Co-designing learning spaces with learners: Lessons from a Welsh primary school classroom

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ABSTRACT

This research presents a case study of one class's reflections on how they redesigned their classroom to suit the diverse needs of the teacher and learners, and how learners continue to adapt their learning space to better suit their individual needs. The findings of this paper illuminate how learners value agency and choice in their classrooms, something which can be achieved by offering them various work surfaces and spaces to complete learning activities. Learners suggested that flexible learning environments enabled them to choose where and how to complete their work, but also enabled them to position themselves in social environments that suit their learning needs. This work provides further context and insight into the implementation of the new Curriculum for Wales from September 2022 onwards, as well as the wider education system-level reforms currently taking place in Wales.

Keywords: learning spaces, Wales, co-design, primary school, flexible learning environments

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Introduction

This research project aimed to determine learners' ideas about learning environments that enable effective and engaging learning opportunities. Using interviews and illustrations to collect data from one Year 4 class (age 8–9 years) in south Wales, this project sought learners' voices to depict how they would redesign their learning spaces to better suit their needs. This pupil voice is complemented by their teacher's reflections about his own journey redesigning his classroom learning space with the help of his learners. Using responses from both learners and their teacher, this research offers a unique perspective on learning space design in Wales and offers a snapshot of how learners and practitioners can collaborate to conduct research projects.

The topic of learning space design has become increasingly relevant for two reasons: children are returning to a new 'normal' after the disruptions of the Covid-19 pandemic (Al-Ansi and Al-Ansi, 2020; Marchant et al., 2022; Hulme et al., 2023; Knight et al., 2023); and schools in Wales are implementing the new Curriculum for Wales, which empowers them to make more autonomous decisions about how and what is taught in each classroom (Crick and Priestley, 2019; Harris et al., 2020; Welsh Government, 2021). In an effort for teachers to respond to lessons learned from the period when children were schooled from home during the pandemic, and their new roles as curriculum designers, questions emerge about how to redesign both online and physical learning environments to accommodate the diverse learning needs of children sharing these spaces (Beauchamp et al., 2019; Sanger, 2020; Crick, 2020). This research begins to answer such questions surrounding children's perspectives about their learning environments.

Literature relating to learning spaces has been published in a range of sources, including academic journals, blogs and policy papers. These sources will be reviewed in conjunction with new policies in Wales which relate to the implementation of the new Curriculum for Wales (Welsh Government, 2021). This watershed moment in Welsh education history provides teachers with the opportunity to evolve their classroom spaces to suit the needs of the curriculum that they, too, must design and implement. Specific attention is being paid to learning experiences of children while they transition into the Curriculum for Wales, and schools are being tasked with considering twelve pedagogical principles, many of

which would benefit from flexible learning environments (Welsh Government, 2023a; 2023b). Therefore, this 'watershed moment' for teachers in Wales encourages innovation and flexibility to better suit a new era of teacher-designed education.

Flexible learning spaces

Architects, interior designers, and educationalists have grappled with the idea of creating 'ideal' learning environments for children for many years. Academic, informal, and practical papers have been written by experts in the field, weighing in on this age-old debate. For instance, Read, Sugawara and Brandt's (1999) research suggests that spaces that encourage experimentation and access to the outdoors seem to aid in educational success, while Fisher, Godwin and Seltman (2014) argue that learners need fewer visual distractions in their learning spaces to focus and engage on their allocated work. Research about learners' need for flexibility in classroom spaces is scarce but promising, with inputs from around the world suggesting that giving learners more freedom to utilise classrooms in unconventional ways has positive impacts on their learning experiences (Painter et al., 2013; Baharuddin and Dalle, 2019; Penn State University, 2020; Saxton, 2021; Hao et al., 2021). Researchers generally agree that certain factors improve learning experiences, including having sufficient natural light, good air quality, careful colour selections, and a connection to nature (Barrett et al., 2015; Barrett et al., 2016). Younger children are more influenced by these factors than their older counterparts, who may have learnt to adjust to the provisions of their schools (Barrett and Zhang, 2009; Hao et al., 2021). However, adjusting to flexible learning environments can be difficult for both teachers and learners, but as is demonstrated in Niemi's (2021) account of six primary schools in Finland, teachers acknowledged that flexible learning spaces improved collegiality and opportunities for team-teaching resulted.

Flexible learning spaces, although difficult to define, represent a range of learning spaces (previously called 'classrooms') that provide various opportunities for spaces to be used in interesting ways. Often, educationalists have referred to the principles of Universal Design for Learning to redesign their classrooms, turning them into inclusive and transformative learning environments (CAST, 2022; Waterford.org, 2022; Neary, 2019).

Technology and pedagogy

Within classrooms in Wales, it is now common to see some form of technology for enhancing the teaching and learning experience (Estyn, 2021). In conjunction with adapting to the blended methods of communication and learning that have arisen from the influx of technology in educational spaces, many more researchers and practitioners are researching technology's place in classrooms. For example, Ferrell, Smith and Knight (2018) suggest that providing learners with a range of technologies that can be used in flexible ways to attain clearly defined goals results in them 'more likely to engage with their learning and spend longer "on task"' (no page); while Damşa, Nerland and Andreadakis (2019) suggest that to support the emergence of resource-rich learning environments, learning spaces and pedagogies need to adapt to offerings of digital technologies. From a school perspective, the Freie Schule Anne-Sophie school (n.d.) proposes that self-directed learning in their classrooms is reliant upon learners' self-directed use of technology. Technology provides opportunities for personalised learning within learning spaces, thereby offering learners the option to engage with their learning environments individually or collaboratively (North Wales Management School, 2023).

As technologies develop, teachers also need to adapt their pedagogies to use them effectively in flexible learning spaces. By placing pedagogy at the centre of learning design, Ferrell (2015) urges teachers to adapt both their teaching style and classroom design to the needs of their learners, instead of continuing with what may be their 'norm'. However, as Feyzi Behnagh and Yasrebi (2020) suggest, the increased use of technology in classrooms has already led to more constructivist-based pedagogies being implemented, which suits learners who use their flexible learning spaces to contextualise knowledge acquisition and improve retention due to the comfort of these spaces (Beauchamp et al, 2019). By using child-centred classroom management to tailor learners' activities and engagement with their flexible learning spaces, teachers can adjust to their pupils' new needs and behaviours (Pereira and Smith-Adcock, 2011). While flexible learning spaces do not necessarily require advanced pedagogies, they provide more opportunities for innovation than teachers have explored in conventionally styled classrooms (Benade, 2018).

Inclusivity

Flexible learning spaces can potentially accommodate more diverse needs and therefore become more inclusive environments for all learners. These spaces can improve the odds of effective learning for all children, therefore embracing the diverse needs of learners. For example, the provision of quiet corners for children who struggle to remain undistracted by others moving around (Oblinger, 2006; Holeton, 2020). While helping children to feel more at ease in their flexible learning spaces, research has shown that the agency children feel in flexible learning spaces leads to feelings of increased motivation and engagement, allowing them to capitalise on their strengths and meet their individual learning needs (Parker, Nova and Bartell, 2017). A recent study suggests the adaptable nature of flexible learning environments supports learner-centred pedagogies to facilitate more interaction and collaboration between children (Kariippanon et al., 2019). Furthermore, flexible learning spaces can lead to self-regulation and feelings of autonomy by learners, who also described their learning experience as more enjoyable, comfortable, and inclusive (Kariippanon et al., 2018). This focus on inclusion is particularly relevant for Wales with the emerging Additional Learning Needs (ALN) system reforms (Knight et al., 2022a), and especially for teachers and practitioners (Knight et al., 2022b).

Involving learners in learning space design

Most recently, there has been a trend towards including learners in the design of their own learning spaces to move away from making assumptions about their learning journeys on their behalf. In their ecological model, Damşa, Nerland, and Andreadakis (2019) rely on co-construction of learning spaces with learners. This process becomes 'an organic, iterative, agentic endeavour for learners' (Damşa, Nerland, and Andreadakis, 2019, p. 2075). This is mirrored by the reflections offered by Bibi (2021), a primary school teacher, who suggests that learning spaces are 'hotbeds' for exploration and change, which can empower children to take their learning into their own hands and continue to adapt their classroom accordingly. Similarly, Albert Einstein is credited — perhaps apocryphally — as saying 'I never teach my pupils; I only attempt to provide the conditions in which they want to learn', which results in arguments for

why architects, designers, and educators need to consult with learners to determine how and why learning spaces should be adapted. This is supported by Weber's (2021) blog post, which suggests that even if teachers do not consult with their learners about learning space designs, the least that can be done is to watch how children interact and play in open spaces, and then design and optimise learning spaces according to those needs.

The available literature, ranging from formal to informal research, provides a useful starting point for presenting the research project reported here. The researchers used literature to situate their study and research aims, which were themselves framed around the guiding questions: *What flexibility is needed by primary school learners to best suit their learning needs and how can learners co-create these spaces?* By acknowledging the advantages of flexible learning spaces, it has been possible to frame our research as a contribution to this global discussion. This paper not only represents a case study of the possibilities of learner empowerment through spatial design, but also serves as a reflection on practice and praxis by the teacher involved, and situates learning space design as a core aspect of the future success of the Curriculum for Wales.

Methodology

Sampling Procedure and Description

The process of data collection began with the use of a purposive convenience sample. The research team identified a Year 4 teacher at a south Wales school who had worked on previous collaborative research projects. The use of a purposive sampling technique placed the information from the participants at the centre of the data-collection process (Patton, 2002) and centred the knowledge and thoughts of the learners involved (Chein, 1981). Through collaboration with the teacher, a visit was arranged to their classroom for a lesson during the school day. The method of data collection involved one classroom-based activity and follow-up interviews with learners who had provided consent to participate in the project.

Data Generation

Due to observed difficulties with seating plans, furniture arrangements and other learning space design aspects, the classroom teacher offered

learners an opportunity to make contributions to a 'space redesign' of the classroom. Therefore, the learners were individually asked to draw and design a new learning space in a new school. This provided the students with freedom of choice and removed any previous influences on their decision-making during the task. The development of drawings by the learners allowed their voice and participation in the research to remain a central aspect of the data collection process (Scott, 2000). The key guidance provided to the learners was that they should include anything they believed would enhance their learning experience. During the task, observational notes were made by the research team, including the Year 4 class teacher. These notes included descriptions of how children engaged with the task: whether they worked alone or in groups, how much attention they paid to details, and whether or not the children were eager to participate in the activity. The notes aimed to complement the learning space designs and provide insight into the learners' reasoning and decision making during the task itself.

The follow-up semi-structured one-to-one interviews aimed to explore the decisions that learners had made and used their individual learning space designs as stimuli for discussion, following previously used visual methods (Clark, 2011). Interviews are most suited when discussing and sharing views on a concept. They facilitate the interchanging of views and can build on mutual interest of a socially situated concept, such as education. By extension, the interview becomes a social encounter and allows the participants to share and explain their interpretations of the phenomena being researched. This room for description, outlined by Hochshield (2009) in terms of exploring issues in depth, is what made the interviewing method most appropriate for this research design. Interview questions reflected the age of the children involved and asked them to describe their classroom designs, where they like to sit when working on different tasks, and how their learning experience varies in different parts of the classroom. Children also had to make value-judgements on whether they thought learning space designs encouraged collaboration and concentration. Additionally, the researchers were able to ask follow-up questions about the 'how' and 'why' of their research design and prompted them to further explain their designs, thereby enriching the data collected (Adams, 2015). Overall, the use of observational notes, semi-structured interviews and learner drawings enabled a detailed case study to be presented whilst providing learners with a range of

opportunities to contribute in a medium that they wished to (Darbyshire, MacDougall and Schiller, 2005).

Ethical Procedures

To ensure ethical procedures and guidelines were followed, the headteacher of the school signed a Gatekeeper consent form. This was followed by individual informed consent forms being provided to all parents of learners in the class. The forms clearly explained the children's participation in the research and allowed parents to provide their own informed consent. In order to provide further explicit informed consent, the children were also given age-appropriate forms that explained their role in the research in simpler terms to ensure they were comfortable to proceed with their participation. This allowed all key stakeholders to understand the learners' role and input within the study, the researchers' aims, and how the data would be utilised (O'Reilly, Ronzoni and Dogra, 2013; Oliver, 2010).

To ensure fairness and equal access to the learning outcomes, all learners participated in the initial classroom-based activity and were interviewed. However, only those who had provided consent for the research were interviewed specifically by the research team. Those without explicit consent were interviewed by the teaching assistant and data was not recorded.

The identity of learners participating was protected through anonymising the dataset using the various techniques (Frankfort-Nachmias, Nachmias and DeWaard, 2019), including the use of aliases and pseudonyms; codes for identifying people; and password-protected files. Learners were encouraged by the research team to use pseudonyms during their explanation of learning space designs. However, if and when names, places or other identifiable factors were mentioned, these were replaced in the data. To ensure further protection of each child's identity during data analysis, each child and their recorded data were assigned a number to differentiate them. All files were stored on password-protected devices only accessible to the core research team.

Data Analysis

Data analysis consisted of three key stages and was completed by the wider research team within the Welsh Government-funded *Wales for*

Collaborative Learning Design (WCLD) project. As previously mentioned, the research used the visual method of drawings to enable learners to better articulate and demonstrate their thoughts during the interview process (Johnson, Pfister and Vindrola-Padros, 2012). Therefore, learning space design drawings and recorded interviews were analysed in tandem. This allowed the drawings themselves, as well as the learners' justification to inform the data analysis processes and produce the initial themes. Observation notes were then reviewed and analysed based on the initial themes drawn from the learning space designs. Data collected from transcriptions of the semi-structured one-to-one interviews were inductively analysed and allowed for initial themes to be further evidenced and for further themes to be generated.

The overarching method of data analysis was inductive thematic analysis; thematic analysis allows for patterns and themes within the data to become apparent (Braun and Clarke, 2017). The key element of thematic analysis was the flexible nature of the analytical processes, whereby multiple researchers could compare and inform the theme development process, as outlined by Nowell et al. (2017). This triangulation included cross-referencing with the drawings provided by each learner. This allowed their interview data to be validated by aspects of their drawings when appropriate; for example the importance of an aspect of their space redesign and the size of this element within the drawing itself. Inductive coding of the data allows for themes to arise from the text itself (Krippendorff, 2013). Whilst this can lead to potential bias being enacted on the dataset, inter-rater reliability ensured that confidence and rigour were applied to the analytical processes (Braun and Clarke, 2013; Thomas and Magilvy, 2011) through several interrogations and interpretations of the dataset (Belotto, 2018). This was achieved by having multiple members of the research team separately analyse the data and then search for commonalities across the identified themes.

Findings

Nine learners participated in all aspects of the research, out of a class of fourteen. This participation meant that ninety responses to structured interview questions were recorded (ten questions per learner). The findings that were identified through analysis reveal learners' perceptions about their learning environments and the factors that impact on their

comfort and ability to learn in flexible learning environments. This also afforded an opportunity for learner voice, including their experiences and needs, to be included in the redesign process in accordance with *Curriculum for Wales* guidance on learner input (Welsh Government, 2020).

This section is divided into identified themes, which are discussed in turn:

- physical and social environment preferences;
- focus vs. distractions;
- comfort vs. rigidity.

Physical and social working preferences

Of the 90 responses to questions about learners' learning environments, 58 included at least some reflection on the type of working space that learners prefer. This included both physical elements of learning spaces, and opportunities for social interaction.

When speaking about their preferred working spaces, learners' responses varied, which is an indication of their individuality within their classroom and their need to find spaces that work specifically for their needs. This is clear through responses from different learners, including: 'When being creative, I like to work on the high table because the seats are comfortable' (Child 2), and 'I like to work on a tall table because I feel I can see the board better from higher up' (Child 6). These two learners prefer the high table for different reasons, but both indicate legitimate requirements for the high table to be part of their learning spaces. These reflections are similar to those found in Parker, Nova and Bartell's (2017) research which highlights the need to give children choices in flexible learning spaces so that they can capitalise on their strengths.

Like physical elements, learners preferred a range of social settings for completing their work. For example, Child 1 noted 'I choose where I work and if people are in a bad mood and it's distracting, I can move', compared to Child 4, who noted that 'my best friend and I… usually sit together and face each other to help us talk', and Child 8 who likes to 'have my own space' no matter what work needs to be done.

Overlapping with the theme of social work preferences, learners often layered their responses with other themes, like 'it's nice to have a choice

based on how you feel' (Child 5), 'people like to be comfortable in order to learn' (Child 6), and 'in different places I might get distracted and have no choice to move away' (Child 4). These responses reveal that the participating learners understand how a multitude of factors impact on their learning experience; a constructivist learning approach anticipates this level of childhood agency when designing and developing their own learning experiences (Vygotsky, 1978).

Focus vs. distractions

Within the second theme, 29 of the 40 responses that related to the tension between focus and distractions in the classroom overlapped with other themes. Thus, most often, learners related their ability to focus to other influences within their classroom. This was evenly spread between learners relating their learning experience to physical and social elements, and to the comfort of their learning space. This finding is supported by Fisher, Godwin and Seltman's (2014) research about learning space design which suggests that children need to be in classrooms with minimal visual and auditory distractions to remain concentrated on learning tasks. Examples of learners relating their ability to focus to other classroom factors include Child 9 saying:

> I like to have my own space with a couple of friends. This helps me stay focused… I don't focus well if I am on the floor. On a normal seat I focus more, the comfy seats are too comfortable.

Additionally, Child 4 suggested 'people can be distracting in groups, and I won't get work done'.

These examples suggest that learners understand that their ability to focus is dependent on many external factors, not only their internal stressors and learning requirements. *Curriculum for Wales* suggests learners should be able to overcome challenge and manage everyday life as independently as possible (Welsh Government, 2020). This finding demonstrates the progress learners are making towards the new curriculum and how providing opportunities for learners to share their voice can enhance this process. Flexible learning environments are a viable approach to ensuring that learners are provided with the opportunities they need to respond to their individual learning needs.

Comfort vs. rigidity

A less prominent theme that emerged was the distinction between comfort and rigidity in learning spaces. Only one question specifically asked learners whether they needed to feel comfortable to learn, but this revealed answers that were all interlinked with other factors influencing learners' experiences. In total, 31 responses to questions made specific reference to the idea of being comfortable while learning, or having the choice to move around to spaces that felt less rigid in the classroom. Research has found that not only should children be encouraged to move around in their learning spaces, but learning spaces should also be flexible and adaptable enough to suit the changing needs of learners (Spector, 2014; Damşa, Nerland and Andreadakis, 2019). Only one of these responses related only to comfort in the classroom, but this response made specific reference to classroom furniture which helps children to feel most 'at home' while learning, including reference to fridges, a fishbowl, and the ability to have privacy while working. All other responses related to other factors that impact on the learning experience, like physical and social surroundings. For instance, Child 5 noted that 'I like to work outside because it gives fresh air and this is important if I get stressed to have space', and Child 7 said 'comfort is important and you can also have a space to write properly on a flat surface'. Other responses that incorporated the theme of focus vs. distraction, like Child 3, who said '[The teacher's classroom] is nice because we struggle to learn if people are noisy and I'd like to be more comfy…I might get distracted and have no choice to move away'. In response to children's changing needs for both structured learning and comfortable learning spaces, this project has illuminated one way to design learning spaces, namely through co-construction.

Learning space designs

From the qualitative data collected in interviews with learners, it became clear that their perception of their learning space was influenced by multiple factors simultaneously. The analysis of learners' experiences of learning spaces enabled the researchers to further investigate how this impacted on their illustrations and descriptions of ideal learning spaces.

Eight of the nine participating learners included differentiated learning spaces within their designs of ideal learning spaces, which related to the common theme of needing specific places to work depending on the activity. Some of these designs incorporated completely different rooms for different areas of working or subject-specific areas, while others just indicated different areas within one common room. Either of these approaches to dividing learning spaces could be argued to be more inclusive of different learners' needs, and therefore it is difficult to suggest that one is more adequate than another (Oblinger, 2006). In addition, a variety of furniture shapes was important in their learning space designs, and all moved away from the rigid rows of desks that are found in conventional classrooms. Four designs emphasised their proximity to the outdoors, which may have been impacted by the fact that data was collected in the summer months. Interestingly, only four learners mentioned any version of ICT in their design or description of their learning space, all of which seem to be stationary in classrooms, not overtly moveable.

Discussion

The findings above reflect learners' perspectives; what follows is a discussion about these themes in relation to the experience and perspectives of these learners' teacher. Learners' experiences of their learning space are multifaceted and can inform practice, therefore, efforts have been made to compare children's perspectives with those of their teacher (who has been co-creating and continually adapting his learning space with the help of learners for years) and relevant literature. Developing learning spaces so that learners feel they have optimal learning conditions is difficult when they need to account for diverse needs and wants, whilst also achieving curricular goals. However, if we ask children to inform the redesign of learning spaces, we may be able to achieve these complex aims simultaneously. Authored primarily by the Year 4 teacher, the discussion below addresses some of these complexities.

Space redesign

Releasing some control and handing agency to learners requires careful planning and consideration; it is not a venture that should be undertaken

without recognising that the process is a journey, not a destination. The decision to experiment with a redesign of the learning environment was primarily a response to the observed difficulties many learners faced in the seating plan initially designed for the classroom. The journey towards redesigning the learning environment began with the most important stakeholder: the learners. They were asked what they would like to change in their classroom, and some key themes began to develop: they wanted different working surfaces, including high and low levels, more carpet space, not to be made to sit in their seat all day, and flexibility to choose who they worked with and where they worked.

With these thoughts in mind, work began to gradually remove tables from the room. Over a period of one half term, the following changes were made:

- one group of tables was replaced with a tall table, with a bench instead of plastic seats;
- one group of tables was removed altogether to open up carpet space;
- one group of tables was replaced with a low-level coffee table;
- one group of tables was replaced with a round table, but retained four plastic chairs;
- sofas and beanbags were sourced to create a reading area;
- benches were placed outdoors to offer an option of learners working in the fresh air, weather permitting.

As a result, learners now had the choice of myriad working spaces and conditions. After a short period of unrestricted agency (whereby the children could do and move as they pleased), it was apparent that some guidance and training was needed to ensure effective use of the space. An example of this is in the use of the carpet space. Whilst very useful for sitting in a group to discuss an idea, facilitating a circle time activity, or even to allow learners to stretch out whilst sketching, learners writing at length on the carpet produced noticeably less work, and of a poorer presentation quality. Consequently, honest discussions with the class established a mantra for our learning space: different spaces are useful for different purposes. They began to identify that writing tasks were best completed at a table, whilst discussions were best when sat closer together. Furthermore, sitting comfortably on a sofa or beanbag was perfect for reading time, but not ideal for numeracy tasks. Behaviour in the classroom also improved as learners were now given the responsibility

of choosing where they worked; the implication being that if they are distracted in that space, or not able to produce their best work, they should choose a more suitable space. Similar to the suggestion in Parker et al. (2017), learners were expected to learn from their experiences. Before long, learners illustrated that even at the age of 8 or 9, they understood which spaces worked best for them, taking into account the demands of the task, managing potential distractions and focusing on the need to produce their best work.

Advantages and challenges of flexible learning spaces

A significant benefit of moving to this flexible environment was observed almost immediately in the improved collaboration between learners. Since they were no longer restricted to a seating plan, learners soon began making positive choices about who they worked with and where they would work best (Kariippanon et al., 2019). Regular reminders by educators to learners to 'make good choices' reminded children to be mindful of their decisions and learners would actively share their thinking as to why they had chosen to work in a particular space. This experience contrasts with the suggestion in Cutieru' (2021) that children need to experience their learning spaces unguided. Instead, it was decided that nudges from teaching staff enabled learners to make their own good choices about where and how to learn in their flexible learning spaces, therefore also requiring learners to develop their reflexivity, problem-solving, and decision-making skills.

It should be noted that such changes can only be implemented successfully if the practitioner is flexible enough in their pedagogy to embrace this approach to learning. With a flexible learning environment, movement in the space is inevitable and encouraged, to a certain degree (Mulcahy, Cleveland and Aberton, 2015). Children are responsible for gathering their equipment and settling themselves to focus fully on the task. They can move around the learning spaces, but not before returning their work area to the condition they found it in. This may involve replacing cushions, tucking in the bench or putting the beanbags back where they belong. This again illustrates the responsibility that is placed upon learners while encouraging them to be considerate about how they behave in their learning environment. Teaching in such an environment also requires practitioners to be

accepting of the space continually evolving (Niemi, 2021). Whilst structure and routine are beneficial to all learners, when an opportunity to evolve and adjust is identified, it should be acted upon in order to ensure the learning environment is most optimal for the learners. Working in this way requires practitioners to adapt in the way their learners need them to, rather than asking learners to fit into the environment that is decided by the teacher.

Learner involvement in co-designing learning spaces

This process is a journey, and the design of the learning environment continues to evolve and change. Central to this journey is feedback from learners, both in a formal sense, and through informal observations of how the space is being used (Damşa, Nerland and Andreadakis, 2019). The latter is a constant process of reflection, requiring adjustment to the space as opportunities are identified or new ideas are found. Learner voice may provide feedback anecdotally, however more formal feedback should be gathered regularly too. This can be through a process of asking the questions 'what do we like about our environment' and 'what would we like to change about our environment'. Through asking these questions, feedback is gathered pertaining to both the physical environment, as well as the way in which the space is used. An honest discussion, balancing teacher and learner voice, preludes changes that have been suggested. This provides an opportunity, within curriculum making and learning space redesign, for teachers to act 'on learner voice and responds to learners' needs, experiences and input' (Welsh Government, 2020), and indeed resonates with related work looking at learner's perception of 'cynefin' (belonging) as part of primary school curriculum development in Wales (Chapman et al., 2023).

The themes discussed above are inextricably linked to those that arose from the learners themselves. From pedagogy to comfort, learners' responses are reflective of the responsibility they hold within their learning space. The case study presented is therefore an example of how teachers and their learners can co-create learning spaces that serve the needs of all. By empowering learners to use their agency to make decisions about their own learning, teachers enable children to learn beyond the curriculum, in dimensions that are arguably more important: problem solving, self-control, social awareness, and reflexivity.

Conclusion

This case study has illustrated that the co-creation of learning spaces to suit the needs of both the learners and their teachers is not only possible, but also beneficial for the overall teaching and learning experience. Qualitative data collected from Year 4 learners revealed that they experience their learning spaces multimodally, thereby understanding the intersectionality of each component of their learning experience. To respond to this, their class teacher has been able to continually co-design his classroom learning space according to the needs of the learners, the demands of the curriculum, and the teaching and learning experience that is required. By sharing the responsibility for the learning space, the teacher and learners have become co-creators of their learning journeys, which has resulted in the learners learning many more skills than just those touted in curriculum documents. This study adds value to the discussion around learning design, specifically in Wales, where schools are required to play a more active role in children's learning journeys.

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