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Prekindergarten Teachers' Perspectives on Classroom Environments and Barriers to Optimal Learning Spaces

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Abstract
Physical classroom environments for young children and the quality of those environments have typically been studied by utilizing various rating scales. Research is limited on early childhood educators' perspectives and decision-making processes in striving to create optimal physical classroom environments during the school year. This qualitative study used the theoretical lens of Bronfenbrenner's microsystem to examine 22 prekindergarten lead teachers' decision-making processes regarding initial set up of physical classroom environments, their ability to modify and update their classroom during the school year, and the barriers they face in providing optimal learning environments. Findings indicated that prekindergarten teachers dedicate most of their time, attention, and resources to physical classroom environments at the start of the school year. Great variations were found in the amount of autonomy the teachers had in set-up and materials selection. Updating and modifying those physical classroom environments also varied greatly depending on school setting and teacher experience. The main barriers revolved around budgets, physical space, and time. Implications for child care quality are discussed.

Keywords Prekindergarten · Early Childhood Education · Classroom Environments · Teachers' Perspectives · Barriers · Child Care Quality

Many children spend most of their waking hours in early childhood classrooms. According to the National Center for Education Statistics (2019), 12.8 million U.S. children (60%) under the age of 5 were in weekly non-parental care in 2016. On average, children spent 30 hours a week in childcare (National Center for Educational Statistics, 2019). Classroom environments are the foundation of learning in every classroom. Due to the amount of time children spend in built environments (Goldhagen, 2017), it is imperative to ensure thoughtful consideration is given to these environments by teachers, directors, and stakeholders. Intentional and purposeful high–quality classroom environments are a priority for optimal child growth and development. However, due to differences in philosophical perspectives on how children acquire knowledge, as well as funding variations and individual community differences, decisions about physical classroom environments are often personal and individual to each teacher or school.

Children need to be given the opportunity to spend much of their time choosing and moving freely in an environment specifically designed for caring and learning (Greenman & Lindstrom, 2017; Zane, 2015). When children are given choices on how they move about and utilize their environments, their behaviors may become regulated by those developmentally appropriate environments (Copple et al., 2013; Greenman & Lindstrom, 2017). Thus, the way teachers initially set up classroom environments, how often and why they modify those environments, and which obstacles and barriers they come across while pursuing optimal environments must be closely examined.

Although great variation exists in the autonomy of the prekindergarten teacher's ability to design and modify the classroom environment, the teacher is typically the person charged with setting up, auditing, and modifying the environment (Denny et al., 2012). Engagement with the physical and social environment is a key contributor to children's school success in early years as well as future years to come during formal schooling (Aydogan et al., 2015).

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The challenge for prekindergarten teachers in creating optimal learning spaces is the great variability in classroom practices due to disagreements in the field regarding the actual purpose of prekindergarten (Farran et al., 2017). Also, additional contributing factors may include the variability in prekindergarten teachers' level of education, experience, professional development, and skill set. In addition, prekindergarten teachers' knowledge of classroom environments can vary greatly.

Thinking about the various components of the classroom environment, including center/area divisions, furniture setup, and selection of developmentally appropriate materials, requires thoughtful and mindful planning and a keen ability to understand how each detail of the classroom sends important, albeit silent, messages to the children (Phillips & Scrinzi, 2013). Most importantly, classrooms should be intentionally designed. keeping the children's development and interests in mind (Bullard, 2017; Curtis & Carter, 2015; Greenman & Lindstrom, 2017). However, this skill is not a requirement of many teacher preparation programs, professional development trainings required by the state, or even included in onboarding training at most early childhood education centers.

School architecture, school furniture, spatial organization, and learning tools impact the teaching and learning process (Tondeur et al., 2015). In fact, the classroom environment has been referred to as the "third teacher" (Zane, 2015). As far back as the 1930s, Maria Montessori recognized that the prepared environment is a teacher to the child (Montessori, 1967). The size of the room and the arrangement of the materials and spaces, where children are expected to engage in thought, must be constantly reconsidered. In a case study of nine teachers who all changed their classroom environments throughout their careers, Tondeur et al. (2017) discovered that as the teachers' pedagogical ideologies changed, so did the evolution of their classrooms and the spaces the children inhabited. As new practices, technological advances, budgeting, and availability of materials changed, so did their classrooms in terms of the materials offered and the classroom arrangement.

To assess the physical classroom environment, some practitioners have turned to environmental rating scales, and much of the research on classroom environments consists of the effectiveness of specific tools and the application of rating scales (Brunsek et al., 2017; Denny et al., 2012; Howe & Jacobs, 2013). Where these tools perform well is in determining if the environment has ample opportunities and adequate materials to foster learning. Unfortunately, what is often missing is the ability to measure the child's engagement in those areas based on how frequently and appropriately the spaces are modified to fit the children's needs during the school year, how much time children are spending in each area, assessing needs for improvement, and how often teachers extend children's questions, curiosities, and opportunities as a springboard to modify the physical environment. Thus, further studies are needed to understand the complexity of a teacher's decision–making regarding the classroom environment.

In a previous study (Stankovic-Ramirez & Vittrup, 2017), we found that children were more engaged in centers their teachers preferred and enjoyed being in themselves. The children could identify which center was their teacher's favorite and tended to not choose centers that were the teacher's least favorite when selecting their own center preferences. In the study, teachers were asked to make modifications based on children's input. After the modifications were implemented, children not only noticed the changes, but also had new favorite centers/areas based on the modifications.

Initial classroom set up, modification of the physical classroom environment throughout the school year, and barriers associated with designing an optimal learning environment have a great impact on whether a classroom serves the needs of every child and thus making it a high–quality environment. Children's development, growth, learning, and engagement are rooted in high quality physical environments and should be a daily consideration of teachers (Dillon et al., 2016; Duncan & Martin, 2018). While literature on best practices and optimal environments exists, research is lacking on whether prekindergarten teachers are able to follow these recommended practices, such as updating their environments appropriately and often enough, taking into consideration the needs and interests of their students, and having access to the materials and resources necessary to create an optimal physical classroom environment. Therefore, the purpose of this study was to explore teachers' perspectives on their prekindergarten classroom environments. Specifically, (1) How do prekindergarten teachers make decisions about initial classroom set up? (2) What factors determine if, when, and how teachers make modifications to their classroom environment throughout the school year? (3) What barriers do teachers face when it comes to setting up and modifying classroom environments?

To this purpose, Bronfenbrenner's (1979) ecological systems theory served as a theoretical lens for this study. Particularly, the focus was on the school environment, which is an important part of the child's microsystem. Bronfenbrenner maintained that children's development is influenced and transformed by activities, roles, and relationships in their environment, and both close and distal systems can impact their development and well-being. The school environment is part of the innermost layer, and the quality of this environment can determine whether child outcomes are positive or negative. Importantly, activities and resources within the school are ultimately influenced by outer layers in the

ecological system, including state and federal guidelines for prekindergarten operations, as well as funding and access, which we will also address.

Method

A qualitative phenomenological approach was used for the collection of data for this study. Such an approach examines the lived experiences of individuals, including their perceptions, descriptions, feelings, and interpretations of such experiences (Patton, 2002). The phenomenological approach allowed us to discover commonalities among the participants in their experience of setting up and modifying prekindergarten classrooms, as well as barriers they faced in creating optimal classroom environments.

Author Positionality

Both authors are white women with European backgrounds. The first author has over 20 years of experience in early childhood education as a teacher, director, and trainer. The second author's background is in developmental psychology. We recognize that our cultural and educational backgrounds may differ from the participants, but our aim with this article is to represent the experiences and perspectives of the participants as authentically as possible by using their own words as the main data source.

Table 1 Participant Information

Participant	Age	Education	Experience	Class Size	Environments Training
P1	29	Some college	8 years	22	A lot
P2	38	Bachelor's	6 years	20	Some
P3	62	Bachelor's	29 years	20	None
P4	59	Master's	15 years	13	None
P5	43	Bachelor's	13 years	--	A lot
P6	48	Bachelor's	25 years	22	A lot
P7	38	Bachelor's	5 years	20	Some
P8	50	Some college	25 years	17	None
P9	62	Bachelor's	29 years	6	A lot
P10	67	Bachelor's	26 years	22	A lot
P11	56	Bachelor's	23 years	12	None
P12	35	Master's	12 years	18	Some
P13	38	Master's	13 years	17	A little
P14	52	Some college	2 years	16	Some
P15	36	Bachelor's	9 years	22	Some
P16	66	Some college	16 years	12	A little
P17	43	Bachelor's	3 years	13	A little
P18	30	Bachelor's	8 years	22	Some
P19	34	Some college	12 years	12	None
P20	50	Bachelor's	20 years	20	A little
P21	32	Some college	15 years	12	A little
P22	35	Master's	20 years	15	A little

Participants

A total of 22 prekindergarten teachers participated in this study and provided unique insights into their individual experiences with classroom environments. The participants were lead teachers in National Association for the Education of Young Children (NAEYC) accredited centers ($n=3$), Head Start centers ($n=3$), Association Montessori Internationale (AMI) or American Montessori Society (AMS) trained guides for ages 3–6 in Montessori settings ($n=6$), public school prekindergarten teachers ($n=6$), and prekindergarten teachers in other licensed but non-accredited childcare centers ($n=4$). All participants were female and ranged in age from 29 to 67 ($M=45.5$, $SD=12.08$). Class sizes ranged from 6 to 22 children ($M=18.0$, $SD=6.38$). The educational background of the teachers included associate degree or CDA ($n=6$), bachelor's degree ($n=11$), and master's degree ($n=5$). Teaching experience ranged from 2 to 26 years ($M=16.0$, $SD=7.83$), and training on classroom environments varied widely, with 13 teachers having completed professional development on the topic as part of their annual training, 4 having received training on environments through their degree program, and 5 having had no formal training on classroom environments. Table 1 shows the basic demographics and characteristics of the participants.

Sociological Context

All participating teachers were employed in prekindergarten centers in Texas, and these centers were licensed by the Texas Department of Family and Protective Services (DFPS). The Texas DFPS minimum standards do not include specific guidelines or requirements for classroom environments, except for minimum square footage per child (30 sqft.), tables and chairs of appropriate height, and storage space for children's belongings (Texas Health & Human Services Commission, 2022). The minimum standards allow one caregiver to supervise up to 18 children at age 4 and up to 22 at age 5. Meanwhile, the National Association for the Education of Young Children (NAEYC) sets additional, more stringent guidelines for childcare centers, including specific standards for the physical environment, such as a minimum of 35 square feet per child; space being divided into specific learning areas; specific materials, equipment, and furniture; natural lighting in indoor areas; and a separate administrative area for planning and preparation, as well as

lower caregiver to child ratios (NAEYC, 2022). Programs accredited by NAEYC are bound by those guidelines.

Compliance with ethical standards

This study was approved by the Institutional Review Board of the second author's university, and all participants signed an informed consent form prior to commencing their participation.

Instruments and Data Collection

Demographic Questionnaire

Participants completed a basic demographic questionnaire, which contained questions about their educational background, years of teaching experience, years teaching prekindergarten, and information about any formal training about classroom environments, such as college–level coursework. The participants were also asked about any professional development training in the past 3 years that specifically addressed classroom environments.

Zoom Audio Recorded Interview

A semi-structured interview was conducted with each participant via Zoom. Each interview was audio recorded for the purpose of post-interview transcription. Participants were asked questions about how they decided on classroom arrangements at the start of the year, what process they utilized to make modifications to the classroom environments throughout the school year, and what barriers they faced with set up and modifications regarding creating what they perceived to be an optimal environment for the children. The authors developed the interview protocol with specific questions based on previous literature and the overarching research questions.

Field Notes

During the interviews, body language and facial expressions were noted as each participant answered the questions. In addition, notes were taken on various ideas or concepts that related to the main research questions. After each interview, preliminary thoughts, and conclusions regarding the information provided were also noted, and at the conclusion of all interviews, the notes were combined for later inclusion in analysis.

Procedure

Participants were recruited via electronic flyers sent to childcare providers in a large metropolitan area. Those interested in participating signed up for an interview time via email. Prior to the interview, they filled out a demographic questionnaire and informed consent form and submitted them electronically. Interviews were completed via Zoom and lasted between 37 and 80 min. Upon completion of the interviews, teachers were mailed a $25 gift card.

Data Analysis

All interviews were transcribed and reviewed multiple times prior to data coding and analysis. The analysis focused on the individual teachers ($N = 22$) rather than the types of centers. The data was analyzed using thematic analysis (Braun & Clarke, 2006). Two cycles of coding were conducted using NVivo. During the first cycle, holistic coding was used to organize the data into manageable chunks representing similarities in the data. The theoretical framework of Bronfenbrenner's ecological systems theory was applied, focusing specifically on the microsystem. Initially, 22 codes were established and applied throughout the data set. These codes were then collapsed into six categories related to the research questions. During the second cycle of coding, the data was further consolidated and organized into patterns, and categories were merged into overarching themes based on similarity of content. Data that occurred repeatedly was given the label of a theme, and subthemes were also established and labeled.

Throughout the coding process, the codes from the first and second cycle were compared, and field notes were reviewed and integrated where applicable, so as to ensure consistency and trustworthiness. Initial coding was done by the first author, and peer debriefing with the second author was conducted to further ensure reliability and credibility of the findings.

Results

The participants' responses to the interview questions shed light on how prekindergarten teachers make decisions regarding classroom environments at the start of the school year, how they make modifications during the school year, and finally the barriers they face when it comes to creating optimal classroom environments.

Research Question 1: Initial Decisions About the Physical Environment

Prekindergarten teachers were asked how they make decisions about their physical classroom environments at the start of the school year. Initial decision-making autonomy varied across the participants. Of the 22 teachers, 13 indicated that they had full autonomy to make decisions about the classroom set-up, and 7 had mixed power over the decision–making process, sharing the responsibility with either a co–teacher or collaborating with leadership (preschool director or principal). The remaining two participants did not have a say in how their classroom was arranged, one of whom was brand new to her school, while the other one belonged to an independent school district Head Start partnership. From the participants' responses, three overarching themes emerged initially: *Curriculum or School Approach, New School Year*, and *Set-Up Based on Experience*. After further analysis, an additional theme of *Autonomy in Decision Making* emerged as well. Within these themes, additional subthemes emerged as described below.

Theme 1: Curriculum or School Approach

Most participants indicated that their classroom set-up was heavily influenced by the specific curriculum or approach their school follows. Everyone indicated that they would start the school year with pre-determined centers or areas, including literacy/library, dramatic play/home center, art, blocks, science, math, and music. The number of centers or classroom areas ranged from 5 to 12.

Montessori Prepared Environment About one quarter of the prekindergarten teachers used the Montessori approach. These six participants all stated that the "prepared environment" (Montessori, 1967) is an integral part of their decision–making process to setting up the classrooms each school year.

> So, within each area the materials are sequenced. So, they're on shelves in a sequenced format and though the children self–direct in a Montessori classroom, it's under the supervision or under the guide of the teachers. (P10)
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> The manuals, the albums are very helpful to those who are just starting to teach Montessori. It's kind of like your Bible… I've been doing it for a long time now. I would still go back and check. (P6)

School/Center Specific Curriculum Of the total, nine participants indicated that their classroom environment was partly determined by the specific prekindergarten curriculum chosen by their center or school. Four of them used Frog Street (n.d.), two used Big Day for PreK (Head Start Early Childhood Learning & Knowledge Center, n.d.), one used Reggio Emilia (Reggio Children, n.d.), one used Backwards Design (Wiggins & McTighe, 2005), and one used OWL (Head Start Early Childhood Learning & Knowledge Center, 2014). Each curriculum calls for specific centers to be present in the classroom and thus influences the classroom set-up. Some curricula also include information about which parts to include in each center, as well as suggested activities.

> We use Big Day curriculum. So, for the week, the beginning of the curriculum, it'll tell us what centers we're going to use for that entire week. Those are the centers that we'll use. So just say if we're into blocks and then if it tells us to build a school, that's what they'll build. They have cars, they have buses, they have people. They can use that to build with. (P8)
>
> High Scope[1]. But they're meant to be pretty open–ended and big on loose parts and stuff. I was going through the certification process last year of High Scope. I changed it up some as I was learning, but once you know the reasoning behind there, what they want you to have in the centers, there's freedom in interpreting that, based on what the kids are interested in and…what's working and what's not for your specific collection of students. (P17)

Self-Created Curriculum Some teachers had the power to self-create curriculum. Three indicated that they or their center created their own curriculum. Since the teachers are creating the curriculum throughout the school year, certain centers may or may not be present depending on the leadership. In addition, the set-up and materials might vary depending on the teacher's assessment of the space.

> The curriculum is basically the same. I brought that over [from a previous school]. Then I had to expand and develop and rewrite a lot of it because I had to make it bilingual. It grew from there. The home center, dress up, all that takes up almost a quarter of the room. Then I needed the instruction area, the circle time area, that rug, it needs its spot. (P9)
>
> For where we put stuff, it came mostly from my mentor. But again, years ago there were very clear

definitions. The loud spaces, the soft spaces, the wet spaces, the dry spaces. …I've heard all those things and then just incorporate it into how I do it. I don't know that we have a set way of doing it now. (P11)

Theme 2: New School Year

More than half of the 22 participants reported that they make decisions about their classroom environments by the start of a new school year starting. Some began each academic year with a blank slate and brand-new set-up, whereas others kept the main areas or centers from the previous year or from a previous teacher in that classroom. Some of the participants expressed that their classroom centers would be moved to the center for deep cleaning over the summer break, and they would come back to start fresh each new school year. Others stated that they were new to the classroom and had autonomy to make it their own.

Blank Slate More than half of the teachers reported starting fresh, with a blank slate for their classroom. Some stated that each year they get a new set of children with a new set of personalities and needs, so starting over was an attempt to meet the needs for that new group. A few also indicated that they might have the classroom set up a certain way, but after the children arrive in the classroom, they realize that it is not working, and they must make changes in order to meet the children's needs.

The walls and everything are very blank, so that it allows for the collaboration of all the people in the room. Not just me or the co-teacher but the children as well. (P11)

I really want to see the classroom. Let's say it's my first year. I really want to see how it looks and then I try to picture it in my head. "Okay, how am I going to put it in order?" I would want the flow; I want to start with practical life. Kind of like a clockwise direction. Like, "Okay, on my list I start with practical life here." And then I'll go to sensorial. And then I want the sensorial connected to math because it's sensorial that transfers to math. The culture and then language arts, kind of like that. You're of course limited by the layout of the room. (P6)

It would be easy to just leave it the same from year to year, but I can't remember a single year that I didn't move things around some. (P16)

Inherited Layout Prior to joining the school or ECE program, five participants stated that their room arrangement was already set up. They did not make major changes to the set-up and left it as they found it for the upcoming school year.

When I got there, it was using High Scope[1] as one of the many resources. And so I just inherited whatever was in there. And it was very haphazard, and we were following what the district wanted… kind of not. And so, in that first year, it was very confusing, but now that we're on the High Scope journey, they're ordering materials for us. (P17)

When I initially got here, Cheryl had already been here a year and set up the room. She was partners with Dave, and they set up the room. And she told me about a couple of changes that they had made during the year. And I asked her if she was satisfied with the way it was at the end, and she said yes. And I'm like, "Let's start it the way you had it. See how it goes." And for the most part, we haven't made huge changes. Tweaks, but not full overhauls. (P3)

Theme 3: Set-Up Based on Experience

The teachers' experience in the early childhood education field appeared to be a major factor in determining how the physical classroom environment was set up. They often spoke of their tenure as evidence of their capabilities in setting up classroom environments.

Years of Teaching Teachers were more often likely to reference their ability to set up the classroom with direct hands-on experience in the classroom and the number of years they have taught versus their educational background, regardless of their education level. For example, six participants cited their ability to set up environments in the classrooms and directly linked it to the number of years they have been teaching or their experience in the field, such as "It was established based on experience. We have these… about 15 years together." Another teacher mentioned "After so many

[1] High Scope is an early childhood curriculum inspired by constructivism and the theories of Jean Piaget and Lev Vygotsky. It is centered on the belief that children are active learners and should take an active role in choosing and planning activities.

years of doing the same… 30 years… there're some things that I would want to change at the beginning."

Leadership and Mentors In addition to relying on their own experience in the early childhood education field, many ($n=13$) also looked to their leadership and mentors for guidance on classroom set-up. For some, the leadership or mentors served as a sounding board for new ideas as well as support and guidance. Almost all of the participants ($n=20$) stated that if their director/leader asked them to change something in their classroom, they would adhere to the director's request.

> My mentor, who I taught with for 10 years, was a master teacher, and I learned something every day from her. I can hear her in my head when I set things up. The reason that our carpet is over here is because it's closer to the materials that I would need. Other people will say, "Well how about if you set up your circle space over here." That's great, but it's really far away from where you would need to grab any materials you would need. The thought process and why I put things where I do, for where we put stuff, and mostly from my mentor. (P11)
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> My director retired this year, so I don't know how they're going to do it when I go back next year, but I would set the room up, and when I would come in the next day for starting to get ready for me as a teacher, it would always be rearranged. Because she was an aesthetic person… and I have to say, sometimes her ideas worked better than mine, but some of them, I glaringly knew that I was not going to be able to make that work for the way we play. (P16)

Theme 4: Autonomy in Decision Making

Participants revealed that when it comes to decisions regarding classroom environments, they have a great deal of autonomy and power over decision making regarding the physical set up. Thirteen stated that they were solely in charge of making decisions regarding classroom environments, and seven stated that they had a say in how the classroom would be arranged with input from leadership and collaboration with other teachers in their rooms. Only two reported not having any decision-making powers.

> I do it on my own. I required help in the beginning to make sure that the materials were sequenced appropriately, but in the training, the Montessori training that I received, it was one of the things that you do is the layout of a classroom, design your classroom and so teachers are instructed in how best to do that. Then it becomes a personality sort of thing. Once you have the order and the sequence of the materials in a Montessori classroom, then the arrangement of the shelves is individual. (P10)
>
> I make those choices on my own, and I also consider input from other the other teachers in my classroom. [Director] has a lot of experience, so I tend to listen to what she has to say. (P1)
>
> We used to be told what we had to do, and last year they said bring in what works for you and what's appropriate for you. And if you don't have all eight, ten, whatever centers that's okay. As long as you can rationalize what you're doing in there, it's okay. (P11)

Research Question 2: Decisions About Classroom Modifications

Participants were asked which factors determine physical classroom modifications during the school year. All participants indicated they give most of their attention to physical classroom environments at the beginning of the school year, and five stated they did a major redesign (e.g., moving centers around) at the start of the second semester (after the holiday/winter break). Most indicated that their modifications involved changing or moving materials as opposed to moving centers or areas. At least once per month, 14 participants modified their classroom materials in all their centers. Three themes emerged regarding the factors for modification decisions: *Observation of Children, Communication with Children/Staff*, and *Safety.*

Theme 5: Observation of Children

All participants indicated that they made classroom modifications based on their observation of children. Such observations provided insight into which centers and materials were popular, and which ones kept the children interested and engaged. The observations also highlighted specific needs of the children, the developmental appropriateness of materials, and whether children had adequate access to the materials.

Child Interest and Engagement Teachers tended to evaluate the success and appropriateness of a center/area based on

how interested and engaged the children appear to be, as well as the amount of time spent in each center.

> If I notice the kids are not interested in a certain center, that's when I need to figure out how can I get them engaged, what are their interests that will bring them to that center more often, how can I make them interested? (P15)
> I see that the kids are not playing with this material anymore… I've noticed that every four weeks, if I changed some materials, even if I rearrange the classroom, move the tables around, it brings the focus back to doing what they need to be doing. (P21)

Child Needs and Developmental Appropriateness Several participants highlighted the importance of factoring in the children's stage of development and specific needs. They also emphasized that furniture must be developmentally appropriate, matching the size of the children in their classroom, and with items presented at children's eye level.

> Developmentally, depends on the age of the kids. I do need to take into consideration. Sometimes I do put that motor skills center instead of... and then as the year goes on, changed it to a math center because they need those skills. So it depends on ... how I see the kids, how young they are, how well they can do those small activities. And so sometimes that math centers start as just a motor skill center. (P20)
> It becomes important to make that more accessible to children and so that is a big factor in making sure that the children have easy access and visual, that they're visually able to see. (P10)
> Where the free work shelf is and where our carpet is, I wouldn't put those two things so far apart, because… they're going to be running back and forth, or ... carrying the basket from so far away to where the carpet is, can also be an issue and frustrating for them. If they're still trying to figure out their coordination, I don't want to create a problem in that way. (P9)

Theme 6: Communication with Children/Staff

Many participants revealed that they often ask children about the environment, in particular the materials they will present next in each center or area. According to nine teachers, they almost always involve children in the decision-making process, and seven stated that they sometimes involve the children. The remaining teachers stated that they do not involve children in their process of deciding if and when the classroom will be modified.

> Part of making students become the owners of their own learning is by asking them what they want to learn, how they want to learn. And ask them like to learn and suggest. (P14)
> I would say that's more of a one-on-one kind of visit with them and say, "Hey, I notice that you spend a lot of time in magna–tiles. Is there another area in the class that is of interest to you? What could make it more interesting to you?" (P11)
> I didn't ask, and that's something that I need to do more of, instead of just getting down and playing with them. But I do need to ask them what makes it their favorite center. (P15)

Several participants also based modification decisions on suggestions and help from other teachers and leadership. They stated that it was important for them to have someone in the school or center who is willing to help when needed.

> In the past it had been very collaborative. We have consultation with the directors and the pedagogista[2]. We certainly pop into each other's rooms and have discussions. (P11)
> When it comes to early childhood specialists, they have more knowledge in early childhood so if they make a suggestion, if I think it'll work for my classroom and my classroom dynamic then I will change something around. (P12)
> I have an instructional coach who follows me and helps me, and he will plan with me with goals to help me grow as a teacher. (P14)

Theme 7: Safety

A majority of participants ($n = 14$) discussed keeping children safe during their school day, and they indicated that safety in the classroom was a priority. For example, if they discover something is a hazard in the environment, they will immediately remove it and modify the environment.

> Where they have tables and chairs, there has to be enough… for me, they have to be able to push their

[2] The term "pedagogista" is commonly used in preschools following the Reggio Emilia curriculum. The pedagogista is an educational advisor who helps teachers improve their skills and assists with curriculum implementation.

chair back clearly and not worry about knocking into a shelf or another table or anything like that. (P7)
From a […] childcare licensing or a NAEYC standpoint, having things from a safety perspective, making sure that children were visible, that I could see them from all parts of the room. (P19)
Supervision is super, super important. Making sure that your furniture is all age–appropriate and nothing is going to fall over on a child and hurt them. Making sure that there's enough space in every center. If it's a small center, maybe only two kids can be in there instead of four. If you want more kids, you got to pull it out and make it a little bigger. (P21)

Research Question 3: Barriers to Optimal Classroom Environments

Participants were asked to identify the major barriers they have experienced in their attempts to create optimal classroom environments for prekindergarten children. The main themes that emerged were *Space, Budget*, and *Time*.

Theme 8: Space

The majority (16) of the teachers indicated that lack of space was their main barrier. They indicated that they would like to have more space in the classroom for children to move freely, and they would like to expand the size of certain centers/areas, or even just to have dedicated spaces for certain centers/areas, including separate spaces for eating, physical activity, and art. The need for more storage space and flex seating also came up.

Sometimes just when we go to trainings, we see these like perfect classrooms, but they're so big and we're always, "where are these classrooms?" …You see all these centers spaced out so nicely. And we have to figure out how to put up the seven centers that we're required in pre–K in a way where it's easy for the kids to maneuver, for the kids to have space and still fit in the tables where they need to work. (P20)
I do wish we had ways to make little nooks for them to go in, if they did feel like being quiet. But it's just so limited in there, partly because of the size, and I just feel like it's hard to give them a quiet area. (P17)
The ideal classroom would be one that I did not have to share with another class. So right now, my classroom is like a long rectangle. There is not a partition. So, I teach 4 and 5s, and so the 3s and 4s is on the other side. So, this little shelf is what divides both classrooms, and the shelf is at the height of the children. So as an adult, you don't really have that separation. (P19)
Right now, I have to accommodate children's personal things within the classroom itself and the coat room. I would have more storage so that things were ... I could put things away in a more organized way. Many times, I find myself just shoving things into the small spaces that I have for storage. (P10)

Natural Light, Windows, and Access to Outdoors A subtheme that emerged around classroom space focused on the ability to visually see and access the outdoors from the classroom. Some participants ($n=6$) felt that having natural light in the classroom would enhance the classroom environment as well as more windows, and even floor to ceiling windows, which would allow the children to enjoy the views of the outside world. Several also wished to have access to the outdoors directly from their classroom, either to access the playground, a garden, or just to go outside.

Theme 9: Budget

Not surprisingly, a common theme around the barriers to optimal classroom environments was the budget. Some indicated that they have a set budget available each year, ranging from $75 to $300, and others were unsure of the budget amount or if there even was a budget for classroom set-up and modifications. Most participants ($n=17$) indicated that they have spent their own money for supplies they needed for the classroom. Only five participants expressed that they had everything they needed, and that the school paid for the necessary materials. The rest stated that they usually spend some of their own money at the start of the year as well as throughout the school year to ensure that their classroom is adequately prepared.

We're always told "No, there's no money." (P13)
We get $200 at the beginning of the year to use for supplies for the whole year or anything else you want for the classroom. Well, usually I've already spent it before school starts… Because there's just so much you don't get that you need. (P14)
We don't get a budget. We can request stuff at the beginning of the year or the end of the previous year, saying "We broke our whatever, and we need a new one." But budgets are tight, and we figure we're probably not going to get it. So, we've been a little more creative in that we go, like I said, to garage sales and other places. (P23)

I just feel like sometimes you're planning a lesson for the next day, and you think… You end up buying it yourself because you can't go through all the red tape of waiting for the office to get it. (P17)

She (director) normally just buys everything. She'll just come by and say, "Give us the [catalog], and just pick out some things that you think that you'll need for your classroom." (P8)

Theme 10: Time

The final main barrier to creating optimal physical environments was the lack of time to modify the actual classrooms. Some participants stated that they did not have adequate time during their working hours to modify their environments, or that they were expected to do it on their own time, such as before and after school, on weekends, during their personal lunch time, or during the children's nap time. Some teachers did indicate that they had 1–2 hours per week of planning time, but that time was reserved for lesson planning, documentation, and paperwork. Out of the 22 participants, 15 stated that they modify classroom environments outside their paid work hours.

Well, we do a little bit before school. Everything needs to be ready; the big part needs to be ready before the kids arrive. And we do a little bit after school. And then when we have nap time, so we do that also. (P14)

Once a month, well, we'll spend the weekend. On Friday of that last day of that theme, we'll start taking down stuff that's the old theme and start planning the new theme. And then each of us will work on something over the weekend. (P23)

I'm pretty sure if I would've had more time to really think about modifying or changing things around, I could have. Because a lot of times everything is go, go, go or assessing, and I'm not really having time to sit and watch and reflect on how they're using it to make sure that it's being used optimally… To sacrifice more of my time for the classroom. Sacrifice more of my personal time. (P12)

Discussion

Throughout children's development, they are affected by many family and societal systems that impact their growth and well-being. Bronfenbrenner's (1979) ecological system's theory emphasizes the importance of the inner-most systems that are closes to the child, such as the family environment and the school environment. The early childhood classroom space is an important part of the child's microsystem (Bronfenbrenner, 1979), and in this space, teachers are designers of the physical classroom environment (Isbell & Exelby, 2001). Thus, teachers play an important role in guiding the child's interaction with this environment, but they are also constrained by knowledge, experience, and the resources available to them. This study of 22 prekindergarten teachers in various settings in Texas focused on how teachers initially set up the classroom environments, how often and why they modify the environments, and the obstacles and barriers they faced in their pursuit of optimal classroom environents and high quality care.

In this study, teachers' autonomy in making decisions about their classroom environment varied greatly, as did their initial set-up of the classroom space. Some were guided by the chosen curriculum or approach used at their center or school, and the curricula varied from school to school. The amount of attention devoted to the classroom environment also varied, with some spending considerable time at the beginning of the school year, starting from scratch in preparation for a new group of children, and others keeping their current classroom or the one they inherited essentially the same for the following school year. The decisions were impacted by the availability of resources and materials, the size of the classroom, the leadership's involvement in classroom design, and the teachers' understanding of how to set up the environment.

It is important that classrooms are intentionally designed and that they keep the children's interests in mind (Bullard, 2017; Greenman & Lindstrom, 2017). This requires a great deal of attention to the physical environment both before the beginning of the school year and throughout the year. It also requires specific knowledge into how the physical classroom space, materials, and activities impact the children who occupy that space. We found that teachers in this study varied in their educational training and experience. Many did not have any or adequate physical classroom environment training during teacher preparation, and therefore, most learned about classroom setup and modifications on the job, either through trial and error or help from experienced peers or school leaders.

Devoting a designated course, or a portion of a course, to child development and early childhood education programs that solely focuses on physical classroom environments would be very beneficial to future preschool teachers. Teachers need sufficient training in how to create and assess high-quality classroom environments, given that they are primarily responsible for this impactful learning environment.

Classroom Modifications

Improving classroom environments can help improve early childhood education in a comprehensive way (Kuh, 2014). Therefore, continuous evaluation of the environment is important to continue to meet the needs of each child in that environment (Bullard, 2017). In this study, the extent and frequency of classroom modifications varied greatly, with most teachers making only small modifications throughout the year, such as moving or replacing materials. The decisions to make modifications were mainly based on observation of the children as they engaged with the room and the materials, communication with the children or staff, and general concerns for children's safety. Through observing children in the physical classroom environment and noting preferences and engagement of the children, as well as noting the children's developmental needs, teachers were able to utilize that data to drive modifications to various centers or areas, thus following the general recommendation of designing classrooms that keep children interested and engaged (Duncan & Martin, 2018).

While overall centers or areas of the classroom may not change, intentional environments with carefully selected materials that are rotated throughout the school year can help children engage (Ostrosky & Meadan, 2010). Most teachers in our study did not make big changes throughout the year, but it was clear that the decisions to modify the classroom space were first and foremost done with the children in mind. Engaging in developmentally appropriate practice requires careful consideration of the children's interests, abilities, and developmental level, and it is encouraging to see that teachers in this study did in fact prioritize the children when making decisions about their classrooms.

Barriers to Creating Optimal Environments

For preschools serving children ages 0–5, the physical environment must align with developmentally appropriate practices and high quality, effective lesson plans that teachers are expected to follow. Engaging with quality physical and social environments is a key contributor to children's development and school success in the early years (Aydogan et al., 2015); therefore, it is important to identify which potential barriers may hinder the realization of such quality environments. The participants in this study identified space, budget, and time as their major barriers. The majority reported not having adequate space available in their classrooms. Specifically, they desired more space for the children to move about the classroom, more space for dedicated centers/areas, separation of centers/areas, and more storage space. In addition, many expressed the need for more windows and natural light, as well as direct access to the outdoors. According to Dillon et al. (2016), the school buildings that teachers are in are often preventing them from delivering contemporary high-quality education. Lack of space impacts the students, and teachers therefore need to bring their focus towards a design that is student centered and student driven (Hare & Dillon, 2016; Dillon et al., 2016). Even though creating more space structurally is often not possible, how teachers use the space they have is important. This includes the division of space for different centers/areas, general layout of the classroom, and availability of materials. Thus, professional development training on how to create optimal classroom environments with minimal space should be a priority for prekindergarten teachers.

Another frequently mentioned barrier was the budget. The participating teachers reported classroom budgets ranging from $0 to $300, thus evidencing great variety in the resources made available for early childhood classrooms. Very few indicated that they had everything they needed in terms of furniture and materials. More commonly, the teachers reported spending their own money on various materials. Teachers need a budget that allows them to have the materials needed to implement the lessons expected by leadership and stakeholders.

Relying on teachers to spend money out of their own pockets is not appropriate. Research shows that money invested in early childhood education yields great public returns. For example, high quality funded programs for children ages 3–4 years old yield better school readiness, greater future academic success, fewer school dropouts, and fewer issues with the law (Rolnick & Grunewald, 2003).

The final barrier teachers mentioned was time. None of the teachers in this study reported having dedicated time to modify their classroom environments. In fact, many reported coming in before school, staying after school, or working on the weekends to set up or modify their classrooms and alternate materials. All of this is extra time for which they are not compensated. Typically, they are tasked with many requirements in addition to delivering instruction to children during the school day. These include lesson planning, notation of observations and assessments of children, communication with parents, and their own lunch breaks. It is easy to see how classroom design and modification can fall to the bottom of the priority list. If teachers are not allocated adequate time to intentionally plan and set up the physical classroom environment, then they face the decision of whether to use their own personal time or to forego the activity altogether.

The microsystem is the closest and nost influential system in a child's life, and the school environment is part of the microsystem (Bronfenbrenner, 1979). However, the reported barriers elucidate the impact of outer layers of the ecological system, such as the exosystem and macrosystem

(Bronfenbrenner, 1979). When funding for early childcare, state and national standards for care, community resources, and access are inadequate, the individual ECE centers and schools are impacted, and teachers' ability to provide high quality environments for the children in their care may suffer.

Implications for Early Childhood Education

The prekindergarten teachers we interviewed appear to be intentional in their approach to setting up their classrooms, and they do so with the children's learning, safety, and well-being in mind. However, they are restricted in terms of physical space, resources and funding for essential materials, and equal access to education and training on classroom environments. This inequity is largely sparked by state and national policies and practices. In the United States, childcare is mostly a for-profit business that is funded by tuition paid by families, with limited subsidies available for low-income families. Thus, to maintain a profitable enterprise, expenses must be kept lower than income. The primary, and simplest, method for controlling expenses is limiting funds spent on salaries and new materials. This is in stark contrast to several other countries where early childcare is funded in large part by the federal government, thus providing low-cost care for families. For example, Luxembourg, Iceland, Denmark, Norway, and Sweden spend between $11,000 and $14,000 per child on early childhood education for children ages 0–5, with 1-1.8% of their GDP spent on early childhood education and care (OECD, 2021). In addition, these governments have national guidelines for safety, care, and curriculum to ensure high quality care (Garvis et al., 2018). Because the United States does not have national standards for early childcare, quality, provision, and availability vary widely from state to state, and even from school to school.

Increased state and federal funding would enable early childhood centers and schools to purchase adequate furniture and materials, hire additional staff to give teachers paid time to work on lesson plans and classroom set-up and modifications, and provide high-quality professional development training for the teachers. In addition, when constructing new buildings and schools, educators must advocate for opportunities to address some of the space concerns, including the amount of square footage dedicated to each classroom and the presence of windows and natural light, which create optimal aesthetics for learning (Greenman & Lindstrom, 2017). Ideally, funding for high quality prekindergarten programs should not be a special privilege afforded only to the wealthy. State and federal funding for prekindergarten and early childhood in general can address the existing inequities in access to high quality prekindergarten in the United States (Bassok & Galdo, 2016).

High quality early childhood learning environments can boost children's language, literacy, and math skills and help reduce problem behaviors like aggression (Yoshikawa et al., 2016). Early childhood education professionals, especially prekindergarten teachers, need to view the classroom as a teaching tool that provides both choices and concrete learning experiences. Environments that are flexible, appropriate, and spark the child's interests are desirable. Educating prekindergarten teachers to understand how crucial the environment is to children's learning will ensure that every child is given a chance at succeeding in school and life.

Bronfenbrenner (1979) emphasized the important impact of a child's microsystem, and due to the amount of time children spend in early childhood centers and classrooms, the quality of that environment can have a long-lasting impact. Thus, it is impertative that teachers and directors prioritize the set-up and materials within these spaces. Kuh (2014) noted that the framework from which the teachers need to operate must consider the environment as a manifestation of what they want to teach, how they want the children to feel, and what the environment will enable the children to learn and do.

As evidenced in this study, many prekindergarten teachers are restricted in what they have available and what they can do based on space, time, and budget. However, there are some key steps they can take to create a high quality learning environment for young children:

(1) Have clearly defined centers or areas in the classroom that are aligned with the approach or curriculum. Typical centers, as defined by Copple and Bredecamp (2021) include: literacy (library, reading, writing), math, science (e.g., nature play), blocks, music, art, dramatic play, sensory (e.g., sand and water), and technology.
(2) Ensure that all centers and materials are accessible to children throughout the day and placed within their reach for easy access.
(3) Materials in each area should be rotated in and out as children's interests wane.
(4) Classroom walls should feature intentional materials and information that aid in children's learning. They should not be cluttered or over-stimulating. Wall displays should be meaningful to the children being served in the classroom.
(5) Classroom materials, books, and wall spaces should be audited to ensure that they represent the diversity and individuality of the children in the classroom in a non-stereotypical and nonbiased way.

Limitations and Directions for Future Research

Due to the qualitative nature of this study and thus the small sample size, the results cannot readily be generalized to the prekindergarten field in general. However, the current research findings mirror those of previous studies, and the additional rich context provides insight into the thoughts, aims, and difficulties experienced by some prekindergarten teachers. Future studies should include larger samples and a wide variety of early childhood teachers to identify which barriers may be more common in some areas than others. Most of the teachers in this study had a great deal of experience in the early childhood education field, so it is advisable to also look at how novice teachers approach classroom design and whether they experience similar or different barriers.

Future research should also investigate the perspectives of other stakeholders, such as parents, center directors, principals, policymakers who oversee funding initiatives for early childhood education, and even the perspectives of prekindergarten children who are the ones most affected by the quality of the classroom environment. Finally, more research is needed on adequate interventions in the form of professional development, grants and external funding, and knowledge of optimal physical environments through high quality training to better illuminate possible solutions to the barriers of space, budget, and time.

Conclusion

Prekindergarten teachers face multiple barriers when it comes to setting up optimal learning environments for children. Undoubtedly, they are committed to the success of the children they serve, as evidenced by their willingness to consider children's interests and input into the classroom environment, spend unpaid time on classroom set-up and modifications, and even use their own money to buy materials for their classrooms. However, while decisions for initial set-up and modification of their classrooms were influenced by a variety of factors, the classroom quality was ultimately impeded by the lack of space, budget, and time. To serve young children with quality learning environments, these barriers must be carefully considered by directors, early childhood professionals, policymakers, and funding initiatives. Eliminating these barriers would greatly aid teachers in having an optimal physical environment for the children they serve in their programs.

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