

# JOB DESCRIPTION: SPACES FOR PROJECT-BASED LEARNING

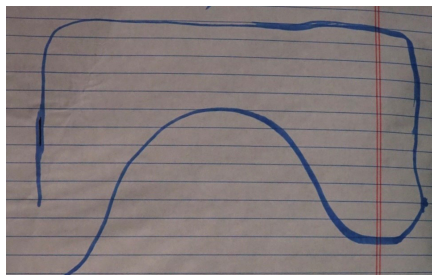
LSC Roundtable at Worcester Polytechnic Institute (WPI) — June 2018

*In imagining the ideal learning space for project-based learning, I asked myself "how to build a space that allows for creative thinking?" My first thought was "how to think outside the box?" To do that I felt I needed to tear down the walls. So naturally, a place with no walls is an outdoor environment.*

*I then tried to incorporate aspects of the natural environment that served as a metaphor of the creative and problem solving processes. The hill is a natural obstacle or problem and represents the process of how you think about problems, incubate solutions, work to overcome them and the euphoric moment of summiting / solving the problem / obstacle.*

*Then I realized the hill could evolve into a sine wave to more accurately represent the innovation process where there are natural periods of discovery, problem solving, summiting, and then realizing the next challenge or obstacle and finding yourself at the bottom of the next hill.*

— Kelly Ivanoff, Colonel, U.S. Army,  
Chairman, Fellows Program— U.S. Army War  
College



This June 2018 LSC Roundtable focused on a specific pedagogical approach—project-based learning—and on the spatial characteristics and affordances important to the success of that pedagogy.

The Roundtable began with participants drawing and describing their mental image of the ideal space for PBL. This was followed by conversations between individuals and teams—about the characteristics of spaces that support the goals and vision of project-based learning.

Attending to a job description for spaces and places for a particular pedagogical and programmatic approach (such as PBL) is an opportunity to consider the utility of learning spaces and places into the future, thus an opportunity to bring diverse voices to the table beyond faculty immediately responsible for that particular approach.

Questions, such as these posed by participants in this roundtable, substantiate the value of having diverse voices involved in planning learning spaces of all types:

- How to overcome the impediment of an academic culture classroom learning where "learning by doing" is considered an inferior mode of learning?
- How can the library optimize limited space to provide space appropriate for PBL learners?
- How might the project-based learning approach work for graduate students in the social sciences?
- How can we ensure all learners—beyond those involved in PBL—have choices of spaces and the authority to shape spaces to have a sense of ownership in their learning?
- When the ideal space is not available, how can we be creative with existing spaces to embrace project-based learning, active learning, learning by doing?
- How to make the case to leadership that funds—capital and/or annual—are needed if our spaces are to reflect and enable us to realize our vision for our learners?



A POSTER SESSION CONVERSATION BETWEEN  
ACADEMICS AND ARCHITECTS — WORCESTER  
POLYTECHNIC INSTITUTE  
June 2018

I.

Our team defined project-based learning spaces as spaces for learning collaboratively. They are spaces designed for connectivity—in terms of technologies, with people on campus and in remote parts of the world.

These spaces should be flexible in many ways from the perspective of discipline and of how many things are movable, including the walls.

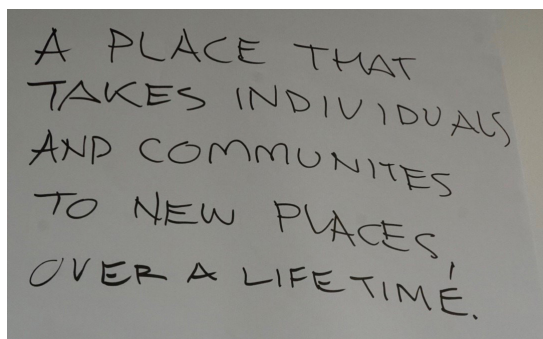
These spaces should accommodate multiple or differing group sizes and be adjacent to all things relevant to students engaged in their individual projects.

These spaces should be designed to give those using them a sense of ownership of the space. We are thinking of a space, of a learning environment in which students can begin to solve problems relating to a real-world need. It has to allow students to focus directly on a particular need rather than making it difficult to do so—which might not be the case in a traditional classroom.

We spoke about spaces that are flexible but with boundaries, spaces that promote private thinking and public expression, for individual and small group work and for presenting and showcasing work.

For me, it is clear that project-based learning requires safe places for tinkering, incubating, innovating, sharing, and celebrating work-in-progress, work done. Such spaces have a good balance between time for working alone and working together.

It is a space that breathes, that allows people and ideas to go in and out.



A PLACE THAT  
TAKES INDIVIDUALS  
AND COMMUNITIES  
TO NEW PLACES,  
OVER A LIFETIME.

Further, learners involved in PBL learning want time to work independently, yet to be surrounded by colleagues. Part of the sense of comfort of being in such a community is that it allows people to speak their mind, but also to be on their toes so they are being “in the present” with others.



II.

Our team thought it important to know each other before talking about a job description of a space for learning. We began by sharing our personal job descriptions at work and realized how diverse we were and that this was an attribute that made our discussion rich.

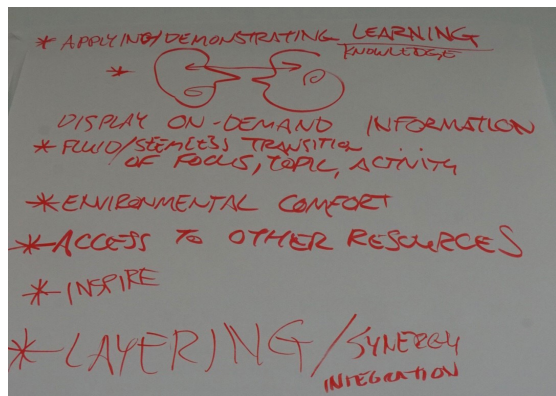
Our discussion was further enriched because we went outside on the grass for the two hour discussion. That we were not actually in a classroom influenced how we began defining what a classroom was—that it is really just a place to go.

Then we talked about who would go to these spaces and about why they would go there, about what would happen there: doing and creating things, exchanging ideas, thinking critically, getting out of their comfort zone. (These, as we all know, are key attributes of a liberal arts education.) We imagined these PBL spaces as somehow elevating users to places they did not know they could reach or even could aspire to reach.

Being such a diverse group meant we had an interesting dynamic in our conversation. We each talked about what worked best for our discipline and sphere of responsibility.



Collectively we arrived at the sense that a layered learning space would be best to encourage the engagement of students with students, and students with instructor. We all feel like we learn best from each other, whether student or instructor.



Perhaps this is most certainly the case in project-based learning. PBL calls for the opportunity to share and integrate knowledge and experience in a way that allows all to improve on what they know and how they innovate.

This space would have different possible layouts, perhaps captured and defined by planners in a "catalogue of layouts."

This catalogue would be a tool for selecting the particular spatial layout for a particular assignment, project, etc. It would illustrate how the space could be used collaboratively, for independent learning, or for a lecture (top-down content presentation).

This is because immediately when someone walks into a PBL space, they should be able to tell what will happen, what they will be able to do at that time, in that place.



III.

In our group, we discussed the many different approaches to project-based learning—sometimes individual, sometimes in small groups, and sometimes in designed PBL spaces for 30 – 60 people. These different approaches require different spaces.

We thought of how learning in PBL happens, that it takes place with a fluid transition of learning as collecting knowledge to learning as experimenting with materials, developing projects.

We think *place* of learning might be better than *space* for learning.

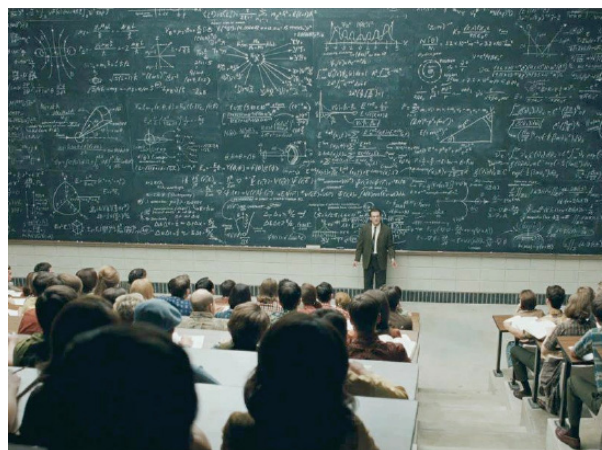
A place of learning has boundaries, but is flexible. It has warmth, life. It has personality, an identity. This is for us an important aspect of an ideal learning environment. Project-based learning is not a place; it is a process for learning.

The expression "deep dive" was appealing to us. We took it to mean that those in a particular learning environment can make a deep dive into a particular subject and—with a wonky fanaticism—have room for thinking differently from ways they had thought of before.

Those involved with project-based learning are hyper-focusing on the business of learning, of learning information, and of learning from each other and doing so in a fanatical way.

This is what I personally think of project-based learners: a fanatical group of people learning in quite a different way than those sitting in rows in front of an instructor who is pouring knowledge into their heads.

What happens in PBL spaces is the face-to-face sharing that is really important in project-based learning, on and beyond the campus.



#### IV.

In thinking about our charge to define a job description, we thought the space had to reflect the culture of the institution, just as an employee would be expected to do. Both accountability and responsibility are tied to this notion of culture. We were also thinking about mission, about the pedagogic expression of that mission and how that influences the spatial expression of the institutional mission.

The mission over a lifetime of spaces and places for project-based learning is to create responsible citizens as our learners go out into the world.

WPI is a sub-community and our intent is that when they go out and join larger communities they know how to engage and encourage each other. This is our institutional mission.



It is hard to think about a job description for a single space if you do not pay attention to its relationship to everything else. It is the same when hiring a person; they are part of a whole, broader organization. And, just like for a person, spaces and places we are talking about must be accountable.

For WPI the measure of the success of a physical space for PBL is that the students produce reports that show their projects are innovative, based on good science or good engineering, or good understanding of a social situation.

Every few years we do reviews of the major and interactive qualifying projects to answer the question, "is what our students are producing good enough?"

When I think about assessing the impact of space, it is easier to define from negatives to positives. A PBL "project" that might receive a negative review most likely has been done start to finish in a very large university laboratory where students have to fight to hear each other and their advisor over the din of other experiments.

Size and acoustics may not be the best possible correlation of architectural environment to outcome of learning, but it is one thing that we can measure.

If we are defining a job description for a space based on a job description for a person, we might also want to explore how well it plays with other spaces.

- Is it visible?
- Is it on the way to someplace else where you can see it?
- Does the space feel present?
- Is it connected to places where people are actually going anyway?
- Does the student engagement continue after they leave your space?
- Are faculty and students always talking in the hallways?"

These might not be really measurable attributes, but perhaps the qualifications of the space are the attributes of colorful, variety, and messy; they should not be fixed or precious. We've not yet mentioned art or plant life as prompts for creativity; I always feel more creative in the presence of art and plants.

*Spaces should inspire. They should be beautiful, calming, with the art perhaps like a visual Mozart, something that will make you feel comfortable and well-proportioned, not too jarring, not too low.*

*There is both an art and a science in it and that is why I am an architect.*

*Because I am too practical to be an artist and too creative to be an engineer. It's the foot in both worlds and the convergence of everything that is exciting to me to be working on educational projects.*

*Everything is beginning to converge; everyone is beginning to see all these connections.*

*And really, when we all begin to do the deep dive in this business of giving attention to spaces (places) for learning, the more we all begin to see new kinds of connections. [Architect comment.]*



V.

What is happening on our campus now is that art is more than décor. It is art that is an idea that is representative of the mission of our institution or somehow connects to the pedagogy, or it is a product of what our students and faculty have created.

Our art is about engaging with the campus and local communities. We are trying to use art in a way that seems seamless, not confined or programmed to serve a particular place.

Our team also spoke about measuring success. I think the space should be monitored every hour or two for a week and see/if how the room is being used in different ways by multiple instructors and groups of students and maybe by others in the community.

That would be a sign of success—that the space is flexible, that it allows people to own it, and that it does not always have to return to a default position. If it were a truly successful space, it would allow being changed all the time.

My personal measure of success is that the space is not a roadblock for my working with my students in enabling and engaging them as learners as I plan and hope for.

*Let me ask, looking at this list of items for a job description for project-based learning, could not many descriptors also fit the traditional lecture hall that the Socratic method values: to encourage, inspire, engage learners, showcase results. I am not saying there is a strong similarity between lecture and project-based learning. There are many differences, but much overlap. Perhaps as a job description for a PBL space becomes final, we could note that many values mentioned here can be applied to other spaces/places for learning on a campus. [Faculty comment.]*



Since 1970, project-based learning has been the core of WPI's undergraduate curriculum, known as the WPI Plan, providing students a professional and social context to apply their acquired skills and abilities. (<http://wp.wpi.edu/projectbasedlearning/proven-pedagogy/project-based-learning-at-wpi/>)

