and learning take place are unrealistic.

Simple provision of a FlexiSpace is not enough—the pedagogical principles informing the provision of these designs must be clearly communicated to educators throughout the design process and during the initial activation of the space. Educators' perspectives should also be shared throughout the design process. Finally, intensive case management and a multidisciplinary team approach to identifying and addressing specific student needs—meeting psychological needs of a sense of autonomy, competence, and relatedness—must also be funded in order to successfully engage the disengaged, instil intrinsic motivation, and eventual self-actualisation.

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Declarations

Conflict of interest The authors declare no conflicting or competing interest with respect to the research, authorship, and/or publication of this article.

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