

Entering School: How Entryways and Foyers Foster Social Interaction

**Holly Ogden
Rena Upitis
Julia Brook
Anna Peterson
Jennifer Davis
Meagan Troop**
*Queen's University
Kingston, Ontario, Canada*

Citation: Ogden, Holly, Rena Upitis, Julia Brook, Anna Peterson, Jennifer Davis, and Meagan Troop (2010). "Entering School: How Entryways and Foyers Foster Social Interaction." *Children, Youth and Environments* 20(2): 150-174.
Retrieved [date] from <http://www.colorado.edu/journals/cye>.

Abstract

The research reported in the present paper explored the architectural features that help to facilitate opportunities for social interactions in the entryways and foyers of elementary and secondary schools. The sites for the study included six elementary and secondary schools in Canada, Germany, and Iceland. The study used photographs of entryways and entrance foyers as the primary data sources for the architectural features of each school. Researcher observations and field notes, as well as interviews with students, teachers, and administrators complemented the content analysis of the photographs and provided information about how the entryways impacted social interactions. The data analysis revealed six core themes of architectural qualities that affected how students, teachers, and administrators experienced their surroundings and interacted with one another. Our research provides evidence that the physical features of entryways and foyers play a role in how children and adults interact, engage, and feel in their schools.

Keywords: schools, school entrances, social interactions, architectural patterns, pattern language

Context and Objectives

Although not as much media attention is given to school architecture as is given to curriculum methods, assessment, teacher education and teacher competency, educator Nel Noddings (2006) notes that many of the challenges faced in school communities are related to the ways that school buildings and grounds are designed. This study is part of a three-year research program exploring how school architecture shapes the nature of learning.

Noddings (2006) and American environmentalist David Orr (1999) both make the sobering observation that place has no particular standing in contemporary education. Orr claims it is easy to overlook the importance of place in schooling because schools are immediate and mundane, and as such, may not contribute to a sense of place nor promote learning in ways that honor complex interactions amongst students, teachers, and their learning environments. In keeping with Orr's conclusion, architect William Bradley (1998) finds that most school construction is set in motion to renovate or replace unsafe or overcrowded facilities. Further, innovative designs often meet with opposition because there is a perception that such designs are necessarily more costly. Perhaps most significant of all, the public simply does not think about how natural and built environments affect education (Bradley 1998). Accordingly, the research reported in the present paper was designed to determine the ways in which students and teachers respond to school entryways and foyers, and the extent to which those responses could be analyzed in terms of architectural features.

We examined the first impressions made by school entrances and how those impressions might impact social interactions. We then examined foyers in terms their ability to host groups of people in terms of the physical spaces available for social groups to form, and in terms of whether the environment invited people to transform the spaces from mere physical environments to places with particular social meaning.

Theoretical Frameworks

In this section, we examine both conceptual and empirical literature that relates to how architectural features contribute to social interactions, as well as how such features help to develop a sense of place and belonging. Three broad categories are considered: (a) social learning theories as they relate to architectural design, (b) place and space, and (c) an architectural pattern language. We hold the view that social learning has the potential to be enhanced when students develop a sense of place, and that there are particular architectural features that can contribute to this sense of place and foster social interactions. While the relationships between these three areas of the literature extend beyond entryways into other school spaces, this extension is beyond the scope of the present paper.

Social Learning Theories and Architectural Design

Social learning theorists (Lambert and Chasteen 1998; Vygotsky 1978) explain human behavior in terms of the reciprocal interactions between cognitive, emotional, and behavioral functions and environmental influences. Opportunities for learning in a social setting can be enhanced in a physical space where individuals

can “bump up” against one another (Davis and Sumara 2006) and observe one another’s behaviors, attitudes, and outcomes (Bandura 1976). Vygotsky (1978) claimed that most learning happens through a complex process of social interactions. Our premise in this research is that learning can be enhanced through social interactions in the Vygotskian sense when architectural features support informal social interactions.

Other environments designed to support learning and living can also be impacted by architectural designs, but these designs have not been extensively described in terms of human experiences of the built environment. For instance, in Marsden’s (2005) work on assisted living residences, he claimed that “architectural theories have been used to generate designs based on professional acceptance of how environments should be, but they have been weak in predicting what designs will be like when built” (38). His empirical work resulted in a conceptual framework with six salient constructs, derived from the residents’ perspective of humane assisted living environments: (a) familiar housing cues, (b) protective enclosure, (c) caring cues, (d) human scale, (e) usability, and (f) naturalness. Our research will determine the extent to which these characteristics are applicable to the entryways of the schools we examined. We have chosen to apply these characteristics of assisted living to a school evaluation because they were generated by users’ perspectives and because we believe that both kinds of buildings are designed to support learning and living.

In order for social learning to occur, there needs to be adequate space that is both functional and comfortable, so that people will choose to engage in social activities. Entryways and foyers can play a particularly important role in this, as they are the spaces that are accessed daily by the school community—students, teachers, parents, school staff, and school visitors. Entryways, therefore, not only set the tone for the type of interactions that are valued at the school, but also provide a welcoming space for people to gather and exchange ideas. One way of conceptualizing these spaces is through the notion of “affordances” described by psychologist Eleanor Gibson and her colleague Anne Pick (2000), building on the earlier work of James Gibson (1977; 1979). An “affordance” refers to the fit between a person’s capabilities and environmental supports or obstacles; thus, a path leading to a destination can contain affordances that support the journey—such as a smooth terrain, or that create obstacles—such as unexpected objects directly in the way of the traveler. An architectural affordance for social interaction in an entryway might include places for students to sit or an inviting gathering space filled with natural light. An implication of this research is that entryways ought to provide architectural affordances for social interactions so that social learning might result.

Place and Space

Malpas (1999) distinguishes between space and place. Space is that which can be found on a map, that is, a physical location. Place refers to the character, emotional connections, and sense of belonging that accompanies a physical location. “A place in which one can dwell is a place that provides a space in which dwelling can occur—it ‘gives space’ to the possibility of dwelling—and yet a place to dwell must

be more than just a 'space' alone" (22). Malpas asserts that while the notion of place is commonly seen as secondary to spatiality, and is often simply considered as a location within a space, place, in fact, is "integral to the very structure and possibility of experience" (32). In schools, entryways and foyers can help establish a sense of place for the school community.

This research examines the architectural features that help to facilitate opportunities for social interactions and learning to occur in the entryways and foyers of elementary and secondary schools; in particular, how these spaces become places to dwell (Malpas 1999; Upitis 2010). Consideration is often given to classroom features since classrooms are recognized as the main spaces in which learning occurs. However, students spend many hours outside the formal learning environments provided by classrooms in entryways, hallways, outdoors, and moving from one space to another. Time spent outside of classrooms, while often informal in nature, also contributes to the overall school experience. Learning that happens in these non-designated learning spaces can be even more powerful than the formal learning enacted in classrooms and other teaching areas, such as gymnasiums and libraries (Upitis 2010). Parents, community members and teachers also need informal spaces to meet, and people who are not part of the everyday functions of the school need to feel welcome when they arrive at a school. Spaces such as entryways and foyers are important for the social interactions that help create a sense of place.

We now describe a theoretical framework with which to analyze the architectural features of entryways and foyers. These features are described not only in physical terms, but in terms of the ways in which they influence perceptions, feelings, and behaviors, thereby supporting the development of a sense of place where meaningful social interactions are likely to occur.

A Pattern Language

An architectural pattern language provides us with a theoretical framework for talking about the architectural features of schools, and relating these features to the kinds of social interactions that occur in these spaces. In the late 1970s, architect Christopher Alexander and his colleagues published *A Pattern Language*, now considered a classic text on design (Alexander, Ishikawa and Silverstein 1977). Alexander's aim was to provide a sourcebook of "patterns" for the built environment that are derived from human behaviors and perceptions. Alexander referred to recurring problems in the built environment (e.g., large parking lots) as "patterns" for which he offered a core solution and related it to other patterns in the environment (e.g., how *small parking lots* can be created in urban settings in conjunction with the patterns *green streets* and *work communities*). One of the key premises of the approach is that patterns relate to one another. Fundamentally, Alexander's approach offers an architectural language capable of describing learning environments. For example, the patterns of *activity pockets* and *alcoves* encourage small group interactions, while the patterns of *warm colors* and *green areas* create welcoming environments and draw people into spaces.

In order to determine the effects of design on student achievement, Tanner developed a school design scale based on Alexander's patterns (Tanner 2000; Tanner and Andersen 2002). Tanner first identified Alexander's patterns that applied to school buildings and grounds such as *green areas*, *play areas*, *flex zones*, *small group areas*, *large group areas*, *outdoor rooms*, *acoustics*, *windows*, *pathways*, and *natural light*. He then examined 44 elementary schools and rated them in terms of the architectural patterns. The architectural pattern ratings were then correlated with achievement measures on the Iowa Test of Basic Skills. While achievement measures are a limited way of assessing the effects of architectural patterns, Tanner's research nevertheless shows that school architecture can play a positive role in school communities. Specifically, after taking into account socio-economic variables, Tanner concluded that some of the best predictors of achievement in language and mathematics were *pathways* (schools that had clearly defined areas for freedom of movement), *positive outdoor spaces*, and *overall impression*. Yarbrough (2001) and Andersen (1999) applied Tanner's design scale to other elementary and middle schools and identified architectural patterns that would support the emergence of social learning. *Small group areas*, *large group areas*, and *pathways* were most significant.

We expected that other patterns developed by Alexander (Alexander, Ishikawa and Silverstein 1977) would also be important if indicators in addition to scholastic achievement were used to examine student and teacher responses to school architecture. In particular, architectural patterns affect social relationships, physical responses, and students' and teachers' responses to the natural world. Thus, the relationships between architectural patterns, pedagogy, place, and the ways that teachers and students experience the foyers and entranceways into their schools, form the focus of our study.

Methodology

Setting

We selected six schools to reflect a variety of school types, teaching philosophies, geographic locations, and cultural settings. The study includes two publicly funded schools in Canada, chosen to represent students at the elementary (Kindergarten to Grade 8) and secondary (Grades 9 to 12) levels. We selected three schools in Germany; one publicly funded church-based school for students in Grades 5 to 12, and two semi-publicly funded Kindergarten to Grade 12 Waldorf schools. We also included one publicly funded purpose-built school in Iceland for students from Grades 1 to 10. Each of the schools is briefly described below to provide a context for the architectural features and kinds of learning activities that take place in them.

Centennial Secondary School, Ontario, Canada

Centennial is a secondary school (Grades 9-12) in a mid-sized city in Ontario, Canada. The two-storey aluminum-sided facility was built in the 1960s and represents a typical publicly funded Canadian secondary school (Figure 1). Situated in a residential area, the school has a large playground and the adjoining parking lots are used after school hours by the community. Teachers at Centennial follow a

traditional provincially mandated curriculum, focusing primarily on mathematics, sciences, and language. Centennial is fully accessible to people with physical disabilities, and has an adjoining greenhouse and a full-stage auditorium. The actual school entrance, however, is difficult to locate along the flat face of the building, and the foyer has no apparent place for students to gather.

Figure 1. Entrance to Centennial Secondary School, Ontario, Canada



Riverheights Elementary School, Manitoba, Canada

Riverheights is an elementary school (K-8) in Manitoba, Canada. Teachers follow a provincially mandated curriculum with compulsory subject areas including language arts, mathematics, science, social studies, physical and health education, and arts education. Built in 1979, this school was designed as a “low-profile” building, whereby the majority of the facilities are underground (Figure 2). This school was also designed as an open-concept building. However, since it was opened, walls have been erected between classrooms; nonetheless, most rooms remain open to the hallways. This building was designed in pods, where hallways lead to groups of classrooms (early years’ and middle years’ groups). Each of the hallways from each pod leads to the library, which is at the center of this one-level school. Riverheights is accessible to students with physical challenges. Some of the special instructional spaces include an Industrial Arts room and a Home Economics room. Entry into the school involves various sets of exterior staircases that lead to steel doors underground. The main foyer is not a large space and has no apparent place for children or adults to gather.

Figure 2. Exterior of Riverheights Elementary School, Brandon, Manitoba



Köln Freie Waldorfschule, Köln, Germany

Köln is a Waldorf school (K-12) built in 1997 (Figure 3). The school has a round central structure that is the heart of the building. The main floor serves as the foyer, which is visible from all of the classrooms, and they can be accessed from this central point. Teachers at the Köln Freie Waldorfschule follow the distinctive approach to educating children that is practiced in Waldorf schools worldwide. The main subjects, such as history, language arts, science and mathematics are augmented with handwork (knitting, crochet, basic weaving, toy making and woodworking), music, foreign languages, art, and movement. The school has out-buildings for woodworking, stone work and after-school programs.

Figure 3. Exterior of Köln Freie Waldorfschule, Köln, Germany



Freie Waldorfschule, Darmstadt, Germany

Freie Waldorfschule Darmstadt is an urban school, easily accessible by public transportation, just south of Frankfurt, Germany. The school serves approximately 600 students from Grades 1 through 12. Teachers at Freie Waldorfschule follow a curriculum similar to that described in Köln. The three-storey building was first constructed in the 1960s, with additions phased in over several decades thereafter. The overall shape is irregular (Figure 4). There are two wings, perpendicular to one another, meeting in a central exterior courtyard. At the time we visited the school, there were plans for the courtyard to become a theatre space once funds for the project were in place. There are rounded corners and irregular shapes featured throughout the building and on the exterior.

Figure 4. Aerial view of Freie Waldorfschule, Darmstadt, Germany

***Evangelische Gesamtschule Gelsenkirchen-Bismarck, Germany***

Gelsenkirchen-Bismarck is a Protestant comprehensive school, Grades 5-12, located in one of the most economically challenged and culturally diverse parts of Germany. The school occupies a former meadow near the heart of the suburb, set between an old school and local sports facilities. At the time of our visit, it had reached its planned capacity of 1100 students. Gelsenkirchen-Bismarck was purposefully-designed as a comprehensive school that would not only serve the diverse neighborhood, but also become a community center. Construction began in 1997, with the main “street” conceived of as a village, with a group of buildings clustering around a central atrium (Figure 5). The entrance is flanked to left by a cafeteria and to the right by the library, which is surrounded by a pond. The music rooms and chapel are located above. A theatre, science labs, and various teaching spaces are conceived as shops along the street. The complex ends in a courtyard adjoining woodworking and technology workshops. There is a large new sports hall to the east of the complex. Starting in 1997, five new classrooms, arranged like row houses, were added each year until the building was completed six years after it

was started. Students and parents were actively involved in the design and construction process. The entire public domain is both for students and for local community members, who can put on plays in the evening, or use the workshops and sports facilities. The school remains open to the neighborhood and forms one of the cultural centers of the district.

Figure 5. Pathways at the Evangelische Gesamtschule Gelsenkirchen-Bismarck (Evangelical Community School of Gelsenkirchen-Bismarck), Germany



Lækjarskóli, Hafnarfjörður, Iceland

Lækjarskóli is a purpose-built urban school in Iceland located in a protected nature area serving approximately 550 students from grades 1–10. Purpose-built schools are defined as those that (a) facilitate the "...generat[ion] of knowledge through the use of many learning methods and activities" (Upitis 2004, 32), and (b) that are in harmony with their natural and cultural surroundings (Upitis 2010). The school, completed in 2002, is the result of a public-private partnership between the city of Hafnarfjörður, a private company, and the government. Lækjarskóli is built mainly of glass and steel, and the curved wall of windows in the dining hall is patterned on the sweep of the original access road through the lava field (Figure 6). Teachers at Lækjarskóli follow National Curriculum Guidelines and core subjects include Icelandic (grammar and literature), mathematics, foreign languages, natural science, social science, religious study, arts and crafts, and physical education with compulsory swimming practice. Lækjarskóli offers general teaching classrooms, as well as specially designed classrooms for woodworking, textile crafts, music, art, cooking, science, and computer technology.

Figure 6. Exterior of Lækjarskóli, Hafnarfjörður, Iceland

Data Collection

Data were collected at the six school sites.¹ The school buildings we selected in Canada, Germany, and Iceland provided a comparative analysis of school entryways and entrance foyers across cultures and geographic regions. At each of the six schools we took photographs, completed checklists, kept field notes of our observations, and conducted semi-structured interviews with students, teachers, and administrators.

Photographs of entryways and entrance foyers served as the primary data source for the *architectural* features for each school in the study, with checklists and field notes serving as secondary data sources for the school architecture. We took hundreds of digital photos over a six-month period from the fall of 2008 to spring 2009, and selected 25 photos from the six sites for analysis. Photographs were only selected if they included three or more of Alexander's patterns. Researchers also completed a checklist comprised of entryway features based on the work of Alexander (Alexander, Ishikawa and Silverstein 1977) and Tanner and Lackney (2006) to supplement the photographic data.

Interviews with teachers, students, and administrators were the primary data source regarding the *uses* of the entryways and foyers, and served as a secondary source of data regarding the architectural features of the school. The semi-structured interviews were conducted with students, teachers, and administrators; although all three populations were not represented in the data from each site since the number of interviews depended on the subjects' availability. In total, we interviewed 18 students, seven teachers, and two administrators. The interviews focused on how foyers and entranceways were used, and how individuals perceived

¹ Prior to contacting potential participants, we received ethical clearance from the General Research Ethics Board (GREB) at Queen's University, Canada. Implied or active consent was obtained from all interview participants, and the schools and/or their school boards agreed to be referred to by name.

these spaces, both in terms of aesthetics and social function. Researchers kept detailed field notes on the ways in which students and teachers interacted with one another in the entryways to supplement the interview data. The architectural checklists and use-related field notes helped to consolidate our shared experiences of the spaces and served as a source of triangulation when we coded the photographs for architectural features and analyze the interview data for social interaction content.

Data Analysis

We entered all of the photos into ATLAS.ti (v6, 2009) to assist in the sorting, coding, organization, and analysis. We followed a two-step data analysis procedure. In the first phase, the analysis was based on a large number of Alexander's patterns (Alexander, Ishikawa and Silverstein 1977). In the second phase, we collapsed codes based on the salient themes that emerged both from the photo data and the interviews.

In order to increase reliability and enrich the analysis, three researchers coded each photograph together. Each code and photograph was openly discussed in a systematic fashion.

We started the analysis process by taking Alexander's 253 patterns and selecting the 98 patterns most relevant to our study. Through a discussion with the full research team, we condensed and modified these codes to 50 in number.

Using these 50 codes as a starting point, we began to analyze the photographs. During this first phase of analysis we added to the list of codes by creating opposite codes to Alexander's patterns (*non-living courtyards; poor entrance transitions*) and by removing codes which did not appear in more than one photograph or did not enrich the analysis (e.g., *animals, building fronts, four-story limit*). Redundancy was another factor in the deletion of codes. For example, *filtered light* and *indoor sunlight* resulted in a duplication of codes because all of the filtered light in the photographs was caused by sunlight. Through this process, we deleted 20 codes because of redundancy or because they did not apply. Ultimately, we identified 32 important features as a result of coding the photographs, interview data, and field observations, most of which originated directly from Alexander's patterns. These included *connection to the earth, feeling pride in a space, indoor sunlight, open stairs, natural doors and windows, and social interactions*. After a discussion with all researchers on the team during two separate data analysis sessions, the 32 features were grouped into six themes.

In the second phase of analysis, we examined the interview data beginning with the six themes derived from the photo analysis. Two researchers worked together in coding each interview. We systematically examined the transcripts using the six themes, taking care to represent the views from all members of the school communities. We also were open to new themes emerging from the interviews that were not incorporated in the first phase of analysis. However, no new themes emerged from the interview data.

Results

The six themes that emerged from the analysis of the photographs, field notes, checklists and interviews were: (a) gathering spaces, (b) movement patterns, (c) greenery and water, (d) aesthetic features, (e) natural light and windows, and (f) warmth. These themes are at once both social and architectural. For example, movement patterns can be described in terms of how architectural features—like hallways—shape the flow of traffic. However, they can also be thought of in terms of human and social interaction. For example, a narrow hallway can limit informal student interactions as students need to keep moving to reach the next space.

The six themes are explored below in detail, highlighting both the features as described by Alexander (Alexander, Ishikawa and Silverstein 1977) and how students, teachers, and administrators interacted and experienced their surroundings.

Gathering Spaces

Gathering spaces include Alexander's patterns of *activity pockets*, *built-in seats*, and *common areas at the heart*. Gathering spaces in a school building promote a sense of community. According to Alexander and colleagues (1977), these patterns can never be designed in one fell swoop, but are rather designed over time so that the community will create its own gathering spaces.

Activity pockets are small, partly enclosed areas at the edges of public gathering spaces. These pockets create a natural area for people to pause and get involved. An example of such a space is in the foyer at Lækjarskóli where sofas and a billiard table border both the foyer and the dining hall. In this school, these sofas are the closest pattern to Alexander's *built in seats*, given that the sofas are considered a permanent fixture of that part of the school (Figure 7). Together, the sofas and billiard table create an area that is a gathering place for senior students. Many students described using the sofas during breaks and before and after school, and identified the area as an important social space, noting that "everyone is in one group by the sofas just chatting and hanging about." Another student echoed this sentiment:

I like the sofas, they are comfy and they're simple, and they're kind of large and we stuff ourselves in them. We are usually like nine or ten together in one sofa, so it's just everybody is on top of everyone else and you're just scrambling about and trying not to fall off.

Figure 7. Foyer at Lækjarskóli, Hafnarfjörður, Iceland

We discovered that even a school without a special entrance foyer will still be used by students as a gathering space. Although the secondary school in Eastern Ontario did not have a large entranceway, for example, students still gathered there as often as possible.

According to Alexander (Alexander, Ishikawa and Silverstein 1977), *common areas at the heart* are designed to architecturally provide a single common area for a group. These areas are located at the center of all the spaces that a group occupies, and designed in such a way that the paths that go in and out of the building lay tangent to them. An entryway and foyer that exemplifies a *common area at the heart* was a part of the purpose-built Gelsenkirchen school in Germany. Upon entering, the first thing we heard was the sound of a waterfall hidden by an indoor grove of olive trees. There was a café-like feeling created by tables and chairs where students gathered on arrival at school and during the day. This foyer was lauded by students, teachers, and administrators; many comments during the interviews focused on the kinds of positive social interactions that took place in the foyer. The school administrator commented on how the café was often used as a place for students to compare homework assignments or to arrange times to meet for social events.

As described above, the underground school in Manitoba was designed as an open-concept school. In this sense, much of the school is a common area. While teachers spoke of wanting more private space, they also acknowledged the benefits of the

open space in facilitating collegial discussions and an increased sense of community. One primary teacher explained:

One of the biggest benefits that I have seen here is that the communication between the adults and the kids in the area is tighter. We all take more responsibility for all the kids.... We all work together better and we communicate with each other and the kids better (Grade 1 teacher, Riverheights).

Another teacher echoed this sentiment, noting that because of the open-concept structure of the school:

I think everyone sees what everyone else is doing more and that's not a bad thing. I mean this is a place that's known for its staff not being isolated from each other. Everybody, they work together, they pull together and I think a lot of that is because of the open area (Resource teacher, Riverheights).

Movement Patterns

The theme of movement patterns incorporates Alexander's patterns of *families of entrances, pedestrian streets, and building complexes*. This theme emerged as a prominent one, incorporating many of Alexander's patterns. Movement patterns play a critical role in the social interaction that occurs in a building. This interaction can occur more easily when people rub shoulders throughout the day—so long as such shoulder rubbing does not actually inhibit free movement through space.

Figure 8. Classrooms at Gelsenkirchen-Bismarck



Families of entrances are broadly similar and are each visible from all the others. These structures exist so that a person can easily navigate around an area. The classrooms at Gelsenkirchen are strong examples of this theme because of the way

that the separate buildings are arranged as if they were townhouses along a street (Figure 8). Members of the school community reported that not only did students and teachers treat the spaces between buildings as a street, but members of the surrounding community also used the walkways throughout the day. In this way, students at Gelsenkirchen-Bismarck not only interacted with their peers and teachers but also with mothers pushing babies and community elders.

Another way that movement patterns can be promoted is with the use of *pedestrian streets*, where many entrances and open stairs make it possible to go directly from upper storeys to the street (or hallway), and so that movement is fluid between storeys and from indoors to outdoors.

According to Alexander (Alexander, Ishikawa and Silverstein 1977), when building complexes are connected by arcades, pathways, and shared walls, they bring about more social interactions in spaces. Teachers at Riverheights, the underground school in Manitoba, had positive comments about the movement patterns in their open-concept school (Figure 9). One teacher noted that there are almost two ways to get anywhere in the school. Another discussed the ease of movement, noting:

Well it's easy to move around from one room to another, that's for sure. It's easy, we're all hallways. Hallways that are wide, which is really nice, that's a bonus in this building. There's always lots of room. You can have kids working in the hallway on projects on the flow and you still have room for classes to pass by (Grade 2 teacher, Riverheights).

Figure 9. Open-concept space at Riverheights



Greenery and Water

The theme of greenery and water incorporates Alexander's patterns of *roof gardens, trees in the foyer, accessible gardens, climbing flowers* and *waterfalls*. Alexander (Alexander, Ishikawa and Silverstein 1977) felt that buildings should

become part of the natural world through the incorporation of live materials (plants and water) in the building process and building decor. Alexander went so far as to claim that the boundary between the building and the earth should be ambiguous.

The importance of greenery and water was discussed by many participants who expressed their affection for features such as still water, climbing plants, living roofs, and accessible greens. When we visited the Köln Freie Waldorfschule, the external entryway did not announce itself. However, the minute we walked in the door we all gasped at the beauty of the central structure (Figure 10). The foyer was vibrant, alive, active, and beautiful. Reaching more than three storeys high, the foyer was topped with a round skylight. Trees and climbing plants surrounded a water source.

Figure 10. Foyer in Köln Freie Waldorfschule



When students were asked about their favorite spaces within the school, many cited the main foyer. In an interview with three girls in the ninth grade, they all agreed that their favorite features in the school were “the skylight, the openness, water, and the plants.” These girls also reported spending free time in the main foyer whenever possible.

One of Alexander’s patterns is *still water*. He claimed that in each house cluster and work community, there should be water. At Gelsenkirchen, water is prominent: access to some of the classrooms and the library are by pathways that have been built over water (Figure 11).

Figure 11. Pond and Library at Gelsenkirchen-Bismarck



Aesthetic Features

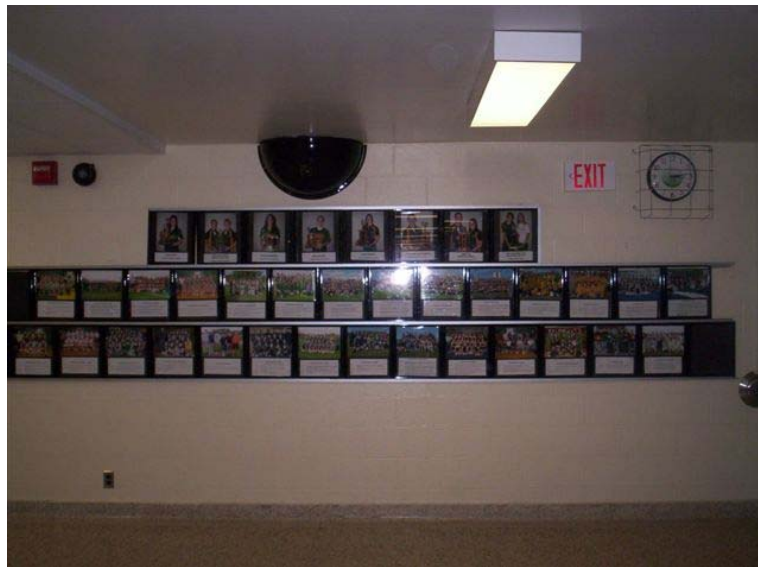
The theme of aesthetic features incorporates Alexander's patterns of *cascade of roofs*, *ceiling height variety*, and *natural building materials*. The kinds of materials used in the building process contribute to the overall aesthetic of an entryway. The entrance to the dining hall at the K-12 Waldorf School in Darmstadt, Germany, lent a sense of warmth and openness through the use of floor-to-ceiling glass windows and wooden doors. The natural building materials gave a feeling of connection between inside and outside spaces (Figure 12).

Figure 12. Entryway from yard to dining hall at Freie Waldorfschule Darmstadt



By contrast, the entrance to the secondary school in Eastern Ontario is far less inviting. It combines aluminum siding and cement block with poured concrete walkways, and is edged with low shrubs and a few annual flowers in summer. The metal doors are windowed with wired glass. While aspects of this school entrance were unappealing to many students, the foyer was a high rotunda, with a very open feel. The foyer's walls are lined with photographs of past sports teams, clubs, and administrators and while the architectural features may not be stellar, students consistently reported a feeling of pride in their school foyer (Figure 13).

Figure 13. Front Foyer at Centennial Secondary School



The aesthetic features of these foyers align with Alexander's pattern of *ceiling heights*. He noted that ceiling height should vary continuously throughout a building, especially between rooms which open into each other. In this way, the relative intimacy of different spaces can be felt. In particular, rooms meant for large gatherings should have high ceilings (above ten feet) whereas rooms for smaller gatherings should have lower ceiling heights.

Natural Light and Windows

The theme of natural light and windows incorporates Alexander's patterns of *indoor sunlight*, *windows that open*, and *windows that overlook life*. The presence of windows in buildings is assumed by Tanner and he therefore focused most of his attention on window placement, and the size of the windows. In some school buildings, however, the presence of windows is limited; when present, this source of natural light is noticed as an important feature. For example, at Riverheights, which is underground, working under the skylight was one of the favorite places in the school. Thus, *indoor sunlight* was an important feature of the underground school. As a teacher explained, "I like the natural light. It comes into the library from the skylight. I like that it has a kind of welcoming and warm feel to it."

Windows that open wide should be easy to get to and open to natural breezes, things you want to smell, and views of paths where you might want to walk. Unfortunately, there are not many windows in either of the Canadian schools observed in this study. As one student in the Ontario Secondary school noted:

There's not too many windows in this school and some places are pretty bad. I think the way the halls are on the outside of the school should be rearranged... it's the way it was built and it probably can't be changed now if they moved the halls in and the classrooms out... so that the classrooms were on the outside there could be windows. Or even if there were windows in[to] the hallways so you could see stuff.

Windows that overlook life are positioned to give the best possible views of life: activities in streets, quiet gardens, pleasant things that are different from the indoor scene. Lækjarskóli in Iceland was noted by students, teachers, and researchers as being a building that had many windows that provided multiple perspectives of the physical surroundings (Figure 14). One student explained that from both inside and out, the school “blends in with the nature.”

Figure 14. Front Foyer of Lækjarskóli



Warmth

The theme of warmth is characterized by Alexander's (Alexander, Ishikawa and Silverstein 1977) patterns of *warm colors*, *soft inside walls*, and a *reception that welcomes you*. A warm color palette provides a hospitable feeling in an entranceway or foyer.

According to Alexander, soft inside walls are warm to the touch and soft enough to take small nails and tacks. Soft plaster, textile hangings, and wood are examples of materials that might contribute to soft inside walls. Surface colors, together with the color of the natural light, reflected light, and artificial lights, can all contribute to warm light in interior rooms.

Reception that welcomes provides a series of objects immediately inside the entrance—soft chairs, a fireplace, food, coffee. This relates to a *positive waiting space*, another of Alexander's patterns. In Iceland, Gelsenkirchen and Köln, the waiting areas were fused with possibilities for activity—newspapers, coffee, pool tables, sofas, water fountains—something that was capable of drawing people in (Figure 16).

Figure 16. Interior entrance atrium of Gelsenkirchen-Bismarck



Conclusions

Three main conclusions became apparent in the analysis of the results. While our study is limited in that only six schools took part, and the schools themselves represent a wide range of architectural styles, geographical locations, and approaches to curriculum, it is apparent that even with these few schools, (a) social interactions can be enhanced by particular architectural features, (b) the natural world is prominent in people's lived experiences of these environments, and (c) architects should pay close attention to how built environments are experienced by the end users, particularly in terms of how spaces can be transformed into dwelling places.

Architectural Features Enhance Social Learning

Various learning theories, such as Vygotsky's (1978) learning through social interaction model, would imply that important learning happens when people have an opportunity to engage in non-formal and unpredictable ways in their learning

environments. To facilitate social learning, space is needed that has the capacity for people to gather but also sets an inviting and intimate tone.

Social interactions can be enhanced by architectural design. In this study, we found that all six architectural themes can contribute to the building of social relationships. While gathering spaces is the most obvious architectural theme to enhance social learning, the other five themes can also contribute if the features entice community members to dwell in those places. The data also revealed that these features facilitated social interactions because they helped members of the school community feel comfortable and at home in their schools.

It is important to note that because humans are social beings, even less-desirable architectural features do not negate social interaction completely. The windowless hallways in Centennial were still used as social meeting places for students. In many cases, students could be found socializing while huddled in stairwells, or crammed into tiny nooks. Social learning was also established in the schools by having spaces that allowed for activities other than sitting at desks. In Riverheights, the students could be found spreading out in the hallways while still engaged in learning activities.

The Natural World and a Sense of Place

A sense of place was established through the opportunities to inhabit beautiful spaces and opportunities to easily move throughout the building. Place is more than bringing the natural environment within the confines of the buildings: it is about making meaningful connections with the local environment. Noddings (2006) urges educators to help students learn to care about their local environments and notes that providing natural environments for exploration are integral to nurturing citizens that will care for their environments. Noddings believes that by focusing on the local environment through the incorporation of physical and social aspects into education, educators are able to foster an attitude that allows students to interact mindfully with the places that they inhabit. In this manner, social learning not only involves other human interactions, but also considers humans' relationship with the natural physical world.

A sense of place can also be developed through social interactions and a feeling of belonging. This may include the display of student work and accomplishments, photographs, or even places for students to sit and interact with one another.

Talk to Users

We began this research with the anticipation of gaining a better understanding of how entryways and foyers impact students and teachers and the extent to which their reactions could be explained in terms of the architectural features of their schools. The findings revealed that many of the pleasing features of the school entryways that were identified by teachers, administrators and students were consistent with Alexander's patterns (Alexander, Ishikawa and Silverstein 1977). These features were also consistent with the research reported earlier regarding assisted living environments (Marsden 2005). Several of our six themes loosely overlapped with those described by Marsden (2005). Marsden's theme of

“naturalness” corresponds with our themes of “greenery and water” and “natural light and windows.” There was also a correspondence between Marsden’s “caring cues” and “familiar housing cues” with our themes titled “warmth” and “aesthetic features.” Marsden’s “protective enclosures” corresponds with “gathering place.” Finally, while the terms differ, students and teachers, as well as residents living in assisted living environments, seek function, beauty, and comfort. This tells us that user perspectives matter. Architects and designers would benefit for learning about these perspectives.

Future Research and Closing Observations

New lines of inquiry have emerged as a result of this research. First, future research needs to examine if social interactions in fact lead to social learning. To determine the answer to this question we need a measure or an operationalized definition of social learning. Second, it would be interesting to explore whether students and teachers use entryway and foyer spaces differently. A further line of inquiry might be to investigate the interaction between architectural features and underlying pedagogical approaches of the schools.

Our results show that entryways, by their design, to a greater or lesser extent can encourage students to stop and interact with one another. Even when the architectural features are not as obvious, this “bumping up” continues to occur, although it occurs with more ease when these features are present. While it is true that students will find ways to interact even in the most inadequate architectural environments, we have a responsibility to enhance their interactions, rather than limit them, through our architectural choices. Teachers, too, can teach in the most meager settings, but teaching is enhanced by good educational facilities. We need to be particularly sensitive to these issues as we are in an era of growth in school construction: on average, for the next decade, construction will begin on two new schools each day in the United States alone, and that figure does not take into account school renovations (Abramson 2007)

Our research provides evidence that the physical features of entrance areas play a significant role in how children and adults interact, engage, and feel in their schools—important places where they spend many years of their lives.

Holly Ogden is a Ph.D. candidate in the Faculty of Education at Queen's University and an elementary school teacher in Kingston, Ontario. She holds Master's and Bachelor of Education degrees from Queen's University, as well as an Honours Bachelor of Arts from Trent University. Her current research explores the effects of teacher learning on student and teacher engagement in elementary classroom learning. She has also conducted research on musical theatre, informal adult learning, and school architecture in Germany.

Dr. Rena Upitis is Professor of Arts Education at Queen's University. She recently completed a six-year term as National Research Co-director of Learning Through the Arts, a project that brings artists to the classrooms of over 100,000 students. Rena frequently presents at conferences and publishes widely in academic and

professional journals. Her research projects have explored teacher, artist, and student transformation through the arts and the use of electronic games in mathematics and science education. She is currently exploring how school architecture both constrains and opens up possibilities for learning. She is a founding Director of Wintergreen Studios (www.wintergreenstudios.com).

Julia Brook is a Ph.D. candidate in the Faculty of Education at Queen's University. Her research examines the relationship between communities and schools in rural communities, specifically within music education. She has also conducted research on school architecture in Western Canada.

Anna Ingibjörg Peterson is a Ph.D. candidate in the Faculty of Education at Queen's University. She completed a Master of Education (Queen's University) with a thesis exploring Icelandic students' perceptions of their purpose-built school through the art of digital photography. Anna holds a Bachelor of Education and a Bachelor of Arts in History and Classical Studies, both from Queen's University. Her current research interests include school architecture as pedagogy and ways of linking students, teachers and architects through participatory design.

Jennifer Davis is a fourth-year doctoral student at the Faculty of Education, Queen's University, Kingston, Ontario. Having taught in secondary schools within the Canadian public school system for over 20 years, she is acutely aware of various styles of school architecture and their effects on the whole school community. Her research interests include architecture's potential for developing connections within a community itself, within the wider community, and with the natural world. Her other research interests include story-telling in the classroom and its effect on character development.

Meagan Troop is a teacher, singer, educational researcher, and a Ph.D. candidate at the Faculty of Education, Queen's University. Meagan holds Honours Bachelor of Music and Education degrees from The University of Western Ontario, as well as a Master's degree in Curriculum from Queen's University. With a deeply vested interest in arts education, Meagan has focused her research in the areas of community-based instruction and performance arts education. She has coached aspiring professional singers and has conducted choirs across Ontario. Meagan remains active as an artist-teacher, in both studio and ensemble settings.

References

Abramson, Paul (2007). *The 12th Annual Construction Report: School Planning and Management*. Available from:
<http://www.peterli.com/spm/resources/rptsspm.shtm>

Alexander, Christopher, Sara Ishikawa and Murray Silverstein (1977). *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.

Andersen, Scott (1999). *The Relationship between School Design Variables and Scores on the Iowa Test of Basic Skills*. Doctoral dissertation, University of Georgia.

ATLAS.ti. (2009). *The Knowledge Workbench*. Berlin: Scientific Software Development.

Bandura, Albert (1976). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bradley, W. S. (1998). "Expecting the Most from School Design." Unpublished manuscript, Thomas Jefferson Center for Educational Design, University of Virginia, Charlottesville. Available from:
<http://curry.edschool.virginia.edu/class/edlp/800/papers/principles/principles.html>

Davis, Brent and David Sumara (2006). *Complexity and Education: Inquiries into Learning, Teaching, and Research*. Mahwah, NJ: Lawrence Erlbaum Associates.

Gibson, Eleanor J. and Anne D. Pick (2000). *An Ecological Approach to Perceptual Learning and Development*. London: Oxford University Press.

Gibson, James J. (1977). "The Theory of Affordances" In Shaw, R. and J. Bransford, eds. *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*. Hillsdale, NJ: Lawrence Erlbaum, 67-82.

----- (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.

Lambert, A. J. and A. L. Chasteen (1998). "Social Cognition." In Bechtel, W. and G. Graham, eds. *A Companion to Cognitive Science*. Malden, MA: Blackwell, 307-313.

Malpas, J. E. (1999). *Place and Experience: A Philosophical Topography*. New York: Cambridge University Press.

Marsden, John P. (2005). *Humanistic Design of Assisted Living*. Baltimore: Johns Hopkins University Press.

Noddings, Nel (2006). *Critical Lessons: What Our Schools Should Teach*. Cambridge: Cambridge University Press.

Orr, David W. (1999). "Reassembling the Pieces: Architecture as Pedagogy". In Glazer, S., ed. *The Heart of Learning: Spirituality in Education*. New York: Penguin, 139-149.

Tanner, C. Kenneth (2000). "The Influence of School Architecture on Academic Achievement." *Journal of Educational Administration* 38(4): 309-330.

Tanner, C. Kenneth and Scott Andersen (2002). "Toward a Pattern Language Theory of Middle School Design." *Educational Planning* 13(3): 3-20.

Tanner, C. Kenneth and Jeffery A. Lackney (2006). *Educational Facilities Planning: Leadership, Architecture, and Management*. New York: Pearson Education Inc.

Upitis, Rena (2010). *Raising a School: Foundations for School Architecture*. Township of South Frontenac: Wintergreen Studios Press.

----- (2004). "School Architecture and Complexity." *Complicity: International Journal of Complexity and Education* 1(1): 19-38.

Vygotsky, Lev S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.

Yarbrough, Kathleen Ann (2001). *The Relationship of School Design to Academic Achievement of Elementary School Children*. Doctoral dissertation, University of Georgia. ERIC Document Reproduction Service No. ED 475272.