

Using Fällman’s Interaction Design Research Triangle as a Methodological Tool for Research About Reading Spaces in Schools



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Abstract This chapter describes the innovative use of a pre-existing framework from the field of Human–Computer Interaction to explore and reimagine reading spaces for beginner readers in primary schools in England. The chapter details the four phases of the research study, from a conceptual level to a physical outcome (a reading nook), the latter providing secondary findings about the value of secluded reading spaces for students in two English classrooms. In adapting and developing a design methodology within an educational context, it is hoped that this research will stimulate communication and dialogue between architects, educators, policy-makers and students. It also offers a contribution to the challenge of improving school design for pupils and practitioners by offering a framework through which education, specifically reading, can be viewed through the prism of design.

Introduction

The curriculum, the rule book, the head teacher’s policy, the staff hierarchy, the punishment regime and other socially prescribed matters may appear to exert a far stronger influence on the way a school works, but the spatial setting is nevertheless ever present and never neutral, for it always makes some patterns of use easier and others more difficult. We become blind to this once habituated in the use of a building, for it seems just to be there, and we have to make an imaginative leap to envisage how it might be otherwise (Blundell Jones, 2014, p. 13).

In this short extract from a chapter about the historical development of the school building and the articulation of territory, the architect and academic Peter Blundell Jones reminds us how significant but also how easily overlooked the role of spatial setting is in schools. In this chapter, I describe how I adapted a framework from the field of Human–Computer Interaction (HCI) to document and record a particular type of unattended-to space in school: those where young children learn to read. Blundell Jones suggests that an imaginative leap needs to be made in order to re-envisage

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forgotten spaces like these but taking such a creative leap is not easy and requires support and inspiration. Here, I demonstrate how I was supported in this through this HCI framework; how this resulted in new knowledge about beginner readers in school; and how this led to the development of a tangible, physical reading space for young children.

This methodologically innovative framework was originally developed by Daniel Fällman in collaboration with his colleagues at the Umeå Institute of Design in Sweden. The framework, described explicitly in Fällman's 2008 paper *The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration*, reflects the complex and interactive nature of design research while maintaining a strong focus on the relationship between design and the end-user. Throughout this chapter, I use the example of my doctoral research about the relationship between inexperienced readers and the school environment to show how this framework can be used to reimagine spatial settings and practices in school buildings. However, since this study was completed, I have begun to investigate the design of therapeutic spaces in schools, where children might receive counselling or therapies, using the same framework.

In exploring the use of this methodology, my doctoral research benefited from a collaboration with an architecture practice, SCABAL and an industrial partner, Jenx. These partnerships enabled me to realise a level of design that would not have been possible without their insight and support.

The Methodological Framework

Figure 1 shows a simplified version of a diagram from Fällman's 2008 paper that gives an overview of his framework. It consists of three non-hierarchical elements or activities: design studies; design practice and design exploration, each of which has a distinct character. *Design studies* is a discipline familiar to academic researchers, necessitating a comprehensive, multi-disciplinary review of the literature, but it also requires precedents of design innovations to be reviewed. *Design practice* brings matters of budget, materials, time, communication with stakeholders and other real-world problems into the equation, while *design exploration* asks "What if...?", prompting the researcher to imagine benefits to the individual end-user and to society at large through experimentation and subversion of objects and practices that are taken for granted and habituated.

The separation of these three elements of design into their triangular formation with a single element at each vertex allows the researcher to choose which combination of two elements of design research they wish to explore at any one time. By isolating one element, the researcher is free to explore the remaining two research activities that may be compromised or complicated by the third. For example, when moving between design studies and design exploration, the researcher can explore new designs and draw on existing precedents without having to focus on the practicalities of the available budget or suitable materials. As there is no prescribed order

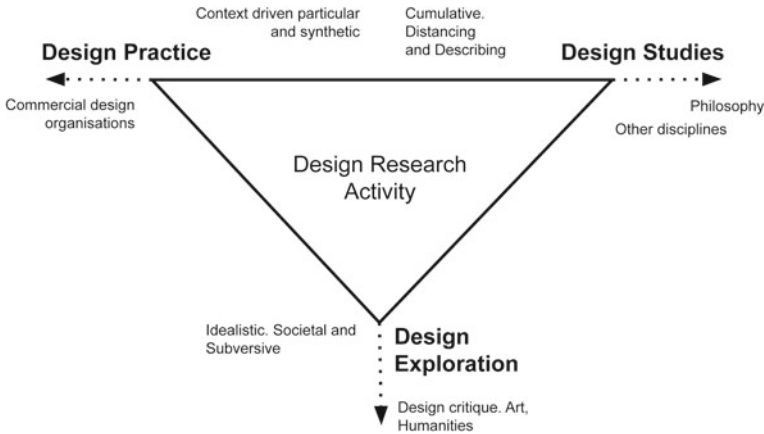


Fig. 1 An overview of Fällman’s interaction design research triangle of design practice, design studies, and design exploration *Source* Daniel Fallman, ‘The interaction design research triangle of design practice, design studies, and design exploration’, *Design Issues*, 24:3 (Summer, 2008), pp. 4–18. © 2008 by the Massachusetts Institute of Technology

for using the framework, the researcher can move between activities as they see fit and at their own pace. The only stipulation for using the framework is that one outcome of the research process must be a designed artefact. This may be virtual or physical.

Three Initial Research Phases

The use of the conceptual research model from the field of Human–Computer Interaction (HCI) highlights the interaction and the interdependence between the physical, sensory requirements of the pupil in school and their surroundings. Literacy education in schools has commonly accorded little importance to the bodily and emotional needs of the novice reader but, as Mayall, Bendelow, Barker, Storey and Veltman remind us, “[c]hildren bring their bodies and emotions to school every day not just their minds” (1996, p. 1). In my study, the body and emotions of the beginner reader were carefully considered through the design of an artefact, a child-scaled classroom reading space, known as a *nook*.

Edgerton, McKechnie and McEwen argue that “in assessing the impact of education, researchers have tended to focus on what is taught or how it is delivered. Limited attention has been paid to *where* pupils learn” (2011, p. 34, emphasis added). This prompted the first of two research questions, “Where do beginner readers read in the contemporary English, mainstream primary school?” This question identified a gap in knowledge about the types of spaces where beginner readers read in school and the qualities of those spaces. My second research question, “Where could beginner

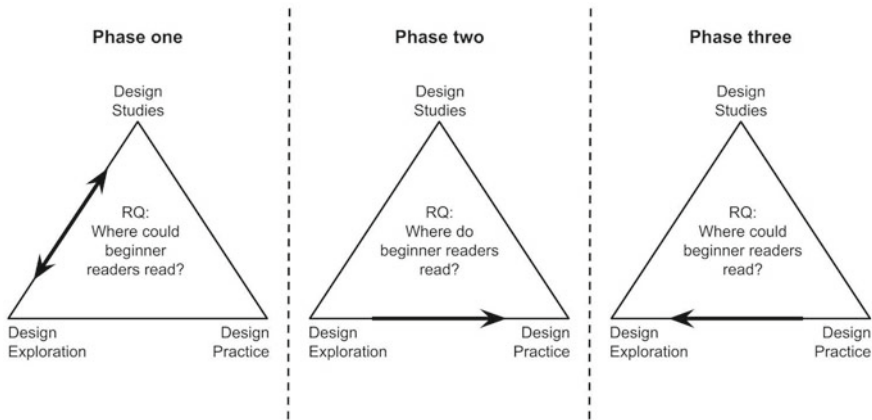


Fig. 2 Three phases of Fällman's triangular model

readers read in the contemporary English, mainstream primary school?”, addressed a propositional design approach, emphasising the complex interaction between the body of the reader and the environment in which they read.

Figure 2 illustrates the way in which I used Fällman's triangular model to frame my study with the arrows demonstrating the direction of the research. Phase one and three were imaginative interpretations of academic and empirical research while the latter was the focus of phase two. Figure 3 maps how the methodology guided the specific activities undertaken during my doctoral research as a whole and includes a fourth, post-doctoral research phase that I describe briefly at the end of this chapter.

Phase One: Design Studies and Design Exploration

Phase one of the study entailed assembling a rich body of relevant academic research and precedents to use when designing a propositional reading space. This initial research was inspired by my work as a Reading Recovery teacher in a London (UK) district notable for social and economic deprivation which had prompted me to consider the vital importance of the school building for children who have little space, attention or comfort in their own homes. My pedagogical, spatial and emotional experiences of teaching reading with children aged five and six were poorly represented in the literature of reading and literacies or that of school design, leading me to identify a significant gap that needed to be explored further. Although I encountered many excellent articles dedicated to a developmental analysis of inexperienced readers, there was little acknowledgement in the literature as a whole that inexperienced readers are more dependent upon a supportive physical environment while they learn to read than fluent readers or that the body of the reader is a significant aspect of reading. Despite this absence of scholarship about the spaces where

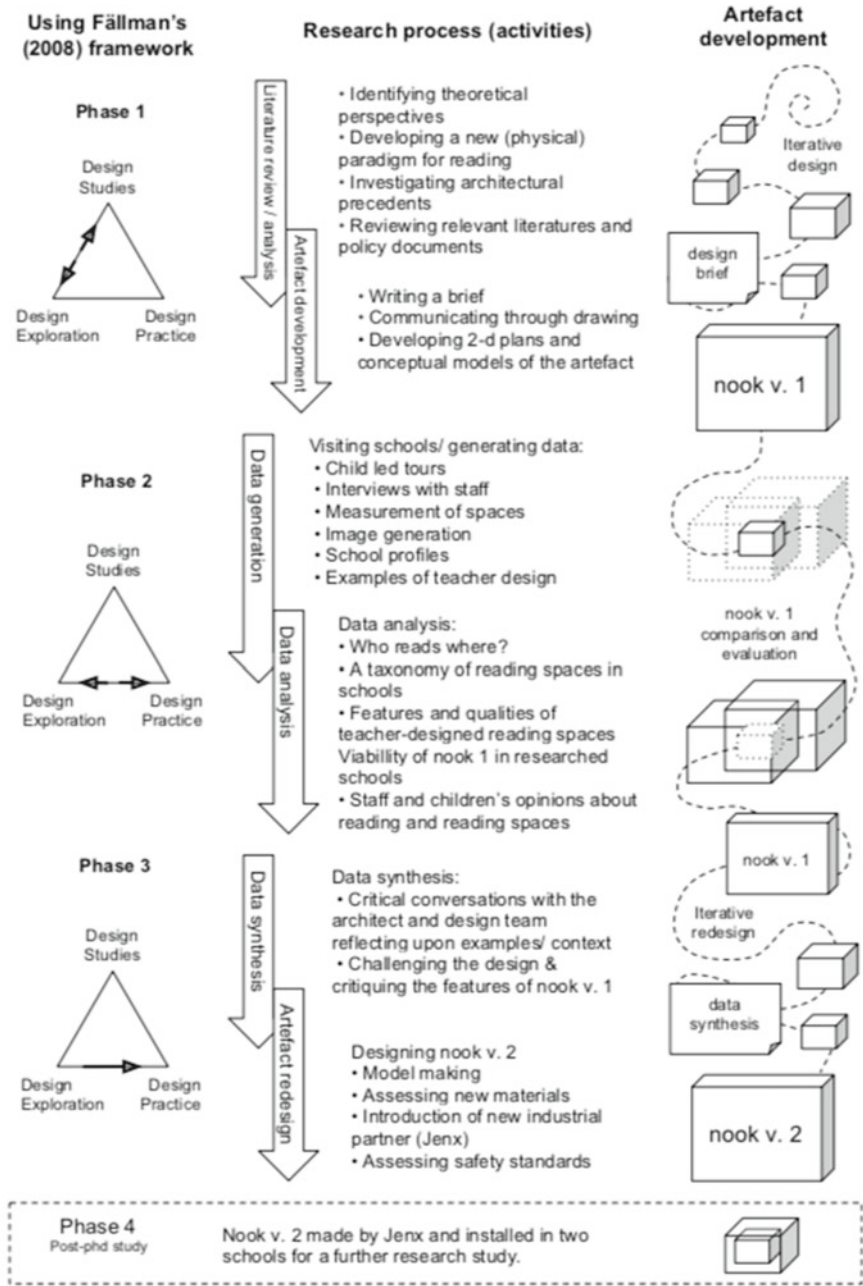


Fig. 3 Phases of research

beginner readers read and of the reading body, I discovered several useful texts about aspects of reading that, when applied to beginner readers, helped me to build a picture of their needs within the school environment. I then examined the current reading curriculum and system of assessment for reading and standards for the design of school buildings with respect to qualities of design, such as acoustics, that might adversely affect beginner readers, who generally learn to read in school by reading aloud. Although I had difficulty in finding any examples of spaces in schools that had been designed specifically by designers and architects for beginner readers, I found examples of design for quiet, nurturing spaces in schools and library spaces that, while not specifically attending to the needs of beginner readers, were well-designed to accommodate all readers.

Fällman's framework, having been developed to aid Ph.D. students in his department, also supported a more traditional approach to doctoral research in this phase of the framework by supporting the development of a comprehensive literature review that identified three significant gaps in scholarship relating to reading and spatial settings:

- The relationship between reading pedagogies, practices and routines and the spatial arrangements inside and beyond the classroom for beginner readers
- A conceptualisation of reading in relation to the physical body of the beginner reader in school
- The current practice of designing reading spaces by teaching staff in primary schools.

The requirement of the framework to explore design studies in tandem with the second element of the framework (here, design exploration) led to an investigation in this phase of how readers might respond to the physical environment of the school building and how they use their bodies to read. Reading demands a high level of concentration and when this has not yet been habituated, non-fluent readers are often easily distracted and prey to interruption. They also rely on good acoustics to distinguish between the sounds (phonemes) being taught to them by their teachers and to relate these to the letters (graphemes) that they are learning. Despite this, it appears that school buildings are often poorly designed for novice readers, who often learn in open, noisy spaces with challenging acoustics. Scholars of reading often take for granted the assumption that the body of the fluent reader is absent, cocooned and unaware, whereas my own theoretical perspective of reading, influenced by the phenomenological texts of Merleau-Ponty, draws on a conception of reading as physical and sensory, as expressed very powerfully by McLaughlin in *Reading and the Body* (2015). Having contextualised my own understanding of fluent reading as a physical, bodily activity during which the reader learns to habituate and conceal the physicality of the experience to themselves in order to promote full concentration upon the text, I extrapolated the qualities that differentiate expert readers from beginner readers. I then sought precedents of reading spaces inside and beyond the school building that could compensate for the differences between experts and beginners, primarily attending to the vulnerability of beginner readers to unwanted

distraction and interruption within the school building. These precedents formed the basis of the first design of the nook.

The design studies element of Fallman's framework prompted a review of the literature of how reading is taught in English schools and of policies relating to the reading curriculum and to assessment. This provided rich, contextual information that supported the design of a reading artefact. I found that a dominant paradigm for the teaching of reading in contemporary English primary education had become increasingly strong since a change of government in 2010. Fundamental to this paradigm is a programme of synthetic, systematic phonics. In the first year of formal education, Year One, when students are five or six years old, the *reading ability* of all students is assessed by a statutory, national pass or fail examination. Every child in school in England must pass this test or retake it in the following year(s) until they do pass, with few exceptions made for children with special educational needs. Schools that administer the test incorrectly can be reported to the national maladministration hotline and their status as a school may also be under threat. Any physical, material designs for reading activities and for readers in the primary education system in England therefore needs to take account of this model and delivery of the teaching of reading. Although I disagree with this cognitive-developmental paradigm for the teaching of reading, I recognise that this model of literacy education in England is delivered through a central government-controlled curriculum and assessment model that punishes any school that fails to enforce it to the letter. My aim in moving between the design studies (academic research) and exploration (an imaginative response to this knowledge) phases during this part of the project was to propose design interventions to ensure that every reader could succeed within that pedagogic model. Consequently, the nook design reflects this paradigm of reading education but also attempts to create, through design, a more reflective, nurturing environment for reading for the children who are currently moving through this stage of the educational system.

The design exploration element of this phase, prior to the realisation of the first version of the nook, was primarily achieved through the development of a design brief for the nook, a designed artefact being a requisite of the framework. During this first phase, I needed to find a method of communicating aspects of the academic research I had undertaken about reading and readers to the architects who were co-designing the nook. They suggested that I created a design brief for them: a medium with which they were familiar and which inhibited the possibility of an esoteric explanation of reading and readers in schools. They responded imaginatively to the brief with sketches and drawings. Using Fällman's framework also allowed us all to temporarily put aside the practicalities of the materiality, assembly and financing of a prototype nook. Eventually, the architects created a series of two-dimensional plans of the nook and a computer aided design programme (CAD) was used to create a virtual model of the design, marking the end of phase one.

Phase one concluded with the synthesis of the design studies and design exploration activities as shown in a preliminary plan of the nook designed with SCABAL architects. The nook design addressed findings from the academic research, including evidence gathered from several fields to suggest that young readers are directly and

adversely affected by the poor design of school buildings, in particular, poor acoustic design. Several cohorts of children who are learning to read are particularly disadvantaged by noise in their school due to impaired hearing; autistic spectrum disorder (ASD); and those for whom English (in English-speaking schools) is not the first language. It also became apparent that acoustic standards vary within English schools, according to the types of space where readers learn. Designated teaching spaces, such as classrooms and small group rooms must be constructed to a higher acoustic standard than non-teaching spaces, like dining halls and gyms and if there are few small group rooms available, then beginner readers are far more likely to be learning in the reverberant acoustic of a hall or corridor.

Phase Two: Design Exploration and Design Practice

In the second phase of the project, with the idealized, imaginative concept of a reading nook in mind (the design exploration element), I began my empirical research in schools (design practice). This phase had two main objectives: firstly to ascertain exactly where within the school building beginner readers read and secondly to consider whether these spaces met the needs of readers and teaching staff. Having already completed an initial design for a nook, this phase allowed me to investigate whether this prototype would be suitable for schools and contribute to a better experience of reading for young readers.

Seven schools in London were chosen to reflect diverse eras of building (between 1887 and 2012) and socio-economic circumstances of pupils. In each school I observed teaching and spatial practices of reading in a Year One classroom; recorded conversations with children and teaching staff about reading and reading spaces; measured and photographed examples of reading spaces designed or commissioned by teaching staff. I was led on individual guided tours of the school by six children from one of each of the Year One classes. I also investigated whether children who were identified by their teachers as less proficient than their peers in Year One class were more likely to be withdrawn for extra tuition to a space beyond the classroom and where each of these children was taken for reading tuition.

To fulfil my first objective of locating the reading spaces where readers read, I documented every space that a child indicated to me on their tour as somewhere they had read. They guided me to reading spaces in classrooms and corridors; to screened-off corners of assembly halls; to bespoke, hand-crafted reading pods and to Perspex pods in full view of anyone who might pass by. Some beginner readers showed me to beautifully designed, secluded structures that afforded privacy and comfort while others pointed out dusty corners and plastic crates of books.

I also discovered that the qualities of designated reading spaces sometimes varied greatly between classes in a single school. Although the classroom footprint was generally broadly similar, the design skills and experience of the teaching staff and their ability to access resources (both material and financial) meant that reading spaces in different classes in the same school could be quite different in intention

and execution. Many of the teachers I spoke with did not make a connection between the qualities of reading spaces and the child’s experience of reading although each one of them expressed a deep enthusiasm for promoting reading and were passionate about children’s literature.

The co-ordination of design for reading across the school outside the classrooms was haphazard in every school I visited. Library spaces, with poor acoustics but often beautifully designed furniture, were often used for the tuition of beginner readers. Classroom spaces, by contrast, usually had superior acoustics but were generally poorly provided with comfortable furniture or sufficient display and storage of books. Additionally, teachers were often unsure where their pupils had been taken for their supplementary reading tuition by teaching assistants and had little or no input into the design of these spaces.

A strong recommendation arising from this study is that schools should be encouraged to make an audit of reading spaces outside the classroom as the first step towards improving design to support all readers in the school building. A simple taxonomy, such as the one below, summarising the spaces where children read across the seven schools I researched, could be a starting point for such an audit (Fig. 4).

Spaces where beginner readers read in school

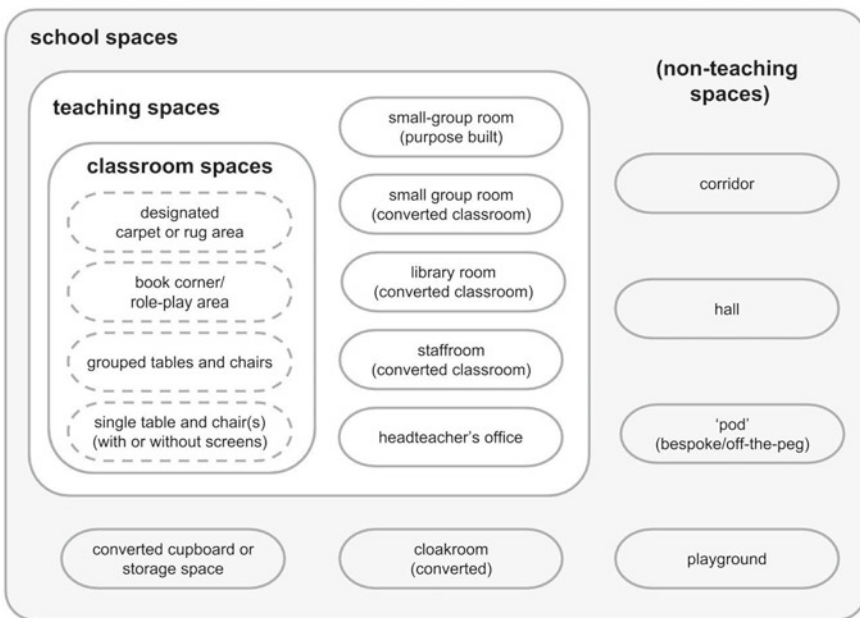


Fig. 4 Mapping the types of spaces where readers read in school

Phase Three: Design Practice and Design Exploration

In the third phase of the research, I returned to the nook artefact and to the second design phase while also attending to the practical considerations of budget, materials, time and dimensions of the nook so that it could be realised as a physical object to be used in further research in schools. Having created a virtual nook during the design exploration phase, I was able to assess the viability of the design in each of the seven schools visited during the course of the study. Following these visits, I made the decision that the final nook design should be viable in each of the seven schools to ensure equality of opportunity for all pupils, no matter which school they attended. Two of the classrooms visited were notably smaller than the other five and this led to significant design changes in its dimensions, including the removal of the bulky seat/bench and the introduction of a far smaller entrance to the nook. The latter meant that the nook would no longer double as a teaching space since access would not be possible for some adults. In my survey of Year One classrooms I had also observed that only three of the seven schools would have been able to accommodate the ventilation system designed by the architects for version one of the nook because it depended upon access to an outside wall. This, in turn, substantially limited the affordance of the nook as a soundproof space. To compensate for this adaptation, a greater focus on visual seclusion was introduced. Having witnessed children reading in a large, transparent pod, which reminded me of a goldfish bowl, this increased visual seclusion also eased my worry about the transparency of Perspex in the original design. No one wants to be watched when they are learning a new skill.

Having completed the second design, I was aware that the cost of financing a physical model of the nook to scale would be well beyond my means as a graduate researcher. A postural support manufacturer, Jenx, generously offered sponsorship at this point to complete the final design and modelling of a series of nooks made in their factory. They also ensured that all safety specifications were fully met so that the nook could be researched in schools (Fig. 5).

The second version of the nook now offered an alternative, protective space within the classroom where students could share books together or enjoy reading alone. During my empirical research in schools I had also found that storage and display for picture books were poorly provided for in classrooms. Ample provision for the display of books of all sizes that were easily accessible to students therefore became a priority during this redesign.

An Extension of the Project into a Fourth Phase of Study

Children make a beeline for it. It's something children would never get bored with.

We have powers in here!

We're on a spacecraft. Everyone in their seats? I'm ready to blast off and see some stars!

(Comments about the nook by staff and children)

Fig. 5 The reading nook

Following the completion of my doctoral research project, but continuing with the design exploration and practice elements of Fällman's framework, two nooks were funded, built and installed by Jenx in two inner-London schools. Neither school had taken part in the original study. I visited each school on six occasions to observe how children and staff responded to their nook. Each nook was set up in a corner of a Year One classroom but since they were fabricated from cardboard, the nooks were easy to move within the classroom and teachers were able to experiment with their positioning.

The application of Fällman's framework supported this fourth phase of research in its five aims:

- To observe where, when and how beginner readers read within the Year One classroom inside the nook.
- To observe how the reading nook space is inhabited and managed by children and teaching staff.

- To evaluate the designed qualities and affordances of the reading nook through observation and conversations with children and teaching staff.
- To record uses of the reading nook beyond reading.
- To consider the viability of further applications of the reading nook beyond reading.

The opportunity to construct a physical outcome to the research project led to the second set of research findings about the ways in which the nook was used in a real school setting. The nook offered a non-narrative, imaginative space in which children could read, reflect, rest or play. Although reading was encouraged in both of the two classrooms researched, it was not enforced. I observed that children's interactions inside the nook were often notably more playful than in other areas of the classroom. Children's use of language inside the nook, in which they were visually but not orally concealed from the rest of the class, was also playful: sometimes pre-verbal, poetic and sung rather than spoken.

The nook was used and enjoyed by the class in different ways in the two schools. The personality and teaching style of the class teacher were particularly influential in dictating how the nook was received and used. In School A, the teacher used the nook in a more limited way, mostly for guided reading sessions and some free play. The timetable in this school was rigorous and less exploratory than in School B, where the teacher used the nook in many different and imaginative ways: for reading, for imaginative play and to help the children to learn how to negotiate boundaries and spaces and to learn how to get on with each other in the classroom. She also made the arrival of the nook into an exciting event for the children and this resulted in an imaginative response through drawings and stories about the nook by the children. As a result, the nook in School B seemed to be a more integral part of the classroom and several children in the class were eager to use it as often as possible. It may be, as the teacher suggested, that some of the quieter children found the nook too overwhelming as a space when other children were playing inside and only ventured in when they could be alone or with one other child.

In one of the schools, the premises manager was extremely enthusiastic about the project and began to create his own version of the nook so that other classes could share in the experience. Additionally, children with special educational needs from other classes were sometimes brought to the Year One classroom where the nook was located, when the class was absent from their own room, to spend time there with a member of staff. On one of these occasions, it was reported to me that a child with elective mutism had begun to speak inside the nook for the first time.

The nook fulfilled a dual role in both classrooms, as a reading space with accessible display shelves for books on its exterior walls and as a role-play area. The dimness of the light inside the nook also provided a space where children could find solace and calm down when they were feeling overwhelmed or overstimulated.

Conclusion

The framework described in this chapter offered a creative, real-world and conceptual way of exploring how reading spaces are designed and used in schools and how they might be improved. The artefact that resulted from the research may now be used to research reading using a different methodology and framework. The primary aim of the doctoral research was not only to design an alternative reading space but also to re-evaluate and reimagine the way in which education in general and reading in particular can be viewed through the prism of design. This can ultimately encourage practices, routines and spaces to become more visible to the end-user and to designers, architects, building contractors and policy-makers and to promote change.

Beyond the contribution to knowledge about the types and qualities of spaces where students learn to read in primary schools—an aspect of educational research that has long been neglected—I hope to have demonstrated that Fällman's framework can be used and adapted as an innovative method of rethinking many aspects of school design. Using this framework, I argue, can challenge habituated spatial practices and arrangements in schools that are viewed by educators and by designers as commonplace or neutral.

Acknowledgements Data utilised in this research was obtained adhering to the required ethical protocol of the author's host institution. All images and diagrams are the property of the author, or the author has obtained consent to use them from the appropriate copyright owner.

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