



**LUCILE PACKARD CHILDREN'S HOSPITAL SCHOOL  
LEARNING 2013**

**By:**

**Whitney Birdwell**

**Carrie Cai**

**Hannah Cho**

**Andrew Davis**

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**Professor Daniel Gilbert**

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# Introduction

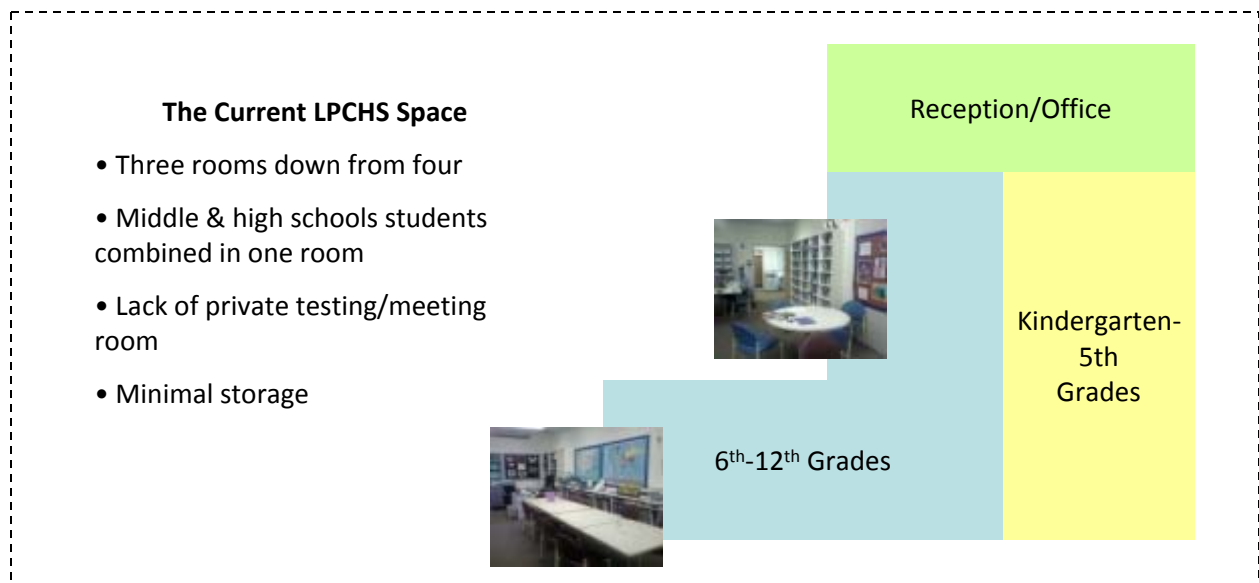
“Thank you for giving me the only experience over the past three months that did not suck.” These words are written on a thank you note with a hand drawn picture that hangs on the wall above a teacher’s desk in the Lucile Packard Children’s Hospital School (LPCHS). While the teenager who wrote them does not reference the many great elements of LPCHS, she is able to communicate a critical element of LPCHS, the sense of normalcy it provides for the 1,000+ students the school serves each year.

The hospital school, first formed in 1924, is now within the Palo Alto Unified School district. Located in the Lucile Packard Children’s Hospital, the school serves students with a wide range of diagnoses. The average Kindergarten to Eight Grade student spends 18 days at the school and the average high school student spends 32 days. Spending time at LPCHS it quickly becomes clear that there are no average students. Some students are in for only a few days of dialysis while others will attend the school for over 100 days while they await and then recover from an organ transplant.

LPCHS is located in three rooms on the 3<sup>rd</sup> floor of the Hospital. The School extends, though, throughout the entire Hospital as teachers each day go throughout the hospital offering 1:1 bedside tutoring. Students regularly flow between coming into the School and being served bedside depending on their health status. One of the major tasks of the teachers is to monitor this and to ensure every student at the Hospital is being served.

While the mission of LPCHS is to provide continuity of education and facilitate school re-entry, it plays a far more important role. The schools provides students with a procedure free zone, a social setting where they can establish new friendships, and a place that feels normal. These social and educational benefits also pay off medically as a child’s ability to attend school is a measurable outcome for medical progress.

As the Hospital prepares to build a new bed tower ready for use in 2013, LPCHS is beginning to plan its role in this new space. What should the new school look like? How could bedside learners be better served? How can we connect the entire school community?



# Design Process: Design Goals

LPCHS excels at serving both the academic & socio-emotional needs of each student. From our interviews with LPCHS teachers and our observation of the school in action we derived three primary learning goals:

- 1. Provide a “normal” life experience.** In almost every other area of the hospital it is clear that life is not normal. LPCHS should provide an *oasis of normalcy* where each student is a student and not a patient.
- 2. Be aware and respectful of the needs of each student.** There is no average student at LPCHS. The school’s space should function well for all students. There should be space for IV poles, outlets for medical devices, and a functioning learning space for students who are in their beds. By designing for each of these needs we can make a space where their *needs are forgotten* and each student is simply at school.
- 3. Facilitate academic excellence.** Illness affects every kind of student. Their medical condition and thus their school space *should not affect their ability to achieve*. LPCHS should provide a learning space that facilitates the learning each of these students wants to achieve.

## Three Goals Represented in Three Personas

### Susan: A 2<sup>nd</sup> Grader

Diagnosed with acute lymphocytic leukemia and is currently receiving induction chemotherapy

Favorite activities in school are the creative arts

Feels lonely because she has been uprooted from her normal life separated from her friends back home

Met a friend, Liz, that she eventually became close with. Liz, a more extroverted child, played with her frequently and integrated her into activities with other children.

Happy to regain a sense of normalcy and looked forward to going to school every day, where she could learn and participate in a warm and nurturing community.

### Madison: A 5<sup>th</sup> Grader

She was in a comma for 2 months after a serious car accident. She is currently confined to a wheel chair and taking pain medication.

Before the accident, she was the star of the cross country team. She was her class president and highly involved in school activities.

At first, Madison did not want to be at school – she had trouble navigating in a wheelchair, she was in pain, she couldn’t focus, and she was depressed.

Began to realize the school space was easy for her to get around and she met lots of new friends that loved to take her for “joy rides” on her wheelchair during breaks.

### Timothy: An 11th Grader

Diagnosed with Complex Regional Pain Syndrome (CRPS) patient

Tim has been hospitalized for 1 and a half years. He mostly has to stay in bed

An excellent student in terms of academic achievement. He loves science and math and used to win for the science fair, math contest, chess contest, etc.

He was a top student with academic ability and wants to continue studying and take the SAT and go to college but feeling out-of-date from his academic path of college prep.

Mainly uses bedside teaching, reviewing whatever he has difficulty with understanding.

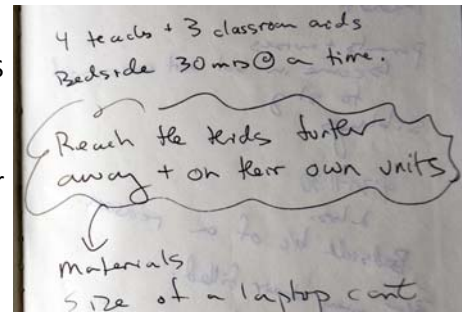
# Design Process: Unfolding Ideas (I)

Our group first formed in front of a whiteboard with LPCH School written on it. We each had a reason we wanted to work on this project and a few, vague ideas. Between that moment and today our ideas have been affected by interview, observations, readings, classmates, books, and an iterative design process. Each major step is described as well as the Key Design Insights (KDI) we gained.

## Meeting Teachers

Having read the project description we went to meet with the LPCHS faculty during a lunch break. As we scribbled notes & sketched they told us the various challenges the school faces.

**KDI:** There is no “average” student at LPCHS. The school extends far beyond the three rooms we saw. School is more than learning, it is feeling normal.



## Scoping the Project

Returning from our first visit we contemplated the scope of our project. The teachers talked about the challenges of a bedside learning space. They also talked of the new hospital space in 2013. Which should we design for? The latter & the former! We went with Learning 2013—a space that meets all learners needs

**KDI:** There is a tension between designing for today and designing for tomorrow. Thinking in terms of “and” rather than “or.” Clarify goals early in project.

### BRAINSTORMING

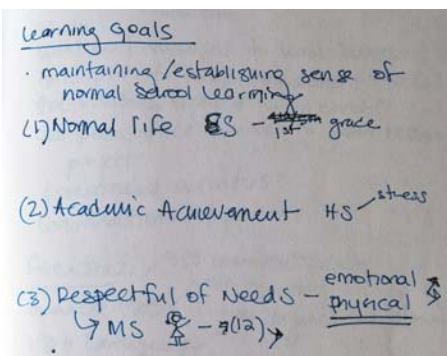
1st Option: Critical Care Bedside Teaching Individual lessons with a teacher for This includes ICU, Dialysis, Bone Marrow Time at hospital is typically a school opportunity? enhance the students classroom space.

Pros: Immediate impact, existing procedures  
Cons: Very extensive procedures for

## Defining Goals & Personas

What role does a school play in a student’s life? How elements of that should be emphasized in at a hospital school? These were the questions we struggled with as we defined the three major goals for the LPCHS design. From the three goals we then created three personas, summarized above, to guide our design.

**KDI:** Learning in a school is more than just textbooks and tests, though those are important too. The medical has to be given space, but not be the focus.



## Seeing the School in Action

Three of us observed LPCHS in action on a Friday morning. While one observed all the students working on an art project, the other two shadowed teachers as they completed bedside learning.

**KDI:** The importance of community space where everyone can socialize. Bedside learning is a back and forth endeavor. All learning is customized—lots of photocopies! All teachers involved at all times—open space facilitates this. A space that one day is a desk for a science experiment is then an artist’s studio. Flexibility is a must!



# Design Process: Unfolding Ideas (II)

Writing Scenarios

Knowing what it looks like day to day we were able to bring our personas to life in scenarios that implemented many of the design solutions we had brainstormed. This forced us to envision the spaces we were going to need.

**KDI:** Our different personas needed different spaces. There is a need for both community space and individual space in order to accomplish the design goals. The definition of “space” is going to be stretched

Design Meeting

With a vision of our three spaces we brainstormed needs and possible design solutions on the Wiki. We then met over lunch and brainstormed. For each space we individually spent five minutes drawing a design and then presented our favorite features. At the end of this we were able to highlight common ideas and “must haves.”

**KDI:** Individual time at the start of brainstorming yields greater creativity and brings out misunderstandings and miscommunication. Each space has a myriad of needs—we must highlight the three to five most relevant to LPCHS learning and design for those.

Visiting & Refining

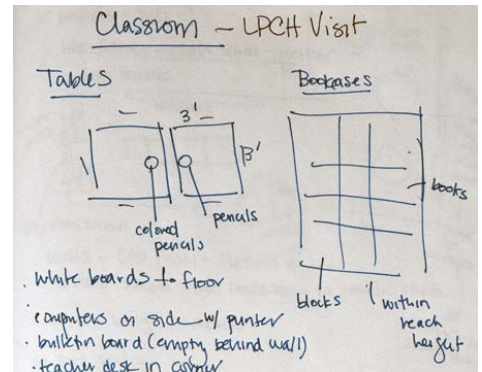
Two of us were able to visit the school again and see academic work on a Wednesday morning. Knowing many of the features of our proposed idea we were able to see that some of our solutions (a portable classroom that would go to and from the school) were unnecessary (by student backpacks that met our desire for normalcy).

**KDI:** Iteration. Different uses of the same space (art vs. academic) show different needs (loud, communal space for art and quiet, individual for academic).

**Scenario 1: Virtual Tim - High School Student**

Like most high school students Tim has to get up early. Others are going to an early morning swim practice, doctors and physical therapists. While there is still early in the morning. By around 9:00 he is left alone at school. He is too tired to make it happen and he

At 9:30, though, he has to go to school. Tim likes to schedule he would keep planning on doing work, would plan on doing work and watch another t.v. show



# Design Process: Design Challenges & 3 Spaces

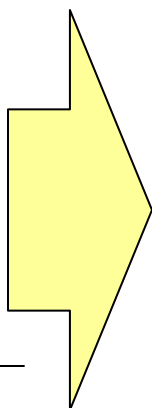
## Design Challenges

- **The Subject:** Seeing sick children is difficult. This project was more than an intellectual challenge, it was an emotional challenge as well.
- **Access:** LPCHS is open from 9:30-11:30 and 1:30-3:00 every day. To observe students we also had to fill out visitor attestation agreements that included not photographing the students. It took some scheduling effort—go Wiki!—but we were all able to see the school in action.
- **Now or Later?** What should we be designing, a tool for bedside learning, ready to implement this year or a new space in the 2013 Bed Tower? We debated the merits of each and opted to do both—Learning 2013 at LPCHS.
- **“Space?”** What counts as a space? Seeing a need to create a community space for bedside or isolation learners we discussed a virtual space to meet that need. Is a lap-desk for bedside learning a space?

The design challenges of LPCHS 2013 extended beyond one space. Rather than limiting our design we expanded to three learning spaces, connected by the community of learners.

Goals  
+ Personas  
+ Interviews  
+ Observations  
+ Scenarios  
+ Feedback  
+ Inspiration

**3 Design Spaces**



## 3 Spaces in LPCHS 2013

1. **New Classrooms:** A “traditional” school with classrooms that students attend. A place to get away from nurses and procedures & learn.
2. **Bedside Learning:** A personal learning space that transforms the hospital room into a classroom. Bring the “normal” to the abnormal
3. **Virtual Learning:** A community that unites all the learners within the LPCHS community.

# Space 1: New Classrooms



Stanford d. school



Stanford d. school

## Goal 1: Provide a “normal” life experience

Space Specific Needs	Design Solutions
1. Students/teachers need a large space for student body	1. Design a large, flexible room for different group activities
2. Students need to feel connected to other students	2. Design a virtual tool displayed on a flat panel monitor
3. Students need to play and have fun	3. Design flexible space

### Space Specific Needs in Depth:

1. Students/teachers need a large space that can fit the entire student body. The students often come together for art projects, theatre and other group activities. This would help create the sense of “normal” school life, as well as help build a sense of community among the students.
2. Students need to feel connected to other students . Many students are unable to attend school on a regular basis and need a means to connect with others.
3. Students need to play and have fun.

### Design Solutions in Depth:

1. A large, flexible room for would allow the entire student body to fit one room for various group activities (i.e. art, theatre, prom, etc). This space could be segmented by the use of partitioned walls.
2. Provide a large flat panel monitor that projects the “status” of all students in the school. This is discussed in the virtual classroom section.
3. Design a flexible space that allows for art, theatre, games and more. The classroom should have access to an outside play area for recess or play time.

# Space 1: New Classrooms



Stanford d. school



Stanford d. school

## Goal 2: Be aware and respectful of the needs of each student

Space Specific Needs	Design Solutions
1. Students need sufficient storage	1. Storage bins and storage cabinets within reach
2. Students need teachers nearby	2. Design teachers' desks that are well located
3. Students need a healthy school environment	3. Introduce natural light, plants and color into the classroom
4. Need access to power outlets and wide walkways	4. Well designed power supply; room for wheelchairs/ poles
5. Students/teachers need a bathroom within the school	5. Incorporate a bathroom in the main entryway

### Space Specific Needs in Depth:

1. Students need sufficient individual storage so they can keep materials and personal supplies within the classroom space. This is particularly important for students with wheelchairs, IV poles, and other special needs. Students also need storage space for classroom supplies and instructional materials (i.e. books). This storage needs to be within reach.
2. Students need teachers nearby at all times. Students are busy at all times helping students with individualized instruction, facilitating
3. Students need a healthy school environment where they can learn and grow. There are significant health benefits from an environment that provides natural light and access to the outdoors.
4. Students and teachers need access to power outlets without having wires and plugs all over the place. The current classroom has very few outlets and the floor outlets have metal covers that stuck up and create a hazard. In addition, students need room so that IV poles don't get in the way of learning. Students also need wheelchair access.
5. Students/teachers need a bathroom within the school. In the current school, teachers and students need to use a bathroom down the hall from the school. Students with special needs require assistance.

### Design Solutions in Depth:

1. The classrooms should have a variety of storage options. It would be useful to have storage bins for each student within the classroom. These should be clearly labeled and within reach. Students should take ownership of this bins and be allowed to customize them (i.e. decorate their "locker"). In addition, there should be sufficient storage space for classroom supplies and instructional materials within reach.
2. The classroom design should be laid out such that teacher's can view the entire classroom from their desks.
3. The design of the classrooms should provide for plenty of natural light. The design should also emphasize the indoor-outdoor connection with internal and external vistas, plant life within the classroom space and the use of color to help create a healthy environment that supports and inspires students.
4. The design should provide for power outlets flush with the floor, outlets near art activities, and outlets along wall. The tables should have power source that allows laptops to be charges without being plugged in. This will help eliminate the burden of plugs. The tables should be lightweight and moveable so that they can accommodate students with IV poles and wheelchairs.
5. An simple design solution would be to build a bathroom in the main entryway to the school, accessible to all students and teachers.



# Space 1: New Classrooms



## Goal 3: Facilitate academic excellence

Space Specific Needs	Design Solutions
1. Separate classroom space for K-4, 5-8, 9-12	1. Design the new school with three separate classrooms
2. Teachers need sufficient storage	2. Storage cabinets, file storage, walk-in storage closet
3. Teachers need room for 1:1 tutoring	3. Create break-out rooms within the classroom
4. Teachers need a space for formal and informal learning	4. Design a flexible space that can be divided
5. Students need sufficient workspace	5. Flexible furniture: moveable, storable
6. K-4 students need a print rich environment	6. Incorporate text and images on walls and ceiling
7. Students need a place to display their projects	7. Create display space and an exhibit hall

### Space Specific Needs in Depth:

1. Teachers need separate classroom space for K-4, 5-8 and 9-12 in order to accommodate the different levels and types of instruction. In the current space, there is one classroom for K-4 and one classroom for 5-12.
2. Teachers need sufficient storage space within the classroom and within the school. The customized curriculum creates a heightened need for file and book storage.
3. Teachers need room for one-on-one tutoring, a quiet testing area and space to meet in small groups with students or parents. This space must be private or semi-private and sound proof if possible.
4. Teachers need a space for formal learning (i.e. math time) and informal learning (i.e. socializing while doing art).
5. Students need sufficient workspace in the classroom. They currently sit at a long table or smaller circular tables to do their schoolwork.
6. K-4 students need a print rich environment. It has been shown that a print rich environment is key for young students to develop and learn (source: field trip to Children’s Discovery Museum).
7. Students need a place to display their projects. This can establish a sense of pride in accomplishments and build a sense of community.

### Design Solutions in Depth:

1. Creating a space for the three levels (K-4, 5-8, 9-12) will help create a greater sense of community within each group.
2. The storage needs of teachers can be met through the use of creative storage solution: cabinets, file storage, walk-in storage closet, storage under seats or tables, etc.
3. It would be useful to create break-out rooms within the classroom: two that are sound proof and two with "garage doors" to create open feel when privacy is not necessary. This will help create an open feel.
4. The space should be designed to be flexible so that can be divided based on activity: flexible furniture, break-out spaces, moveable screens, etc.
5. The classroom should be filled with flexible furniture that is easy to move and store. Whiteboard table tops would enable brainstorming and tables could have power source that allows laptops to be charged without plugs.
6. A print-rich environment can be created by incorporating text and images on the walls and the ceiling of the classroom. This can be enhanced through the use of personas and scenarios.
7. The classroom can be used to display projects via bulletin boards and flat panel monitors (to display digital work). A student gallery could serve to share projects with the entire school, parents and other visitors.

## Space 1: New Classrooms



Stanford d. school



Stanford d. school

### Connection to Overall Learning Goals:

The three need-design solution tables provided have been purposely organized based on our three specific learning goals: (1) normal life, (2) special needs, and (3) academic achievement. There is some overlap between these goals.

For example, a design solution that meets teachers' need for a space for formal and informal learning is geared towards achieving both academic achievement by facilitating collaboration and promoting a normal life by providing social interaction. In addition, a design solution that meets students' need for a healthy learning environment should incorporate academic achievement, creating a sense of a normal life and be sensitive to the special needs of these students.

Along these lines, the connection to overall learning goals is expressed in each of our design solutions.

### Facilitating Learning:

The design of the new classrooms has the potential of having a significant impact on the learning of students at the Lucile Packard Children's Hospital.

*Backwards Design:* We have approached the entire design of the school from the perspective of the users. This backwards design approach starts with the needs of the students and teachers and then creates an environment that meets these needs.

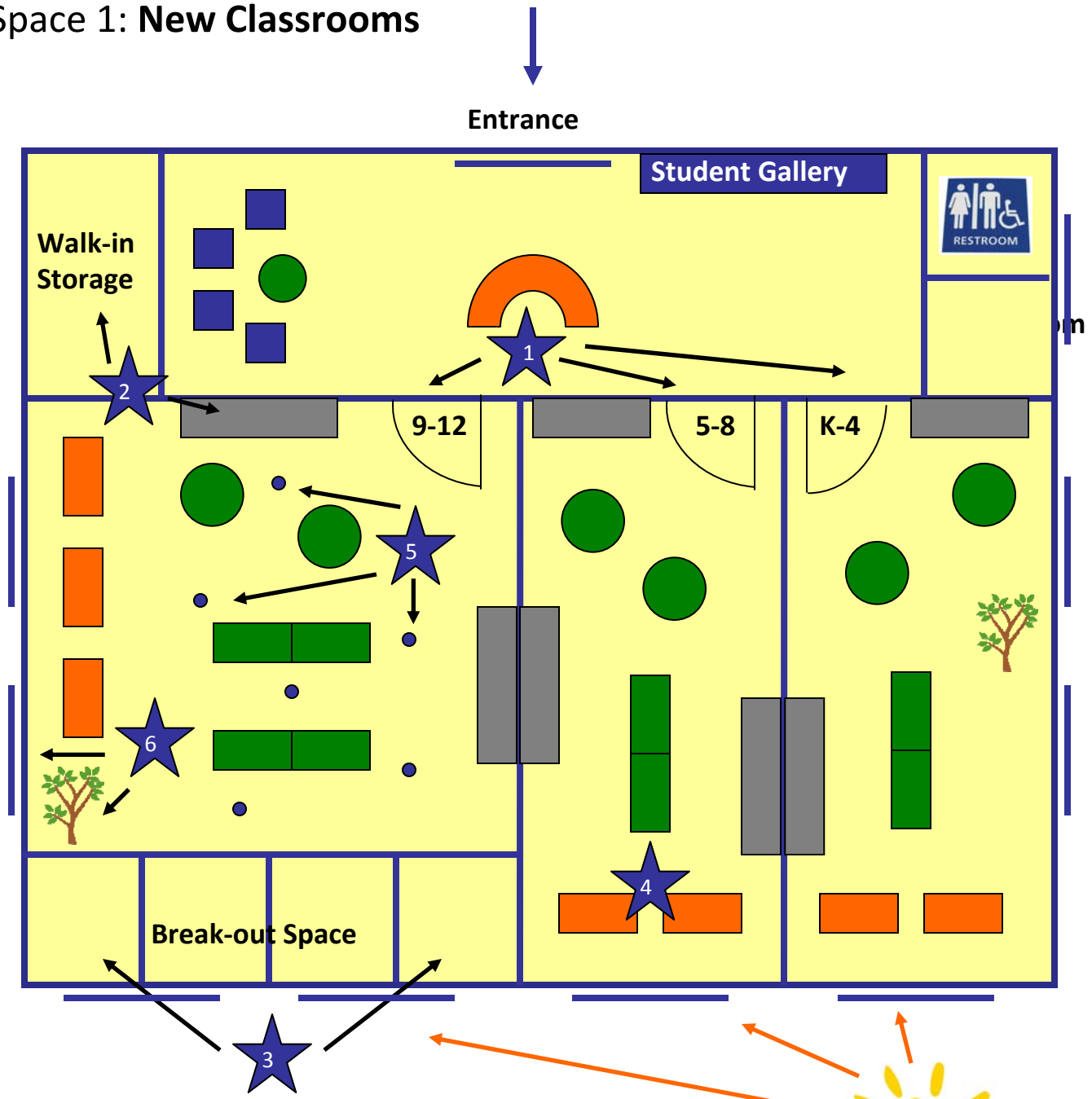
*Emotional Design:* By including our third learning goal of special needs we have been able to incorporate emotional design into the design process. This allows for flexibility to meet the varying needs of individual students.

*Learning from Experiences:* The students at Lucile Packard Children's Hospital are an inspiration. They bring incredible life experiences into the classroom each day. We have tried to emphasize learning from others by promoting collaboration and community in the design of the new classroom spaces. This will enable students to learn from each others knowledge and experience on a daily basis.

*The Association of Ideas:* The learning environment we have designed for LPCH that emphasizes collaboration and individualized instruction will continue to promote association of ideas among the students. This will allow students to personalize their learning and make it more memorable.

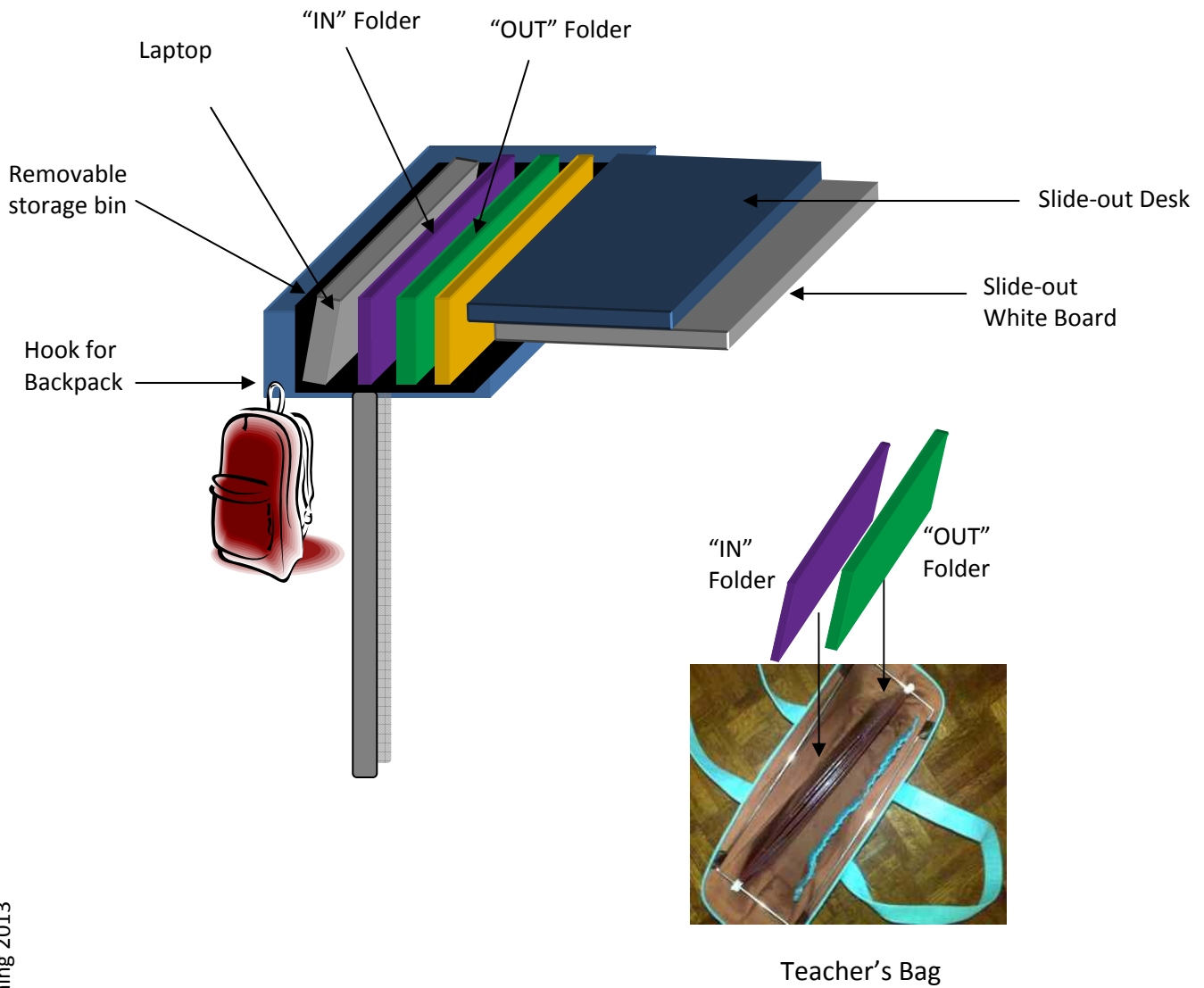
*The Different Realms of Human Experience:* Our three learning goals, the needs we identified and our design solutions all take into account the four realms of human experience: spatial, psychological, physiological and behavioral. By addressing these four realms, we feel this project will connect with students and teachers on a deeper level.

# Space 1: New Classrooms



1. Separate classroom space for K-4, 5-8, 9-12
2. Storage for students/teachers
3. Breakout rooms
4. Flexible workspace
5. Power outlets and wide walkways
6. Healthy environment

## Space 2: Portable Bedside Learning Space



Space Specific Needs	Design Solutions
Way for students in isolation to keep up with their schoolwork.	A Hospital "Lap-Desk" on wheels that functions as desk space and storage compartment.
Way for students to fluctuate between bedside and school learning on a daily basis.	Lap-desk includes removable storage bin that can be taken out and carried to school if necessary.
Way for teachers to transport materials between school and bedside.	Teacher bag with rails for hanging individual student folders.

## Space 2: Portable Bedside Learning Space

### Space Specific Needs in Depth:

1. Way for students in isolation to keep up with their schoolwork.  
When a child is hospitalized, one of his/her worst fears is that of falling behind in school. The obstacle to continuation of schoolwork is exacerbated when students are in isolation and cannot be physically present at the school in LPCH. Given LPCH's belief that "carrying on the everyday activity of going to school can have a positive effect on the hospitalized child's attitude toward and acceptance of treatment," there exists a major need for a learning space for children in isolation.
2. Way for students to fluctuate between bedside and school learning on a daily basis.  
Some children are able to attend school on some days and confined to bedside learning on other days. This creates a need for a flexible system for transporting materials to and from bedside.
3. Way for teachers to transport materials between school and bedside.  
Teachers engaged in bedside teaching have expressed a need for more efficient transport of worksheets, folders, and other materials between school and bedside. Because they work in a complex environment that requires significant flexibility and multi-tasking, an effective system would be both logistically consistent and adaptable to circumstances.

### Key Design Solutions in Depth:

1. A Hospital "Lap-Desk" on wheels that functions as desk space and storage compartment.
  - a. Insight: Hospital rooms already include rolling food tray tables that are well sized for hospital beds. This idea can be adapted for bedside learning.
  - b. Lap-Desk features include:
    - 1) Wheels to ease transition between schoolwork and hospital procedures
    - 2) Side hook for hanging backpack
    - 3) Storage compartment for folders, textbooks, laptop, school supplies
    - 4) Sliding desk and whiteboard
2. Lap-desk includes removable storage bin that can be taken out and carried to school if necessary.
3. Teacher bag with rails for hanging individual student folders.
  - a. "In" folders and "Out" folders generate efficient system between teacher and student for delivering new assignments and returning completed worksheets.
  - b. Hanging bag frees both hands for in-transit duties such as opening doors, putting on gloves, etc.

## Space 2: Portable Bedside Learning Space

### Facilitating Learning:

Ultimately, the purpose of designing a portable bedside-learning space is to enhance learning in an unfamiliar, non-classroom setting. Research shows that children learn most effectively through collaborative participation and personalized scaffolding (Vygotsky, 1978). Moreover, we know that the success of group problem solving depends more on the ways in which members respond to each other's ideas than on the prior achievement of individuals (Barron).

The lap-desk strives to create a common space through which teachers and students can communicate and collaborate on focused tasks, even in physical isolation and distance from a real classroom. For example, the slideable dry-erase whiteboard encourages teacher and student to share attention on a central task and to build upon each other's ideas visually. When physical collaboration is not possible, such as when bedside learning is interrupted by doctor visits and other pressing tasks, the transportable hanging folders can serve as a route for communication between teacher and student. For example, a student may put his/her completed homework along with any lingering questions about specific concepts in a folder that the teacher can bring back to the classroom and respond to before the next visit.

Lastly, the whiteboard creates an opportunity for learners to engage multiple intelligences (Gardner, 1983) such that learning is achieved not only through linguistic means but also through spatial conceptualization and interpersonal interaction.

### Connection to Overall Learning Goals:

1. **Normal Life:** Hospital lap-desk conveys a sense of normalcy by functioning like a normal school desk, with a hook for hanging student's backpack and space for textbooks, laptop, and homework.
2. **Academic Achievement:** Lap-desk helps students achieve academically by effectively organizing student's schoolwork and allowing for efficient communication system between teacher and student.
3. **Sensitivity to Health and Emotional Needs:** Lap-desk moves on wheels as a simple unit and thus prevents unnecessary hassle when transitioning between academic work and hospital/health procedures.

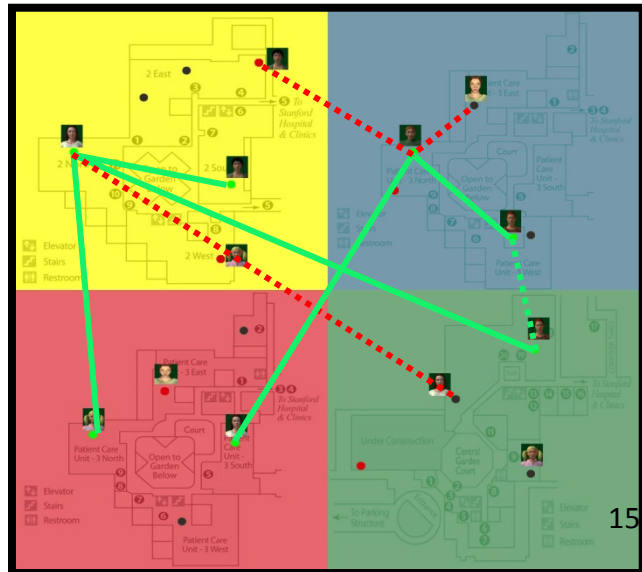
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# Space 3: Virtual Classroom



## Space 3: Virtual Classroom

Space Specific Needs	Design Solutions
Way to promote social and communal atmosphere for students in isolation	LPCH Virtual school and classroom than can be logged in from students' personal lap tops
Way to increase self confidence and promote healthy self esteem	Design and maintain one's own cyber identity: avatar.
Way to connect with the school of origin	Information and communication technology in the virtual classroom will allow students to connect from the bedside to their school of origin
Way to increase collaboration and community of practice	Older students can help younger students with their homework and other academic and non-academic topics, including newcomer's adjustment to the hospital life. Promote <b>Legitimate peripheral participation (LPP)</b>

### Space Specific Needs in Depth:

- Way to promote social and communal atmosphere for students in isolation

According to the interview and observation, one of the most desperate needs for the hospitalized students is interaction with peers and teachers. It would be highly beneficial for those who are in isolation to interact with peers and form a network of support with others who are going through similar experiences. Interaction with those who are in similar situations and also with those in their school of origin is one of the most urgent needs that the hospital school should provide.
- Way to increase self confidence and healthy self-esteem

Many of the hospitalized students go through a number of intensive medical treatment such as chemo therapy, surgery, etc. Their appearance may change after medical treatment and trauma. Such changed appearances and physical constraints may affect the students' confidence and self-esteem.
- Way to connect with their school of origin

Children and young people who are absent from school for health reasons are isolated from not only the other hospitalized students but also peers from their home school.
- Way to increase collaboration and social learning

Another need in student life at the hospital is social interaction and , concurrently, adjustment to a very different lifestyle. This is particularly urgent to those who are isolated. Interaction with others who are "old timers" – students with more experience staying at the hospital – can help those who are newcomers with their adjustment to the new life. "Old timers" may also benefit from this interaction through increased self confidence and self-esteem.



## Space 3: Virtual Classroom

### Key Design Solutions in Depth:

1. Creation of an LPCH Virtual school and classroom which students can log into from their personal lap tops

This would be a virtual school where students in isolation can log in from their bedside to connect them to other students at the hospital as well as to students at their home school. Once they log-in, students can check their status in terms of homework, work progress, SAT score, etc. They can upload their homework online and chat, IM, talk to their friends and teachers online. There is a video streaming system in the classroom and students can watch their school classroom of origin.

2. Design and maintain one's own cyber identity-avatar

When they set up their account with LPCH virtual school, students would be provided with an avatar to represent their cyber identity as they'd like. Once they complete required courses and homework, they are able to earn virtual currency. With the currency they earn, they can buy items for their avatar. In the virtual world, students are freed from their physical isolation. They are able to go anywhere in the hospital, make friends, and chat long-distance. They can signal to teachers when they are available for bedside learning, and also indicate their status to friends and family.

3. Information and communication technology in the virtual classroom will allow students to connect from the bedside to their school of origin

The students can watch their classroom at the school of origin whenever they want to see. There is Information and communication technology(ICT) which is a video streaming facility that connects the real school classroom and bedside. With ICT system, students are able to communicate with their peers at the school of origin which they eventually will return to.

4. Older students can help younger students with their homework and other academic and non-academic topics, including newcomer's adjustment to hospital life

Old timers can help newcomers become experienced members of a community of practice or collaborative project in this virtual school classroom. The virtual environment enables students who are not physically mobile to walk, talk, socialize and do whatever they want to do. The virtual environment encourages students to become more proactively engaged with their peers, teachers, and their school work. The "status" screen shows who is online and offline, as well as a general profile of the students- hospital join date, birth date, etc. Students can IM, chat, type-chat for social, practical, or educational reasons. In the virtual classroom, they can meet and share their problems and experiences.

## Space 3: Virtual Classroom

### Facilitating Learning:

Students who are physically unable to attend the hospital school can log into their virtual school and manage their school life from their rooms. This virtual space promotes collaborative learning by encouraging students to be more engaged and involved in the school space, freeing them from physical and psychological constraints. This promotes more interaction between students and other students, teachers, and educational material. It also increases opportunities for collaborative project sand communities of practice. For those who are newcomers to the hospital school and who must adjust their lives to hospital environment, the virtual world can give them developmental **scaffolding** by providing an avenue for them to learn from those who are old timers. Old timers may benefit in return via increased self confidence. According to **Legitimate peripheral participation (LPP)** by Lave and Wenger (1991), observing an expert participate in a community of practice helps newcomers adapt to a new environment and become more expert themselves.

Through promoting social interaction and collaboration with other peers, the virtual world helps increase self confidence. According to an interesting research by Yee & Bailenson (2007), virtual avatars may have a very significant impact on real life behaviors and experiences. The research suggests that the qualities one acquire online – whether it’s confidence or insecurity – can spill over and change his or her conduct in the real world. Students might be able to gain more confidence and self-esteem through sound and healthy experience in the virtual world.

### Connection to Overall Learning Goals:

#### 1. Academic Achievement

Virtual environment supports the academic performance track system. Each student has access to his or her own profile of academic achievement and the profile is managed by both students and teachers. The network also inspires collaborative learning among students and between students and teachers.

#### 2. Normal Life

Virtual environment maximizes normalcy by freeing them from physical, social and health constraints. As such, it creates a new form of “normalcy”: through the virtual network, students can make friends, attend school, and ask for help on homework just as they would in normal life.

#### 3. Sensitivity to Health and Emotional Needs

The virtual classroom opens up an avenue for students to share concerns and similar experiences. Through these routes of communication, students will discover both internal and social mechanisms of coping with their health and emotions.

# Influence: Relevant Learning Theory (I)

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**Learning Theory:** Yee & Bailenson(2007) suggests that virtual avatar may have a very significant impact on real life behaviors and experiences. The research says that the qualities one acquire online can spill over and change his or her conduct in the real life. It essentially shows how having an avatar and experiencing healthy and encouraging experience can actually increases self confidence in the real world.

**References:** Yee, N. & Bailenson, J.N. (2007). *The Proteus Effect: Self transformations in virtual reality. Human Communication Research, 33, 271-290.*

**Influence:** When designing our online learning community space we debated whether we should have student photos or avatars. This research supports our decision to use avatars in our virtual environment as the cyber identity - visual, moving, gesturing - can actually have impact on the behavior in the real world.

**Learning Theory:** Wiggins’ Backwards Design and Perkins & Gardner’s Teaching for Understanding both stress the importance of clarifying learning goals before designing lessons and assessments. Perkins and Gardner ask us to be clear about not what we want students to know but what we want them to understand, they encourage depth versus breadth.

**References:** Wiggins, G., & McTighe, J. (1998). *Understanding By Design.* Alexandria, VA: Association for Supervision and Curriculum Development. pp. 7-19. David Perkins & Howard Gardner Blythe, T., & Associates. (1998). *The teaching for understanding guide.* San Francisco, CA: Jossey-Bass.

**Influence:** After each visit to LPCHS we had numerous design ideas. Each was valuable but there were too many ideas to be incorporated into the design. Like these authors we first set our design goals. Once those goals were clear we worked backwards to select the design features that best met those goals. Similarly, we focused on a narrow set of goals rather than a wide range—depth over breadth.

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**Learning Theory:** Dewey argued that students learn from experiences and that the space that learning happens in affects those experiences. The teacher is responsible for not only guiding the events of learning, but also shaping the environment in which the learning happens.

**References:** Dewey, J. (1963). *Experience and Education.* New York: Collier.

**Influence:** When debating the scope of our project we were considering if we could include the bedrooms where bedside learners study. Dewey shows that we must include this space as the environment these students are in is affecting their learning. This helped us define our project as three different spaces.

## Influence: RLT (II) & Design Inspirations

Finding a Social Bridge

**Learning Theory:** Vygotsky's socio-cultural learning emphasizes the social nature of learning. This social interaction is made possible by tools such as language.

**References:** Vygotsky, L S. Mind in Society: The Development of Higher Psychological Processes. Harvard University Press; Cambridge, MA: 1978.

**Influence:** Our initial focus for bedside learning was on ways to improve learning in that space. We did not think of ways to provide more social learning. As we compared our designs to our goals we recognized the need to provide more social learning opportunities for those who are bedridden or in isolation. While our community space might initially appear to only meet the "fun" needs of school, Vygotsky shows that it also satisfies an important learning need.

### Aha! Design Inspirations From Throughout the Quarter

•**Y2E2 & Visualizing Community:** Three of us visited Stanford's Y2E2 building and talked about how the mural representing scientists and research projects could be used as a model to represent all the students in the hospital participating in bedside and virtual learning.

•**CDM's City w/in a Museum:** The Children's Discovery Museum has a city block recreated within the museum. This helped us see our role as creating a school within a hospital. If CDM has traffic lights, can we have lockers?

•**Print Rich Learning Environment:** The early elementary room at the CDM has words all over it. Our host talked of the importance of a print rich environment. Can we make the elementary school room print-rich?

•**Inspiration from a book club book?**

•**Another inspiration from book club?**

## Assessment: Do these spaces work?

	Assessment Methods & Possible Metrics
Classroom	<ul style="list-style-type: none"> <li>• Surveys of students: Effectiveness of work done before and after. Amount of work completed.</li> <li>• Attendance rates: Are more students coming to the classroom space because it is a more usable space?</li> <li>• Teacher surveys: Is the space better meeting their needs? Do they have to augment or change the space to make it usable?</li> </ul>
Portable Bedside	<ul style="list-style-type: none"> <li>• Change in amount of work completed by bedside/isolation students or changes in study patterns of such students</li> <li>• Survey of students: ease of completing work before and after implementation.</li> <li>• Survey of teachers: ease of working with new system</li> <li>• Time it takes students to change room to “study space”</li> </ul>
Virtual	<ul style="list-style-type: none"> <li>• Usage patterns by students &amp; teachers: how much usage is there? How many students are logged on? How much “academic” work goes on?</li> <li>• Surveys for teachers: Ease of system use? Does system improve connection with current students?</li> <li>• Survey of students: Self image of students in isolation before and after implementation of virtual school space.</li> <li>• Change in amount &amp; quality of work completed by students.</li> </ul>