

A Case Study: Natural Outcomes of Creating Classroom Space

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ABSTRACT

Having empty floor space in a classroom contributes to student achievement, but how open space influences teaching and learning is not as well understood. In this case study researchers coached two teachers in a rural elementary school regarding the reduction of material and furniture, and using storage and classroom organization to support the taught curriculum. The researchers observed the classrooms multiple times to uncover teacher and student behaviors that emerge when a classroom is planned around space. Increasing the amount of empty floor space had a positive influence on affective behavior, organization and opportunities for student learning.

Background

How do teachers create sufficient space for student-centered activities within their traditional classrooms? Student teachers newly trained to develop personalized instructional strategies often express frustration at their inability to create appropriate learning centers and space for large- and small-group activities. These concerns led the researchers to question the importance of classroom space and the potential of space to influence teaching and learning. A clinical investigation of two elementary classrooms whose teachers had altered classroom space led to this case study.

Stake (1995) and Achilles (1999) suggested that there is a need to evaluate the functioning of an uncluttered classroom. "One place to start observing classrooms is to

consider space, space use, and the environment or context of the teaching-learning process” (Achilles, 1999, p. 36). In this study we studied classroom practice and strategies. We present the observations, based mostly on normative data, in narrative form.

We selected classrooms in a rural elementary school because they were accessible and the teachers volunteered to participate. The teachers were individually interested in learning how to arrange a classroom to benefit students. The researchers had previously observed the teachers at work for two days, and were familiar with how the classrooms were used for instruction and learning. Students had become accustomed to the researchers being in the room so the researcher’s presence did not overtly influence student or teacher behavior.

Issue: Given that practicing teachers are untrained in classroom arrangement, how does teaching and learning change when a classroom is planned around the use of space?

Space and Behavior

The design of a room delivers silent but very clear messages to its occupants. People see rooms in different ways. “This means there is a relationship between people and patterns” (Hall, 1959, p. 121). The appearance of a room – how space is used – speaks to people and influences their interactions with each other.

Spatial changes give a tone to a communication, accent it, and at times even override the spoken word. The flow and shift of distance between people as they interact with each other is part and parcel of the communication process. (Hall, 1959, p. 175)

Hall (1975, 1976) focused attention on the study of human use of space and the impact of buildings on human behavior. Hall reported that buildings did indeed impact human behavior. “It is quite clear that everyone sees the building from his/her own personal point of view” (Hall & Hall, 1975, p. 53). It is natural that classrooms enter into a transaction with humans. In schools, teachers become the architects of interior space that is designed for people. “When a classroom is arranged with assigned seats for each child, a teacher is apt to see the Real Classroom as the area where desks or tables are grouped, while viewing the remaining spaces in the back or around the edges as leftover space” (Loughlin & Suina, 1982, p. 26). “However, the arranged environment that is suitable for adults may be entirely the wrong arrangement for kids, who often prefer to use space (floors) horizontally” (Duncanson, 2003b, p. 26). Yet, university classes for pre-service teachers normally do not include classroom arrangement as course content (Tanner, 2000). Thus, teachers tend to copy arrangements they find in other classrooms without consideration of the consequences for students.

Classrooms space impacts how teachers and students behave. Classrooms with a small amount of open space are prone to have inefficient pathways and look cluttered. In part, this situation was caused by the large amount of room teachers reserved for their own use and the large amount of space covered by other pieces of furniture. The arrangement of the furniture hampered natural flow patterns and

created small open spaces that were not useful as alternative places for students to work. Thus teachers more or less identified and assigned the spaces that were to be used by students while working on an activity. (Duncanson, 2003a, p. 90)

Having empty space in a classroom is important. Duncanson's (2003a) research has shown that increasing floor space in elementary classrooms results in higher levels of student achievement in science ($p \leq .05$). Large open spaces provide broad pathways for ease of movement and offer students alternative areas to spread out and work. Space enables groups of students to be doing different things at the same time. Teachers can focus on continuous involvement of all students while students can engage in meaningful conversations with teachers. Teachers can continue to keep an eye on the clock but students are better able to control their own use of time (Duncanson, 2003b). This finding complements research on class size (e.g. Tennessee's Student Teacher Achievement Ratio [STAR]) experiment showed that having fewer students in a classroom is one way to increase space/student and improve student outcomes (Achilles & Boyd-Zaharias, 2008).

The renewed focus on classrooms or contexts for learning is not surprising. Ouchi (2004) noted that, "Structure must change before culture can change" (p. 18). Classroom realignment must happen before teachers can expect improvement in student performance. Removing unneeded materials and reducing the amount of furniture are within the power of teachers. Teachers can create a logical classroom arrangement that embraces learning. But there is more to it than just rearranging the furniture (Cookson, 2006).

Meier (2008) stated that "you have to change the way people act" (p. 59). People can act differently if the environment is changed. Redesigning old classrooms that need 'upgrades' has had a positive impact on teachers and students. A contest for An Extreme Classroom Makeover was sponsored by the Jefferson County (AL) American Federation of Teachers (AFT). The purpose of the contest was to draw attention to the need to upgrade classrooms and schools in the community. The winning teacher gained a new view of teaching.

I feel like anything is possible with my teaching now. I feel more prepared to provide the children with what they need for a promising future. There are places to put things so we don't worry about clutter any more. (Holloway, 2008)

Setting for the Present Case Study

The Indian Lake Elementary School (pseudonym) was built in 1959. The traditional classrooms contain built-in cabinets but no counter space. Two four-drawer metal files and a built-in two-door wooden cabinet provide storage for the teacher and classroom materials. Built-in coat racks and a sink are provided for students. Additional storage is built into the back of the room over the sink and coat-rack area.

Joan (pseudonym) has completed her second year teaching grade two. She previously operated a home-care center for special needs preschool children. She admits to enjoying working with low-performing students. "I seem to gravitate to those kids." She was given the opportunity to move to grade three, in a different classroom, with the

same students she now teaches. Three students will be added to bring the class count to 22. The room Joan will occupy is now used by Jim (pseudonym).

Jim has four years of teaching experience and is leaving grade three materials behind as he is headed with his class to grade four. Many materials that Jim left behind were left to him by a teacher who retired after a 30-year career.

Planning for Space: Furniture and Materials

During summer vacation, the researchers suggested that Joan assess materials left behind in her new classroom and identify what she needed. Joan spent about three days sorting materials to identify what to keep and what to discard. On day one she started with the bookcases. She kept one item in 20. Many discarded materials were from the last century: mimeograph sheets; magazines from 1986; a social studies program from 1988.

Old text books and teacher manuals could not be disposed of immediately. "There is a Board of Education (BOE) process to get rid of old books and manuals but it is time-consuming and involves paperwork. I can't believe how many manuals there are." Several manuals are boxed for disposal following BOE approval but newer teacher manuals are kept. "When I got my first classroom, some manuals were still in shrink wrap. You need to keep them so if you have students who are way ahead of the class; you have some materials for them." While sorting materials, Joan rearranged and dusted books and shelves.

Then there were boxes on the floor. "I had boxed everything [from my old room] to move [here]. There was 40 years of teacher 'stuff' in my old room left behind by the teacher when she retired; I have been told to keep it. I have four pencil sharpeners, eight staplers that do not work, four easels, and a set of books we no longer use. I have a 40-year supply of colored paper. Then I was told to leave supplies in my old room. Money for supplies goes with the classroom and not with the teacher, so I took some 'stuff' back. But I also have the grade-3 'stuff' Jim left behind."

Over three days of sorting, Joan removed things she would not need: a teacher's desk; one 2-shelf bookcase; 2 easels; 8 boxes of old materials; and 1 box of manuals to be trashed after BOE approval.

Planning for Space: Storage

Storage was an issue. "The storage of the reading materials is a major problem. There is so much stuff. Some sets of books here are no longer used." To help with this problem, the principal did find space outside the classroom to store books used only for the plant-science unit.

Joan pointed to a tall, wooden, 2-door cabinet – "This is where I store materials I need on a regular basis – paper, tissues, and teacher manuals." Joan moved math materials that were scattered around the room to a tall metal cabinet. "I will have the special education math teacher working out of my room so I also have to house all her materials. Where was this math stuff before? Why do I have it now?"

Another teacher who is changing grades tried to help Joan by giving her some grade-three materials. “I don’t know if you can use this math stuff but I’m leaving it for you.” She deposited a 4” stack of worksheets, materials for centers, and letters to parents on a table. Joan afterwards lamented, “Why do I get all this stuff?” She looked through the material. “This folder has many 1st day activities, but I have the same kids as last year. They know each other. And I know the new students who will be added to the class. I invited them into my class for short periods at the end of the school year. That way they got to mingle with the class. Besides, they knew all the kids already because they have been in the same school.”

“I have enough colored paper for three classrooms. Hopefully the math stuff will get moved to each classroom. I don’t understand why I have all the stuff. The paper will get distributed too. And I have a lot of storage containers here. If I don’t need them I will take them home. Next is to get some stuff into other classrooms.”

Planning for Space: Room Arrangement

Joan’s room has 783 sq. ft. of space (27’ x 29’). Student seating is provided at six round tables that each seat four students. Joan was asked about the spaces she needs for whole-class meetings, instruction, and small-group work. Jim indicated that one chalkboard in Joan’s new room had something sprayed on it and does not function well. We asked Joan which board she will probably use and she selected one toward the center of the front wall. To make the chalkboards accessible, the bookcases in front of the chalkboard were moved to the side of the room under the windows.

We suggested the computer tables stay flat against the side wall rather than jut out into the room as mentioned by Jim as an alternative. This arrangement allowed for a straight pathway for students to enter the room and move to the coat-rack built into the back of the room. The ‘morning message’ can be placed on the wall next to the student coat-rack. Student work can be placed on the tack-board above the computers.

That decision, and moving the bookcases, opened a wide pathway across the front of the room and indicated where to place the student tables. The six student tables were arranged in two rows of three in front of the chalkboards. A small table was placed to the right of the door to serve as a place for students to record attendance and sign up for lunch.

Moving tables toward the front of the room opened spaces in the back of the room. The kidney shaped table (used for reading groups) was placed in the back of the classroom in front of two teacher cabinets. This opened a large floor area in each back corner. The back right corner will be used for the morning meeting. The back left is in front of the coat-rack and a sink, and has no special designation (free space).

We tell Joan that we remember her using five portable activity centers in her old room. We asked how she would handle that situation in grade-3. “Teachers tell me they use fewer centers in grade-3. I don’t plan to have large centers. I can do centers in a bucket where kids pick an activity to do and then they can do it anywhere. The buckets can be placed on any of the tables.”

Joan liked the arrangement. She had additional plans: go through some other materials to determine what could be discarded in the hope that the teacher manuals can be moved into a cabinet and a bookcase can be eliminated to make room for a book stand; purchase a soft floor material for the ‘morning meeting’ area; and move some materials to other classrooms.

Jim was a patient listener and duplicated each of Joan’s efforts in his own room. Jim reduced the furniture by getting rid of his teacher’s desk, and three pieces of non-school furniture that the previous teacher had used for “holding things.” He reduced the amount of paper material by 50%. With more room and less paper, he improved his filing system so everything had a proper place to be stored. Books were categorized by reading level and placed in bins rather than being arranged in a library. Jim’s room has 840 sq. ft. of space (28’ x 30’). The walls are painted yellow. He copied Joan’s furniture arrangement in his room. The walls have been transformed to be utilitarian and a useful teaching tool. Pocket posters for attendance, lunch orders, and hall passes were created and hung on the wall near the classroom door. He reduced the wall decorations to focus on the topics being taught. A round table was used to hold an activity center or group activity materials.

In addition to six round tables for student seating, both rooms contain five moveable 2-shelf bookcases holding student texts, reading materials, and games. Five computers sit on rectangular tables. A small table, a stool, a kidney shaped table, a metal storage cabinet, two file cabinets, and a book rack complete the furniture in each room.

Space = Improved Learning Environment

By removing the teacher’s desk, excess furniture, and unneeded materials, the teachers gave empty floor space back to the students. By using round tables in place of individual student desks, they eliminated narrow pathways between desks that are not useful as student work areas. At a minimum, they added 80 sq. ft. of open space to the classroom for student work

Space created in the classrooms was quickly put to good use. Jim reported, “That meeting space we created in the back of the room has been great. I use the open area now because its there. We use it to do more fun reading as a group. The kids love it.” Joan also reported an increase in the amount of time students spent reading. “Getting rid of the junk has been a good thing. I now have more reading materials out for the students so they are reading more than before.”

Jim appreciated his new room arrangement. “Teaching space in the room is more flexible than ever. We have had three speakers talk about the upcoming elections. We needed a larger space so we just moved the tables. It was easy.” Jim had space to add a portable SmartBoard to the room. In her old classroom, Joan was not able to gather her class comfortably on the floor in front of the chalkboard. By moving one table she has enough room for everyone to gather for instruction or student presentations. By moving the tables to the back of the room she was able to accommodate three classes of students to watch the presidential inauguration.

Students use different parts of the room on a daily basis depending on the activity. Wide pathways enabled students to move around without bumping into each other. Given the choice of where to work, most students are found on the floor. During a quiet reading time in Jim's room 11 students headed for the floor: 7 sat against a wall while 4 moved to the middle of an open space. Seven students remained at their desks. Everyone appeared to be at ease in the location she/he selected. In Joan's room, even when directed to stay at their seats, pairs of students moved to another space in the room while testing each other using flash cards.

The open spaces in the room are different sizes and are used in a variety of ways: whole- group instruction, small-group projects, activities for pairs of students, and for individual work. Group work was conducted in one of the large open spaces while other students worked on a different activity at a table. The distance between the two groups has reduced the distraction level. Both teachers concur that distractions were a bigger problem with students at individual desks.

A migration map created during a visit to each room showed that students and the teacher used the entire room: all the floor space has been used by a student during the day. The broad pathways allowed students to move freely from one activity area to another. The teacher could be found in every part of the room speaking to each student: teacher-student contact increased.

We asked both teachers, "Without your desk how do you do your planning?" Jim said, "I now have more folders for the children – that organized the stuff I used to have on my desk. Best thing I ever did was get rid of my desk. I work at the kidney-shaped group reading table. I put all the stuff I need in here. (Jim showed me a plastic milk crate with 4 hanging file folders. It is stored on ½ of a shelf in a locked cabinet.) I don't have a place to lay things down. I have to deal with everything immediately: toss it or put it away. There is no more clutter. It is wonderful." Joan stated, "I use the kidney shaped reading table. I have more space to spread out on the table than I ever had on my desk. I do miss my desk as a place to put things down during the day. I don't need a big desk: just a little place to put things down."

In both classrooms stuff that was stored in book cases has given way to bins of student materials. Students are not heard asking where things are located: needed materials are in the open and students know where things are kept. Materials students use on a daily basis (pencils, pens, crayons, markers, etc.) are in containers on top of the tables. Students are not looking in a desk for a pencil and distracting other students. Each table has a designated helper to pick up texts when they are needed.

The round tables for student seating are popular with both teachers. Joan reported, "The tables are better than the desks; even with the desks in clusters. Often the desks are different heights which doesn't give you a flat surface. The bigger table surface helps kids with tests. Often the test papers are several pages stapled at the top left corner of the page. The extra room on the table allows kids to open up the test pages and still have room to work." Jim has students use plastic pocket-folders as a barrier. Students who desire privacy stand two folders on end to create a wall. In a testing situation, only five students elected to build a wall.

A class routine focused on neatness and order has evolved. At the end of the day, students are seen picking up anything on the floor: pencils, crayons, erasers, and paper

waste. Jim reported, “The custodians love the room. The kids put the chairs against the front wall in the afternoon. The custodian can clean the floors quickly because nothing is in the way. My floors get mopped every day. They are clean so the kids don’t mind sitting on them.” The custodian agreed that the rooms with tables were easy to take care of: He only had to deal with dust. Both teachers introduced plants into their rooms and decreased the amount of distracting paper on the walls. A soft and inviting atmosphere filled the room. The classroom delivered a message: This is a nice place for learning. Both teachers admitted to enjoying their workplace: it is clean and comfortable.

Concluding Remarks

While the nature of instruction has changed, traditional-style classrooms still exist. Research suggests the need to plan classroom space that is effective and efficient for instruction and work areas conducive to student learning. Careful consideration of the type and amount of materials and furniture in a classroom is necessary. Although rearranging furniture may appear at first to be a superficial modification, there is evidence that creating larger, freer spaces leads to improved teaching and learning. Among the observed advantages of increased space are:

- Space is used in new ways to support learning
- Classroom organization is improved
- Flexible room arrangements accommodate special events
- Easy flow patterns are established
- Teacher-student interaction increases

The authors suggest that model classrooms with similar, carefully designed arrangements be established in schools at all grade levels. Teachers using newly arranged rooms can provide both anecdotal and measureable evidence on the immediate and long-range effects of teaching and learning. School administrators can support these teachers by supplying, if necessary, new furniture and storage supplies. Long-term studies on larger numbers of rearranged classrooms are recommended to help us better understand the impact that increased and improved space has on student performance.

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