

A Kindergarten Creator Space: Building a Space for 3- to 7-Year- Old Makers

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Background

The International School of Billund in Denmark has a multi-room Creator Space built at the heart of the school that contains a laser cutter, a 3D printer, a textile studio, woodworking equipment, clay and paint tools, LEGO robotics kits, and a wide variety of crafting materials. However, despite the plethora of tools available for making and designing, most of the early childhood classrooms stay away from the space during the school day. Because makerspaces are such a new idea, their success depends on teachers coming together and collaborating to figure out how to make it work for their context. In this picture of practice, we join the teachers in the Kindergarten Playful Environments Study Group at ISB as they ask, “How can we design a Creator Space for our young students?” The Kindergarten teachers decide to use Study Group as a forum to enact their changes, and leverage an existing partnership with Tufts University in Boston, inviting Amanda Strawhacker, a consulting researcher and Child Study Ph.D. student from Tufts who has experience designing developmentally appropriate spaces, tools, and technologies for young children, to help.

“How can we design a Creator Space for our young students?”



Central area of the ISB Creator Space. Each folded door leads to a specialized room such as a wood shop, sewing room or art room

“The Creator Space feels like a big-kids room”

It is afterschool time in the Creator Space. Four 10-year-old students are using the iPads to explore a tangram challenge on the Osmo app. An 8-year-old boy is navigating a Wonder Workshop robot around the space, sending it dodging under tables and chairs. Three girls from P4 are using beads and hot glue guns to make bracelets, and there is a steady stream of 6- and 7-year-olds building houses and rockets inside of the enclosed LEGO bench. With so many tools and materials to choose from, it is surprising that there are no children from the Kindergarten classrooms. Two 5-year-old girls from K3A walk through the space with Marina Benavente Barbon, their K3A teacher, on the way to the nurse. They look around and pause to ask older children what they are working on, but quickly lose interest and leave. Later, when asked why the Kindergarten classes don't use the space throughout the day, Marina replies “it feels like a big-kids room.”

She's not wrong. The layout and furnishings of the Creator Space can be daunting to Kindergarten children. The tables and chairs are so tall that the young students need help getting up and down. They aren't able to see the offerings above the lowest shelf of the “candy wall,” an open storage area with dozens of craft and art material bins, with items ranging from cloth strips to beads and buttons.

The wide walkways that cross through the space can be overwhelming, with new people constantly walking through and loud noises echoing through the hall. Despite those issues, the hall and tables are the most young-child-friendly areas of the Creator Space, as most of the other rooms contain complex woodworking or textile machines, or complicated and expensive robotics and arts equipment.



The question of how to make the Creator Space more inviting and useful for Kindergarteners has come up before at the school. Although they have used parts of the main Creator Space in the past, schedule and time management became issues with older classes. Kindergarten teachers want a place where the smaller children can create and store large projects, without space being an issue. The idea of a Kindergarten Creator Space surfaced in Study Group, and left kindergarten teachers wondering how to make a room available for their children. The administration knows about the teachers' wish for a Creator Space that feels like a Kindergarten Space. They even have a room in mind to work on.



View of the Clay Room.

Converting the Clay Room

One room in the Creator Space is not used as much as the others. While the Clay Room is occasionally used by 10- to 14-year-old students for art classes and language tutoring, often, the room is empty for the majority of the day. Amanda decides to collaborate with the Kindergarten Study Group, co-designing a space that works for them, and with Awanti Seth Rabenhøj, an art teacher, to help ensure that the needs of the arts students are still met. They will use their study group time to come up with a wish list for their dream space that will be welcoming to young children, and Amanda will coordinate and collaborate with these stakeholders to realize their new vision of a playful Kindergarten Creator Space.

Why a Kindergarten Creator Space?

For one week, Amanda observes several of the six Kindergarten classes as they work in their classrooms, play on the playground, and even during meal times. The teachers share what making activities they already do in their classroom, such as painting and crafting, and which ones they need a separate space for. For example, children in Gaby Salas Davila's K3B classroom are very excited about paper airplanes this week. She offers to let them fold their airplanes in the classroom and test-fly them around the room. As free play ends and it is time to line up for lunch, Martin¹, Casper, and Viva are still engrossed in flying the airplanes. Divani is curious about their airplanes and begins to make her own instead of lining up to wash her hands. Gaby mentions that if they had a place to do airplanes that wasn't in the middle of the classroom, it might help organize their day and make transitions like this easier for the children.

¹ When referring to children, pseudonyms are assigned throughout this paper

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Co-design in the Study Group and Beyond

The next week, the Kindergarten teaching team gathers in the Clay Room for their study group session. This session's focus is the Creator Space, and Amanda joins as a guest to help teachers brainstorm ideas and goals for the space. To support this brainstorm, the group engages in a values-identifying activity². Teachers select cards that they feel resonate with their own teaching style and their goals for developing a Kindergarten Creator Space.



Teachers choose cards to identify their favorite values that children can learn through making

Although the cards are useful, the important element of this activity is the conversation that it inspires among the teachers.

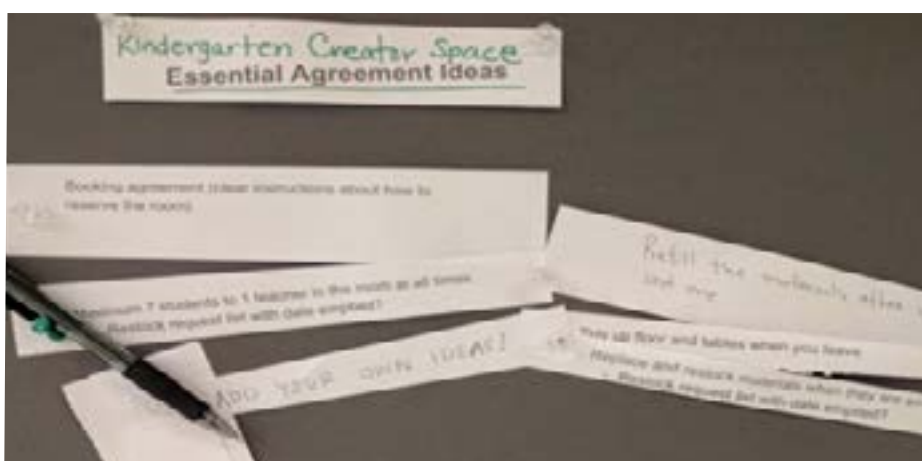
The group agrees on several learning goals that they believe are important for their Kindergarten Creator Space. These include: confidence, design thinking, problem solving, exploring sensory experiences, and feeling part of a community. The teachers refer back to themes that have surfaced throughout the year, such as designing a space that “says yes” to children. In other words, teachers want to design a space where the furnishings and tools are invitations to play, and not temptations that teachers constantly need to monitor for safe use. A space that “says yes” implies that the environment evokes the freedom and creativity of a playground, rather than the strict rules of a museum. Teachers also mention striking a balance between rules of the space and the freedom to explore and make. By the end of the conversation, the teachers agree that they need to think about their needs and come up with a list of boundaries, or Essential Agreements, to govern the use of the space. They also have specific questions about materials, room layout, and scheduling that Amanda agrees to work on.



The values cards chosen by the K teaching team

² The Maker Values Card Sorting task was initially developed by researchers at the Tufts Center for Engineering Education and Outreach to help teachers hone in on the specific areas of learning that they hope to see children develop in their maker space.

To continue the conversation begun in Study Group, many kindergarten teachers spend part of their team meetings or daily planning thinking about their goals for the Creator Space. For example, in the K3 team meeting, the teachers plan outreach to coordinate all of the kindergarten teaching team efforts. They discuss specific questions they have, like how to complete the list of Essential Agreements. Carolina Ayala (K3 teacher) offers to coordinate with the study group to post their ideas for Essential Agreements on a bulletin board in the staff room. Marina also points out that materials ordering and management will become a consideration. Laura Tontsch (K3 teacher) volunteers to assemble a list of materials requested from Study Group teachers, and to discuss the materials management and storage with the administration. Finally, Marina wonders about scheduling and sharing the space with Awanti's classes. Amanda takes this information to the administration, in order to work out an effective solution.



Teachers draft ideas for the Essential Agreements list, and post them on the study group board in the Staff Room

A few teachers also participate in one-on-one interviews with Amanda to further understand their maker values using the card sorting task. K1 teacher Ruth Baxter Hesseldal says that making something that “works” is not as important to her as letting children explore materials:

Ruth: “Instead of [the children] having a prearranged idea in their head of what they want to happen, it’s more looking at what can I do with this thing, whatever it is in front of me. How does it feel? How does it look? How does it move? What can I make it do?”

She also touches on art and craftsmanship, and the importance of offering opportunities for children to experiment and come to their own conclusions.

Gaby also talks about exploring with the materials:

Gaby: *“Taking care of the materials is very important for us and we have been trying to understand the way they use the material, and how they use it, and we’ve been giving them choices about how to use them, and examples.”*

She also speaks about the value of letting children develop their creativity through playful making:

Gaby: *“you know, children are very creative. They really like to create, and it’s always very important. You saw in our playing, it’s very important for them to have that sense of personalization. And of course, the [...] pride that they feel when they make something.”*

A Gallery Walk of Documentation to Reflect on the New Space

It’s April now, and the Creator Space has been used by the Kindergarten classes for the past few months. Children have explored such activities as foot-painting, KIBO robotics, building large models of houses, and investigations of materials using the light table. The Study Group has worked out a weekly schedule that allows everyone to access the space regularly. They can also make special arrangements to book the room after checking with the Study Group, Awanti, and the school administration. Laura continues to manage the materials and teacher requests for the room, volunteering part of her prep hours every week to as Kindergarten Creator Space Coordinator. She feels everyone is working together to keep the space warm and inviting for the children. The Essential Agreements that the group developed collaboratively are posted. Laura is pleased to find that classes adhere closely to the guidelines for number of children in the space, instructions to wear indoor shoes, and how to leave the room for the next group.



The Kindergarten Creator Space

Today, the teachers are once again gathering in the Kindergarten Creator Space for Study Group, but this meeting feels different. They've organized a "gallery walk" of their work, with documentation posted on the walls. The guiding question teachers used to frame their documentation is, "How do children explore the Kindergarten Creator Space?". There are many different experiences, with some children diving right into exploration, and others feeling shy about the loose structure and freedom of the room. For example, when K3B children used the Kindergarten Creator Space to complete their unit on Communities, students were allowed free access to the candy wall to construct small buildings. Several girls hesitated and asked before taking items out of the bins, a few other students looked carefully into each bin before choosing the materials they wanted to use to build their house, and one student picked an excessive amount of items. The K3B teachers feel that it might have been a little overwhelming for one or two children in the class to have so much freedom in making, and this sparks a conversation within the Study Group about tailoring the presentation of materials to match teachers' knowledge of particular children.



Kindergarten teachers explore documentation during Gallery Walk. The guiding question was, "What do children do in the K Creator Space?"

As they reflect on the documentation, the teachers talk about how the work they are doing in the Pedagogy of Play Study Group feels more connected to the work they are doing in classes:

Ruth: "All that we've done is feeding into getting this space up and going, and we're using it"

Marina: "We've got a room! And it's not like yeah, we got a room and we're done – no, we're cat fighting for time in it!"

Group: *"It's nice, yeah...That's the best outcome I think."*

Ruth: *"Yeah, and we're using it. It's like it's real instead of just theory."*

Andreia Adiaconiei (K2 teacher): *"We have all this, like I can feel the pride that we are feeling and we feel like we've achieved something. The school and the parents should know about it, maybe more pictures on the boards and around the school. So when we have our Show and Tell for the parents, even though we haven't done much but it doesn't matter, just so that everyone can know what's going on and have a look at it."*

The teachers all feel a strong sense of community and ownership for all the work that they've put into the PoP meetings, the Kindergarten Playful Environments framework, and the Study Group. This Creator Space feels like a validation and a result of all that work; they know that the space has their unique fingerprint. Indeed, they're so proud of it that they're excited to share it with the rest of the school community.

The administration continues to be supportive of the project. In one of the weekly staff newsletters, Head of School Camilla Uhre Fog, writes:



Clockwise from top left: Two girls build a house out of bubbles; A K class works on signs for the Creator Space; The K candy wall offers a variety of materials; A boy explores colors on the light table

The Kindergarten Creator Space (KGCS) is a hit! The Kindergarten Creator Space is working out so well, and it is positive how an idea, born in a study group, has become a reality. Laura Tontsch is contact-person for the space. The K teachers and children are working hard to care for and maintain the space, and we need everybody to support that.

This explicit support of the ideas and requests agreed upon by the Study Group shows how strongly the impact of the project has been felt throughout the school.

Now that the Kindergarten Creator Space is built, the Kindergarten Playful Environments Study Group is focusing on pedagogy and activities that support children's use of the space. For example, Laura invites families and children to collect items at home to bring in and donate to their new space. This home-school connection is meant to give the children a sense of ownership. Children are excited about the project, and want to know when they can take their found materials to the new Creator Space. Laura is pleased to see the children express so much joy and excitement about contributing to the new room.

As the co-design process shifts into the next phase, the teachers will continue to consider new questions that have emerged, such as: How can we iterate on the space to respond to children's needs for exploration and structure? How can we engage the broader ISB community in the activities that happen in the Kindergarten Creator Space? and How can we empower children to feel safe and confident in the space without overwhelming them? Additionally, since this project has been so successful, the teachers are excited to explore and redesign different spaces around the school that could be more playful for the children.

Makerspaces are exciting and full of potential, but this new style of learning requires careful and collective planning to fit into a school community. This picture of practice demonstrates one example of how teachers can come together and collaborate to design a space that suits their needs. When a new makerspace is being developed at a school, it is essential that teachers, staff, and administration all work together to realize their goals.

This picture of practice is a product of the Pedagogy of Play (PoP) project, a participatory research collaboration between the International School of Billund and Project Zero at the Harvard Graduate School of Education. PoP is carried out with support and collaborative input from the LEGO Foundation, and seeks to investigate the relationship between play and learning in a school context.

To learn more about ISB, please visit <https://isbillund.com/academics/pedagogy-of-play/>

To learn more about PoP and Project Zero, please visit www.pz.harvard.edu/projects/pedagogy-of-play

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