



Art in Early Childhood

Cultivating a Learning Space for Preservice Early Childhood Teachers: Methods, Materials, and Inquiry-based Learning in an Early Childhood Lab

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Abstract

This article is inspired by a presentation given at the 10th International Art in Early Childhood Conference at the University of Wollongong in July, by Dr. Juana Reyes (2025). The presentation, Arts, Science, and Space: Cultivating Curiosity with Preservice Teachers Through Biophilic Design, an Exploration of Materials, and Inquiry-based Learning in the Early Childhood Learning Lab (EC Learning Lab) focused on the design and use of an early learning lab at a midwestern university in the United States. The authors note a disparity between learning spaces used for early childhood teacher preparation and the constructivist philosophical (slow knowledge) and curricular approaches to early childhood learning and development. Using participatory action research, the researchers identified slow knowledge practices that advance inquiry-based, arts integrated pedagogy in teacher education. Drawing on the possibilities endowed by the space, the findings illustrate the use of the curated materials and redesigned space align with the educational philosophy of the early childhood program.

Introduction

The push down of K-12 standards to the early learning setting compels teacher preparation programs to focus on content and standards to the risk of abandoning what we know about how young children learn. Consequently, the commodification of education as a whole and early childhood in particular, threatens the constructivist and responsive nature of early childhood education (Reyes & Yu, 2023; Roberts-Holmes & Moss, 2021). Furthermore, the authors recognize an incongruence between a constructivist approach to early childhood that embraces a slow pedagogy and the traditional higher education classroom setting used in teacher preparation programs. For this reason, the authors worked collaboratively to create a space to cultivate wonder, collaboration, and inquiry-based learning for a teacher preparation program at a midwestern university. Using participatory action research, the following questions guided the research:

How do the specialized materials and the redesigned space of the EC Learning Lab support the day-to-day experiences of early childhood preservice teachers enrolled in a methods course while embracing uncertainty and wonder?

Does the redesigned space align with a constructivist educational philosophy and curriculum approach?

The authors recount the process of redesigning an adult learning space on a university campus that is reflective of and in dialogue with the local context and community of learners. By sharing images of the transformation and reflections from undergraduate students who are enrolled in a methods course, the evolution reveals the deep connection that humans have to their surrounding environments along with the role the environment plays in influencing creativity, expression, and relationships. The purpose of this study is to understand how the teaching methods and the classroom environment can cultivate inquiry with preservice teachers.

Theoretical Framework

The theoretical framework provides both a foundation to ground the educational project and an analytical lens for the collected evidence including student work samples, researcher observational notes, and focus group discussions. Each of the elements of this framework are discussed below.

Slow Knowledge

The unremitting focus on aligning early learning with standards and objectives meant for the K-12 setting has prompted a contradiction in the field of early education between meeting standards (fast pedagogy) and cultivating meaningful learning (slow pedagogy). The authors value slow knowledge, as described by Orr (1996) and further developed and applied to the early education setting by Clark (2023), as foundational to early learning and meaningful inquiry-based learning. Fast pedagogy is commodified and packaged by the same purveyors of the standards, curriculum, and assessments. Orr cautions society apropos the unintended consequences of fast knowledge and the homogenization of knowledge (1996). Driven by affection, slow knowledge is generated through process in community (Orr, 1996), focuses on constructing a deeper understanding of fewer topics, and curtails the breadth of knowledge (Clark, 2023). Furthermore, embracing uncertainty and wonder begets new possibilities for building a lasting and deeper understanding of the world.

Elements of Biophilic Design

When designing and furnishing the classroom, the authors worked to create a space that fostered contextual and meaningful opportunities for building sustainable relationships with nature by engaging on macro and micro levels with the natural spaces and local materials. Through individual and collaborative work, boundaries separating the indoors and the outdoors are slowly dismantled. According to Martin and Choi, “Biophilia is, in effect, a description of the subconscious connection with nature that we as humans still retain as a result of constant interaction with living things which we’ve been immersed in for most of human history” (2018, p. 3). Likewise, Kellert (2015) notes that biophilic design, that is including elements of nature in design, helps humans to mitigate their inherent need to connect to nature. The early learning lab has aspects of biophilic design including the preexisting windows, overlooking a foliage filled courtyard, that span the length of the room and invite nature within the space (Figures 1-3). Raw edge wooden tables were selected to mirror the many tall trees on campus with arboretum status. This is indicative of the dialogue between the designed environment and the natural world. Further discussion about the exchange with the natural world and the flourishing relationship between the indoors and outdoors is included in the course vignettes.





Figures 1-3
Classroom and Incorporation of Nature

Note. A wall of windows remains free of clutter to maintain the indoor/outdoor connection. Natural materials are accessible to students and placed near the view of the courtyard. Students were invited to use window markers to capture the outdoor scene during early fall. As the outdoor scene changed with the seasons, and snow blanketed the courtyard, the traces of fall remained visible through the marks made by the students, creating a sort of visual overlay.

Elements of the Reggio Emilia Philosophy

Educators from Reggio Emilia, Italy have extensively discussed the role of materials and the environment within the Reggio Emilia philosophy (Bendotti & De Poi, 2018; Cagliari, et al., 2016; Vecchi, 2010; Vecchi, 2004). However, absent from the literature is a discussion about the role of materials and the learning environment for preservice teachers.

While the authors drew upon several principles of the Reggio Emilia philosophy for this paper, they will introduce three and acknowledge their interplay. First is the role of materials. Valued as methods and modes of communication, expression, critical thinking, and problem solving, diverse materials offer opportunities for the development of complex and meaningful relationships between and among the many participants in the educational project as well as the local context. (Figures 4 & 5). Acknowledging the benefits of understanding the properties and

attributes of a material, students are invited to explore the materials before being asked to represent complex ideas (Scheinfeld, et al., 2008) illustrated in the vignettes that follow. Moreover, diverse and thoughtfully displayed materials are made available throughout the environment, often organized in interesting and transportable containers to add to the adaptability of the space. When intentional provocations are presented in the room, the environment and the materials work in unison to invite and sustain meaningful interactions (Figures 4 & 5).

When discussing the continuity of space and relationships, Gandini (2012, p.324) notes, “What is socially connected to the school permeates it and is filtered by the values and the educational philosophy of the school itself.” The role of the environment in the municipal schools of Reggio Emilia are “rich with a high level of culture,” (Nicolosi & Cagliari, 2017, p. 11). For this reason, the authors carefully curated furnishings and materials that acknowledge and extend the surrounding community and represent the identity of those who engage in the space. A detailed discussion of the choices are discussed in the Context and Setting section below. Furthermore, the environment invites participation—another integral element of the Reggio Emilia philosophy. There are multiple spaces for small group exploration and collaboration. Each space offers unique work surfaces and seating options to support various levels of collective work.



Figures 4 & 5. *Interesting materials in the classroom*

Note. Everyday materials are thoughtfully organized to draw the interest of the preservice educators. A nearby projector and an open wall space welcome rich possibilities.

Methodology: Critical Participatory Action Research (C-PAR)

Critical participatory action research (C-PAR) was employed due to the collaborative and dynamic nature of the methodology that blurs the lines between the theorist and the practitioner (Kemmis, et al., 2014; Reason, 2001; Baum, et al., 2006). The authors represent the researcher, a full-time faculty in the early childhood education program and the course instructor, an independent studio consultant who collaborated on the design of the space and the course framework highlighted in this research. The researcher attended class weekly to observe and interact with the class that was taught by the instructor, C-PAR indicates an ongoing dialogue with the participants who each vacillate between researcher and practitioner. The nature of this research is reflective and practical. The evidence collected included observational data, work samples, focus group interviews, photographic documentation, and the ongoing discussions between the two authors. These discussions were framed to revisit and reflect upon the day-to-day class and to make adjustments to the materials, environment, or provocations during the course of each semester.

In 2022, Juana contacted Kristin with an opportunity to create a syllabus for a new science methods course offered to graduate and undergraduate students enrolled in Lewis University's Early Childhood Education Program. Drawing on years of experience working with educators in various contexts, they developed a materials-focused, inquiry-based eight week and sixteen-week course syllabus for preservice educators. While the experiences presented throughout the course have evolved over the years, one goal remained steady—to build a community of curious learners, preservice teachers as researchers, by nurturing relationships with self, peers, materials and the world around through observation, meaningful experiences, and ongoing reflection.

This project took place over two fall semesters in which the ECED course on science inquiry was taught to undergraduate early childhood education seniors in the early childhood learning lab classroom. This course was selected because of the interactive and inquiry-based nature of the content. C-PAR is not focused on collecting data that is objective and separate from the researchers, rather the evidence collected is subjective and objective and intimately intertwined with the thoughts and experiences of the researchers. For this reason, the authors sought to gather many layers of evidence during this project. The dialogue between the two authors continued beyond the timeline of each fall course as they worked collaboratively to create educational documentation in the form of books and panels that serve as a record and a springboard of possibilities for future practice. The students from each methods course section were invited to participate in the study and they were given the option to withdraw at any time per the Institutional Review Board (IRB) approved protocol.

Context and Setting: The Importance of the Early Learning Lab

Higher education spaces earmarked for teacher preparation are typically organized in ways that indicate what is to happen in that space—sending a message that is contrary to the constructivist

ideology. The teacher preparation classrooms are similar to other higher education classrooms with tables lined up facing the front of the classroom where the professor is stationed. While there is some flexibility for small group dialogue, the overall message is that the information shared in the classroom is mainly sourced from the front of the room (fast pedagogy). In their extensive literature review of higher education learning spaces, Ellis and Goodyear noted, “One of the key associations between learner and space in this body of research is the link between learning and spatial cues” (2016, p. 166). For example, in the previous classroom chairs and tables were the majority of the furnishing of the space and they were arranged to focus on the front of the classroom as in fast pedagogy that is concerned with consumption of content and direct instruction (Figure 6). In contrast, the early childhood learning lab was created as an infrastructure of teaching and learning to cultivate the identity of the educator and student as a researcher without the usual implied hierarchy.



Figure 6. *Classroom Before the Redesign*

Before further examination of the course framework and vignettes illustrating the work and ideas that emerged, it is important to acknowledge in greater detail the specific setting in which the students meet. A long straight hall leads to a small common area constructed of monotonous blank cinder block and plaster walls void of personality, interrupted only by heavy, metal closed doors. A drop ceiling and harsh overhead lighting create an office-like atmosphere. But behind the first door there is a sensorial surprise - a large warm and welcoming classroom space. It is the newly redesigned early childhood learning lab (Figures 7-9). With attention to detail, the room sends a message of what Ceppi and Zini (1998) call “rich normality”. “A whole made up of different parts in harmony, balanced. Interaction of different elements (objects, situations, iconography, materials) that produce a tranquil result, a symphony of the individual parts, well balanced, with amalgamated ‘flavors’ — not a situation of cacophony” (p. 27). A former student mirrors this idea in her reflection of the space stating, “I remember when I first walked into the room, the way everything was set up, it was very organized and everything had a place. It was very welcoming.”



Figures 7-9. *Classroom Images*



Fig.9. *New learning space.*

Note. Caption (Clockwise top left): The mini studio space, an area for building and construction, the center meeting area and south wall interest areas. Documentation from the students' work begins to add another layer of meaning.

The initial goals for the learning lab, designed in early 2023, were to reflect the identity of the campus and the surrounding town of Romeoville, incorporate elements of biophilic design and generate wonder while supporting the day-to-day experiences of early childhood education students. The materials and furnishings throughout the space were carefully selected to reflect the identity of the school and community through choice of color, shape, texture, and pattern. An example of this intentionality is made visible through the choice of flooring with a limestone-adjacent texture on the tiles and furnishings displaying stone-like shapes on the area rugs and

coffee table to highlight the town's quarry resources and nickname, Stone City (Figures 7-9). While the interest areas were inspired by early learning spaces, this space was designed for adults to interact with materials and engage in emergent and collaborative experiences. Instead of a room full of completeness, this room presents a learning environment that sends thoughtful messages about possibilities.

Course Design

The course, titled *Scientific Inquiry and Technology in Early Childhood Education*, is based on a constructivist approach focusing on big ideas to explore (Chaille, 2008; Chaille & Davis, 2015). The course presents teacher candidates with open-ended wonder-based possibilities for young learners by way of exploration and inquiry through thought provoking experiences in local spaces. Students engage in weekly encounters related to three big ideas in science – color and light, structure and engineering, and the natural world. The authors decided to focus on only three topics as a way to slow-down the learning process and to offer possibilities for the teacher candidates to experience a similar, constructivist approach to develop learning and understanding in collaboration with others. After the first fall course, the authors considered changing one or more of the topics for the second year. However, after several conversations and revisiting the work, it was decided to continue with the same topics so that the authors could gain a deeper understanding of their own teaching and learning practice. Thoughtfully chosen materials provide complexity and depth to the explorations as the undergraduates enrich the framework of their future profession through new perspectives and mediums. Digital applications contribute additional opportunities for representation and meaning making.

Influenced by the Reggio Emilia Approach, the syllabus aspires to familiarize students with multi-modal ways of thinking and expressing by introducing a variety of interesting artistic and constructive materials while making connections to the local and familiar context. The materials are viewed as languages or modes to communicate, express and relate. Vecchi (2010) explains, "In Reggio pedagogy, a choice has been made to extend the term language beyond the verbal and consider languages as the different ways used by human beings to express themselves; visual language, mathematical language, scientific language, etc." (p.9). This extension welcomes a more inclusive approach while providing opportunities for the interplay between and among languages. In contrast to a more traditional approach to education, verbal language is viewed as one of many important and available languages as opposed to the dominant and most valued. Opportunities for meaningful connections between interests, context, content, and the various languages throughout the course intend to generate deeper, more empathetic relationships with the physical and social world while nurturing creativity through a slow pedagogy. Valuing collaboration and acknowledging the ways in which it can cultivate inclusivity, shared purpose and a sense of responsibility (Giacopini & Orlandini, 2011), students have weekly opportunities to work in small groups while using these materials and investigating the community.

The course was designed with the belief that young children do not learn science using the scientific method in a lab as this kind of thinking cannot successfully be taught to retention until many years later (Larvik, 2020). Rather, young children learn science through play and meaningful experiences that connect to their context. Research has informed us of the importance of such meaningful, contextualized, active, and varied experiences for young children. Consequently, preservice teachers should be informed about and prepared for providing these types of experiences for young children. Beaven, Floyd, and Turner (2023) have outlined ideal learning principles that describe the importance of relationships, play, and the teacher as a co-constructor of knowledge. Additionally, they emphasize that “children construct knowledge from diverse experiences to make meaning of the world” (2023, p. 6).

Through this lens, inquiry driven, open-ended experiences were developed based on each of the three big ideas previously mentioned. The syllabus weaves relevant literature with inviting provocations, emphasizing the mindset and physical act of creativity and exploration. After completing the course, a student echoed these ideas when she said, “I see science as something to be experienced and observed rather than as a set of information, which I feel [is how] a lot of us saw it before this class. This is an important perspective to have in early childhood, as we are not having young children memorize facts and information—we are creating experiences for and with them.” This sentiment was shared by another student who commented, “Instead of focusing on memorization of facts, we explored the importance of fostering and encouraging exploration.”

Initial Thoughts about Science

Before the course unfolded, small groups of students were asked to share their thoughts about exploring ideas about science with young children. The table (Table 1) below includes some of their initial ideas. Many of the ideas focus on science as something that is to be taught. Likewise, some of the students thought they may need to “water down” the complex concepts of science. To further reinforce the value of meaningful experiences that lead to a slowing down and building understanding in small groups, the authors were vindicated in their intentional approach to explore three big ideas of science throughout the 16 week course.

Question:	Preservice educator responses before taking the course in the learning lab:
What are your goals around science with young children?	I'd like to extend my knowledge and experience within the classroom to more than just experiments. There are all types of different science topics. For instance, there is earth science, biology, physics, astronomy, and so much more that I believe children would love to learn about. My concerns are making sure I am providing age-appropriate assignments that will peak the children's interest.

<p>What are some challenges that you have/anticipate?</p>	<p>One of my challenges about working with children around ideas related to science and technology is coming up with developmentally age appropriate activities that are engaging and fun for my students.</p> <p>Some of the concerns I have are that some children may not be able to understand science and technology especially if they are younger, which is not a problem if they don't it will just have to be modified in a certain way for them to be able to get what is being taught. Also, in my personal opinion, they both can be somewhat dangerous in their own way if not monitored by an adult. For instance, with science, if it's an experiment then they need to either monitor or be taught the correct way how to go about doing the project.</p>
<p>What are your ideas about exploring science with young children?</p>	<p>The children will engage in using magnifying glasses, rulers, eye droppers and test tubes.</p> <p>I love science and how it relates so much to our everyday lives. I worry that I won't be able to "water down" the science I've learned over the years. In other words, I'm not sure how to appropriately explain science to children in a way they will grasp/understand.</p>

Table 1. Students' responses to small group discussion questions.

Course Vignettes

The following vignettes highlight work from undergraduate preservice educators collected during the 2025 fall semester. The examples provide a glimpse into explorations related to the three big ideas, color/light, structure/engineering, and the natural world. Moreover, they intend to illustrate the interplay of the redesigned learning environment and its diverse materials and student experiences.

Color and Light

Within the first few weeks of class, the front of the room was transformed to further support the exploration of color and light using projectors, blocks, flashlights and fabrics. This area of the room was designed as an open space to welcome a variety of experiences depending on the course instructor's goals and the direction of the students' work. Ceppi and Zini (1998) speak to this transformability of space when they say, "The school environment must lend itself to

manipulation and transformation by adults and children alike, and be open to different ways of use” (p. 38).

There was a magical quality to the color and light provocations that demanded attention as tangible materials interacted with surreal videos and images of local, familiar places (Figures 10-12). Historically, the students have shown some degree of hesitation before engaging with these materials, admiring from a few feet away. However, once their hands touched the materials, curiosity and wonder became visible through gesture, facial expressions and dialogue.



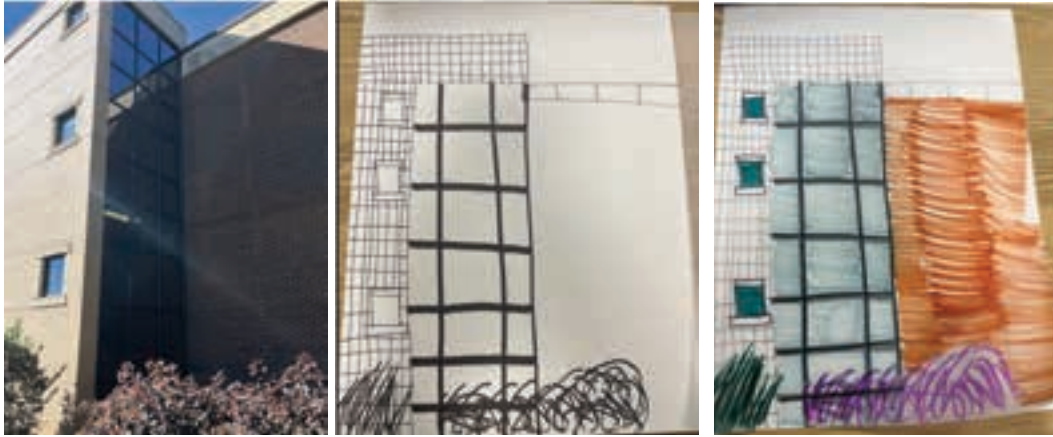
Figures 10-12. *Exploring Color*

Note. Caption (Left to right): Students using blocks and color scarves to interact with and respond to a video projected onto the wall. Students working with transparent and translucent materials alongside blocks to interact with a projection of a local outdoor space.

Structure and Engineering

The block and projection experience served as a segue to the next big idea. As the class shifted focus to structure and engineering, students were asked to walk the campus grounds in small groups while photographing interesting structures. The suburban campus setting is rich with history, boasting arches, a chapel, statues, and brown and red brick buildings.

Later, each group made a collaborative decision, choosing one photo from their collection to represent (Figure 13). Black Sharpies were provided because of their mark making qualities providing the students an opportunity to look closely at line and composition in the structures (Figure 14). After creating a blackline drawing, transparencies were provided. Students were challenged to enhance their blackline drawing on an overlay, with the option of adding color (Figure 15). The new surface introduced potential for another layer of critical and creative thinking by asking the students to revisit and reconsider without altering the original work. This is an example of adding complexity to the work through the use of materials (Clark, 2023). In this experience, color was not the main protagonist for the work but rather an addition to the representation. This practice challenged more traditional educational approaches with children where educators often immediately fill children’s hands with brightly colored markers and crayons making the color the highlight of the work and the process.



Figures 13-15. *Structure and Engineering Work Samples*

Note. Caption (Left to right) A photograph of a structure on Lewis University campus, a blackline drawing of the structure, and a color drawing on a transparency overlaying the blackline drawing.

The Natural World

As nature began to take root as the classroom's third focus area, students were encouraged to explore outdoor spaces on campus and in their communities. From observations of animals and insects to the visual representation of sound and movement, each experience was designed to nurture the adult's relationship with the natural world while becoming more in tune to the joy and connection that children have to nature. David Sobel (2025) connects to the work of William Wordsworth stating that, "Children perceived nature differently from adults and that this mode of perception was a gift rather than a delusion. Their experiences were transcendent in that the individual often felt connected to or merged with the natural world in some highly compelling fashion" (p. 4).

Mid fall, each student was asked to find one interesting natural material in the community. Those natural materials became the catalyst for representations of nature through various media. Working with one material at a time, students looked closely at the object they found, noticing line, texture, color, and form. Black Sharpie markers were the first material for representation. This material was chosen to provide an opportunity for the exploration of line and texture seen and felt in the natural objects without the distraction of color. Using both the three-dimensional object and the blackline drawing, students were then asked to work with pipe cleaners. This material introduced a color variable while maintaining a strong element of line. Twisting and turning the chenille covered wire, the natural materials slowly came to life through a new medium.

After reflecting on the first two pieces of work, white paper was introduced. Although a common and simple material, this was assumed to be the most challenging and therefore it was introduced last. Removing the apparent structure that the pipe cleaner offered and the concise

marks made possible by the Sharpie, the flat paper laid still on the table. A number of students sat thinking for a period of time. Some inquired aloud expressing concerns about how they might transform this material to look like their chosen natural material asking, "What am I supposed to do with this paper?" As a class, we discussed the properties of paper we previously explored during class when we investigated structure and engineering, inquiring: "what did you learn about the material and how it works in order to support what you want to represent now?" After some time, the room grew quiet and hands started working. The work was laid out so that the representation through three different materials, could be viewed in close proximity (Figures 16 & 17). Moving away from rushed activities, there was a complexity achieved through extensions and thoughtful deepening of relationships with the materials.



Fig.16 & 17. *Complexity*

Note. A pinecone represented by a student using three different materials. A stick represented by a student using three different materials.

While continuing a focus on the natural world, each student was asked to collect images of tree trunks from local outdoor spaces, highlighting the defining marks observed on different trunks (Figure 18). After viewing the images as a group and talking about the uniqueness of nature in relationship to geographical context, students identified a favorite image. They took time to look closely and then worked with blackline to represent what they observed. After creating a first draft, long rectangular pieces of mat board were introduced with an opportunity for a second drawing. The artwork was mounted on one of the trunk-like structural columns in the classroom (Figure 19). Future students will add their work, creating an ongoing, collaborative, vertical documentation display of drawings that represent tree bark. The vertical presentation is

intended to mirror the upright trunks of the majestic trees just outside the classroom on the campus grounds.



Figures 18 & 19. *Exploring the Natural World*

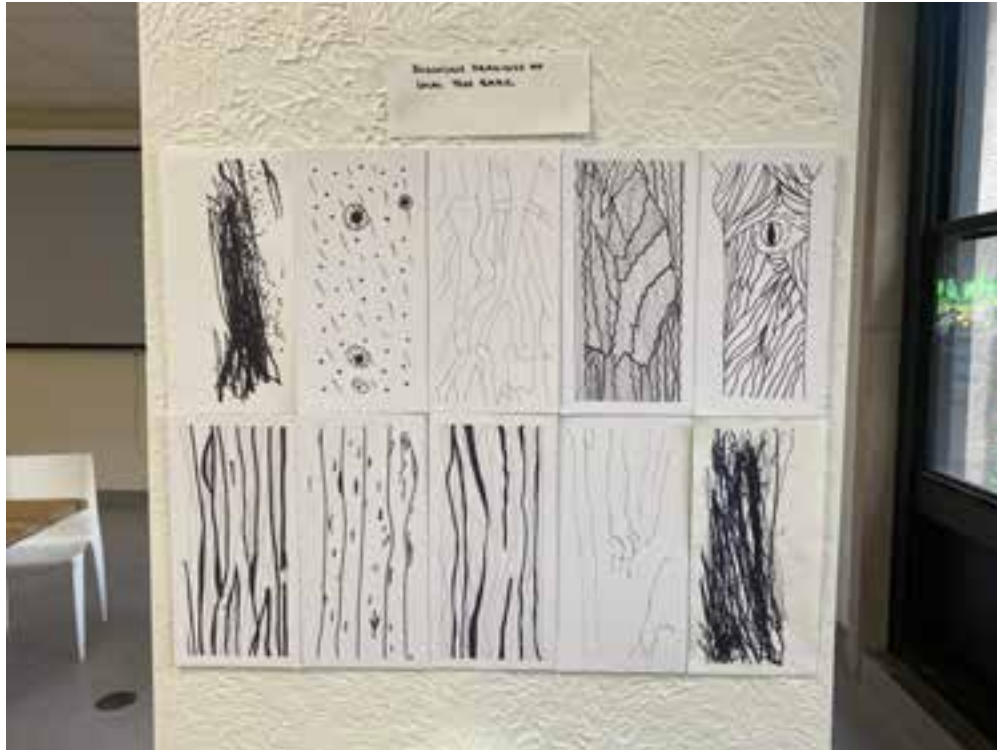


Fig. 20. *Exploring the Natural World*

Note. Student work capturing images of local tree bark and representing chosen photos with Sharpie markers. The column, which runs the full height of the room, will eventually be covered with similar drawings collected over the years.

Findings

The above vignettes from the methods course were included to demonstrate how the materials, furnishings, and organization of the environment contributed to the experiences in the classroom. The early learning lab provided a context rich with materials conducive to slow pedagogy. For example, before introducing color (Figures 13-15) students were asked to represent the selected image of a structure on campus using white paper and a black drawing material. Only later were layers of complexity added slowly and intentionally with the inclusion of colored markers followed by transparent overlays. What could have been no more than a quick drawing activity was instead afforded time and space to evolve into a more sophisticated experience requiring critical thinking, reflection, and close observation. The space, the materials, and the course worked together contributing to a shared framework and collective values.

During the color and light portion of the course, the authors noted that students displayed a repeated hesitance when engaging with the provocation. This might reflect their unfamiliarity with play-focused, open-ended experiences in an academic setting creating an uncertainty around if and how they are expected to interact with the proposal. The co-researchers noted

that one student initiated the play with the color and light (Figures 10 and 11) while the others in the small group merely observed her solo exploration. After several minutes, they joined the exploration as well. This gradual engagement was discussed with the larger group when we revisited the experience. During a later conversation, an undergraduate senior reflected, "For each experience we did, especially the provocations, there was usually no example. We had to come up with what we were doing on our own. This challenged me to think more originally, and for several provocations, it took me a while to figure out what I was going to focus on." This finding is also indicative of the parallel process of learning between adults and children (Scheinfeld, et al., 2008).

The authors intentionally selected the natural world as one of the three topics for the course as a way to blur the boundaries of the inside/outdoor space (Figures 3, 16 & 17, and 18 & 19).. Also, the tree drawings acknowledged the identity of the campus as an arboretum (Figures 18-19) and the value of biophilia as well as the importance of collective participation in the educational project.

Discussion

Rarely do university faculty have the opportunity to teach in a space that is so uniquely responsive to their practice and welcoming of the use of diverse media. The design and arrangement provide space for future and in-service teachers to explore the methods and materials of an interdisciplinary, constructivist approach. As early education students engage in experiences within the materials-rich environment, they learn how to cultivate the multiple ways of knowing that young children bring into the learning environment. This is integral to advocating for the rights of young children and humanizing education especially as educational policy continues to focus on standardization and content i.e., fast pedagogy.

Conclusion

Inviting the students to move into what might at first be considered uncomfortable or uncertain experiences, due to unfamiliarity or lack of practice, provided opportunities for growth, appreciation, and capacity. One student reflected near the end of the course, "I have been looking more into creativity, even outside of class. I have more ideas now after working with materials. I said before I struggled with being original. Now instead of looking to copy, I try to come up with my own ideas." The act of slowing down and revisiting made way for meaningful work with the materials through different perspectives, creating layers of complexity around ideas, making visible the depth of possibilities, and allowing time for intense relationships with the context and the media. A student expressed the value of revisiting, slowing down and becoming more familiar with materials stating, "Since we use them in every class, it gave me the desire to stick with something to develop it and learn more. In a classroom, [with children] I shouldn't switch it [materials] out so often." Another added, "Seeing how we were getting better at using the materials, a lot of stuff came easier. At the beginning it was so hard to think of what to do with them."

The learning lab and the methods course were both designed to nurture the role of educator as a researcher, a co-constructor of knowledge, while valuing and elevating the significance of the profession of early childhood. In turn, this approach to preservice educator preparation and higher education learning spaces seeks to uphold an image of children as contributing members of a community who are capable and full of potential.

References

- Baum, F., MacDougall, C., & Smith, D. (2006). Participatory action research. *Journal of Epidemiology and Community Health*, 60(10), 854–857. <https://doi.org/10.1136/jech.2004.028662>
- Beaven, L., Floyd, C. A., & Turner, L. (2023). *Nurturing all children in nature: Ideal learning in the natural world*. Trust for Learning.
- Bendotti, M., & De Poi, S. (2018). Behind metaphor: A conversation with Paola Cagliari, Annamaria Contini, & Veà Vecchi. *ReChild: Reggio Children Newsletter*, December, 2–11.
- Cagliari, P., Castagnetti, M., Giudici, C., Rinaldi, C., Vecchi, V., & Moss, P. (Eds.). (2016). *Loris Malaguzzi and the schools of Reggio Emilia: A selection of his writings and speeches, 1945–1993*. Routledge.
- Cepi, G., & Zini, M. (1998). *Children, spaces, relations: Metaproject for an environment for young children*. Reggio Children.
- Chaillé, C. (2008). *Constructivism across the curriculum in early childhood classrooms: Big ideas as inspiration*. Pearson.
- Chaillé, C. M., & Davis, S. M. (2015). *Integrating math and science in early childhood classrooms through big ideas: A constructivist approach*. Pearson.
- Clark, A. (2023). *Slow knowledge and the unhurried child: Time for slow pedagogies in early childhood education*. Routledge.
- Ellis, R. A., & Goodyear, P. (2016). Models of learning space: Integrating research on space, place and learning in higher education. *Review of Education*, 4(2), 149–191.
- Gandini, L. (2012). Connecting through caring and learning spaces. In *The hundred languages of children: The Reggio Emilia experience in transformation* (3rd ed., pp. 317–342).
- Giacopini, E., & Orlandini, A. (2011, June). The Reggio Emilia approach to education: Introducing “The Wonder of Learning—The Hundred Languages of Children” exhibit. Paper presented at the Seventh NAREA Summer Conference, Pacific Grove, CA, United States.

- Kellert, S. (2015). What is and is not biophilic design. *Metropolis Magazine*. <https://www.metropolismag.com/architecture/what-is-and-is-not-biophilic-design/>
- Kemmis, S., McTaggart, R., & Nixon, R. (2014). Introducing critical participatory action research. In *The action research planner*. Springer. https://doi.org/10.1007/978-981-4560-67-2_1
- Larvik, G. (2020, June 16). Allowing children to be the scientists they are ready to be. In *You don't say? Developmental science offers answers to questions about how nurture matters*. <https://pressbooks.pub/hownurturematters/chapter/chapter-11-2/>
- Martin, R., & Choi, S. (2018). Biophilic design: An introduction for designers. *Environment Design Guide*, 1–15.
- Nicolosi, M., & Cagliari, G. (2017). Beyond linearity in teaching: Learning as research. *Innovations in Early Education: The International Reggio Emilia Exchange*, 24(2), 8–23.
- Orr, D. W. (1996). Slow knowledge. *Conservation Biology*, 10(3), 699–702.
- Reason, P. (2001). Inquiry and participation in search of a world worthy of human aspiration. In P. Reason & H. Bradbury (Eds.), *Handbook of action research: Participative inquiry and practice*. Sage.
- Reyes, J. (2025, July). *Arts, science, and space: Cultivating curiosity with preservice teachers through biophilic design, an exploration of materials, and inquiry-based learning in the early childhood education learning lab*. Paper presented at the Art in Early Childhood International Conference, University of Wollongong, Wollongong, Australia.
- Reyes, J., & Yu, G. S. (2023). Words unspoken: The radical pursuit of culturally relevant and culturally sustaining pedagogical documentation. In *Affirming the rights of emergent bilingual and multilingual children and families* (pp. 93–109). Routledge.
- Roberts-Holmes, G., & Moss, P. (2021). *Neoliberalism and early childhood education: Markets, imaginaries and governance*. Routledge.
- Scheinfeld, D. R., Haigh, K. M., & Scheinfeld, J. P. (2008). *We are all explorers: Learning and teaching with Reggio principles in urban settings*. Teachers College Press.
- Sobel, D. (2025). *Childhood and nature design principles for educators*. Cornell University.
- Vecchi, V. (2004). The multiple fonts of knowledge. *Children in Europe*, March, 18–21.
- Vecchi, V. (2010). *Art and creativity in Reggio Emilia: Exploring the role and potential of ateliers in early childhood education*. Routledge.