



Second Grade Students' Perspectives of Their Classrooms' Physical Learning Environment: A Multiple Case Study

Tsitsi Nyabando¹ · Pamela Evanshen²

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Abstract

The study employed a qualitative multiple case study approach to investigate second-grade students' perceptions of their classrooms' physical learning environment. Data were collected through interviews, participant-generated photographs, and observations. Participants in the study were 16 students in four classrooms in three school districts. A physical learning environment tool, Assessing the Pillars of the Physical Environment for Academic Learning (APPEAL), developed by Evanshen and Faulk and published in 2019, was used to select classrooms to participate in the study. According to the scale, the top-scoring classrooms were more learner-centered (more constructivist) than the lowest-scoring (more traditional) classrooms. Generally, participants believed that classroom physical learning environments that were best for them were meaningful, offered easy access to resources and materials, and provided active learning and social engagement opportunities. Both physical and emotional comfort were important to participants. There were more similarities than differences between the participants' perceptions in the classrooms that scored highest on the APPEAL and the classes that scored lowest. The findings suggested that young children's perceptions of the environment can be influenced by their experiences or contexts and their differences. The results encourage teachers of young children to think about their students as actively affected by their environment and challenge them to design classroom physical learning environments that support the diverse needs of students within these spaces.

Keywords Physical learning environment · Elementary students · Children's perspectives

Introduction

The center of instruction in the public school setting is the classroom. Students in the early primary grades in the United States and other countries are likely to spend more than half of their day in the classroom during the school year (National Center for Education Statistics: Education indicators, n.d.). The classroom environments determine the extent and quality of learning experiences in which students engage in their hours at school (Kellock & Sexton, 2018).

The physical learning environment is one of three main components (social, physical, and temporal environments)

of the classroom (Iris Center, 2015). These elements are interconnected and form a holistic enabling condition for student learning (United Nations Educational, Scientific, and Cultural Organization: Institute for Educational Statistics and Cultural Organization [UNESCO], 2012). The physical learning environment includes the organization and materials in the classroom (Iris Center, 2015).

The National Association for the Education of Young Children (2019) identifies the physical environment as one of the 10 program quality standards. The National Quality Standards for Australia lists physical environments as a critical quality area (Australian Children's Education and Care Quality Authority, 2017). UNESCO (2012) reported dimensions of the physical learning environment as significant parts of checklists and standards for quality learning in the elementary grades for Denmark, Kenya, and Spain. The physical environment fosters both the development and learning of young children (Sando, 2019; Tanner, 2008).

Generally, two approaches to education influence the design and use of the physical classroom environment.

✉ Tsitsi Nyabando
tsitsi.nyabando@enmu.edu

¹ Educational Studies Department, Eastern New Mexico University, 1500 South Ave K, Station 25, Portales, NM 88130, USA

² Early Childhood Education Department, East Tennessee State University, Johnson City, TN, USA

These are traditionalism and constructivism. The central principle of constructivism is that the learner is an active participant in learning (Ciamba, 2012). Learning occurs as students interact with their physical environment and social environment (Dangel et al., 2004). The traditional approach to education involves instructional practices based on the belief that the teacher is the source of knowledge. In this approach the education experience is teacher centered, and the learner has a passive role (Günüşen et al., 2014). The study reported in this article was guided by the constructivist framework as informed by theorists such as Piaget, Vygotsky, and Dewey. The physical learning environment is one of the essential components of a constructivist classroom (Guney & Al, 2012).

Berris and Miller (2011) suggested that flexible and quiet spaces foster young children's development by encouraging them to explore. Additionally, Barrett et al., (2013) found that younger and older primary-age children's learning progress was affected differently by the color in their classroom. Primary-age students also learned more in spaces that were flexible, where different learning activities could take place. Flexible spaces allowing for choice and designated areas for learning in small groups, individually, or the whole group is consistent with developmentally appropriate practice (Tomlinson, 2014).

Assessment of early childhood environments is currently conducted using scales or through observations. The tools developed to assess quality of the learning environment help to identify classroom components that are key to the learning of young students, as they are based on findings from research (Reutzel & Jones, 2013; Sakai et al., 2003). Examples of such assessments of school and classroom environmental qualities are scales such as the Children's Physical Environment Rating Scale (Moore & Sugiyama, 2007), School-Age Care Environmental Rating Scale (Harms et al., 2013), the Design Appraisal Scale for Elementary Schools (Tanner, 2008) and the Assessing the Pillars of the Physical Environment for Academic Learning Scale (Evanshen & Faulk, 2019). However, young student voices are not prevalent in these scales and are limited in the existing literature on classroom environments.

Additionally, although students are an essential user group, they do not have control over their classroom physical learning environments. Teachers design and control the classroom environment to fit their philosophical, pedagogical, and classroom management goals (Şahin et al., 2011). Theories and ideas about how young children learn are a strong influence on how teachers design the learning environment, and the setting is a reflection of the teacher's beliefs (Dangel et al., 2004; Fernandes et al., 2011; Pointon & Kershner, 2000). A few studies have revealed differences between teacher beliefs about aspects of their physical learning environment concerning student learning and the

perceptions of the students who used the spaces (Maxwell, 2000; Pointon & Kershner, 2000).

Cleveland and Fisher (2014) believe that there is a need to develop tools that can gather students' perspectives because they are the primary users of the learning spaces. They also recommend using "formative evaluation methodologies" in learning environments research to meet 21st-century educational beliefs (p. 25). In the same vein, Bluysen (2017), in a review on how different classroom physical factors affect students, suggests involving students in studying the physical learning environment in active ways rather than the commonly used "questionnaires or performance tests" (p. 1047).

A literature review shows that studying the physical learning environment in elementary schools to gather students' perceptions is an area in need of more research (Maxwell, 2000). Collectively, studies that have been done (Barrett et al., 2011; Johnson, 2006; Kangas, 2010; Merewether, 2015; Pointon & Kershner, 2000) show that children in different cultural contexts are aware of their learning environments. They are also capable of expressing their preferences for their learning environment. Moreover, the findings identify several essential aspects that children feel are important for their environments, including the school, outdoor, and classroom physical learning spaces.

It is essential to understand how the classroom physical environment can help early primary-age students thrive in academically demanding schools. It is also vital to learn about children's preferences and their perceived needs in their classrooms, although the relationship between the two is not completely clear (Pointon & Kershner, 2000). It is the early grades in which teachers teach students how to learn. Together with other aspects like the social-emotional climate and routines and procedures, a high-quality classroom physical learning environment has a significant influence on student engagement, social-emotional development, and positive learning outcomes (Abreu-Lima et al., 2013; Berris & Miller, 2011). Teachers need to know the environmental elements that help individual students learn, that students prefer or do not prefer, and that young students say influence their positive engagement. Such knowledge acquired from studies helps teachers to design environments that are conducive for the learning of primary-age students and environments where young students feel they belong.

In the past, very little research was conducted with children actively participating in the process (Merewether, 2015). Merewether (2015) argued that growth in such research in recent years could be partly credited to the United Nations Convention on the Rights of the Child (UNCRC, 1989) and increased childhood studies. Their argument is from a child's rights perspective that children should be given opportunities to share their opinions, especially on issues that affect them. A contrasting and more appealing reason is Rasmussen's (2014) argument that children's

involvement should go beyond rights and goodwill to be practical, thoughtful, and genuine.

Recent research on the physical learning environment where young students actively participated includes studies on the outdoor environment, the school, and a few focused explicitly on the classroom environment. A United Kingdom study with participants ranging in age from 4 to 11 years included open-ended questionnaires that asked students what they liked, disliked, and wished they had in their school physical environment (Barrett et al., 2011). Data was also collected through workshops with some of the participants, observations of the school, and pictures of the rooms taken by the researchers. A study seeking 3–4-year-old perceptions of their outdoor environment gathered data through photos, conversations, drawings, and observations (Merewether, 2015). For a study with fifth-grade students, the researcher used a survey to gain students' learning preferences (Johnson, 2006). A study that included aspects of the physical learning environment with 7 to 14-year-old participants used questionnaires, student designed models of spaces they thought were ideal for learning, and focus group discussions with the researchers (Mäkelä et al., 2014). A study with kindergarten students exploring the participants' views about the Reggio Emilia concept of the environment as the third teacher, used observation field notes, participant-generated photographs, and interviews based on the pictures (Robson & Mastrangelo, 2017).

Currently, the research on young students' perceptions of aspects of their educational experience and their classroom's physical learning environment, in particular, is sparse in the United States. Therefore, this study sought to contribute to the national and international research on physical learning environments conducted with young students (Barrett et al., 2011; Johnson, 2006; Kangas, 2010; Kershner & Pointon, 2000; Merewether, 2015). Unlike previous studies, this study focused specifically on students' perceptions in traditional and constructivist early primary grade classrooms as assessed by the APPEAL environment tool.

The study's purpose was to explore and understand the experiences and perceptions of second-grade students of their classroom's physical learning environment. The main research question was: What are the perceptions of second-grade students in three districts in Northeast Tennessee about their classrooms' physical learning environment? Subquestions included (1) What do students like about their classrooms' physical learning environment? (2) Where in the classroom do students prefer to spend their time? (3) When studying various content areas (reading, math, science) which aspects of the classrooms' physical environment do students think help them to learn? (4) Which aspects of the physical learning environment contribute to students' sense of belonging? and (5) Which aspects of the physical learning environment do students prefer to be changed?

Methodology

This research design is a qualitative multiple case study. It was an appropriate methodology to gain an in-depth understanding of the physical learning environment's influence on young students. It sought to explore students' views and allowed for the use of "child-based ways of encountering children's perspectives in their own communication territory" (Greig et al., 2013, p. 213). The focus was more on optimizing "understanding of the case than to generalize beyond it" (Stake, 2005, p. 443). The case or unit of analysis was each of the four classrooms, two that were identified as traditional and two as constructivist classroom environments, according to the APPEAL scale (Evanshen & Faulk, 2019). A multiple case study was preferable to a single case study because it made each case's uniqueness more pronounced (Yin, 2014) and led to a deeper understanding of the analysis unit (Stake, 2005). After developing a study plan, the researcher conducted a pilot study with a second-grade classroom in one of the school districts where the final study was carried out.

Participants

Participants were second-grade students in two city school systems and one county school system in Northeast Tennessee. The school districts were chosen because they were easily accessible to the researcher and the administrators granted permission for the study. Additionally, no similar study had been done in the school systems. According to the Tennessee Department of Education (n.d.), the city school system that housed two of the classrooms had 35.1% economically disadvantaged students. The student population was 2.4% Asian, 11.7% Black, 6% Hispanic, 1.1% American Indian/Alaska Native, 78.6% White, and 0.2% Native Hawaiian/Pacific Islander. For the other city school system, 31.3% of the students were economically disadvantaged. Four percent were Asian, 15.5%, Black/African American, 12.2%, Hispanic, 0.3%, American Indian/Alaska Native, and 67.9% were White. For the county school system 25.3% were economically disadvantaged, 0.4% American Indian/Alaska Native, 1.1% Asian, 3.1% Black/African American, 3.3% Hispanic, 0.1% Native Hawaiian/Pacific Islander, and 92.1% White. These characteristics were reflected in the classrooms that took part in the study.

In all, 16 Caucasian second-grade students from four classrooms participated in the study. Sample selection for the study was a two-step process. In selecting the sample, one of the aims was to incorporate a variety of classrooms and not to choose a sample that was representative of the larger populations as in studies aimed at a generalization of findings. This increased chances for the data to be enhanced (Patton, 2015). First, cases were selected, then participants

within the cases. The researcher used a purposeful sampling technique to identify classrooms to participate in the study that would provide rich information because of distinct characteristics. Once permission was gained from the schools, the researcher and one of the scale authors used the APPEAL scale to rate 10 classrooms. In rubric format, the tool assesses the classroom's physical learning environment on a continuum of traditional, teacher-directed environments to nontraditional or constructivist, learner-centered environments that support teaching and learning. The interrater reliability was established to a criterion of 91% agreement before administering the scale.

After that, the researcher selected the two top-scoring classrooms (constructivist learner-centered environments) and the two lowest-scoring classrooms (traditional teacher-centered environments). This created a design where the study cases came from two ends of analysis of classroom learning environments, which allowed for contrasts in data analysis (Yin, 2014) and uniqueness in samples. The researcher then asked the teachers to recommend four students to interview in each classroom guided by a criterion she provided that included: gender balance, being articulate, and able to share experiences comfortably. Working with the teacher in selecting students was purposeful sampling in line with Yin's (2014) recommendation to select participants that would "most likely illuminate" the study questions (p. 28). This sampling technique allowed for in-depth study from participants who were comfortable talking about their experiences. Purposeful sampling was appropriate in this situation where any of the students in the classrooms could be potential participants. Stake (2005) also recommends considering access and hospitality of the sample selection context to maximize the opportunity to learn. Four students from each of the four classrooms identified for the study constituted the sample of 16 participants. This was an adequate sample that was manageable and provided sufficient data to answer the research questions. According to Yin (2014), the sample size decisions in case studies is "discretionary, not formulaic" (p. 16).

Data Sources and Procedures

This study used semi-structured interviews, participant-generated photographs, and observations. After the interview, participants were asked to take five pictures of their favorite parts of their classroom. The researcher decided that five pictures were adequate based on lessons learned from the pilot study. During the pilot study there was no limit on how many pictures a student could take, and the researcher found that the pictures (after five) were usually of similar spaces. The researcher learned in the pilot study, by discussing the photographs with the students, that they were not always able to frequent their favorite areas due to teacher

controls and classroom procedures that limited the use of what students described as their favorite places. Therefore, the researcher learned that asking the participants to photograph their favorite place would be different from asking them to take pictures of places they frequent. Also, the designation of "favorite" was more aligned with the research question, "What do students like about their classrooms' physical learning environment?"

Following photograph taking, participants and the researcher talked about the pictures. Allowing participants the opportunity to talk about their photographs helped the researcher gain a more accurate interpretation (Pyle, 2013; Rasmussen, 2014). The researcher then observed the four students in each classroom for behaviors that showed what they liked about the environment, the spaces where they spend time, and general behavior in line with research questions. For instance, the spaces and materials that students chose to work at during free choice time or indoor recess were recorded by the researcher as elements that the participants liked. Activities by the students were recorded on a focused observation-guiding template created by the researcher. The template was developed during the pilot study and revised after gaining feedback from early childhood education professionals. The researcher conducted the observations in the afternoon during reading stations, math stations, indoor recess, and free-choice time.

To ensure the credibility of the research findings data triangulation and peer debriefing were employed throughout the study. Additionally, the researcher continuously engaged in reflection after each interview and asked a peer to review interview transcripts for errors, coding for intercoder agreement and analysis, and to assess for potential bias. To avoid biases associated with the interview technique, the researcher used a field reflection journal. An IRB approved interview protocol was piloted and revised using feedback from early childhood education professionals and researchers. Additionally, the researcher spent 15 h volunteering in each classroom, in order to build trust with the participants and to better understand the research context. Ethical clearance was gained from the University's Institutional Review Board (IRB), and the researcher obtained consent from participants' parents and assent from the participants.

Data Analysis

The researcher started the process of data analysis during data collection. Generally, she analyzed data in two main stages, first within each case (classroom), then across the two groups (teacher-centered classrooms and learner-centered classrooms). The focus during analysis was on the sub-questions, as suggested by Yin (2014). In the initial stages of analysis, she labeled and organized data by source, class, and participant. Organizing and storage of data were also

done with the help of QSR NVivo® version 11 software. The researcher transcribed interview data from audio recordings, which helped to engage more with the data and provided a sound foundation for analysis. Content analysis involving identifying codes, initial coding, classifying, and labeling primary patterns started at the participant level across all three forms of data collected (Patton, 2015). Open coding was followed by axial coding, category development, and identification of themes.

The coding process was repetitive, and categories were revised when necessary, as different data sets and segments were compared (Yin, 2014). The researcher assigned codes to interview data, pictures, and then observation data. She sorted pictures into different categories depending on the object or areas in the images. Additionally, the researcher studied the photographs for codes, guided by what the participants said about their pictures. The codes developed during the initial cycles for all data sources were inductive, comprised of *in vivo* codes and others that the researcher deemed to substantially represent meaning in the data (Ravitch & Carl, 2016). The labels were words and phrases that were mainly descriptive and in line with the research questions. She grouped codes into categories before identifying the themes emerging from the categories and data. The researcher developed a coding scheme, which she shared with a peer reviewer and used for intercoder reliability. For intercoder reliability, a peer reviewed the interview transcript and coded some of the data using the coding scheme. The researcher generated five themes from the coding and categorization process.

Findings

The themes that emerged from the data analysis process were: access and meaningfulness, comfort, active learning, management, and learning community. Themes were developed from participant data from the teacher-centered and learner-centered classrooms as measured by the APPEAL. Some of the themes emerged in the learner and teacher-centered classrooms in different degrees, as discussed in this section. The theme of access and meaningfulness was related to easy access to materials and other environmental elements, which fostered independence and afforded the participants choice. It also included meaningful features to the participants, views related to instructional displays, materials that were easy to access and transport, and organized spaces in general.

The comfort theme emerged mainly from interview and photograph data, and the observations confirmed some of the aspects. Comfort to the participants encompassed both physical and emotional factors. These included spaces that students felt were designed for them, areas and materials

that provided privacy, aspects that helped them focus on learning, and elements that promoted emotional well-being. Many of the participants used words like *comfy*, *comfortable*, *calming*, or *nice* when talking about the aspects. Participants' individuality was very evident in their perceptions.

The theme of active learning was connected to play and the use of materials. Most of the participants who talked about learning materials in depth were in the learner-centered classrooms. Students in the teacher-centered classrooms probably did not talk about certain materials and aspects of their physical learning environment because they were not aware of the elements due to the classroom's design and the pedagogy the environment promoted. Participants' photos and researcher observation notes also illustrated this theme. Many of the participants' photographs were of related aspects of the environment that allowed for active engagement, which included learning centers or stations and materials.

The learning community theme was related to aspects that promoted social interaction. The theme captured participants' preferences and desires for spaces to engage with their peers and teachers. Most of the participants showed the need for a balance between areas where they could work alone and with others. Participants' photographs included small-group rotations, a whole group gathering space, and math and science centers. Students in both groups also valued access to teachers or an adult to help them with work.

A theme that emerged mainly from teacher-centered classrooms was the physical learning environment as a classroom management tool. The participants' perspective was about how the teacher used the physical learning environment for classroom management and guidance. In interviews and pictures, participants shared how seating was assigned and how the teacher used the environment to guide them. The participants' names in the discussion below are associated with the two groups of classrooms: teacher-centered (TC) and learner-centered (LC).

What Do Students Like About the Physical Learning Environment in Their Classrooms?

The major themes that emerged concerning what students liked in their classroom environment were comfort, access and meaningfulness, and learning community. Although students identified similar aspects in their photographs and interviews, their reasons for selecting elements were different at times. A common perspective among participants was that they liked computers because they could play games and read various books. One participant said, "This picture is of the computers. I really like it because I can look up stuff that I don't know." (TC4).

Some participants liked places in the classroom because they were comfortable. Most informants in both groups

of classrooms felt that the reading area was a comfortable place. For instance, TC4 liked it because, “It’s very quiet, and you can choose any books that you may want to read, and you read them. It’s fun.” Similar sentiments were shared by LC5, who said, “There are pillows right here, and then down here there are reading buddies... little stuffed animals you can get out and read with.” Some participants liked sitting close to the teacher away from friends not to be distracted and because of comfortable seating. This idea of private or secret spaces showed up in different ways among the participants in both groups.

Students in both groups also shared that they liked the books, but participants in one of the learner-centered classrooms seemed to focus more on the variety of books and how they helped them learn. A small number of participants in the two groups of classrooms liked some places because the spaces gave them opportunities to work with other students. This was mainly evident in teacher-centered classrooms. Several participants, like TC1 and TC3, identified their teacher and friends as what they liked about their classroom environment. Only two participants from the learner-centered classrooms shared similar views about the question.

Another common theme was active learning. Some students in both groups liked flexible seating or opportunities to move. For instance, TC6 loved the “lower table because... you can actually stretch your legs.” LC4 said he liked recess because, “Did you know that you can’t live, actually you can, but you won’t be very smart if you have never played before?”

Access and meaningfulness were essential to students. Several students from the two groups identified classroom materials as something they liked and provided different reasons. TC4 said the math game area helped him learn more. TC5 said some classroom materials helped him “to do stuff.” TC6 shared that having access to clocks when they were learning about time was helpful. TC6 was the only participant in his classroom who talked about displays as something he liked. His pictures included a picture of the hundreds chart and one about coins. In discussing the coins’ chart, he said it “[s]hows how we know our cents and stuff.” In talking about the hundreds chart, he said, “We can actually know what we are doing.” More participants in learner-centered classrooms, however, identified displays as something they liked in the classroom. They also showed more awareness of the displays’ purpose and seemed to use them more when compared to students in teacher-centered classrooms. LC5, when discussing displays, said the teacher “has examples like writing goals, like how we do our plans...”

Easy access to materials was an important concept found mainly in learner-centered classrooms. LC8 took a picture of the area at the rug because, “When you need materials or if you are just wanting to play a game you can go there...” LC3 and LC4 played games during observations, and LC4’s

photographs also showed active engagement. LC6 shared about active engagement, “The geoblocks, basically you can build stuff with it.”

The focus of the participants for the classroom management theme was different. While the students in the learner-centered classroom seemed to be express classroom management thoughts about the environment related to promoting interaction with one another, the students in the teacher-centered classroom seemed to be more focused on environmental elements for individual activities or learning.

Where in the Classroom Do Students Prefer to Spend Their Time?

Comfort, learning community, and active engagement were the main themes regarding where students preferred to spend their time. Generally, they preferred parts of the classroom that were comfortable, had flexible seating, and that provided the opportunity to work in small groups or alone. This was supported by participants’ data in both groups of classrooms. Students’ preferences for comfortable spaces were depicted in their pictures, primary interviews, and discussions about their photographs. For instance, TC5 shared that he preferred to work from the rug and added that, “It is soft.” LC5 shared that he had three “good little spots to work at.” LC1 also echoed the same idea when she described a place she liked to work as “little like place, little space...” Some participants in learner-centered classrooms even shared their previous experiences regarding how the spaces they talked about were comfortable or ideal for work because of elements like lighting.

Flexible seating was described by participants as a preferential place to work. For instance, in one of the teacher-centered classrooms, most participants shared they liked working at two tables in the classroom that had comfortable, flexible seating. Their pictures also supported the same messages. TC7 shared he enjoyed working from a table in the classroom because, “It’s quiet, and I can get headphones, and I can just rock back and forth in my wobble stool.” Quiet places were favorite places for many students. For instance, LC1 stated in the interview that she did not like working at her seat when it was close to the place where the class usually had whole-group instruction, and a lot of students would be around her chair. LC1’s preference to work in spaces without a lot of students was something the researcher observed. Through observations the researcher found several participants working in quiet places that they did not talk about in the interview or show in their pictures.

Not all participants thought places that other students said were comfortable were right for them. For instance, although most participants in her classroom identified the reading loft as a comfortable place to work, participant LC3 shared that she did not like working in the loft because, “I will be kind

of scared. It's tree high." She also added that she would be too distracted by the loft's pillows, although they were comfortable. However, LC3 shared a picture of the loft as one of her favorite places and mentioned that she read in the loft.

Several participants in both groups seemed to have a preference for places where they could work with friends or their teachers. This was mainly depicted in their observation data more than the interviews and pictures. Participants like LC5, TC5, LC2, LC3, and LC8 worked at places like the classroom rug with other students when they had free choice time or indoor recess. LC8 identified the teacher's table as an excellent place to work because, "...if you need help, one of the teachers are there to help you." TC4 also shared that she, "...feel safer when I am close to the grown-ups."

A few participants in both groups shared a preference for places where they could actively engage with materials. LC1, for instance, identified the cubby room as a place where he preferred to work. LC3 also worked in the same room during an observation session and played a math game with her peers. LC7 listed games, puzzles, and other materials as she talked about the rug as a place where she liked to work. Although most participants did not talk about learning centers or other places where they could engage with materials as a place they would prefer to work, more than half of the participants in both groups mentioned something related to materials in general in response to other interview questions or in their photographs.

Participants were also pleased to have different materials that they could easily access in their classrooms. Observations, especially in learner-centered classrooms, where the researcher had more opportunity to observe participants during free-choice time or indoor recess, also showed participants working with peers mostly at the rug and sometimes at the tables. LC6 shared that she liked working at the writing center and having coloring materials and paper readily available. She also talked about her preference for working at the teacher's table because it was a place, she could easily see the displays while she worked. TC7 also shared she would get a poster or other materials and work from the rug.

When Studying Various Content Areas (Reading, Math, Science), Which Aspects of the Classrooms' Physical Environment do Students Think Help Them to Learn?

Access and meaningfulness, comfort, and learning community were prominent themes in answers related to where students would prefer to write, read, do math, and science.

Writing

Regarding physical learning environment elements that helped them when writing, many students felt places where

they could focus helped them write more productively. Examples they gave were places where a few people could work at a time. These included little spaces where, "there is nothing else around you to distract you" (LC1), "there is not much noise like screaming or something falling down" (LC4), and that is "really quiet" (TC2).

Their descriptions of what made the places comfortable included flexible seating that moves, "It just makes me feel like it makes me work better. When I am in a comfy chair, to roll around and then go back and forth" (TC7). Another student shared that she felt comfortable at her desk when writing, "maybe because that's like the really organized place that I really like because ...I don't like unorganized areas" (TC8). A participant said she preferred writing "under the table, that's the most dark spot that I would do it...it's just right. It's dark, so I like dark spaces" (LC3).

Reading

Participants in both groups felt comfortable places were important for reading. Thirteen participants during the interview talked about elements that were important to make a reading space comfortable. They used words like nice and comfy, soft, comfy spot, little, and comfortable to describe the areas. Several of the participants, mostly in the learner-centered classrooms, took pictures of the comfortable places. These included comfortable chairs, pillows, stuffed animals, and quiet areas. For instance, LC4 shared that the reading loft was comfortable and "really quiet, and like you can just relax, read, and no one can bother you." TC1 shared that the cubbies in the classroom were a good place to read "when it's quiet, and you can read by yourself there." Flexible, comfortable seating helped participants when reading. LC1 said she liked reading in the reading loft because "It's just this comfy spot where you can lie down and just read your book."

In talking about one of her pictures, a participant pointed out that classroom displays helped her in reading. She said, "The reason I selected this part as a taken picture is because you could see we have reading strategies like the long e, and then magic e, long a digraph, long o digraph, long i digraph or controlled words like ...then the r words right here..." Participants did not share the idea of classroom displays as important for reading in teacher-centered classrooms. Participants, however, talked about having books close to where they are reading as crucial for reading. One participant, LC8, shared that if he had a choice for where he wanted to read, he would read at one of the tables with his friend because they had been friends since kindergarten.

Math Learning

Students from both groups of classrooms thought places without distractions were necessary, and these were places that were quiet and away from a lot of activity. Some participants in the teacher centered classroom preferred doing math at their assigned seats because they all felt comfortable working from their desks. Two participants felt comfortable doing math from their desk because it was a place they were used to working, and another student thought it was a place where he could clearly see the whiteboard.

One student felt calm places helped him to learn math because he sometimes got frustrated. According to him, the classroom reading area was an example because, “It’s really like one of the calmest places in the classroom” (LC5). Displays helped students to learn math. For instance, one said if she had a choice for where to do math, she would work from one of the teacher’s tables because, “If I needed a hundreds chart they are right over at the table, and you can see the number line really good” (LC6). When talking about his photograph of the hundreds chart, another student said, “This is the hundreds chart over there, and it helps, if we are doing a math problem... We can actually know what we are doing” (TC6). Displays related to math learning were something several students from both groups talked about mostly when they discussed photographs. A few students in a teacher centered classroom thought spaces allowing them to work alone were vital because they did not want other students to copy their work. For instance, TC1 said, “Right where I am right now (desk) because I will have no one like cheating on my paper.”

Science Learning

Comfort was essential to participants for science learning. The most common aspect of the environment identified by participants was the need for room when doing science activities. Half of the participants across cases identified spaces in their classroom that they thought were conducive to science learning. In the interviews, they mentioned that the spaces had adequate room. According to some participants in both groups, comfortable seating was also crucial for science learning. A participant identified a part of her classroom being ideal for science learning because it had “a little chair right here. It’s comfy” (LC3). Another participant said, “Like right over here sitting on one of these chairs. Because probably that’s gonna be easier for me to sit down and be relaxed” (TC2).

There were two participants, one from each classroom group, who thought seating that allowed them to work alone or with a small group would help them focus. One of the student’s comments was that he would prefer doing science at

his table, “...when there are not many people” and “where I am far apart from different people” (LC4). The other participant preferred doing science at a desk where he could work alone and concentrate. A small group of participants from both groups thought they should work with other students or their teachers when they do science.

Which Aspects of the Physical Learning Environment Contribute to Students’ Sense of Belonging?

Comfort was a central theme associated with participants’ positive emotions or their personalities. They identified parts of the classroom where they felt comfortable because of the design. In some cases, the specific places allowed them to have some privacy or time to themselves. Their pictures and interviews illustrated this. In one of the learner-centered classrooms, some participants talked about the cubby room. In a teacher-centered classroom, almost all participants spoke about the calming zone as a space they felt was essential for their sense of belonging. The researcher observed participants creating such spaces in the classroom like a space TC2 created in the cubbies and behind the chair in the reading area for privacy.

Some of the words that participants used to describe how they felt in the places were really calm, relaxed, happy, comfy, and comfortable. For instance, participant LC1 shared that she felt good in the loft because it was comfortable. She shared a picture of families in the loft and explained that it helped them know about each other. LC2 shared that the cubby room was a place that helped him feel good, and he goes there after a bad day to calm down and to feel inspired. A similar idea was shared by LC5, who mentioned, “If you wanna know this about me, I actually love soft things.” TC2 shared that he did not feel good when he was around people who were loud and could get him into trouble. LC2 shared that the reading loft made him feel good, because it was a place without distractions and where he could not be “annoyed by some people and all that stuff.”

Working close to teachers gave some participants a sense of belonging. TC7 said she felt safe close to her teacher, and LC8 shared that his classroom made him feel good and it was, “The best I could ever be in, because the teachers in here are really good to us, and everything in here is made to look happy.”

Which Aspects of the Physical Learning Environment Do Students Prefer to Be Changed?

Although participants’ views of what they wanted to be changed in their classroom’s physical environment were very diverse, access and meaningfulness, as well as classroom management and guidance were common themes. A unique aspect in teacher-centered classrooms was participants’

expressed need to change and reorganize displays in the classroom. For instance, TC2 shared that he would remove some displays in the classroom and add a dinosaur-themed peripheral. TC3 wanted “...old Charlie Brown stuff” removed and replaced with horses. A learner-centered classroom participant wanted a machine to be added to the classroom that could help students with work faster than the teachers.

Participants in teacher-centered classrooms were the only ones who raised concerns regarding aspects related to student behavior and displays. TC8 suggested adding cameras to the classroom to record disruptive behaviors in the classroom. Another participant in the same classroom also talked about bringing back a jar that the teacher used to encourage positive behavior.

Interrelation of Themes

The five themes are interconnected and provide the view that second-grade students perceive their physical learning environment as multi-dimensional. They described it as mainly serving their needs and significantly less the needs of their teachers, except for classroom management. The theme of access and meaningfulness was described in relation to active learning. Comfort was an additional element that many students discussed in relation to their preferences while learning. Working with peers, and having access to and support from teachers, supported engagement within the learning community.

Discussion of Findings

This study identified five main themes concerning second-grade students’ perceptions of their classrooms’ physical learning environment. Both physical and emotional comfort were important to participants, and many were drawn to parts of the physical learning environment that facilitated active learning and social engagement as they learned. Participants also perceived the physical environment as a tool that their teachers used for classroom management and guidance. Findings from the study showed many similarities and little differences between students’ perceptions in the classrooms from opposite ends of the APPEAL rating scale. The major difference was that students referenced aspects in their classrooms and seemed to be generally influenced by their experiences or contexts, so they would not talk about aspects of which they were not familiar.

Although there were common themes that emerged from the data, participants’ perceptions were generally varied, depicting their individuality. According to Shao-Chang Wee and Anthamatten (2014), children’s experiences of

their environment are different depending on their “social and physical context” (p. 88). In their study on children’s play culture, they concluded that the culture of play is “individual, social, and ultimately contextual” (p. 90). This is consistent with findings in this study where perceptions differed because of participants’ backgrounds and experiences.

Educators need to be aware of this and try to observe what the students in their classrooms need, in order to create such spaces or spaces that are flexible enough for students to adapt in a way that enhances their learning and development. Giving young students such opportunities can increase their sense of ownership and autonomy. This observation is consistent with findings from Rasmussen (2004) and Moore (2015).

Moore’s (2015) study found that children create secret, or their own places, in the outdoor space; and this is something this study found occurring in an indoor space. In Rasmussen’s (2004) study, children talked about outdoor spaces that were meaningful to them. These were spaces such as corners that adults did not notice. In the present study on the theme of comfort, one of the constructs was privacy. Some of the participants valued private places that they created in the classroom. Participants brought this up in interviews, and some called the areas “secret spots.”

In one of the learner-centered classrooms, several participants talked about a place by the loft referring to a small space by the mailbox where they liked to work and do different activities. While in Rasmussen’s (2004), and Clark’s (2007) studies such places were created by children for play and were outdoors, in this study students mainly considered such places as ideal work places where they could work without distraction or focus on a task like writing, math, or reading. This was common among participants in both groups of classrooms. Similar to Rasmussen’s (2014) study, participants also created these secret places for privacy or to have personal time with friends. This was captured in the description from one of the participants who was in a teacher-directed classroom. In this example, the student created a place in the cubbies with coats so that he and his friend could have personal time to play away from the rest of the class. In Clark’s (2007) study with preschoolers, children also created quiet spaces.

According to Sunday (2018), “a flexible environment moves with children’s interests and ideas and deepens experiences” (p. 5). Flexibility in a primary-school environment might be challenging because there are policies and state standards to be followed in the curriculum. However, teachers still have room to incorporate flexibility in their classroom environment through learning centers, or having materials and resources in the classroom that allow for flexibility of use. This was displayed in the study when participants in two of the classrooms shared that they had blocks that they could use for math and play. One participant in a

learner-centered classroom gave an elaborate account of an experience she had using the flexible materials (blocks) in a flexible space (the carpet/rug) for play. The environment was so flexible that she could incorporate personal belongings to her play experience that she brought from home. This is in line with the constructivist theoretical framework guiding this research. If we believe that children construct their own knowledge, they should have rich physical learning environments to foster those experiences.

One of the main themes drawn from this study was comfort. Parallels can be drawn to a study with Finnish students on their ideal school environment (Kangas, 2010). The concept of environmental comfort was very evident in the findings with 49% of participants identifying factors related to comfort, such as the need for more space in the classrooms and around the school, and comfortable furniture, and lighting.

In Kangas's study (2010), participants also expressed desire to use technology like computers and the Internet. In this study, many participants identified computers as an element they liked about their classroom environment which helped them learn. Participants in Kangas's (2010) study also identified social and emotional factors as important for their ideal school. Although the current study's questions focused on the physical environment, several participants mentioned or discussed aspects related to the social and emotional environment in their perceptions of their physical learning environment. The findings of a few studies provide insights into how young students in the elementary grades are aware of the effect of their classroom's physical learning environments and can express views on issues affecting them (Barrett et al., 2011; Kershner & Pointon, 2000).

Overall, this study supports the findings of other similar studies and strengthens the idea that the classroom's physical learning environment influences learning and sends different messages to students. Although the study focused on second-grade students, the findings may well have a bearing on physical learning environments in older grades or younger grade levels. This study's findings enhance our understanding of what young elementary students think about their classroom's physical learning environment and the aspects that are important to them.

The results add to the expanding field of research with children in education and other areas showing the need to research with students on matters that have a direct influence on their lives (Gill et al., 2008; Harcourt & Mazzoni, 2012; Loizou, 2011). Findings from the current study adds contributions to the area of elementary-level early childhood education classroom experiences for students in teacher-centered and learner centered environments.

Limitations

The study's first limitation is that findings cannot be generalized to the larger population because of the small sample size. Qualitative research seeks to find "meaning in context" (Merriam & Tisdell, 2016, p. 2), and the select context for the current study was four second-grade classrooms from opposite ends of the APPEAL rating scale (Evanshen & Faulk, 2019). Therefore, findings are specific for the study contexts although similar settings might draw lessons from the students' perceptions. Three classrooms did not have free choice time built into their daily schedules. This led to limited opportunities to observe participants engaging with their physical learning environment when provided choice.

Implications for Teaching and Teacher Training

The findings offer a way for teachers and teacher educators to think about second-grade students as actively affected by their classroom physical learning environment and the ways in which the environment can be designed to support each student's diverse needs in the learning space. Teachers can use findings from the study to design classroom environments that are engaging for young learners. Additionally, study findings communicate how students are aware of, and affected by, their classroom environment. This can help teachers be intentional about creating a classroom physical environment that better meets their students' needs and be more aware and considerate of the unique needs of the main user of the classroom: the students.

Teachers may need to consider assessing the classroom physical learning environment more from their students' perspectives, rather than their adult view. They may want to consider examining if there is something the students are experiencing that influences their learning. Teachers may need to listen to children's expressions and thoughts, and ponder their ideas to determine if there is something they can do to support student learning further. For instance, the furniture set up may need adapting to afford easy access to students when they need help.

While the results and suggestions offered from this study are not a prescription of what a second-grade classroom should look like, students do not have much power for decisions related to their environment as noted in other studies (McEvoy, 2014; Shao-Chang Wee & Anthamatten, 2014). Teachers should consider making time to understand and appreciate students' perspectives on the spaces they use and incorporate the information they learn from students with what they know from research on best practices when designing their classroom's physical environment. The

teacher is the facilitator and guide for the learning process; however, preferences from young children in their classroom's physical learning environment should be considered and possibly adopted. Students should have some choice in the classroom regarding where to work in an environment that fosters academic motivation and increases students' chances of success on tasks. The teacher, however, should remain the guide and not leave students to do anything they want.

Teachers can use what they know about students' interests in their classroom to inform decisions about the design of the classroom physical learning environment. This could be in such areas as the peripherals in the classroom or resources in the learning centers and stations. Findings from the study imply that when the classroom environment is reflective of the children in the classroom, it helps students to feel comfortable in the learning space, and it fosters their sense of belonging, and helps them to learn.

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Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Conflict of interest Not applicable.

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