

Social Exchanges Found in Collaborative School Space Design

By

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Abstract

American classroom design has remained relatively unchanged for decades, however instructional practices have become exceedingly more varied. In recent years, school construction has adapted in the midst of instructional practices, safe school initiatives, energy efficiency, political and economic influences, and global interests, linking future workforce expectations with the educational system. However, the physical structural school landscape remains relatively untouched. Transitional change occurs with corporate inclusive collaborative design approach and educational stakeholders respond by developing relational capacity and mirroring interactive physical spaces. Analyzing workplace trends can enlighten us to architectural design's influence on learning spaces and provide future building change direction.

This study analyzes how corporate design, worker autonomy, and collaborative practices couple creating effective and innovative educational learning environments. Development of these spaces include influences from retail, corporate, and current architectural design trends resulting in new school construction which pushes community's instructional heritage. Understanding where designs originate provides appropriate stakeholder input and ensures corporate collaborative structural elements find their way into schools.

Aesthetic variables play into these new designs incorporating substantial glass frameworks and natural elements conducive with positive student and employee morale. Corporate workforces mirror these features as they impact social structures based on physical design elements. The question becomes, who is driving the design elements that appear in new school construction? Additionally, how are corporate design trends becoming more prevalent, implementing innovative physical features, and thus shaping student social structures?

Thirteen interviews were conducted with individuals intimately involved in developing new school designs. Placed in a suburb of Kansas City, three buildings, at different instructional levels, were analyzed for design elements, impact on instructional practice, and development of teacher and student social structures. This study identifies the ultimate influencing role which dictated design changes from previous prototypes and illustrates the cohesion between corporate and educational design initiatives.

Acknowledgements and Dedication

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Chapter 1

Introduction

Context and Scope of Study

School building design has shifted drastically from the closed structures of early education to the more collaborative design of the 21st century. As a child, I remember nervously holding my mother's hand as we slowly walked up to the old elementary school. The symmetry of the tall, colonial style windows coupled with the impenetrable stone façade created a sense of trepidation within me. What could possibly be behind this formidable structure? My early classroom memories included the smell of freshly varnished hardwood. Light streamed in exposing dust particles settling on rows of wooden desks. Those desks contained the names of former students etched into the tops, untouched for years. The unwavering classroom structure provided a measure of consistency with the teacher, the sole proprietor of knowledge standing at the front and peer collaboration only occurring on the playground or intermixing at lunch.

These memories are not unique as many adults who are products of the American education system can attest. School construction has adapted in light of instructional practices, safe school initiatives, energy efficiency, political and economic influences, and global interests, linking the educational system to future workforce expectations, however the physical structure remains relatively untouched. Transition occurs when corporate community stakeholders demonstrate more collaborative approaches and schools follow suit in developing relational capacity and physical building design. Analyzing workplace trends can enlighten us to the depth of influence on architectural design and provide future building change direction.

There is a coupling of new corporate design and philosophical changes relating to individualized work and team-level collaboration. Networking and “coffee-house” style spaces

provide opportunities to network and make personal connections with colleagues. The question then becomes who is driving the design elements that are finding their way into our new school construction? How are our corporate trends influencing the social structures found in new school design?

Overview: Collaborative Space Design Elements

Education in the 21st century transitioned to a focus on soft skills, essential for networking within a global workforce (Bush, 2019; Oliver & Kostouros, 2014). Architects and educational professionals began to realize that the physical school space could enhance students' soft skill integration (Lippman, 2015; Rosenthal, 2002) and create school-wide climate change. Schools offered classroom space with undefined purposes, enabling a wide-variety of content to use the space and adapt to the collaborative instructional needs (Boys, 2010; Katsikakis, 2017; Lippman, 2013). These "loose-fit" (Katsikakis, 2017, p. 75) spaces shifted the control of the design from the architects to the user. However, determining the "spatial practice" (Benade, 2017, p. 799), or the community's way of defining physical space, proved difficult as stakeholders' interpretations differed. Changes in classroom furniture design reflected this flexibility, attempting to meet a variety of student learning needs (Mann, 2019; Markusen, 2016).

Re-evaluating school design elements allowed new technology integration and expansion of collaborative spaces (Stryker, Santoro, & Farris, 2011). The technology infrastructure creates an architectural challenge when infusing creative learning spaces with functionality, as well as security measures (Baker, 2012; Dorn et al., 2014). Through school "community hubs," (McShane, Watkins, & Meredyth, 2012) school relationships were fostered and innovative school safety protocols were cleverly established using strategic space design (Dorn et al., 2014).

Research Questions

Four central research questions will guide this study, exploring the influence on public school collaborative space design.

- 1) *What architectural elements are commonly found in new school designs?*
- 2) *How do educators and architects describe the impetus for recent innovations in school designs?*
- 3) *What aspects of business workplace elements, especially collaborative spaces, found their way into new school design and construction?*
- 4) *How do social exchange theories intersect workplace and school design models?*

Chapter 2

Literature Review

Historically, schools have mirrored corporate workplace design elements, representative of the political, economic, and global climate of the period. Analyzing the development of workplace design and schoolhouse construction provides an understanding of future development and the rationale behind collaborative space design. Schools are responding to employers need for a creative workforce that possesses problem solving skills and collaboration experiences by creating more flexible learning environments (Harrison & Cairns, 2008).

Historical School Design

Early Design Elements. At the turn of the century, the Common School Movement afforded children education regardless of their socio-economic status resulting in educational reformers such as Horace Mann, finding inequities as a result of compulsory education. Initially, Mann sought standardized school buildings, however unanticipated waves of student enrollment forced districts to quickly build classroom additions described as “factory-like, dark and dank” (Baker, 2012, p. 2). The goal was not to provide creative learning spaces, but to maximize classroom space and service as many children as possible. Corridors were necessary for Common School design, but were as awkwardly placed, taking up as little instructional space as possible (C Kenneth Tanner, 2009).

School building design research integrated healthy options in an effort to maintain student health (Baker, 2012) and the creation of “open air schools” dramatically changed the climate with fresh air and natural light prior to the invention of fluorescent lighting (Baker, 2012; C. Tanner & Lackney, 2005). This holistic approach to education transformed the way that architects dealt with school design and aligned with Maria Montessori and John Dewey’s

educational frameworks, emphasizing the same natural elements of “open air schools” (Baker, 2012; Hille, 2011; Holy, 1935).

Analysis of Engagement – Early Classroom Designs. Early design positioned students sequentially in classroom rows with the teacher as the focal point, however research quickly found that engagement deteriorates from the front to the back within these traditional seating arrangements, resulting in lower grades, poor attendance, decreased social skills, and a myriad of negative impacts (Sommer & Olsen, 1980). Students positioned toward the front of the class tend to display a more favorable view of school and are often identified as strong learners (Sommer & Olsen, 1980). However, this institutional design and classroom organization and school structure limited student interactions. Alexander in Tanner (2009) argued that institutionalized classroom design negatively reflects modern architectural design and limits students’ abilities to develop a “sense of community” (p. 383). Through homogeneous education, Upitis (2004) found that,

It has been observed that for nearly two centuries, public schools have been built largely as a reflection of the factory model for learning: put a homogeneous group of children in a confined space (called a classroom), process them for a year (fill them with knowledge), make sure they have learned the set and predictable curriculum (test them according to established standards), move them to the next processing container (another classroom), and continue the cycle until they have reached the age at which they are deemed ready to leave (and enter the workplace) (2004, p. 20).

Educational design was equated to a “factory model” which mirrored the current period of national industrialism (Baker, 2012; Upitis, 2004). Even Frank Lloyd Wright, known for his contemporary view of aesthetic construction and design, incorporated practical design elements indicative of period business models (Katsikakis, 2017). As compulsory education began to formalize education, workplace design would provide more stringent parameters on future employee productivity.

Progression Into Modern Design. Compulsory education saw significant numbers of children entering the schoolhouse and districts responded by building facility additions rather than new construction, creating a labyrinth of rooms and corridors (Baker, 2012). The 1950's saw more school design innovation incorporating lower roof lines, new air-conditioning units, and sprawling plans rather than colonial or plantation style buildings (Baker, 2012; Hille, 2011). Substantial school enrollment created the need for innovative, yet segmented classroom designs (C. Tanner & Lackney, 2005) such as the "finger plan" (Baker, 2012, p. 10).

Life-Long Learning Emphasis. Psychological study began to gain popularity and researchers saw correlations between spatial elements and student behavior and achievement (L. E. Maxwell, 1999; Ondrashek, 2017). Effective instructional practices were no longer teacher centric, but rather included a "third teacher" (Benade, 2017, p. 800) referring to the influence of "pedagogy, technology, curriculum and facility" (Ondrashek, 2017; Sullivan, 2012) as an equal instructional component. Schools faced the facility design challenge of incorporating life-long learning skills, specifically "critical thinking and problem solving; collaboration and leadership; agility and adaptability; initiative and entrepreneurialism; effective oral and written communication; accessing and analyzing information; and curiosity and imagination." (Benade, 2017, p. 797).

Workplace Design

Early Emphasis – Productivity. Workplace design in the early 21st century mirrored school building structural designs with a worker productivity emphasis. This "assembly line" approach maximized employee productivity and enabled corporations to work towards mass production (Upitis, 2004). Schools also maximized their student impact by creating standardized

classrooms (Baker, 2012) with little attention to individual student well-being (Heerwagen, Heubach, Montgomery, & Weimer, 1995) resulting in declined school satisfaction.

Business values progressed during the 20th century focusing first on open concept plans and adapting privacy and “personal control” with the advent of the cubical (Kupritz, 1998). The desktop computer challenged design professionals to provide adequate ventilation, cabling, and networking structures (Foster, 2002; Katsikakis, 2017) while maintaining workplace design. Segmenting the corporate workforce created an hyper-focused impetus, limiting personal interactions between employees (Gibson, 2003). Perceived privacy was available in employee cubicles and as conference rooms were sparingly used, employees’ collaboration time was limited. Findings were inconsistent when architects and space designers predicted positive results as employees “move[d] from closed offices to an open workstation” (Stryker et al., 2011, p. 610). Beginning in the 1990’s, portable technology transformed office spaces into mobile, social locations such as coffee houses, restaurants, and home offices (Katsikakis, 2017). As corporate design began to embrace this new informal work style, new school construction also found the need for a more portable social infrastructure (Boys, 2010).

Psychologists found the connection between positive physical spaces and student engagement very compelling and the same held true for workplace environments (Baldry & Hallier, 2010; Heerwagen et al., 1995; Leonard, 2013). Green elements, such as natural lighting, recyclable materials, and environmental impact gave communities a social response to global protection initiatives (Leonard, 2013). Employee well-being and retention increased with availability of natural light, additional windows, and environmental décor (Katsikakis, 2017).

Movement Towards Collaborative Workspaces. Companies such as Starbucks, Google, and Amazon began to shape their corporate norms through fun and innovative

communal workspaces and headquarter designs (Baldry & Hallier, 2010). Anglo-American culture reveals company cultural hierarchy through the elaborate headquarters' exteriors (Baldry & Hallier, 2010).

Schools quickly found the correlations between workspace design and employee engagement, attempting to engage similar elements in new school construction (Boys, 2010; Cheryan, Ziegler, Plaut, & Meltzoff, 2014). Emulating 21st century workplaces, school designs shifted creating more collaboration and transitional spaces, conducting business outside of structured workspaces and using interpersonal connections to engage employees and students (Chernyak-Hai & Rabenu, 2018; K. S. Cook, Emerson, Cook, & Emerson, 1987).

Corporations allocated substantial space to group work and collaboration areas, encouraging employees to interact rather than work in isolation (Harrison & Cairns, 2008; Katsikakis, 2017). Katsikakis (2017) explained this social workplace shift: “Modern corporations rely on highly motivated individuals empowered...to work autonomously but who nevertheless need face-to-face interactions in inspiring spaces...to support the increasing richness of their business transactions” (2017, pp. 71-72).

Workplace Privacy. Space developers must balance opportunities for collaborative interactions with private workspaces. A psychological “boundary” allows the employee some control over personal interactions and information accessibility (Kupritz, 1998). Innovative workspaces must still incorporate situational private or semi-private spaces and as Lippman (2013) expressed, through spatial practice, is flexible enough to include variable spaces:

Breakout Niches: Flexible open area designed for a myriad of purposes including presentation, group processes, or individual work; **Breakout Hollows:** Included on the peripheral of the instructional or workspace area, but intended for more privacy; **Breakout Rooms:** Enclosed

space designed to hold a wide variety of groups, typically equipped with technology components for both group and individual processes; *Breakout Nodes*: Separated through design elements from the open collaboration are, but enabled to be fairly private and equipped with technology (p. 37). Individual workplace eliminates personal identity and privacy through the incorporation of mobile workstations (Baldry & Hallier, 2010). Building workplace privacy options into the design empowers employees' decisions about appropriate social interaction levels.

Influencing Design

Designers are challenged with prioritizing expected behaviors within undefined instructional spaces (Thornburg, 2014) and increasing their understanding of instructional space influencers (Boys, 2010). Anticipated behaviors are often influenced by modern building aesthetics (Boys, 2010; Cheryan et al., 2014). However, early school structures rarely incorporated appealing design elements in lieu of more simplistic, cost-effective buildings as research failed correlate motivation and aesthetics (Holy, 1935). Public opinion shifted new building design towards more appealing and collaborative spaces which impressed community stakeholders. Community stakeholders accept these flexible learning spaces as “better” than formal instruction from opinion rather than concrete research (Boys, 2010).

Innovative design must originate somewhere and there is debate over whether these new design elements are based on theoretical concepts or simply a response to isomorphic tendencies (Lefebvre & Nicholson-Smith, 1991). Wasserman's (2011, p. 23) phrase “aesthetic isomorphism” may apply to school and workplace design which relay the client's desired output, yet incorporate aesthetically pleasing environmental variables. The inclusion of these design elements without a theoretical framework highlights the impetus of aesthetic functionality with little regard to past research. The design fits the organizational expectations rather than

portraying innovative thought (Aldrich & Fiol, 1994; DiMaggio & Powell, 1983; Wasserman, 2011). As Wasserman (2011) explains,

[Organizational structures] conform to ‘rationalised myths’ in society about what constitutes a proper organization, and these myths emerge as acceptable solutions. As more organisations conform to these myths, they become more institutionalized and legitimate, which subsequently leads to institutional isomorphism and to further diffusion of ideas (p.23).

Architects stress the important marriage of aesthetics with functionality, however in school design, there is concern over a lack of foundational educational theory (Wasserman, 2011).

Functionality usurps theoretical frameworks when including innovative design elements.

New construction is highly motivating and appears impactful, but there are research gaps indicating the degree of positive influence (L. E. Maxwell, 1999; Neilson, 2014). Boys’ (2010) study states, “...while many of the new learning environments being developed can offer exciting additions to existing spaces, they do not enable a better conceptual framework, appropriate research methods or strategic critique to be developed” (p. 5). In order to understand classroom dynamics, designers should become fluent in basic educational pedagogy and its relations to design elements (Boys, 2010).

Aging facilities face disadvantages as community stakeholders tend to enroll students in schools touting innovative architecture and collaborative learning spaces rather than older buildings (Lippman, 2013, 2015; Neilson, 2014). Informal “learning cafes” and collaborative spaces have become the norm for newer construction and forms a dichotomy between existing, aging facilities (Boys, 2010) System-wide physical space equity is becoming more difficult as districts experience financial strains unresolved through renovations.

Social Design Theory

Millennials rising to the workforce require vastly different instruction than 20th century students. Their ability to frequently adapt to changes may create a social deficit, making long-lasting workplace relationships difficult and eliminating connections or “organizational loyalty” (Chernyak-Hai & Rabenu, 2018, p. 461). However, our global society prioritizes interpersonal relationships as essential strong business connections (Vaagaasar, 2018). Schools are responding by emphasizing interactions which erase the line between instructor and student, thus changing the learning paradigm to more student-focused rather than teacher-focused (Rands & Gansemer-Topf, 2017).

21st century facility design accounts for mobility and when buildings fail to substantiate interpersonal dynamics and mobile social structures, the corporation (or school) community will falter (Podolny & Baron, 1997). Social design theory reinforces the worker’s importance and autonomy, fewer required supervisory interactions, mutual respect, and collegial collaboration (Chernyak-Hai & Rabenu, 2018; Ryan & Patrick, 2001) even when the workspace design alters employees’ perceptions and social expectations (Vaagaasar, 2018; Zhou, Shin, Brass, Choi, & Zhang, 2009). Task completion intensity is then based on the employees’ perceptions of their groups’ efficiency practices. Globally, when planned neighborhood structures are too transient to foster collaboration, communities will organically create mobilizing structures conducive to socializing (Guidry, Kennedy, & Zald, 2009). School social connections also develop in collaborative spaces, initiating positive personal rewards regardless of the designer’s intentions for the space.

Intersecting human relationships and facility design is the core of the Social Exchange Theory (SET) and is foundational when creating strong social climates and community, both in schools and in the workplace (Chernyak-Hai & Rabenu, 2018; Homans, 1958). Simplistically,

interpersonal relationships recur as long as there is a positive experience, creating a subjective cost-benefit analysis (Homans, 1958). If the structural variables foster a positive experience, then positive social interactions in the space are more probable.

Optimal Learning Environments. Identifying design variables that enhance student outcomes is essential when developing “optimal learning environments” (Boys, 2010; C Kenneth Tanner, 2008). Sommer and Olsen’s (1980) study of the “soft classroom” controlled for physical changes in which a generic collegiate lecture-style classroom was transformed into flexible learning space. This study contributed significantly to environmental-behavioral research and spatial practice analysis (Sommer & Olsen, 1980; Wong, Sommer, & Cook, 1992).

Undefined classrooms created inconsistent understanding of the rooms’ intention, allowing instructions flexibility when purposing the space and enabling the content to interact with the space (Wong et al., 1992). According to post-occupancy questionnaires, classroom engagement increased significantly, however students indicated that the “soft classroom” failed in structural support primarily during formalized assessments (Sommer & Olsen, 1980) and the individuals’ perceptions of the physical space dictated student outcomes (C Kenneth Tanner, 2008).

Aligning instructional spaces within the learning continuum (See Figure 1) addresses the

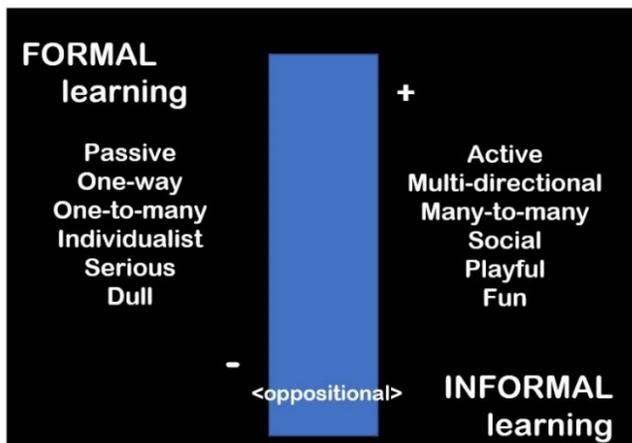


Figure 1. Varied Learning Spaces. Adapted from *Towards Creative Learning Spaces* (Boys, 2010, p. 5)

task and nature of students' work moving from passivity to playfulness (Boys, 2010).

Collaborative spaces typically fall on the informal side, teachers must cross the “oppositional” (p. 5) line, bouncing between formal and informal structures, thus engaging brain stimulation (Boys, 2010; Harrison & Cairns, 2008). Tanner also found that designers need “...development of spaces that engage, challenge, and around a student's imagination. Brain-compatible learning requires much more interaction with the environment than current facilities allow” (C. Kenneth Tanner, 2014, p. 26). How then does school and workplace design influence repeated social exchanges?

Collaborative Engagement

Building 21st century schools, there is difficulty determining the exact impetus for incorporating collaborative spaces. Schools are incorporating flexible seating with structural design elements to enhance learning environments and make spaces conducive to collaborative work (Anderson & Hartley, 2018; Benade, 2017). The physical space often dictates how work is accomplished and must differentiate for various student learning needs (Lippman, 2015; Molnar, 2019; Oliver & Kostouros, 2014; Ondrashek, 2017). One cannot assume that all collaborative work occurs in large group settings and as such, designers must address a variety of classroom arrangements. As Lippman (2013) found,

“...cooperative learning spaces may contract when the group comes together to discuss the project and then expand as individuals separate from one another to work on their specific tasks. This separation might simply entail moving their seating position a few feet away...or it might mean moving into another space altogether” (p. 34-35).

Reflecting, educators should identify student outcomes both academically and socially, as well as analyze their spatial practices through those expectations (Boys, 2010; Oliver & Kostouros, 2014). It is nearly impossible to design a perfect learning activity paired with the space, but rather should be flexible enough to meet a variety of needs (Boys, 2010).

Physical Space Variables

Causal relationships of structural and physical building features with positive student outcomes has been explored while controlling for a wide range of physical stimuli including sound, temperature, air, light and color, and space (Badayai, 2012; Simmons, Carpenter, Crenshaw, & Hinton, 2015; Sommer & Olsen, 1980; C Kenneth Tanner, 2009; Thornburg, 2014; Uline & Tschannen-Moran, 2008; Wong et al., 1992; Zimmerman, 2007). However, one cannot forget the depth of a teacher's influence. Classroom structure does not foster collaboration and student success alone, but rather the teacher's planning and activity within the space (Boys, 2010; Sommer & Olsen, 1980).

Interplay between physical variables and the collaborative space is complicated by the instructional flexibility. As Badayai's (2012) study found, "...the uncongeniality and misfit of physical working environment indeed affect not only the motivation of the worker, but also the satisfaction, social relations, performance and health of the employees" (p. 487). Crowding and density research isolates movement patterns necessary for effective student engagement and found correlations between three studies which were statistically significant (C Kenneth Tanner, 2009; C. Kenneth Tanner, 2014). Fluid classroom spaces prove difficult when determining optimal learning capacities (Boys, 2010).

Technology Accessibility. Global learning creates a necessity for substantial technology connectivity and yet, aesthetically pleasing design must still ensure seamless operations and allow for thorough wireless networking (Stryker et al., 2011). Moving the locus of control from the front of the classroom to all four classroom corners (Molnar, 2019) changes technology's availability and creates connectivity issues within collaborative "nooks" (Harrison & Cairns, 2008). As Long and Ehrmann (2005) stress, "architecture is no longer merely a container within

which learning happens – buildings themselves can provide several dimensions of support...access to information, always-on services, and ‘anytime, anywhere’ learning” (p. 45).. Seamless technology integration transforms standard buildings into flexible holistic learning environments.

Security. In the wake of school shootings and intruder alerts, security concerns are paramount within new school construction. Schools, public buildings, and airports have similar security needs, but with one distinct difference – the school building houses children and should be sensitive to their developmental needs (Dorn et al., 2014). Designers need to balance “the appearance of a place of learning, even after safety and security measures are implemented” (Dorn et al., 2014, p. 3). Creating effective school structures involves an intricate system of physical barriers such as sight lines, pinch point entries, and locking door systems (Fennelly & Perry, 2014; Xaba, 2006) without compromising aesthetically pleasing features (Dorn et al., 2014).

As learners feel comfortable and safe, passivity can often set in (Meyer & Rowan, 1977), however workplace design contradicts this finding as employees become more productive when working in comfortable, creative, and safe environments (Boys, 2010; Lave & Wenger-Trayner, 1991). Negative outcomes face students exposed to distressing or fearful school situations, further emphasizing the importance of student safety and well-being (McDowell, 2010).

Integration of Environmental and School Design

Environmental Theorists. School design lacks collaborative connections between environmental research and design theorists. Bolstering student achievement and equipping students for their future should center school reform efforts. However, historically, school design

failed to strategically enhance student achievement, but rather was a quick response to rapid enrollment increases (Baker, 2012; C. Kenneth Tanner, 2014).

Some cynical theorists would contend that society views physical workplaces as constraining containers for employment processes (Baldry & Hallier, 2010). However, research supports an aesthetically pleasing, comfortable, and “fun” work environment, which develops productive and creative 21st century employees (Baldry & Hallier, 2010).

Design Balance

Facility design accommodates a plethora of learning spaces, with undefined purpose, often blurring the lines between teacher and student (Boys, 2010). Some would argue that physical structures and boundaries ensure that students’ tasks and activity perspectives are clearly defined (Neill & Etheridge, 2008). Thornburg (2014) stresses a balance between four types of learning spaces: Campfire (lecture space), Watering Hole (conversation space), Cave (reflection space), and Life (Experiential Space).

Campfire. Creation of a focal learning space or lectern area is essential in pre-compulsory schools and serves to centralize the locus of classroom control (Baker, 2012).

Watering Hole. Instruction requires substantial focus, however there must be opportunities for cognitive release allowing for mobile social structures, and adapting individual needs within a low-risk environment (Chernyak-Hai & Rabenu, 2018).

Cave. For students with sensory-processing disorders, pulling back from full social interaction allows for refocused effort and future productivity (Burgoyne & Ketcham, 2015; L. E. Maxwell, 1999).

Life. Open arranged instructional space lends itself to more interactive teaching and allows more small group flexibility, as well as providing natural environments for relationship

building (Neill & Etheridge, 2008; Sommer & Olsen, 1980). Schools have followed corporate designers and have identified students' social needs, providing common areas that serve multiple purposes and are accessible to the general public (Katsikakis, 2017).

Social Exchange Theory

Architects and space designers are seeking rationale for their collaborative design choices as school spaces influence social interactions. In a study of MIT graduate students time allotments, classrooms were rarely mentioned, but rather informal learning spaces, and more conversational areas (Long & Ehrmann, 2005). Students learn better when engaged in dialogue with varying skill level peers, a collaborative team model used in the corporate sector (Lave & Wenger-Trayner, 1991). This inclusive group process is difficult to achieve without the rewards found through the social exchange theory (SET).

Homans (1958) expresses social exchange theory as “social structures [that] emerge from elementary forms of behavior and change over time in response to changes in this behavior by aggregates” (K. Cook & Whitmeyer, 1992, p. 110) and as found in school design, influenced by physical elements. Individuals remain in positive relationships when the perceived opportunity for interpersonal reward is high, even when the individuals' interpretations vary (Ribarsky, 2013).

Group processes rely on environmental structures to dictate how interactions take place and whether open communication is encouraged or squelched (L. E. Maxwell, 1999). In transient workspace design or unassigned personal space, individuals associate a negative risk with the environment and fail to establish strong interpersonal connections (C. Tanner & Lackney, 2005; C Kenneth Tanner, 2008, 2009; Weaver & Qi, 2005). As in SET, relationships are based on the individual's value and build from there (Baldry & Hallier, 2010). When strong school

communities are established, interpersonal relationships are perceived as positive rewards and are more desirable than individual (Rands & Gansemer-Topf, 2017).

Further Research

There is substantial literature available relating student engagement outcomes with new construction design elements. However, there is little known of the influencers that combine collaborative elements and innovative construction. Renovating aging schools and constructing new buildings with collaborative spaces will require districts and designers to provide stakeholders rationale for their decisions and express how these new designs will positively impact academic and social success.

Chapter 3

Methodology

Purpose Statement

There is ambiguity regarding educational design influence as elements such as learning stairs and flexible classrooms show up in new construction (Baker, 2012). Initially, school designers looked to the educational expertise of Dewey and Montessori (Baker, 2012; Uptis, 2004) as their insights and seminal research had significant impact on school and classroom physical layouts.

This study explores the architectural and educational influence on new school design and construction in regard to cooperative learning spaces. This case study analyzes new school builds in the River Valley School District (pseudonym) which constructed three new buildings, at each level – elementary, middle, and high, within three years. This study focuses on how educational design has mirrored workplace design and the social constructs that permeate both systems.

Research Questions

Four central research questions guide this study designed to explore the influence on collaborative public school space design.

- 1) *What architectural elements are commonly found in new school designs?*
- 2) *How do educators and architects describe the impetus for recent innovations in school designs?*
- 3) *What aspects of business workplace elements, especially collaborative spaces, found their way into new school design and construction?*
- 4) *How do social exchange theories intersect workplace and school design models?*

The River Valley School District is situated in the Midwest region of the United States and serves a growing suburb of Kansas City. The study schools were each built within the last three years and collaborative space was purposefully included the construction design (Table 1).

Table 1.

Overview River Valley School District Case Study Samples (Kansas State Department of Education, 2019)

	<i>River Valley School District</i>	<i>Valley West High School</i>	<i>Valley View Middle School</i>	<i>Lower Canyon Elementary School</i>
FTE	29,603	1329	514	311
Gender				
% Male	51.5	54.4	50	54*
% Female	48.5	45.6	50	46*
SES				
% Non-Economically Disadvantaged	73.1	70.43	68.48	94.5*
% Economically Disadvantaged	26.9	29.57	31.52	5.4*
Race				
% White	66.5	66.5	62.84	84*
% African American	7.33	6.25	8.37	4*
% Hispanic	16.8	20.99	21.79	5*
% Other	9.3	6.25	7	7*

Note. *Data obtained from River Valley School District Curriculum and Instruction Department as KSDE statistics are unavailable during the first year of operation.

Overview

The purpose of this study was best served through a qualitative design model where interviews, conversations, and other qualitative data allow for flexibility and inform this study’s research questions. As J. Creswell (2013) describes, “...qualitative inquiry employs different knowledge claims, strategies of inquiry, and methods of data collection and analysis...qualitative procedures rely on text and image data, have unique steps in data analysis, and draw on diverse strategies of inquiry” (p. 20). Using a variety of data sources ensures triangulation of the research questions.

Focusing on educational facility design stakeholders, I analyzed how individual design experience influences structural elements. Employing a qualitative model allowed for open-ended responses, theme identification, and possible recurring trends (Hamilton & Corbett-Whittier, 2012; Merriam & Grenier, 2019). Understanding social constructs within design requires identifying variables and situational interpretation which is difficult to convey through quantitative measures (Hoepfl, 1997). Using qualitative methods, I identified and explored the intersecting relationships between design and education, analyzing a series of new local school construction projects. This study lent itself to qualitative design methods as individuals intersect, creating collaborative school spaces intended to enhance student learning and social bonds.

The River Valley School District provides a model case study setting. Design relationships within a single school district allows for “the natural setting as the source of data,” (Hoepfl, 1997, p. 49) allowing for descriptive comparison between each building’s design elements. Diving into a single district enabled consistent relationships and strong rapport with the participants (Creswell, 2013). Interpreting design influencers exposed variables in relation to hierarchical social structures within new construction (Merriam, 1998). Deciding on a case study is relational to the audience (Creswell, 2013; Hamilton & Corbett-Whittier, 2012). Analyzing this district provided insight desired by educational social researchers, as well as architectural designers tasked with creating instructionally diverse school buildings.

In qualitative studies, the researcher “acts as the ‘human instrument’ of data collection” (Hoepfl, 1997, p. 49) and interprets events as presented by the subjects (Merriam & Grenier, 2019). As the primary instrument of data collection, I engaged with the case study buildings, observing the effects of collaborative space on students’ social interactions and analyzing instructional space against corporate design elements. Lacking prior significant research, this

case study analysis was fairly exploratory (Foster, 2002) and enables an in-depth look at the research questions.

Research Design

A case study allows for relational analysis between designers and educational experts within a single school district. River Valley School District has experienced substantial enrollment growth and new K-12 construction within the last three years. This case study was designed to analyze the role and influence of groups involved in the inception, design, construction, and use of new school buildings at the elementary, middle, and high school levels. With many individual building contributors, a qualitative approach helped create meaning from the individual interactions and bridge the distinct perceptions of design elements (J. A. Maxwell, 2012; Merriam & Grenier, 2019). Connecting these elements illuminates the individuals' perceptions of their role in the design process based on their education and experience.

Case Context

This case study consisted of conducting in-depth interviews of architectural and educational professions perception of their impact on new school design and construction (Grades PK-12). Purposeful sampling consisted of design professionals, administrators, and teachers working on/in schools constructed within the last five years within the River Valley School District. Including document and building analysis provided additional interview context.

The recent construction of three new school buildings, at all grade levels within the last five years, met the study inclusion criteria. As a River Valley building administrator, I have substantial access to the study buildings. The new school building teachers and administrators provided insight on collaborative space functionality and school social constructs.

Participant Sample

The selected target population sample participated in face-to-face, comprehensive interviews of approximately 45-60 minutes in length. I conducted 13 semi-structured interviews (Two Architectural professionals, Two District Administrators, Four Building Administrators, Three Teachers, and Two Steering Committee Members). These individuals were selected based on their direct knowledge and work on/in the district's three newly constructed buildings. Selected lead building administrators served additional time during construction and design and have experienced connections between the school district and design professionals. Administrators suggested selected educators representing primary, middle, and secondary grade levels, as well as a variety of content areas. Candidates were provided a study synopsis, study goals, and consent form.

Instrumentation

Interviews. Semi-structured interview protocols using open-ended questions will ensure maximum data collection (Creswell, 2013). Piloted interview protocols (Appendix B, C) ensured that interview sessions remain research question focused and probing centered on emerging themes. My Doctoral Field Study cohort piloted all interview questions and protocol revisions ensured research question focus and clarity.

Validity. Qualitative studies rely on the researcher's ability to support their conclusions and demonstrate detailed evidence (Merriam & Grenier, 2019; Merriam & Tisdell, 2015). Consulting with Marie-Alice L'Heurex, Ph.D. through the University of Kansas School of Architecture and Design, interview questions were aligned to current architectural literature and trends.

Reliability. Case study reliability is often difficult to establish as the content complexity and subjectivity is not addressed through quantitative measures (Stake, 2005). Case studies are

not typically generalizable and (Creswell, 2013) and as such, must be reviewed in the context for which they are written. The Doctoral Field Study cohort reviewed protocol questions prior to interview ensuring consistency and reliable results. Additionally, interviewing individuals from varying building design perspectives aided in triangulating information and allowed for data stability.

Human Subjects Consideration

The Instructional Review Board (IRB) govern the protection of the subjects' personal and professional lives regarding human subjects in research. All subjects' identities are protected through IRB permission and an informed consent protocol was obtained and signed prior to the interview. A synopsis, goals, data collection process, storage methods, and analysis was provided to all candidates. Additionally, each subject was informed in writing of their option to withdraw from the study at any time.

Data Collection Process

Each interview was digitally recorded on-site for the subject's convenience. Transcriptions and a session synopsis was also provided to all subjects and they were asked for feedback and corrections. All recordings and transcription data were housed in an encrypted file until the completion of the study and transcripts removed any personally identifying information. The school district identity will be presented throughout this study under the pseudonym River Valley School District. Individual school identities will also be protected through the use of pseudonyms – Lower Canyon Elementary, Valley View Middle School, and Valley West High School. If clarification is necessary after the interview is transcribed, the subject was contacted for follow up questions via phone or email.

Additional data was obtained by visually inspecting newly constructed facilities. This walkthrough observatory data provided interview context and identified collaborative space design elements currently in use. Photographs were collected, as well as a variety of archival documents (blueprints, space use calculations, etc.) enabling detailed analysis (Merriam & Grenier, 2019). This information may not provide depth of understanding, but may yield triangulation of interview data (Creswell, 2013).

Data Analysis

Data interpretation “involves attaching meaning and significance to the analysis, explaining descriptive patterns, and looking for relationships and linkages” (Genzok, 2003, p. 9). Using field notes, interview transcripts, and other collected data, I utilized the *Constant Comparative Analysis* (CCA) (Fram, 2013; Kolb, 2012) to decipher trends and interpret the data set using constant recoding. CCA enabled comparison of themes, adaptation between concepts, and information categorization into a useable format. Data analysis and collection often occur concurrently (Merriam & Grenier, 2019), however once fully transcribed, the transcripts were coded individually. CCA then enabled data triangulation through multiple sources and perspectives (Creswell, 2013).

Interview and walkthrough data were cross-coded, providing interview context. Photographs were included demonstrating current collaborative design elements and themes which transfer between study buildings. Identifying school features were removed from the artifacts.

Qualitative studies are “emergent rather than tightly prefigured” (Creswell, 2013, p. 20) creating opportunities for new themes to surface and study parameter changes as needed. As new themes emerged, additional probes were followed and literature reviewed.

Limitations

Researcher Context. Working to address my own subjectivity as sole researcher proactively limited potential issues or biases formed during the data collection process. Addressing subjectivity goes further than simply acknowledging its presence, but rather avoiding incorrectly interpreted data (Peshkin, 1988). Continually monitoring is a necessary discipline when evaluating for personal biases (Peshkin, 1988).

Regardless of precautions, the study design will possess limitations. Using a single school district and limiting participants narrowed the impact to comparable socio-economic areas. This study's findings may not be applicable to a wider audience. Additionally, being employed by River Valley presents a challenge to limit my personal experiences with the study buildings and staff. Additionally, the buildings analyzed in this study are beta versions and some design elements have not been fully revised or evaluated by the construction companies. Educators in one of the selected buildings have not completed a full school year at the beginning of this study and may not fully realize the concepts being discussed.

Summary

The nature of qualitative study allows for open-ended dialog to present themes and clusters found across a phenomenon (Creswell, 2013; Merriam, 1998). It is the researcher's job to ensure research questions are clearly defined (Genzuk, 2003) and provide connections between the phenomenon and case study. This case study crosses professions, teaching levels, and time constraints controlling for the relationships between educational professionals and new school designers. All precautions were taken to preserve this relational response in an effort to analyze the impact and form social constructs.

Chapter 4

Results and Findings

Initial Direction

The River Valley School District's continued growth enabled a case study of recent school construction. This study's purpose was to explore the stakeholder's depth of influence on new school design and development. This investigation explored stakeholder perceptions, communication, and implementation of new school design from conceptual definition to building occupancy. This chapter explores the findings related to the following research questions:

- 1) What architectural elements are commonly found in new school designs?
- 2) How do educators and architects describe the impetus for recent innovations in school designs?
- 3) What aspects of business workplace elements, especially collaborative spaces, found their way into new school design and construction?
- 4) How do social exchange theories intersect workplace and school design models?

New Construction Similarities

Valley West High School. River Valley started a design shift with the Valley West High School opening Fall 2017. This high school was coined the district's "flagship" for technology upgrades, innovation, collaborative spaces, and a shift in scheduling paradigms. This new building design deviated from previous buildings in both aesthetics and functionality. This three-story building consists of 32 conference style areas, a connective, learning Commons at the center of the building, "Learning Stairs" as shown in Figure 2, and open-door, module "blended learning labs." Conceptually, Valley West focuses on Project Based Learning (PBL) units and emphasizes cross-curricular collaborative programming.



Figure 2. East learning stairs spanning the second and third floors of Valley West High School in River Valley, KS. Retrieved from Hollis and Miller...

Teachers are completely mobile, eliminating classroom teacher desks and consistently assigned classrooms. Teachers sign up for their classroom space in three-week intervals via a Google document and rotating schedule. The only parameters which tether students are grade level community assignments which, at the building's opening, were arranged into neighborhoods. Each neighborhood touts their own administrative suite and satellite library, complete with grade-level counselors and administrative secretaries. Students intermix

throughout the school during electives and lunch. With no lockers and more of a coffee house feel as shown in Figure 3, students have the freedom to form social structures throughout the learning Commons.



Figure 3. Intimate lunch table groupings facing west on the ground floor of Valley West's commons area in River Valley, KS. Retrieved from River Valley School District Website.

Valley View Middle School. The River Valley School District experienced exponential West side growth and needed immediate middle school relief. In the interest of time, the district Steering Committee determined that a second building reflective of the initial building prototype be built. Based on teacher and administrative feedback, the building saw minor changes such as the addition of “Learning Stairs” which are illustrated in Figure 4, elective class location changes, stairwell directions, and additional classroom spaces. Valley View resembles the prior build and is not PBL focused.



Figure 4. Valley View learning stairs located in center commons area in River Valley, KS. February 10, 2020.

Lower Canyon Elementary School. Lower Canyon’s innovative, futuristic design strays from any other previously constructed River Valley elementary building. As the 36th elementary school, Lower Canyon again serves the town’s West side and alleviates growing population from two other elementary buildings. This new prototype features substantial glass walls between classrooms, learning pods, “Learning Stairs” (Figure 5), and a vast multi-purpose common space as shown in Figure 6.



Figure 5. Lower Valley Elementary learning stairs across from the performance venue, center of school in River Valley, KS. January 13, 2020.



Figure 6. Lower Valley commons space overlooking performance area and lunchroom in River Valley, KS. Retrieved from HTK

Study Participants

For this study, I interviewed thirteen professionals intimately involved in the construction and opening of the most recent River Valley construction projects (Valley West High School opened Fall 2017, Valley View Middle School opened Fall 2018, Lower Canyon Elementary School opened Fall of 2019). Every candidate contacted responded favorably and participated in the interview process. Stakeholders included two principal architects, two district administrators who served on the Steering Committee and as Board of Education liaisons, four building administrators, and three teachers as initial hires and still currently working in those locations. As interviews progressed, two additional candidates were contacted as representatives of the Lower Canyon Steering Committee (one administrator and teacher). Stakeholders involved represented a variety of grade levels, content areas, prior experiences, and years in their respective fields as shown in Table 2. Each stakeholder shared their perspectives through a semi-structured interview conducted during January and February of the 2019-2020 school year and insights gathered are illustrated within this chapter.

Table 2.
Stakeholder Profiles, Coding, and Experience Levels

Study ID	Study Group Association	Experience Areas	Years
Teacher			
TA	Elementary	Elementary, Instructional Coach	15+
TB	Middle	Core Content	10+
TC	High	Elective	5+
Steering Committee			
STD	Teacher	Elementary	5+
SAE	Administrator	Elementary	20+
Administrator			
PF	Elementary	Elementary, Instructional Coach	20+
PG	Middle	Elementary, Core	20+
PH	High – Assistant	Core Content	15+
PI	High – Lead	Core Content	20+
District Leadership			
DJ	Facilities Director	Architect – Education	20+
DK	District Administrator	Construction and Design Liaison	20+
Architect			
AL	Principal Architect	K-12 Education	10+
AM	Principal Architect & Firm President	K-12 Education	20+

Participant Group Profiles

Participants were asked to provide a professional experience overview and description of their role during the design phase. During the interviews, several participants shared that they have children attending the study schools.

Principal Architects. Both principal architects in this study work for large, local architectural firms in the Kansas City area which primarily focus on public and private Early Childhood, K-12, and higher education work. Valley West High School and Valley View Middle School had the same principal architect with 10+ years of experience and Lower Valley’s principal architect also served as the firm’s president with over 20 years’ experience. Both architects expressed that they had previous worked on other River Valley building renovations and had significant professional relationships among district leadership. The architectural firm

selection was determined through a district bidding process approximately two-three years prior to the opening of each school. Each architect worked extensively with River Valley's Steering Committee and organized many out of district school site visits.

District Administration. Participating district administrators were selected from the Superintendent's Leadership Team (SLT) and were instrumental in selecting each new building's Steering Committee. The Facilities Director is a licensed architect who had previous work experience at one of the participating architectural firms prior to joining the district. The Director's primary experience was in K-12 educational design and currently leads the district facilities department, planning new building construction, aging facility renovation, and existing facilities structural maintenance. The District Administrator supervised the formation of Valley West and Valley View's Steering Committee. The District Administrator's previous experience included opening Valley View Middle School's initial prototype (2010) prior to accepting his current role.

Building Administrators. Three lead administrators and one assistant principal were interviewed for this study. Each individual participated late in the school design phase, facilitating staffing's internal structure, and opening the buildings. They are still currently in this role. Valley West's principal was hired earliest in the process, a full year before the school's opening and additionally, had served on the school's Steering Committee simultaneously. His assistant principal was hired in the Spring prior to the school's opening as his first administrative experience. Valley View and Lower Canyon's principals were selected in the Spring prior to the school's opening and had prior to their appointment, had little experience with the design. All lead principals had 20+ years educational experience in a variety of roles. One administrator holds a doctorate and three hold a masters' degree.

New School Educators. Educators for this study were selected from each of the three levels (high school, middle school, elementary) and had varying years of experience. The elementary teacher had 15+ years' teaching experience in many different grade levels K-6. Her role shifted as an Instructional Resource Teacher, and then with opening the new school. The middle level educator had over 10 years' experience in core content instruction. Her previous experience was in an aging facility with vastly different structural elements than the new building. A theater teacher was the final candidate who had less than 10 years' experience, who started in rural Missouri and then was hired for River Valley in 2017.

Steering Committee Representatives. The Steering Committee was not initially considered for inclusion in the study. However, multiple interviews identified these individuals as having substantial input and experience with the school buildings' initial design and rationale. A building administrator with 20+ years' in education and a teacher with over five years' experience, who currently teaches core content in Valley View Middle School were hand-selected by District administration to serve on Lower Valley's Steering Committee. This Steering Committee began meeting in the Spring of 2018 with scheduled trips studying Texas elementary buildings.

Initial Findings: Emerging Themes

Utilizing the Constant Comparative Analysis, data was interpreted throughout the process and the researcher deciphered trends, reproducing them into a useable format. The following themes emerged with corresponding sub-categories (See Table 3) that were developed from interview transcripts and wholly based on the interview protocol (Appendix B and C):

- **Design influence**
- **Communication of Vision**
- **Depth of Collaboration**
- **Social Design Structures**

- **Visibility.**

The raw data was transferred into applicable case study categories, with some communicative element generalizations. These interviews provide an experience synthesis which illuminates the themes interconnectedness and influence which drives new school construction.

Table 3.
Five Major Themes, Sub-Categories, and Coding

Coding	Theme	Sub-Category
Changing business Career Preparation Research-based Trends Flexible Furniture Cubicle	Design Influence	Corporate & Workplace Design Influence Experience With Trending Design District Level Vision Site Visits Instructional Design Stimulus Community Impact
Teamwork Collaboration	Collaboration	Vision Rationale Stakeholder Impetus Alignment During Implementation Systems Infrastructure
Strategic Plan Architect Influence Communication	Communication of Vision	Collaborative Design Practices Teacher Collaboration Student Collaboration Collaborative Spaces
Neighborhoods Community Flexible Furniture Systems Design	Social Design Structures	Flexible Furniture Physical, Structural Anchors Mobility Infrastructure Design
Glass Transparency Accountability Visible Learning	Visibility	Accountability Illusion of Openness Visible Learning Everywhere Safety

Theme: Design Influence

Design is influenced by a myriad of experiences and perspectives. Coding this theme involved substantial analysis of stakeholder groups and where their design concept originated. Each experiential influence is coded and explained as they apply to the case study.

Corporate and Workplace Design Influences. Workplace structures have evolved to a substantially more casual experience. The structured office is antiquated as new flexible workspaces takes precedent.

Businesses have changed. And so that's really driving it. The workforce and the expectations of the way people want to work has shifted in that direction where it's a lot more informal. You see less ties and suits, more business casual, and you see a lot more ping pong tables in office buildings than you do a fax machine...I've got to start preparing our kids for what the office is going to look like and it doesn't look like somebody sitting in rows anymore (PI).

One high school teacher identified changing workforce requirements by saying, "...we're getting rid of a lot of the pedantic jobs that are [being replaced] by robots, machines. Now we need to learn to create and communicate in order to be successful in our future" (TC). Additionally, a connection fuses educational collaborative design and corporate culture together: "...I think they're trying to emulate the business model to maybe give kids an idea of what it could be like in the future" (TC).

When asked where flexible design began, one District Administrator said,

What drove the change is corporate working environments. I think you see a shift over time of how people dress...their workspaces...I'm not talking just Google or Apple, but I'm talking of lots of industries now. We cater to a different work environment and physical environment, including not only design, but furniture...a new way of working and learning (DK).

Some teachers struggle with relaxing age-old cultural workplace dress standards and professionalism. However, they acknowledge that the corporate sector influences the change. "I definitely think that some of that is coming from corporate, from careers. We hear that it doesn't look the same in the professional setting now. Things are in some ways getting more casual, more open in terms of communication" (AL).

Corporate culture has begun to dictate environmental changes responsible for employees' workspace enjoyment. Architectural design efforts to improve employee morale has found its way into River Valley's educational design.

I'd say business was first, in their ways to find ways to make workers more happy and productive...they have places for them [employees] to play and create and take a break, or to foster communication that goes beyond just the water cooler...I feel like those companies have had success with that and therefore, we think that school could be that same way (TC).

Corporate design identifies the need for positive environments as a catalyst for employees' creativity and in turn, aids schools creating motivational learning spaces. "I feel like with our different collaboration spaces, you would see those in corporate America. Even though our learning commons is a library, it's got...things in it that makes it more comfortable for employees. There are places to sit, work, find information" (PF). There is a stronger impetus on workplace comfort that has translated into school design. Functionality, coupled with aesthetically pleasing surroundings, appear to bridge the gap between corporate workplace and educational designs.

River Valley's strategic plan identifies the District's role in preparing students for their future, whether that be college preparatory or a trade. Additional probing examined whether participants thought the college and career program of study initiated in the educational or corporate sector. One elementary administrator acknowledged, "I think corporate was more innovative. And that's what we're trying to do. We're trying to give them the kind of employees that they want. So, we're emulating their space" (PF). Earlier *silo* workplace approaches have been all but eliminated in River Valley's new designs.

New aesthetic elements also relay corporate design's influence. "Glass seems to be pretty [much] in vogue right now...the bright colors and the moveable furniture, the common spaces,

all that is evidenced in my school...I have no idea, but I would imagine that corporate design came first” (TB). Although, the incorporation of glass is seen through a different lens by one Administrator, “I feel like I look at it a little bit differently with the amount of glass...I would think that’s probably driven through architects...they’re serving all of those dimensions, business, private, and public. I think [glass use was] probably was hand in hand” (SAE).

Whether implemented by corporate America or through architectural trends, material changes have woven their way into River Valley’s new schools. One architect described the change:

I struggle a little bit, because when I started as an architect, if we were designing an elementary school...it had primary colors...Now they look very professional when you go in there. And I don’t know where that came from. Somewhere it became the mix of a business, but also retail...I think some of that has spread into what we’re seeing in schools because it’s what we’re used to seeing in the real world...There are vibrant and exciting spaces and I think that’s what we’ve seen come into the schools a little bit too (AM).

The question remains, who influenced school design changes first? With the incorporation of different materials, the Steering Committee teacher posited, “I’m even thinking when you go to a newly designed company...I see a lot of natural wood and that kind of stuff, I see a lot of that at Lower Valley. I can tell you Google did not get their ideas from Upper Valley [aging facility]” (STD). The creation of large, collaborative spaces also appears to have made a reappearance. “...When I started my career, we were closing up a lot of these open classroom schools. They just didn’t work. Well, now we are bringing those walls back down and things are back open again” (AM).

Offices have moved from cubicles to multi-purposed, large workspaces which are indicative of collaborative work. Looking at employee flexibility and mobile workspaces, one Lower Canyon teacher said, “I kind of feel like corporate design has more influence because I feel like corporate design has been more diverse...I can think of a lot of different work

environments where they created new...learning models” (TA). Retail and corporate location designers have been forced to embrace multi-purposed workspaces touting its ability to foster varied creative work. Education finds itself lacking as adaptations to centuries old classrooms are just now being implemented. As River Valley’s District Administrator stressed, “I think education is kind of adapting and it’s probably a little behind the game in my opinion” (DK).

Experience with Trending Design. New designs often require reliance on previous experience and who is better to identify those trends than architects. However, architects were initially faced with a difficult task: adapting a new educational structure after classrooms had remained untouched for years.

When you look at not only curriculum, but learning spaces, they have been the same for a hundred years. Everybody’s kind of stuck with it...I think change is hard. It’s certainly a cost issue, especially when you look at our system with fifty some schools...it’s a size and scope piece that we’re just going to have to chip away at continually. And, opening new buildings helps because you are exposed to architects and others that are up-to-date on the most current research (DK).

Regardless of an architectural firm’s educational focus, school districts are ultimately responsible to question whether these new trends are indicative of instructional best practices or simply a fad. One Steering Committee member commented, “...the whole trend in education right now is that we have to teach those...problem solving skills, those social domains” (SAE). Architects find themselves on the forefront of research-based trends and must cross the lines between design and instruction, citing evidence for their choices. “I definitely think that professional work settings are driving some of that...feeling and mood of these spaces...you know we try to do as much research and look at trends and things like that, seeing what educators want to do” (AL). “Every architecture firm...has an education branch. They have people that really study educational trends” (PI).

Consequently, one Steering Committee member commented that in the midst of innovative design trends, their role was to ensure best practices were followed throughout the process.

I don't think that we did any changing of minds. I think that we made them lean towards one way or another on something that they had no preference on...for the most part, I think we were there to make sure that their ideas about how teachers would use the building were on target...we did more confirming than generating...they were almost always dead on...they know what best practices are (STD).

However, the Steering Committee administrator felt that the teachers' impact was more significant. "The architectural firm was very open, very collaborative. I think our teachers that were on the committee...were ones that perhaps influenced the most..." (SAE). However, teachers were not involved in decisions made after the furniture integration and pilot program.

We picked out things in conjunction with the design team...with a furniture vendor who has expertise in educational facilities and has done studies on flexible learning environments...we were able to pilot it for about four months and then go back and talk to the staff and even students on what they liked and don't like. There were pieces that were in that pilot program that we did not take to Lower Canyon (DJ).

The collaboration between stakeholder groups appeared to dictate design changes and allowed for instructional dialogue, but to differing degrees.

Throughout the process, architects looked to keep the balance between instructional practices, fiscal responsibility, and trending design elements. "...Listening to the big trends at the time, which were flexible furniture, and also from a bond perspective...[was] part of this whole process...that was always part of the discussion" (SAE). However, there was an understanding that beautiful design couldn't dwarf the project's purpose. "Obviously, we're designers and architects, so we want it to be nice space, very warm and inviting. That's usually a byproduct of everything else. And it's important, but I don't think it can overshadow all the other things" (AL).

District Level Vision. The purpose of each new school was dependent on the district's overall vision and was directly linked to the strategic plan. With Valley West's design, the District Administrator acknowledged how the previous Superintendent led the charge. "It's based on leadership. [The superintendent] stood by the comment, 'I would not be doing the kids in this community a favor by building just another school...that's not preparing kids for their future and not moving us forward...I thought that was pretty thoughtful at this point'" (DK). He was then tasked with carrying the vision through the remainder of the process.

Ensuring that collaboration between architects and educational professional was effective required additional insight. The Facilities Director shared his desire to gain instructional understanding.

I'm trying to get the education side and instructional side...especially with our strategic plan and portrait of a graduate, we'll really be able to hone-in and get some spaces that'll meet the needs...I was part of all the [strategic plan] committee meetings...I was sitting in the back room cause if I don't know what they're doing, then how can I help them (DJ)?

When groups fail to identify their role in the strategic plan, collaboration can break down. "I think [the school design process], is a team effort. I know that sounds like a cliché, but sometimes architects think they're school leaders and school leaders think they're architects...collaboration is really listening to each other and understanding the 'why' of the vision" (DK).

River Valley's strategic plan centers on preparing students for a future not yet realized and is dependent on space creation accommodating changing population needs.

As designers, we want to make [classrooms] as flexible as possible because education is evolving right now based off job descriptions that we don't even know exist at this time. We got to be able to make sure that we're designing spaces that work for today and then 10-15 years down the road... (DJ).

Architects were challenged to create innovative spaces that reflect the district’s strategic plan, yet are ingrained with instructional best practices which will outlast changing trends. “...Thinking long-term, education as you know, policies and theories come and go...is [the design] malleable enough in its use to stand for 75 years and stand the test of increasingly every changing winds of educational thought?” (TB) River Valley wanted to secure building designs which could withstand trending educational philosophies. Architects acknowledged their task for developing these multi-purposed spaces: “Flexible and adaptable [spaces], so we know that the change will happen...we know it’s going to change somewhere down the road. Whatever we can do to allow you to change and adapt is very important” (AM).

Site Visits. The district Steering Committee visited several educational sites with contemporary architectural elements. These sites were architect selected and were indicative of their company’s influence. These visits, both nationally and in state were arranged to showcase specific structural elements. Being part of this influential team left some staff feeling empowered.

So, it’s the only time I’ve ever been treated like a professional...that’s not a thing in education...it really was one of the only times I felt like an expert, a professional, like what I thought mattered. It’s empowering...it communicated to me that I was a professional, that my opinions had validity and that my district was being led by people who cared about those things. (STD).

However, as the site visits concluded, Steering Committee input was limited. “Input ended once they had all the trips completed...then the upper administration kind of took it from there” (SAE).

During each site visit, architects and District administration would solicit school impressions and guide participants towards fiscally responsible elements. “They [the architects] were good about saying...that’s going to save us costs” (SAE). One teacher felt that some design

elements showcased were not applicable to River Valley. “I felt like I didn’t know if that was the district showing off for the architects or vice versa, but it felt a little more performative than informative” (STD) Additionally, the Steering Committee stressed the importance of debriefing together as an essential element in a collaboratively, designed product. As one member said, “...more time at that decision-making point for our building would’ve been helpful” (STD) There was consensus that time together as a committee would allowed for more insightful dialogue and would have provided for innovative change in the design.

Committee members spent time discussing their design process purpose and focused on how the new design impacted instructional practices. One committee teacher shared his perspective, “I think one of my goals while we were on that trip was to not let the building be a limiting factor...Don’t let the building stop teachers from the things they might want to do” (STD).

Instructional Design Stimulus. Including teachers on the Steering Committee solidified the district’s impetus on instructional best practices throughout the design process. Initially, when a Lower Valley teacher was shown the building plans, she was taken aback by the disconnect between architectural design and current instructional practices. She explains,

...And I remember when they showed the diagrams of the architects...all of the desks were in a row. That was so interesting that I said, you know, I think when you’re thinking of space, you need to think about how the furniture is arranged. And teacher never in elementary school put things in a row. And that was like a new thing to the architects. Like they hadn’t really connected with that (TA).

Project architects held to a different perspective, advocating for input from the start. One architect outlined their involvement by saying, “...we ask at the very beginning, what is your building limiting you from doing” (AL)? When asked about the quantity of design input from teachers, students, and administrators, one architect replied,

Hopefully, input in every project. Architectural design can't be done in a vacuum...we like everyone to have a sense of authorship in that design. It's important that they felt like they were listened to and that we can help them achieve their goals. The architecture should not be working against what you are doing. It ought to be shoring it up and helping you do a better job (AM).

This concept of buy-in was not entirely recognized by new building teachers. As one expressed, "I felt like the actual decision-making process may have administrators more involved than...the teachers in that group were" (STD) Another teacher seemed confused by the purpose of more innovative building design elements. "It would have been nice to kind of know why it was built the way it was built" (TC). However, one architect expressed that buy-in and ownership is essential to making a building functional saying, "...to make the space their own is really important" (AL).

New building administrators viewed classroom design through the instructional effectiveness lens. Space deficits were illustrated as a limiting factor to innovative instruction. "It's a lot more challenging to do [cross-curricular projects] when you don't have those spaces" (PG). One principal highlighted the architectural professionals and district leadership integrated approach as upcoming educational trends were interpreted into innovative design elements.

It was truly led by educational standards that were coming...if you look around at some of the new buildings that are being constructed, they look very similar to ours...It was led by architectural firms...Valley View did the research on what the educational trends were and what real role learning was going to look like moving forward...I think everything stems from us. I don't really give architects much credit other than listening to us. They did a good job, but they really look at what we needed and then designed around that (PH).

There was confusion on how much influence architects and educational professionals had in the overall design. The principal of Lower Canyon Elementary felt that the district representatives demonstrated substantial influence through design changes.

I think they [the District] had quite a bit of input on certain things. Like the sliding glass doors, that was ---'s idea, which are in between the classrooms...the district went to three

different schools and came back with their ideas and shared them...I think they had quite a bit of say in what they wanted (PF).

However, a Valley West teacher could identify design elements that lacked educational direction. “I didn’t really have much of a say of what got put in [the classroom]” (TC). Additionally, design challenges were explained, “...probably the learning stairs being so close to these collaboration areas...if you get noise on the learning stairs, it distracts the people in the collaboration rooms and vice versa” (TC). This teacher expressed her frustration with collaboration on assembly and theatrical performance sightline visibility.

The auditorium space in general feels very driven by architects...and I know they had a ...consulting firm...to consult with the architectural design. To me it feels like there was a lot not taken into consideration...the sight lines are pretty bad...the balcony is especially bad because there is this overhang in your view (TC).

Architects addressed these instructional design deficits through a Post-Occupancy Evaluation (POE). One architect explains,

We typically will start [the POE] at one year...it helps us to become better designers. You know, we’re listening and we’re trying to design, but we don’t know. We go away. We don’t really know if it works that way or not (AM).

Teachers and administrators expressed a deep connection with the new space, however architects are not tied to their creation and can move more freely to new spaces, using feedback to drive space changes.

There’s so much you learn from repetition. Failure is not a bad thing. To some degree we are always going to get it right? Probably not, but I think that’s what spawns a lot of the flexibility and adaptability because individuals want to teach it so different (AL).

Architects’ separation from the design created a dichotomy between spatial elements and their impact on daily instructional practices.

Community Impact. The community at-large encompasses an essential stakeholder group in new school creation. Adopting unprecedented learning spaces is fully dependent on the

tolerance and culture of community members' ability to accept educational change. Inventive design elements far outside the norm may face community concern prior to implementation. "We have to fit the audience...and oftentimes, you can't push it too far. You can raise the bar 1 inch, but you can't go crazy (AM). Additionally, designs are assessed through the community's acceptance. River Valley's District Administrator provided this clarification, "...we ultimately fell back to a culture in our community of neighborhood schools. Frankly, that's the expectation still to this day in our community" (DK). Understanding a community's innovation threshold is essential when transforming school culture.

It is really important to understand what is the mindset [of] the people in that building, what they're experiencing because sometimes you do have to tone it down...But sometimes it really needs to be the more quiet, calming experience. You know it's the same thing as you start to talk about special needs and different disabilities and things like that to balance the environment. Everything can't be noisy and chaotic. You got to give those moments for reflection. Whether it's at a Valley West or Valley View, there are still moments where individuals can go and decompress. And I think it's even more important depending on the kids that you're serving (AL).

"We have to learn a lot from [the community]...to see what you will embrace" (AM).

Theme: Collaboration

New school construction prioritizes student and staff collaborative spaces through anchored design elements and instructional infrastructure. Throughout this study, collaboration emerged in both the building creation process, implementation, and occupancy.

Collaborative Design Practices. Ensuring stakeholder buy-in during the conceptual design phase allowed staff, community members, and even students input opportunities. The Facilities Director express his desire for increased communication during this process.

I want to make sure everybody's got a say and has that chance to voice their ideas and thoughts cause it'll just make the project better...I just want to make sure that we get people there that are ready to talk and be open about it and have actual, honest conversations about the design (DJ).

Valley View Middle's inception was unique compared to Valley West High School and Lower Canyon Elementary. With substantial enrollment growth, Valley View faced a more aggressive timeline and by using a previous prototype, Steering Committee input was minimal. Comparing the stakeholder investment in Valley West and Lower Valley, the District Administrator elaborated on age differential.

I think that when you build something brand new and different like Valley West, it's hard to have those conversations. With Lower Valley, I think there certainly was a little more room for collaboration with people that had opened some of our more recent elementary schools...I do think there was a lot more collaborative input on Lower Valley, which is why I think it turned out the way it did (DK).

The varying stakeholder perspectives caused consensus to be unattainable. An architect described the collaborative process used.

We see the most success when even if everybody doesn't agree on everything, the ability to be part of the process and understand the 'why' things are happening, even if you didn't like them...is critical...You have to build consensus...if people don't feel like they've been heard or that they haven't had any input, it's really hard to bring them along (AL).

Educating stakeholders on appropriate, emerging instructional practices became increasingly important as they identified that "...there was a big departure in the sense of not everybody learns the same, not everybody teaches the same, and if that's the case, why does every classroom look the same" (AL)? This realization came through discussion, site visits, and conceptual design analysis.

Teacher Collaboration. A new design outcome instilled an educator collaboration experience increase. Combining staff into a central workroom among mixed content areas allowed them to draw upon collegial expertise. The lack of cubicles and privatized office space ensured that staff would be available for discussion and could learn from one another.

Everybody wanted a private office and there wasn't the collaboration. Then the younger millennials have started to bring it back down, more open. I forgot that even though it can

be disruptive...as a young architect, I could hear other conversations. I learned how to conduct myself as an architect...you heard the problems and began to understand how people took care of things. (AM).

Learning from one another, colleagues began to raise the bar for problem solving and informal professional growth. As one assistant principal expressed, "I think teachers really enjoy it...they can see what other teachers are doing and be encouraged...there's a healthy competition between them where they're trying to support each other" (PH). The lead principal at Valley West identified the depth of collaboration as an unanticipated benefit of eliminating individualized classrooms and moving towards a collective teacher workroom structure.

...one of the greatest things that we've had is you're set up by your department...we're community...you have a lot of cross curricular collaboration. Those teachers will work with one another. They'll talk with one another. It has helped our teachers get to know each other socially, a lot more than just hanging out with the English department only, which is something that we really didn't anticipate. (PI).

With private workroom areas established by grade level rather than content, Valley West provided confidential teacher work spaces for planning, collaboration, and social interactions. Protecting that private time was essential for candid conversations to occur. "[The teachers] want to have a little bit of privacy so everybody knows when they go in their work room, there's never going to be any kids in there, which they all appreciate" (PI). Listening to their conversations, one assistant principal remembered his personal classroom collaboration time saying, "The amount of discussion that takes place is astronomically more than what I ever experienced as a teacher. (PH). The only drawback expressed was the potential for "group think" and mass negativity. The administration, although aware of potential issues, refrained from stepping in.

Obviously, we are not trying to control conversations...if you have a group of people together and things don't go well, it's much easier to talk about things that are not as positive...it really doesn't accomplish anything...I would say that's really the only negative to it (PI).

Overall, Valley West's administration felt that the wide-open, collaborative workspace fostered strong inter-department relationships. "I feel like our teachers support one another across all departments, because they spend a lot of time with each other" (PH).

Valley View Middle experienced a similar increase in teacher collaboration, but as the lead principal explained, sometimes this collaboration occurred by accident.

I think a lot of it is the way we set up, the way I set up the classrooms. What I did and one of them was not done intentionally, I did it by accident. I try to put them in teams. So, sixth grade has one big pod. So, I've got every core teacher. And that pod, and then the science teachers are all science teachers are in the middle of the building, so they're right across. ...So, originally, I was going to put the four teachers over on this side for one team and four for the other. I accidentally didn't catch it until I put my two seventh grade language arts' teachers side-by-side. And so one day, I think it was a month into school, I was standing out there and said, 'geez, that pod, no one's over there. Everyone's over here.'" The teachers responded, '...actually, we love this because they're right next to each other.' And so they collaborate...the kids just rotate through all of them (PG).

Administrative walkthroughs reveal team collaboration and effective Professional Learning Communities (PLCs) occurring daily. "The biggest thing that I enjoy and appreciate is the collaboration amongst all the teachers that you see going on in that learning space" (PG) This principal acknowledged that space implementation can often differ from the initial vision, but can often provide more substantial outputs.

Elementary classroom mobility looks slightly different, but open classroom formations still encourage collegial collaboration. Discussing the earlier elementary prototype, one architect explains the design change saying, "A lot works well with it. But it has a series of classrooms with a center pod at the end...these people that were down here clustered around restrooms. These first couple of classrooms...felt isolated" (AM). Hiring staff excited to work together makes the paradigm shift easier. Collaboration in these buildings is not an anomaly, but the norm. "I'm smart enough to know that I don't know how to do everything...so that collaboration

starts to work” (AM). Acknowledging this shift, an administrator shared, “At [my old school], it just wasn’t conducive to it. You’re in your own classroom...unless you were intentional about making [collaboration] happen, it didn’t happen naturally. You could easily hide in that kind of traditional school setting” (PH).

Student Collaboration. New district designs aggressively solicit areas for student collaboration and flexible learning. Students are asked to rearrange and form groups of varying dynamics and sizes almost instantaneously. This integrated approach combining physical space design and flexible furniture provides a foundation for current engagement philosophies. As a Lower Canyon teacher expressed, “...collaboration is not a new thing by any means. I think it might be a little bit of a trend, or a fad to some extent. But it’s becoming more of a norm...it’s helping us function better” (TA). River Valley’s leadership initiated the district transformation into collaborative learning spaces and were then translated into architectural goals.

“Understanding what the users’ goals and needs are [important]. We can design very functional spaces, but if they don’t meet the needs of your goals and objectives, and what your curriculum is, then it’s not really supporting what you’re doing” (AL).

The question became how best to support students and foster a collaborative culture. The Facilities Director explained his approach.

The way I like to design things is to provide as many options to our students as possible...If we can provide as many sort of different environments, we’re gonna find that one that gets that one student. To me, that’s what it’s all about (DJ).

Reflecting new workplace options, schools that provide additional environmental learning options should see increases in student productivity and collaborative peer practices. “We know that the future, there’s jobs that have not been invented yet, but we know that people have to work together and work together collaboratively for different types of projects and to teach those

critical thinking skills (SAE). However, incorporating collaborative strategies can be difficult without the right classroom tools. Flexible furniture became an integral part of each new building design. As the principal architect on Valley West and Valley View explained,

Our interior architects select the furniture...I call that the icing on the cake because I can take a great teacher and on most days you're gonna be able to communicate and teach...but, I've got to provide something for you that will help you move things forward...it's the cool stuff... (AL).

The Steering Committee also recognized the importance of effective, flexible furniture.

I think [collaboration] is easier when the design is right and some of that is furniture design. It makes it easier for the teacher to transition from activity to activity...you're meeting in groups of three...suddenly it's six...Whatever it is, they can quickly transition versus spending a half and hour moving desks out of the way (SAE).

New building classrooms could be configured to fill a multitude of roles and purposes which ultimately fostered deeper student communication. Refusing to integrate active participation in the shifting paradigm would only defeat the design's purpose. As the Facilities Director explained, "We could design a space, but if you put traditional desks and chairs in it, then I feel the space is worthless. It's not what we intended to do" (DJ). A Valley West teacher reaffirmed the administration's desire to implement innovative learning experiences by discussing how expectations were clearly aligned from the beginning.

The open spaces, the glass, the collaborative nature, they kind of expected that this was going to be a different experience going into it. There's prepping on the front end...and really having the teachers on board is most important. I think they did a really good job at hiring people who are willing to try different things (TC).

When individual teacher workspaces are eliminated, there is pressure to develop interpersonal relationships and build collective teacher efficacy.

Collaborative Spaces. Identifying collaborative building elements can be difficult when they encompass many different locations and content areas. Interview participants referred to several locations as referenced in Table 4.

Table 4.

Collaborative Building Elements by Location		School Location		
Design Element	Definition	VW	VV	LCE
Commons	Promenade with access to main office, counseling, and lunch	X	X	X
Learning Stairs	Tiered theater seating extending at least 5 levels	X	X	X
Blended Learning Lab	Open/No door classroom with flexible seating and partitions	X		
Small Group Collaboration Spaces	Glass enclosed conference rooms seating 6-10	X		X
Learning Pods	Transition areas between Classrooms with flexible seating		X	X
Media Center	Library access with technology and flexible seating access	X	X	X

Each new River Valley school boasted a significant increase in collaborative spaces accommodations for wide-audience variety. Describing the deconstruction plan and conceptual model, the Director of Facilities provided rationale for Lower Valley’s open design as shown in Figure 7.

I feel it was more of a hybrid because, if you look at the floor plan, it’s almost similar to [previous schools]. We just took the guts and kind of exploded it out...got rid of the transition spaces, the corridors, and opened it up to the media center learning commons...make that more into instructional space (DJ).

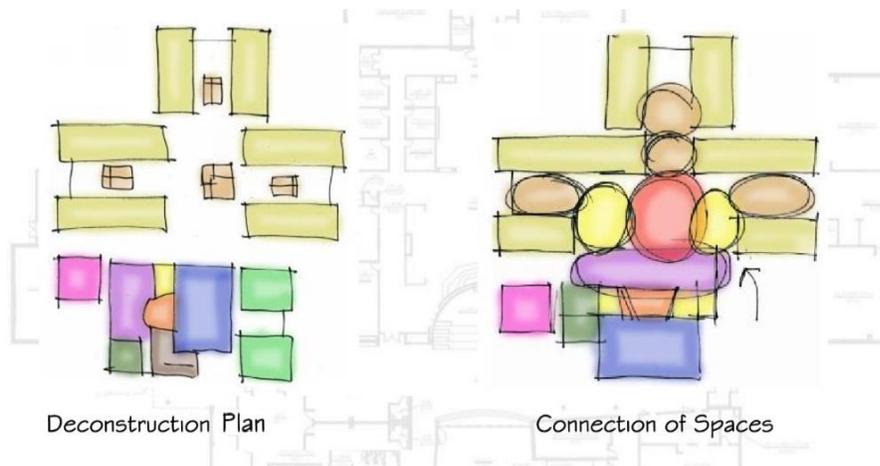


Figure 7. Conceptual drawing presented to River Valley Board of Education in River Valley, KS. February 1, 2018.

River Valley was tasked with explaining this paradigm shift and emphasizing collaborative learning within the new design.

We as a society have changed. I think the formality of a lot of the way that everybody does things [has changed]...I think the kids truly feel like the more comfortable they are, the better they're going to learn. I don't know if that's necessarily the case, but I know that they enjoy it a lot more and it's not as rigid (PI).

New school common spaces were identified as pivotal for school culture development. Lower Valley's principal found that, "...we're really trying to develop a sense of community and a sense of family...with our space" (PF) This concept was reinforced through the infrastructure development of high school "communities," middle school "teams," and elementary "crews."

Initial plans resembled prior River Valley builds, but the multi-purposed learning space incorporation required more room and access to building media centers. Changing instructional systems have modified the purpose and function of media centers. The architects for Valley West and Valley View identified the media centers as a school focal point with a changed purpose.

As a designer, I would hope that's it's a fun and dynamic space and is in high demand, but I don't know if that's true...the media center has a lot of collaboration space in it...Media centers used to be libraries and libraries were quiet. Now they're active spaces. It's encouraged. You might go there to get peer-to-peer help (AL).

Illustrated in Figure 8, new library media center designs are fully integrated common spaces.

Investing heavily in these areas, as one administrator shared, is well worth the price.

I don't think you can make your, what I call high-profile spaces too big...those are really public spaces that kids use, staff use, parents use, community uses. To me, you really have to emphasize the quality of the size, the usability of those spaces because they...are arguable two of our most high-profile spaces and were probably our two biggest errors from a design standpoint (DK).

These integrated collaborative spaces serve as a bridge to stakeholders and help to share the vision of the district.



Figure 8. View of Lower Valley’s library media center adjacent to the commons in River Valley, KS. Retrieved from River Valley School District website.

Finding the purpose and communicating possible uses proves difficult with extremely large instructional spaces. Participants were asked how designers shared their instructional space vision. One teacher said, “I feel like we’ve had some professional development days where people will share ideas for certain lessons that they’ve had in those spaces....they have us do group activities in those spaces to model that stuff for us” (TC). However, Valley West’s staff found some collegial support through their online scheduling document. Valley West’s Assistant Principal shared that teachers brainstormed ways to use the space and shared the document with the staff.

We send out an email every month for room scheduling. We designed a brainstorming pool and how to use specific spaces...so we created this with the help of our teachers. We did a PD where teachers really look at our spaces and how they utilize them and then we shared this with them (PH).

Sharing this information with the whole staff allowed more efficient room scheduling.

Implementing a transitional school-wide schedule mirrored current workforce practices. “I think it’s just like the real world. I mean, now that we have computers, your classrooms are really not tied to any specific space” (PH). Accessing a variety of classroom and instructional space allows

for higher level differentiation. "...as we move towards standards as the way to determine how well kids are doing, we're going to hit a problem...if you have more physical spaces available, it's just easier to differentiate" (STD). Understanding multi-purpose space best practices was challenging for each building.

The learning stairs was identified through site visits as a unique feature. Students and staff can use the stairs for a variety of learning opportunities including, but not limited to special guest lecturers, performances, investigative and observational writing, and unstructured social time. During one site visit, an administrator remembered, "We liked the common spaces, they were a huge thing. The learning stairs were big. We wanted a collaborative space" (SAE).

However, there was some confusion as to proper implementation and effective use practices of the learning stairs. A Valley View teacher shared, "...they mentioned at the end of last year...the learning stairs weren't utilized that much...I mean, the kids definitely know what the learning stairs are...it is not super conducive to the type of teaching and learning we do" (TB). Even a Steering Committee member saw the dichotomy. "I hear teachers say they're not impactful, but having multiple places...those are all things that teachers want" (STD). Lower Canyon's principal, who uses the learning stairs for morning meetings and announcements shared her perspective that, "...the idea behind it is that we want to promote collaboration. And if we're open, we can, there's just more opportunity for that than people closed off in their room" (PF). Whether a collaborative or simply open design, teachers appeared to need guidance developing their personal vision for the space.

Theme: Communication of Vision

Vision Rationale. Educational change is not always initially accepted. Innovative design requires strategic vision and a communication plan which explains the rationale and implementation in a clear and concise manner.

Communicating the “Why.” The design process unites varied educational perspectives into one creative space. However, communication from these constituents is essential to bridging the gap between educational understanding and the public’s understanding of instructional best practices.

Valley West High School and Lower Canyon Elementary’s innovative designs were so far outside the educational norm, that community members required an explanation of the rationale. As Valley West’s assistant principal suggested, “Prepare your community. I think we did a good job of opening our doors up so people could see what we were doing and then justifying through research and data why we operate like this. (PH) Frontloading information prepared stakeholders for what they would experience internally. “There’s a lot of research done before [districts] unroll these new ways of teaching and that comes with a lot of public information...lets people start to understand...and ask questions” (AM).

Implementing new instructional practices required substantial buy-in from both the community and incoming staff. Teachers were given the vision early in the hiring process. “I think it’s just communication and setting that expectation from the get-go. ...just planted the seed and then they just have made it totally theirs” (PG). One architect coined the phrase “co-create” as the process by which they have the most collaborative ownership and development of the new space and is dependent on staff implementation.

You have to hit all the functional things first...make sure things are convenient, that spaces work properly, that things are sized appropriately before you get to the aesthetics...it’s really understanding and listening to the educators and even sometimes the students. When we get engaged and see how you are really going to use the space, we

call it ‘co-create’ (AL).

Co-creating educational spaces transferred some power from designers to educators and resulted in a building reflecting the District’s mission. “The more people you can have engaged from the beginning to the end and at different levels, so that everybody understands the ‘why’ behind why you did things is where we feel the most successful” (AL). A teacher living in the new space affirmed what teachers want. “...if they [architects] really, really listen to what teachers want and administration want, and then explain the why” (TC). Incorporating perspectives from a variety of instructional areas, experience, and past building experience enabled collaborative design and initiated a District-wide paradigm shift.

Alignment of district strategic plan. A new District Strategic Plan was implemented during the new buildings’ design and construction process. Additionally, a new District Superintendent took control during Valley West’s opening year which could cause the initial vision to be questioned. Valley West’s lead principal had been hired by the previous superintendent who gave a clear picture of District expectations. “...[Our superintendent], the one who hired me said, ‘I want to try to do something that’s going to benefit our kids not only while they’re in our building, but when they leave’” (PI). In response to concerns that the vision was lost, the principal said, “...the whole school is built around flexibility...We’ve held true to exactly what the district has wanted us to do. We haven’t walked away from it” (PI). The District Administrator reaffirmed this District perspective saying, “I think our vision that really has panned out at Valley West is that every space can be a learning space...those pod areas throughout the building, those really have become student gathering and collaboration spaces...” (DK).

Classroom space intentions. Significant stakeholder input influenced architects' conceptualization of how District curriculum would function best in innovative classroom spaces. "We start to talk about what are we teaching, how are we doing it...we look at how we start to schedule a building and utilization of that building. That's all before we ever design...we try to identify every space" (AM). However, the architects also acknowledged their limited understanding of instructional practices.

So, we're not educators. We do a lot of work with educators, but we believe we've got to understand from the very beginning what curriculum you're going to be doing and how you're going to be approaching it so we can build the space to support what you're going to be doing now and into the future (AL).

Regardless of architectural perspective, the building's intention was to serve the District's needs and enhance the instructional philosophy. "It's all about functionality and understanding the user's needs" (AL). Throughout the design process, "the architect has to be able to glean, to ask the right questions, and glean the information back that you need to create a design that basically solves all your problems or any issues...ask those good questions" (AM). After asking those questions, the conceptual design belongs to the architects.

As architects, we're meant to be listeners first when we're designing, at least that's the way I was always taught. And then we take that and we regurgitate it into the design. Now, granted, the designers can have an influence on the building as well, but to me I was never that way. Yes, we're designing the building and it's forever going to be linked to the firm, but ultimately it is the end users' building and they should have a pretty big say on how it functions (DJ).

Communicating instructional best practices and design elements is a well-orchestrated dance between the District leadership and architects as the Facilities Director explains.

We [architects] bring a lot to the table because we've seen a lot of things that are done in the metro, nationally, or regionally...we can have that dialog...but, if ultimately the owner said, '...this is what we really want,' I'm going to defer to what you want and design it that way. I'm not going to try to push something that I think is new and fresh and cool in the architectural industry and then of course, it not be what you want (DJ).

Architects provided teachers some ideas to incorporate multi-functional areas into instruction.

Understanding what those different kinds of division are and creating zones within that classroom so you have flexibility to open up the space, you also have a little bit of that anchor or focus area to give teachers some clues of how to use it. Sometimes for staff, that can be overwhelming because there's too many options. We try to approach some of those wide-open spaces with anchor points (AL).

Without establishing room anchor points, fundamental design elements create a structural deficit and intentional space use is lost. One Steering Committee member argued how the purpose of a space is undefined without the one most important element. "...I'm not sure [the classroom] really has a purpose until it's filled with students...a space doesn't really take shape or become a classroom until you have the kids in it" (SAE).

Stakeholder Impetus. Balancing influential constituents can often blur the purpose of design creating a dichotomy of vision. Attempting to cross that line can often create communication difficulties.

Architects. Communicating architectural concepts and practices can prove challenging when working with laypeople. During the design process, the Facilities Director served as the liaison and explained, "There's a little bit of a hurdle to jump there...I can show you a 2D floor plan and you won't have any idea what I'm talking about. So, we try to take that next step with 3D" (DJ). Some on the design committee failed to understand the regulatory restraints architects were under.

Bridging that understanding gap, architects set out to experience what students and teachers go through on a daily basis.

We went through a whole series of programming exercises. Our team even followed some high schoolers at the other schools and watched how they were moving through the spaces...really understanding. If I'm a staff member, am I in my room all day or am I a traveling teacher (AL).

One Steering Committee member didn't realize that architects had shadowed students and remarked, "I would love architects to really spend a day in the classroom to hear the functionality of things" (SAE). Architects' prior experience and preparation prior to the design often went unnoticed by most educational professionals in the study. A Steering Committee member expressed,

I was impressed by the thought that [the architects] put into it on the front end. And I don't feel like that was conveyed. I don't know if that was, I'm not wanting to congratulate themselves or not wanting to point out the disparity between the new building features and the old. But, I feel like more of a celebration could have been made of the ways that we are trying to change in response to students and to not limit teachers. I feel like if it was sold as our teachers are doing amazing things and we don't want the building to be the limiting factor, that's a lot more powerful than, 'look at all these windows we put in' (STD).

Additionally, this teacher suggested that architects provide answers early in occupancy in order to increase rationale buy-in.

...once the [teachers] lived in the space for a week or two, to be able to meet with all the teachers and say, 'what questions do you have about the design? What do you not understand? What would you like clarification on why we did what we did?'...so you've got teacher who would give feedback (STD).

During interviews, there were several building elements that teachers were unclear of the instructional purpose. As one Steering Committee member admitted, "I don't know how to convey what the architects wanted, but...maybe we could do it. We could easily say, here was our thought process behind the learning stairs. Here's four ways you could use learning stairs..." (STD). Ultimately, communicating the architectural perspective to teachers and administrators would have opened a dialog, thus expressing an understanding of District vision and related building elements.

Steering committee. Engaging District stakeholders in the process allowed for practitioner input and collaborative discussion on moving the strategic plan forward via

innovative learning spaces. Architects saw the Steering Committee as a vehicle to pilot change and dissect any potential issues.

It's not a perfect process. You get out of it what you put in, like anything in life. And those who are invested, it's important and they share. They kicked the tires, tested it so to speak. We end up with better products, I think. The more collaboration or back and forth works better than, 'this is the way we've always done it' (AM).

The origin of Valley West's foundational instructional changes were unclear. An architect shared, "Valley West was from the leadership group. There was a desire to take a big leap forward" (AL). However, the quick turnaround of Valley View's construction forced the Steering Committee to be utilized differently than the other two schools.

Valley View Middle needed to be built fast. We were running up against capacity...and needed to relieve it as soon as possible. So, instead of going through that full design process similar to Valley West and Lower Canyon, they took [previous school] and morphed it with a smaller steering committee of more middle school-based stakeholders. (DJ).

The middle school's aggressive timeline only allowed for minor prototype adaptations and relied more heavily on District and administrator leadership.

Principal influence. Each level hired principals at different stages of the design. Valley West's administrative team was hired a full year before the building opened and the lead principal served on the initial Steering Committee.

I was put on the design team to help...just get it off the ground. And so I was really on the very beginning of it, which was kind of nice when you went to apply for the position, you understood exactly what the vision was (PI).

The high school principal had to hire significantly more staff and administered a wide variety of instructional programs not applicable at the middle and elementary levels. Not all administrators were fortunate enough to join in the building's foundational design teams. Lower Canyon's principal explained the depth of her design influence saying,

I didn't really have conversations with the architect, so it was mainly, 'what do I

envision?’ Now, they may have had those conversations with the district office, but they had all that planned out before I was brought into the picture. I had been told about the collaboration spaces, which is where students are working...I didn’t have any input. The only input we had was that the students got to pick the school colors...but the areas were already designed. I didn’t have any say in the furniture or anything before I was hired...I think it’s always important for you to include the educators in the process. And, I felt like they did that, just because I wasn’t a part of it...just making sure that they get feedback. I think they should get feedback from my teachers. They could probably give you better answers than I can because they’re the ones using the space (PF).

Another principal acknowledged how her design influence was generally focused on aesthetics.

“I knew what colors I want to come in no matter what” (AG). One principal expressed, ...I think they could have brought me in a little bit earlier so I could have looked [at the design]” (PF)

Perspectives on administrator design influence seemed to vary between District leadership and administrators. There was a fine line between designing a building for future generations rather than the administrator’s individual personality.

There’s input to be had, but I think you also have to look at, in a system of our size, at what’s going to be best, not only for the current principal, but for the next, and the next...we’ve got to make sure it’s not too personalized to the taste of one individual (DK).

District leadership acknowledged that great input is often received from individuals without a vested interest in the building.

...principals come and go...I think principal input is valuable, but sometimes I think there’s more value...when you don’t have a dog in the fight...We were building the school district...when you open a building it can become very personal. So, I think sometimes you get blinders on...it’s not about what [the principal] likes. It’s about what professional designers and architects say is our best model (DK).

One principal conjectured that the District might not want the input of a single administrator.

It would be nice if they would name the principal earlier in the process. I wonder why they wait. Sometimes I think maybe they don’t want our input or maybe they already have a vision in mind and that they will find the person that will match that” (PG).

Even Valley West’s principal, who was brought in a full year before opening felt that he could have had more influence on the design.

I had not been involved in the earlier stage of the architects meeting with district folks. But I think we have certainly under-planned...I think that really communication is probably the downfall there, where the missed opportunity was that there just wasn't enough foresight" (PI).

All study principals felt that their influence was under-utilized in prior design discussions. However, there was a level of District trust established once the administrator was named. These administrators shared that most of their suggested changes were accepted once rationale was provided. "That goes back to the trust of you being in that role that they're going to say yes to [changes]" (PI). Valley View's principal was successful in submitting change proposals. "Cause I wanted so much more, but I would always do a writeup and...I always feel like there's always extra funds somewhere that they set aside just in case. And it wasn't like I was asking for a lot" (PG). Valley West saw a few substantial design changes, whereas other levels faced more aesthetic design deviations.

Alignment During Implementation. Correlations between conceptual design and implementation are often misaligned. River Valley faced this same struggle as the new buildings were transitioned to occupying staff. Would the vision of collaborative spaces and multi-purposed learning spaces transfer to instruction?

Instructional decisions in new spaces. Initially, the concept that learning can occur anywhere was a District paradigm shift and educators often needed permission to identify those opportunities. "[New design] helps kids understand that learning can occur anywhere. You don't have to just be in a classroom to experience or be engaged in learning" (PH). Even though permission was granted to try new things, such as PBL initiatives and mobile classrooms, standards-based instruction and student engagement practices were non-negotiable. "You want to be creative and you want to be, create a flexible space, but there's some things you can't really bend on..." (PI). Acknowledging that education has remained relatively unchanged, the District

was poised to try something new. “A lot of schools, even in our district...looks the exact same way it did in the fifties and sixties. You know, nothing really has changed” (PI).

Administrators touted teacher encouragement to make professional decisions on how to best utilize the new spaces. However, that idea wasn't always translated appropriately by the teachers.

...My goal was to not limit what teachers would do and so, I don't know that I would even want to say, here's how you should use this building...most teachers have the idea that I'm here to do what I do and no one really cares. I think that's a pretty American idea that, teachers as professionals don't really matter. (STD).

The question remained whether teachers could fulfill the vision and expectation for flexible instruction that the building was designed for.

Design fidelity during implementation. The overall design vision was communicated through the principal selection process. Valley West's principal explained the Superintendent's implementation position. “Even [the superintendent] was pretty much hands off, ‘Here's my overall vision. Now make it happen.’” (PI). Success seemed to hinge on the District's trust in the design and their selected leadership. As the Director of Facilities expressed,

We can design spaces like this all day, but if the school isn't using it to the way it was designed, then it's going to be looked on as a failure. And that's not gonna work. Luckily, we had administration at that building that knew and were part of the process the whole entire time (DJ).

Hiring practices were essential to ensure teacher buy-in and vision encapsulation from the beginning. Valley View's principal illustrated how she approached the interview process.

I think for me, when I was interviewing, knowing what this space was and knowing what my vision was...one of the questions that I asked was about collaboration, working together with the other team and I think, when they came in and they saw it naturally, there was some concern, but at the same time the excitement to be able to do that” (PG).

Ensuring that staff understand the expectations of using this multi-purposed space came down to two ideas.

I think it just comes down to how 1) how we present it to what our expectations are, and 2) just starting off slow. But I think once they get started, it's so easy for them to do. I mean they love it. They really do... when I hired each staff member, that was a question that I asked in the interview... We have this beautiful facility. How are we going to make instruction different in this building that you would get in any other building? They were all on board. I mean, they were just excited to do it (PG).

Vision fidelity was dependent on the administrator's tenacity and desire to keep District expectations on the forefront of teachers' minds. Communicating the vision of River Valley's architects, Steering Committees, and District leadership was left to the building administrators' discretion.

Theme: Social Structure Design

New school design elements influence individual communication efforts and how peer interactions progress. These social connections help develop relationships between students, teachers, and administrations. Elements such as building anchors, flexible seating, and traffic patterns aided in supporting social constructs between stakeholder groups.

Flexible Furniture. Flexible furniture encompasses many different multi-purpose, moveable, and reconfigurable pieces. Incorporating these pieces into River Valley's new schools provided an integrative design approach and a system-wide approach appears to be on the horizon. This flexibility integration emphasis came from two primary sources. "I think these were pretty much our two big influences. We want kids to feel at home. We want kids to feel productive. So, we want the comfort that kids feel at home and then the productivity, encouraging aesthetics" (STD). Focused on student connections, providing learning space flexibility allows students choice in determining their best learning posture. This choice cannot be made simply with structural elements in mind, but integrating furniture pieces allowed for the continuance of the design's flexible learning vision. As one architect shared,

We feel very strongly that furniture is a part of the environment. If you don't have the right pieces to support that quick-change environment, or a flexible space to give some of that choice and ownership, things could go very wrong" (AL).

River Valley's flexible seating approach stems from the desire to change configurations seamlessly and provide varying group options. Remaining in structured rows is reminiscent of last century classrooms. "I think what you're going to see in our schools is a multi-functional space. We look for anything from small spaces to large group interaction and everything in between" (AM). These previously confined classrooms eliminated potential for strong student collaboration and instructional best practices. Speaking of the new, integrated classroom and flexible seating, Lower Canyon's elementary teacher explained,

...we've given the kids an opportunity to choose the spot that they're going to do their best learning...I had that philosophy in some of my previous spaces, but it wasn't possible. You know, I've taught with 27, 28 kids in a small room and...the teacher can't give those energizers and brain breaks and cooperative stations because you can't move" (TA).

As with any change in classroom structure, there is a significant learning curve. There was trepidation around providing teacher's with organizational options and Valley West decided to allow teachers some freedom.

There are teachers here, very, very creative. They are our best advocates, our best resource for how to use the classrooms...they were leading us. We had ideas on how you could use this...but, you turned them loose in those areas...and they came up with some awesome things" (PH).

Valley View's principal shared how teachers attempted to maneuver flexible furniture choices from the very beginning.

You know, every teacher was worried at first, nobody wanted the little chairs, the desks that swivel. And I had so many teachers coming to me asking, 'just can I swap with this teacher?' ...that's what's there, make it work. And so, it's just a matter of classroom management. The kids will adapt so it didn't take very long (PG)

Teachers found that incorporating these new pieces of equipment allowed for intensive differentiation and daily variety. As one Steering Committee member commented, “If the seating is flexible, then your classroom can be used for [re-teaching]. If the school is flexible, then everywhere...is possibly a space for you to differentiate in” (STD). One middle school teacher was asked how the new furniture changed how she uses collaborative structures within her classroom.

In the sense of, in the middle of class we do...it used to be, if I wanted to set something up, I had to spend 20 minutes after school and moved all the desks and chairs. Now, I can get my groups in a circle and it takes the kids doing it together less than a minute” (TB).

Allowing for impromptu collaborative group changes created an active participation culture and increased student engagement throughout the new space.

The middle school learning pods experiences some unanticipated social issues with their flexible seating. As one teacher shared,

We actually took away a lot of the furniture at the beginning of this year because what was happening with the creepily standing close to each other...you would have 20 kids standing on the outside and 20 more sitting. It was like we couldn't see what was happening on the inside, which was becoming a problem. So, I have three or four pieces of pod furniture in my room right now...we're trying to force them to stand up so we can see most of what's going on (TB).

Understanding influential social dynamics on student behavior, staff began to arrange furniture which fostered appropriate social interactions. However, one teacher indicated that their best intentions were often undermined by students' free choice.

They [the students] largely ignore the things that we tried to set up in Valley View Middle. They don't use the furniture. They just stand and talk to each other...Their use of furniture is completely unpredictable and they all...want to stand as physically close to each other as they can...So, they're not like spread out focusing like the freelancers at Starbucks. They're still kids. They benefit...when teachers structure them... (STD)

Students would gravitate towards open, multi-purposed space rather than the furniture within the area. Interactions between students appear more familiar and teachers found that “...the

socializing is a lot more important to them than comfort. It's a very comfortable area, but they just stand there and talk" (STD). However, the administration seemed unaware of the learning pods' social difficulties.

In the morning the most used [area] is the commons gym area. But overall, our pods, our learning pods because it's almost like they have their own little PLC in the pods during passing period...They love the furniture, they love sitting there and just chit chatting...I think the layout just really makes them gravitate towards it in their furniture. It's very inviting" (PG).

Architects appeared to control the furniture integration and the Steering Committee felt uninformed. The differing perspectives are explained.

We did a couple test classrooms...and then actually talking to those students and staff and finding out what worked and what didn't. That process worked really well because we had both administrative leadership and some building buy-in. That's not always possible...but that's even another layer that really brings things together...always ends in the most successful product" (AL).

However, teachers responded that, "...we didn't know the furniture piece until almost the last minute...we just knew it was cool. That's what we wanted" (SAE). District leadership tapped existing buildings to pilot furniture and made selections based on their feedback.

Physical, Structural Anchors. Eliminating furniture structures, administrators and teachers looked at how physical elements could shape school social structures. Elements such as leveled areas, glass doors, and partitioned walls provided additional instructional space outside of the typical classroom. River Valley's District Administrator identified how the Commons could be sectioned into learning environments through the physical anchor points. "It's kind of leveled. Even if it's just one stair, it really separates different spaces...they did a great job of trying to make every space a potential instructional space" (DK). Anchoring physical space allotments through design elements was accentuated by the incorporation of open Library Media Centers (LMC).

Establishing functional learning spaces became paramount when Library Media Centers entered the new buildings' core. There was some frustration at Valley West as the LMC was used as a student social area.

“...It's an open library, it's going to be loud...they blocked off the third floor...during lunch they've put these scansion poles across certain areas so that you can avoid having the kids be mall walkers around a circle...I kind of questioned that. I was like, well what's wrong with them walking around. I'm sure they got into trouble and that's why it's a problem” (TC).

Infrastructure changes limiting student mobility had an impact on area social experiences.

“...The library is a cool place to hang out. There's fun places to sit and relax...they are no longer allowed to eat in the library, so that has reduced the amount of kids who go there” (TC)

The administration felt that the expansive Commons compensated for lack of library access and emphasized the relaxed communication among students.

I think of our commons as a showstopper. It's a place where all our kids love to hang out. And it's a warm place. It doesn't feel like a lunchroom. You feel like you're sitting in a library at a college campus. It's kind of open and there's a big space and a lot of the flexible seating...that students really enjoying doing...sitting and communicating” (PI).

District leadership recognized the impact that the Commons has on student community and peer interactions. “That [Commons] is just one big social community in there and it's awesome.

That's where kids want to hang out, which is great” (DK). The correlation between Valley West and collegiate environments was apparent in comments from former students.

...There have been kids that have come back...and said,...the way that you guys have done things has helped me a the collegiate level...you have to navigate different spaces...there is a little bit of a soft skill piece to what we're doing...” (PI).



Figure 9. Reading nooks behind the learning stairs in Lower Valley's library media center in River Valley, KS. January 13, 2020.

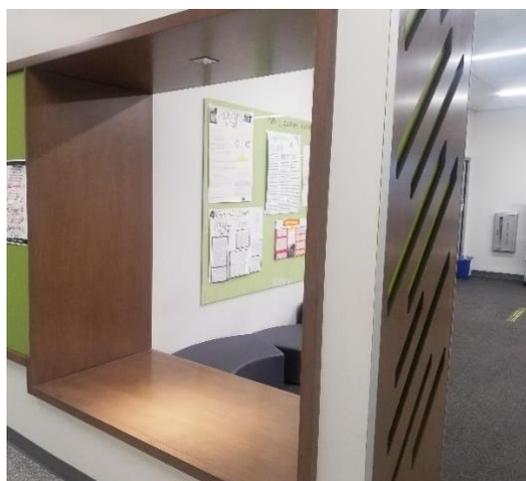


Figure 10. Valley View upper area learning pod cut-out seats in River Valley, KS. February 10, 2020.

Open are physical separation points were slightly less obvious at the elementary level. As Lower Canyon's principal expressed, "For an elementary school, definitely should have been made more kid friendly" (PF). Providing anchored physical elements would identify spaces and create more age-appropriate collaborative opportunities. As shown in Figure 9, Lower Valley students have access to interestingly, designed reading nooks reminiscent of Valley View's learning pod cut-outs, illustrated in Figure 10. Looking for age-appropriate fun, one principal expressed "...put some more innovative type things inside...put in a slide that comes down into the library..." (PF). Enjoyable, age-appropriate physical elements create highly motivational spaces and foster the building's culture and climate.

Incorporating nooks and intimate social areas fostered relationships and aided staff in identifying potential outlying students.

I think what's cool about that space though is it allows for, if there's a couple of kids that are maybe just on their own, it's pretty easy for them to pair up...we try to be real cognizant of that...we try to get them connected and I think that our spaces do allow us to do that on a certain level" (PI).

With a District mental health emphasis, administrators are using the building's physical design to help connect students with the larger school community.

Mobility. Social group mobility is a highlight of River Valley's innovative design, with both students and adults. Mobile structures progress with scaffolding from supportive elementary transitions to a fully nomadic high school experience.

Student group patterns. Classroom teachers find student collaboration much easier within a larger space. "I have everybody spreading out in the room...I'm really able to provide them that opportunity where in a different typical classroom, the teacher can't always ensure that [supervision]" (TA). Larger elementary classroom sizes and vast open areas empower teachers and helps make student behavior more manageable. An elementary teacher admitted, "I honestly feel that I have less behavior problems, less classroom management challenges because of the open space...I think it's cause they're not tightly compacted" (TA). Freedom to move has also increased student vigor as one high school teacher shared. "...The kids definitely have a lot more energy and are a little more mobile because they're allowed to be somewhat more mobile" (TC).

Transitions within River Valley's new schools create opportunities for unstructured peer interactions, illustrating intermixed social patterns. Architects looked at traffic patterns typically assigned to secondary schools and found them transferring down into elementary settings. "I find that middle school is where a lot of that social aspect starts to happen...you started to change classes, move around...now they're bringing that down to the elementary schools" (AM).

However, understanding congestion and traffic patterns at each of the schools provided rationale for designers provide more open space. As Valley West's assistant principal found, "[The design] helps ease anxieties because not everyone is like going through one central location. We dispersed the population throughout the building" (PH).

Dispersing the school populations into Neighborhoods dispersed student groups around the building aiding traffic flow. Valley West’s principal had concerns for his own effectiveness with dispersed offices, but soon found that increased social interactions between administrators and students were a welcome benefit.

I feel like our defining feature that has been the most successful is our dispersed administrative offices. That was the number one hands down...concern I had about taking this job because I knew I was going to be the only administrator in this office...what I found, is every single one of our assistant principals is known by every single one of our grade level kids...there are kids that will pop in between every single hour and get a piece of candy and just say hello to their counselor, and assistant principal (PI)

Integrating building leadership among the students instilled a sense of community within the high school. Additionally, interspersing smaller grade level social spaces as illustrated by the Blended learning lab in Figure 11, enabled students to create cohesive, tight knit societies.

“They’ll usually hang out in there because it kind of feels like it has a lounge feel to it” (PI).



Figure 11. Students utilizing the blended learning lab located on Valley West’s second floor in River Valley, KS. Retrieved from River Valley Architectural website.

As parents voice concerns over student mobility, the principal illustrates the changing educational times saying,

The thing that I point out to the parents is, 90% of their stuff is on their laptop and even their textbooks are on their laptop. They're not carrying a lot of books around...and we realized that you don't have a place to put your coat sometimes, but most kids don't wear coats anymore (PI).

Content area traffic becomes more congested at Valley View because of limited learning pod space.

...During passing periods, I think that [learning pods] causes more disciplinary issues because kids don't have anywhere to go. I mean, it's literally probably five steps from my door to the math door and then maybe ten steps from my door to language arts. So, they gather in the pod" (TB).

Traffic flows much easier in the hallways and common spaces. When asked whether the problem is more structural or programmatic, a Valley View teacher said,

...absolutely a scheduling issue. So, [students] gather in the pod...this year, they stand creepily close to each other. I don't like personal bubbles, I don't get it...but when you give kids five minutes that they don't need to go anywhere...things are going to happen (TB).

Elementary traffic patterns tend to differ as they are typically teacher driven. At Lower Canyon, students are taught general pedestrian traffic skills. Some teachers have found this difficult to accept. "We teach them, we don't necessarily move in lines. We teach them traffic, we call them traffic patterns. Like, you stay to the right on the right side...but I don't see any difference than I noticed before" (PF). Equating traffic instruction to real world skills, one teacher explained,

...[we] really wanted to teach kids to have an authentic real-world experience of going to the mall. You stay on the right and as you're walking, there's times where you're going to be loud, but...there's times where it's appropriate to be quieter...I go back to the windows... (TA).

Lower Canyon student groups simply move to their dismissal location and stand with mixed age-groups. Rather than uncontrollable behavior, students stand around and talk. One teacher stressed

the importance of this time by saying, "...we're all in a space together. We should be a community" (TA). Lack of traffic structures actually allowed varied age-groups to intermix, creating a layered social configuration unavailable through typical lined dismissal procedures.

Teacher groups. Teacher mobility looks vastly different at each of the new River Valley buildings. Elementary students are still assigned a homeroom teacher, however there are many options for student to move around the building. Teachers still have a personal instructional space, but can open sliding doors between classrooms, creating a transitional learning environment.

Valley View Middle School has slightly more teacher transitions, however they are more schedule and enrollment based rather than structural design. Valley West High School's organizational structure has eliminated individual, assigned teacher classrooms and has shifted to a changing scheduling process. Teachers are expected to analyze their instructional plans monthly and reserve learning spaces which fit their lessons best. When opening the building, teacher movement and room assignments were an administrative challenge. "...There's no individualized classrooms for teachers. They utilize space based on the need for the day. Which, in my opinion, was probably one of our biggest concerns. How are teachers going to operate not in their own designated classrooms" (PH)?

River Valley had never experienced a system like this before and staff flexibility was essential. "Our teachers aren't settling into classrooms...everybody understands that...you're going to move rooms depending on what they're doing in their lesson" (PI). One teacher saw many staff members in different locations remarking that "...a lot of teachers utilize the moving and where they need to go for a certain class. I walk around and I see teachers in different spots all the time. I think they definitely utilize that" (TC).

Conversely, there were some teachers who found this new system difficult to operate in and struggled during the first opening year. The principal expressed, “There are some [teachers] that I think feel it was harder than they anticipated and it’s usually the person that’s been in the business 25 years and they’ve been around a while” (PI).

Additionally, staff mobility uncovered a lack of pride in instructional areas. Staff would often leave spaces untidy and disorganized rather than resetting the space for incoming teachers.

Since there is no like designed individual spaces, sometimes the spaces get, I guess ‘abused’ for lack of a better term...we’ve tried to train them to take pride in the new space...we established some procedures...we have a standards, how the room is supposed to look (PH).

After this initial “training,” room disorganization decreased and the Assistant Principal equated that to staff buy-in. “When you have that buy-in, the problems are minimal” (PH).

Privacy Issues. Without a classroom “home,” teachers struggled with having space ownership and privacy. One architect described the struggle eliminating teacher desks and private office space.

Some districts take away the teacher’s desk. I don’t know how that’s gonna go over because I still think you need a place to put your family pictures, your purse. They want the staff walking behind students, now that we’re on tables, looking over shoulders...I think we need a mixture (AM).

Valley West’s staff workrooms is a combination of individualized preparation areas and mobility. Administrative staff discussed the importance of allowing workroom staff autonomy.

We’ve kind of pretty much been hands off on what it looks like. So, there’s some creativity in there and they’re at a cubicle essentially. So, we let them decorate it however we want. And some of them do the whole room and some of them don’t. But you know, those are some things you have to trade off on as a principal because you’re asking so much of your teachers, to take risks and do these things. You can’t sit there and micromanage every little thing, and it’s hard in a new building to see some string of lights or something...They have some privacy and they want to have fun and so, we let them do it (PI).

Allowing independence in certain areas empowers staff and increases their flexibility with other, more rigid requirements.

Infrastructure Design. Physical design fosters social interactions, but the school infrastructure frames how students will move within that space. Building processes and procedures establish the building culture and climate by using the space effectively. Developing student relationships outside of typical social groups was a huge success for Lower Canyon's principal. "...You might have two different grade levels and you might see them interacting with each other...I've seen the big ones go over to the little ones and say, 'He buddy! How are you?' That type of thing" (PF). Development of new student relationships across grade levels is a strategic use of collaborative design.

Encouraging community and social groups. New school community culture is easily established when teachers, administrators, counselors and offices are an integral part of learning pods. However, some staff are divided on whether culture depends on physical space designs or building infrastructure. Valley View's principal explains,

I think the way we have it set up, it's not so much just the design of the school...it's inviting where we're all in here together like a family. It's a community. And then our teachers are being a part of that as well cause, the teachers are right there with them" (PG).

Another teacher concedes that the classroom accessibility and common areas aids in culture building.

...each wing of the building is almost identical. They have the same amount of learning spaces, same amount of maker spaces, collaborative classrooms...each area has the administrative office...so that is nice. If you have an issue with a kid, they're all right there for you (TC).

Yet, without organizational design elements, community building is challenging. The physical space allocations enabled staff to organize students in way that fosters relationships.

There's the student learner structure and then the educator one...How do we create identity and social groups within that 2000 kid bubble, to break that down and make people feel ownership...we looked at the breakdown of what can we really support and at that point, they really wanted to go to grade level pods (AL).

Structured learning pods was a focus for Valley View Middle as 6th grade parents are often insecure about their child becoming lost among a larger school setting. Transitioning students through a scaffolded physical space, resembles elementary activity areas. Students begin in a closer classroom structure and move to more spread out areas as they progress through the school.

...Our 6th grade parents always talked about...the transition to middle school...I wanted to keep some of that...elementary background. So that's why we kept all the 6th grade in the larger pod than we did with the other ones. Then we start gradually separating them out to where they're not just in one big pod and it works great (PG).

Community and social development combine physical space structures with supportive infrastructure programming. Utilizing design elements enhances the school's connection with students, staff, and the community.

Theme: Visibility

A major component of River Valley's new school designs is transparent sightlines and visibility features. Eliminating doors and use of glass throughout the buildings creates the wider collaborative instructional areas and illusion of openness.

Accountability. Accountability is naturally built into River Valley's new school designs as learning is visible throughout. Questions arise as to whether accountability is focused on staff or student performance.

Teacher performance. Transparency increases teacher accountability without question. This visibility naturally increases teacher responsibility for effective instruction. "...You don't want to get caught sitting at your desk with your feet up when the principal walks by. So, I'm

sure they're way more cognizant of their vulnerability. (TC). Another teacher shared, "...subconsciously, I'm more on my game because of the windows on the interior..." (TA) As tours increase, River Valley's new schools are keenly aware of performance standards. Valley View's principal expressed, "...you're on it all the time" (PG). Extreme visibility also impacts how students relate to teachers. As one teacher recounted, "I don't spend any time at my desk...A huge change is just the level of student independence" (STD) Teachers are forced to evaluate their instructional decisions and follow best practices since the results are exposed to administrators and colleagues alike.

The pressure of being visible makes you think about what you're going to have kids do. I feel that pressure honestly at Valley Middle in a positive way just from principal walkthroughs...but the most pressure that I feel is peer-to-peer...there was just a higher expectation climate (STD).

Collegial collaborative practices have also increased with the transparency and glass enclosures. At Lower Canyon, teachers reported,

...the teachers collaborate more because they can. I mean, I think I've always been a pretty responsible person...I love teaching. I hold myself accountable. I want to do the right thing. I think I teach better because someone's always watching me, if that makes sense (TA).

There is accountability to optimize organizational spaces and find unique ways to collaborate.

Lower Canyon's principal said, "...they use their collaboration spaces and their activity areas more...since everything is open" (PF).

Administration Performance. Valley View's administrative team avoided the discussion inferring that transparent classroom walls encouraged teacher monitoring and instead, focused their attention on their personal accountability. As the Assistant Principal conceded,

I'm sure there's a little accountability...That's helped from my perspective too because people can look in here and they don't see me just sitting at my desk...they see me walk in the halls, they see me working with kids..." (PH).

The lead principal acknowledged similar impact on administrative roles.

This is a side benefit to this school...our teachers see how hard our administrative team works because they're out there with them and...we have a lot of glass in this building. So, they see them hustling, you know, it's not just, sit in your office and do nothing. They're really on the front lines of seeing what a life of an [assistant principal] is like" (PI).

Accountability crosses all content areas and staffing positions as glass increases visibility throughout the new school buildings.

Student Performance. Architects field questions related to student distractibility when new construction touts large glass enclosed spaces and open sightlines. As one architect expressed, "We always get that question, 'if you put a ton of glass in there will the kids get distracted?'...kids are adaptable...the first week, it's distracting,...actually, kids are behaving better because they know that someone might always be watching" (AL). Corroborating this theory, new building staff face incessant tours and frequent visitors with potential student distractibility. A Valley View staff member recalled,

I remember when someone at Valley View when they first opened saying we're more like a zoo because there's all the district people who would pass by...I think [the students] are used to it. It becomes white noise in some respects, unless it's one of their friends and in which case, it can be a distraction (TB).

Understanding glass as a distractor, the Steering Committee suggested a sightline change. "We tried to put a lot of thought into the pros and cons of sightlines. We want teachers to easily be able to see students, but not necessarily have students be able to see everything all the time (STD).

However, Valley View's principal suggested that it simply took time for students to adjust to the visibility factor.

...I think what you see more of is the kids. It's just there's not a distraction anymore. Originally it was a distraction cause it was like, 'Oh my gosh, I can see everybody that's

walking through.’...They’ll wave, but they’re very focused on what they’re doing. It’s just a norm in the building now...I think [it took] a couple of weeks” (PG).

One teacher admitted that distractions are inevitable with glass framed classrooms and was sure that the positive effects outweigh the negative. “...I think having that glass is a little bit more freeing and open feeling and that kind of offsets the distraction factor...they’re gonna find ways to get distracted regardless, right” (TC)? “Kids, after a while...they concentrate on what’s going on in their classroom and they don’t really look at us because it doesn’t matter” (PI). At Lower Canyon, the visibility is an asset for struggling students. “...I think it honestly reassures a brother or sister that they can see their sister sometimes and they’re doing okay” (TA).

The initial design goal intended students gain understanding of other instructional areas. The Facilities Director explained, “Whether it’s a big open space or kind of glassed in, it’s so students can see what other students are doing, which is first and foremost to get them interested [in programs] instead of the old traditional way...” (DJ). This visibility could increase specialized program enrollment because of their student body visibility.

Additionally, glass partitions enabled staff to supervise many areas, working with varied group processes.

Being able to send people to a different space for reteaching or for an activity...that still speaks to the glass and the design because you’ve got to have that supervision piece and a place to go and see things at work (SAE).

Small table groupings, learning nooks, and technology areas, as illustrated in Figure 12 and 13, allow teachers differentiated flexibility while still supervising students. This inescapable transparency improves classroom management practices and staff develop trust in their colleagues and appraisers. As one teacher expressed,



Figure 12. Multiple student groups working in the learning pods of Lower Valley in River Valley, KS. Retrieved from River Valley’s District website.



Figure 13. Learning pod flexible furniture outside Valley View classrooms in River Valley, KS. February 10, 2020

I think the biggest factor are the windows on the interior walls. I think that’s what influences the classroom management because it’s not a secret. Like everything’s out in the open. The kids know there’s that trust factor already established because we see you, right? It’s just the accountability raises that because it’s all knowing. So, I think the windows are probably a bigger factor than the space, if that makes sense (TA).

Sometimes, the visibility and exposure prove too much for students. Some students face substantial sensory needs and the building transparency keeps them from being successful.

...We have rooms with no doors on them and sound understandably does carry...there are very few kids that cannot operate in that environment...we put them in positions in the classroom that are a little more conducive...it’s usually a resource student or...requires special services that we can work into their IEP (PH).

Staff acknowledge the potential for distraction and ensuing special education adaptation, but stress that these are rare situations.

Illusion of Openness. River Valley maintained similar square footage to their previous builds, but utilized transparent sightlines, glass walls, and open-air common spaces creating the illusion of immense size. There is little question that natural light and design variables play a role on employee and student well-being. The extensive use of glass in these new buildings heightens the influence. “The building seems more bright and cohesive and cheery. I finally have windows in my classroom for once...it makes a big difference and I think that’s probably good for overall morale” (TC). Another teacher shared, “...natural light coming in is a really big factor for a lot of people...I like the big open community spaces, the learning stairs or the library, just easy access I guess” (TA). The Steering Committee identified the benefits of invisible walls and transparency. “If we have a space, glass...kind of rose to the forefront almost immediately once they saw that...with the supervision piece to be able to have more flexibility with groupings...without the barrier of a wall” (SAE). The learning stairs, however, strained instructional practices for one teacher.

They look pretty, they’re cool and they promote group learning, I guess. But I found myself unable to concentrate because I was hearing the teacher down the way talk and then the kids walking in the halls and they were cleaning up from lunch downstairs...it wasn’t exactly conducive for learning” (TC).

Site visits confirmed the Steering Committee’s large common space inclusion and open-air libraries into the conceptual designs. The resulting plan enabled many learning spaces to be visible and accessible.

We liked the welcoming feel of coming into the building and the [common space] was the center...our key was more centered around the flexible spaces, the glass, knowing that we wanted that. I would also say the library, that discussion about the library was huge and whether we were going to have a self-contained library or was it going to be mobile (SAE).

Additionally, the sheer size of the entrances reveals bright windows and colorful graphics. “The building definitely is beautiful. I mean, very eye catching for sure when you walk in. It’s just

magnificent and massive” (TC). Visitors assimilate into the learning environment through the open and transparent building feel. Valley View’s principal conveys the building climate. “And now, the teachers love it because what they love about it is when somebody’s walking in our building, they see what’s going on in the classroom and they really do like that. They welcome it” (PG).

Visible Learning Everywhere. Architects wanted to showcase instruction throughout the building by including glass. Modeling the concept of “learning on display,” designers emphasized new program visibility and everyday instruction immediately upon entry. Additionally, visitors should see instructional evidence from multiple building points. “The concept of ‘learning on display’ came from the Media Center being there open and exposed...Again, that was the concept of learning can happen anywhere” (AL).

Transparent classroom walls highlight active student learning, a culture not possible in aging facilities. As Valley View’s principal explains, “What I also like is the layout, the glass. So, kids and teachers can have different students work in different groups, in different areas, not just in the classroom and the pod areas. The proximity and the visibility” (PG). Having students completely visible eliminates classroom ownership and creates a share responsibility for student achievement, as well as behavior. Sharing students has both positive and negative aspects.

As far as the glass wall to the pod goes, I can supervise both my classroom and the pod during passing periods...I can send the kids out to the pod to take a test and continue teaching my class...that might be a negative...I feel a little bit responsible for everyone’s kiddos in the pod...there are times that I disrupt the flow of my own class to stick my head out there and give them the ‘look’ (TB).

Ultimately, transparency eliminates the division between classroom and common space. Building visitors have expressed that they simply look around and see the school’s vision realized. “My husband was telling me the other day, he was like, when you just walk into the building, when

you look around, you can tell that learning is a priority...the spaces are designed for learning” (TA).

Even with full visibility, there are sometimes when teachers fail to embrace the District collaboration initiative. Recounting a prior experience, an architect shared how a District’s transparency vision failed during implementation.

It seems like [the district] created a plan...but, they got in their own way. We decided we were going to take the teachers out of the room and we were going to put them in professional organizations...the staff went into cubes...and they didn’t like it. They did not embrace it. The rooms all had glass windows. Well, when I went back, they had put butcher paper up over the glass of the windows so that nobody could see what they were teaching in their room or they said it was a distraction (AM).

Refusal to embrace change damaged this District’s best intentions and undermined an expensive community construction project.

River Valley also transferred visible learning to elective class enrollment promotion. These classes, often hidden in previous designs, were brought to the forefront by opening up classroom space, glass enclosures, and instructional mobility.

Unless you take one of those classes, you don’t really see them. That design was flipping the mindset and pulling programs up front...blurring the lines between what’s going on and getting some of those different or unique programs out front” (AL).

The District hopes that visibility will increase enrollment and interconnectivity among core content and specials classes.

Safety. With a societal emphasis on school safety, proactive controls often usurp all other design issues. As River Valley’s Steering Committee expanded the conceptual building design, they found that safety features were not their responsibility.

I don’t really notice a lot of visible safety features built in...that wasn’t part of our job. I think the architects know and the district knows, here are best practices for safety and those were taken as ‘givens’...some of these safety concerns came before aesthetic concerns, but I don’t think that the design necessarily suffered because of that (STD).

The Steering Committee was challenged to balance pre-determined safety elements with aesthetics. As the District Administrator described the task,

...there's a balance to be found; providing that warm learning environment that has lots of natural daylight and lots of openness to it, and lots of flexibility while also make sure you can bunker down and be safe when you need to...having the right practices and protocols in place can really allow you to be a little more flexible in your design... (DK).

Eliminating safety from the design committee's task allowed a more concerted focus on instructional effectiveness and the interplay of visual elements.

Safety Element Communication. Interviews revealed that there was a significant lack of communication between architects and occupying staff on physical safety elements built into the design. When asked whether the safety vision was communicated by designers, Valley View's principal responded, "No, nothing. They give you the typical safety stuff" (PG). Additionally, Lower Canyon's principal echoed the same sentiment.

I think they did a nice job with aesthetics, definitely. I don't know that there was a lot of thought on the safety piece. You know, I think there was more so after the fact of what are we going to do to make sure. I think it was just as safe as any other school just based on previous design (PF).

New building staff working in vulnerable, glass enclosed spaces experienced this communication lapse. One teacher realized that,

...[the classroom] is not designed at all for safety features. And really, if you just walk in the pod area, if there was an intruder, you wouldn't, there's not like a little alcove that you could hide easily. So, it's not built for safety features (TA).

They expressed concerns at communicating safety protocols to students and parents, while having enough knowledge to make split-second decisions.

And some of the kids wonder about the safety of [the glass]...some parents have asked that sort of thing...we've had to learn how do we answer that in a way that makes somebody feel comfortable...the glass could be bulletproof. I don't know...that would be nice [to know], or at least which ones are bulletproof...cause I'm going to stand behind those (TA).

Understanding the building's physical safety features would empower staff when answering questions and communicating preparation to the public. "I believe the outside windows are [bulletproof], but I don't remember about the inside though" (TA). Communication deficits could create a volatile emergency situation for educators.

I think I would echo back to the safety, even just for peace of mind of kids. Literally, every time we go over ALICE, I have to answer questions about my glass wall, which is most of the time, a politician non-answer because, what am I supposed to say? Yeah, you're right. We're screwed. You want them to go home and tell their parents that? That's terrible (TB).

Participants were asked the extent of their building safety knowledge. Unfortunately, most teachers failed to express even the most basic elements of their building's physical safety plan.

I know that our office can lock down, but even then, that's all glass and I don't know if it's bulletproof. I don't think it is...I'm not worried about it, but it is my responsibility and it feels a little bit like, do you really care?...I think [knowing] would make me a wiser decision maker...if you're asking me to react with a half a second notice to keep 25 kids safe, having all the information possible would be beneficial (TB).

Sometimes, building leaders compromised after design completion and added essential safety components. At Lower Canyon, the principal realized safety concerns after the school opened and worked with the District to find a solution.

I may have looked more at security...if there were to be an active shooter or something, just with all the glass here...I don't even know if they put [bulletproof glass] on there yet, but the film, that bullet proof film on the doors...you just pull the shade down...the safety guy, he was there and brought up a lot of his concerns about all the glass and what they were going to do. Because originally, we weren't going to have all the blinds, and that was a compromise...I just know the blinds were purposefully added after we had the conversation. To make sure it was safe, to add the bullet proof glass on the doors (PF).

When asked about their concern over safety issues, one administrator responded,

You know, they did a couple of really smart things. There are more stairwells in this building than are required...if we made an ALICE call, the first floor would be empty in a second...the building is glass and you can see a long way in this building. That can be a detriment. But it can also help you see a lot more stuff that's going on. If you heard something, you'd be able to react accordingly (PI).

This administrator viewed visibility as an asset in emergency situations, however, even the Facilities Director acknowledged the dangers associated with glass classrooms. "...Open classrooms are all glass, you know. They certainly provide more risk than a traditional classroom" (DK). However, designers must determine whether the artistic elements outweigh the safety features.

...We get clients that ask us for a lot of transparency, but then we have the Safety and Security side that says we need to have huddle places and we can't have all that glass. So, that's where we get stuck in the middle sometimes (AM).

Generally, architects and school leadership desire a balance of beauty and security. However, architects are forced to confront whether safety and security issues or instructional practices drive their design efforts.

When it comes to the big more open [spaces], we've done everything in terms of...identifying every space that has a thumb turn...lock down and get out of sight. Sometimes, if you're at a high school, there's different areas that they can go to...a lot of times we have to go through the process of understanding where can kids go if there's a situation nearby...It's really a partnership with the district and understanding what their policies are now and if they're looking at moving away from it. If the current policy is get out of sight and lock your door, then we've got to understand that...And I recently had a conversation with the district security team, and it's a very scary conversation. Do we design these buildings for every day, for the optimal educational environment on a daily basis, or do we let a situation that may never occur, but absolutely could occur, drive the design (AL)?

Understanding the District's impetus aids architects as they project appropriate safety and security priorities.

Safety Protocols vs. Design Elements. Beauty and functionally safe schools strike a balance when reviewing protocols and improving training initiatives. As Valley View's principal reviewed the building design, there were some safety concerns regarding the extensive glass.

So, that was actually my area of concern. Even though I was excited about [the glass], at the back of my mind, I was like, gosh, with all this glass, what do we do? When my teachers saw it, they thought the same thing. This is beautiful, but you know, intruder comes in (PG).

Physical design can assist school personnel as they protect students. The real difference is in training those individuals on how to effectively use building design elements. River Valley adopted the proactive school safety Alert, Lockdown, Inform, Counter, Evacuate (ALICE) protocol several years ago. "...It's what I love about ALICE because, it's such a great life skill...I would lean more towards the piece rather than the architectural design...it really goes back to people diligence and kids self-reporting" (DK). Focusing on integrating design elements with proactive personnel training enables River Valley to utilize all building safety features.

Privacy Challenges. Teacher privacy was addressed earlier with the elimination of individualized classroom space. Student visibility serves to keep teacher behavior and interactions within view but can also be challenging when sensitive issues arise. A Valley View teacher explained how glass walls provide visibility, thus never questioning her integrity. "It's a double-edged sword because with the society we have...being able to say at any time I was in plain view of anyone...even really just to protect kids...there is no private space" (TB). Prioritizing glass in River Valley's new buildings provides a layer of protection for all staff working with children.

River Valley struggled with providing enough private space for more sensitive student populations. At Valley West, there is a significant lack of allotted special education space creating difficulties in transportation and accessibility.

...We didn't do a great job of planning for all of our specialty programs in that building. It really was designed with what I would call a base model...when you look at that building, the first floor, there's not a ton of classrooms...especially with a lot of our CBR kids, and autism, you don't want to be trucking them up and down the stairs and elevators. So, we're kind of in a bit of a pinch there right now already in year three with space (DK).

There are some benefits to special populations being located on the first floor. Valley West's Principal explained how accessibility to those students outweighs designating larger, more distant locations. "We have some challenging kids...our sped wing is right off of our commons and there is a lot of privacy there. It allows for dignity, safety for teachers, and easy access for us" (PI).

However, Special Education student services are faced with strict confidentiality guidelines. At Valley View, Individualized Education Plan (IEP) meetings are sometimes conducted on the second floor in what staff refers to as "the glass castle" as illustrated in Figure 14. This area juts out into the lunchroom/commons area and is visible from all sides. When meetings are conducted in this location, student confidentiality is compromised.

...We call it the glass castle up there in the library...we should have IEP meetings in a different room because it is totally visible to everyone. It's also not soundproof. So, I've walked by a few times and...I can hear every single thing you're saying. That's bad (TB).

This space is ineffective for sensitive meetings and calls into question whether this was the space's intended use. Administrators shared that they use centrally located conference rooms for sensitive conversations. "Every one of our administrative suites has a conference room built into it...that's very private. We use that a lot when we need privacy" (PI).

Unfortunately, teachers don't typically have access to those rooms and find private student conversations difficult to come by. Simply put, "...it's very hard to have a confidential conversation..." (TA). "Maybe another challenge that I face is having to talk to students privately is really hard because there's just no privacy" (TB). At Lower Valley, parents have expressed their lack of comfort during parent teacher conferences.



Figure 14. View of the “glass castle” from the commons area of Valley View Middle School in River Valley, KS. February 10, 2020.

I think it does impact it a little bit negatively every once in a while...even just doing parent teacher conferences...I'm not aware of people looking in, but I could see parents being a little hesitant of knowing that the next person's just waiting outside and kind of watching (TA).

Being receptive to an open classroom design mandate and still provide confidential areas is difficult. As one architect shared,

Not every classroom has to have ultimate flexibility...it's a tough balance of finding different ways to use the space and not leaving them completely open...I think that's been one of the harder challenges that we've had, communication, getting people on board with how ultimate flexibility doesn't always mean a wide-open space (AL).

Providing appropriate space allotments for private conversations and protected special populations can often change once enrollment occurs.

A set of classrooms for special education wasn't designed to be an ELL center... So, our special education suite is on the first floor, but then when you add two more CBR rooms and now we're looking at another CBR and autism that wasn't there. Then, all of a sudden there's, there's just no room (DK).

Programming fluctuations challenged River Valley's designers as needs changed mid-design.

Understanding potential programming shifts prior to design completion could aid administrators in assigning classroom space and protection of these student populations.

Interview Analysis Summary

Chapter Four provided qualitative data analysis obtained through semi-structured interview of 13 educational and architectural professionals involved with River Valley's successive new school designs. Interviews were audio recorded, transcribed, and analyzed without software. Participants were provided transcripts for correction and feedback. Interview participants were contacted for follow-up dialog as needed. The research read each transcript multiple times and using the Constant Comparative Method (CCM) of coding. Each transcript was analyzed for emerging themes, categorized within the same document, and then correlating data aligned with relative participant interviews. Themes discovered during the interview and follow-up probes were helpful in gaining additional information. Transcription text was extracted and excerpts shortened to include pertinent information and data representative of emerging themes. Text which proved superfluous, repetitive, and deviating from the research focus were excluded. Photographs, schematic drawings, and functional capacity data obtained provided clarifying evidence and aided in triangulating interview data.

This study's findings highlighted interconnections between stakeholder groups as new schools are designed, constructed, and implemented. Additionally, social constructs were analyzed through the lens of physical design elements. Five major themes emerged through transcription analysis: Design Influence, Communication of Vision, Depth of Collaboration,

Social Design Structures, and Visibility. Categories within each theme illustrated evidence supporting design influence. Within each theme, categories provided considerable influential evidence. Through interview data, categories emerged in the theme Design Influence: corporate and workplace design influence, experience with trending design, district level vision, site visits, instructional design stimulus, and community impact. Emerging categories in the theme Collaboration included: vision rationale, stakeholder impetus, alignment during implementation, and systems infrastructure. Emerging categories in the theme Communication of Vision included: collaborative design practices, teacher collaboration, student collaboration, and collaborative spaces. Emerging categories in the theme Social Design Structures included: flexible furniture, physical and structural anchors, mobility, and infrastructure design. Emerging categories in the theme Visibility included: accountability, illusion of openness, visible learning everywhere, and safety. Categorization of each theme and recurring sub-categories illustrated influence depth on the research questions.

Chapter Five provides insight in the findings' summary, study outcomes, and results discussion. Implications for future research end this chapter and allow for further study.

Chapter 5

Discussion, Conclusions, and Further Research

Overview

This study's findings capture individual's perceptions relating to their influence on new school design. This chapter includes an interconnected analysis and discussion of participant's perceived realities on River Valley's planning of new school construction projects. Participants spanning K-12 education and architectural fields provided insight and narratives from broad experiences. These merging views were interpreted through the lens of current instructional practices and emerging architectural trends. Chapter Five concludes with study limitations, implications for further research, and study summary.

This chapter discusses the study's findings related to the following research questions:

- 1) What architectural elements are commonly found in new school designs?
- 2) How do educators and architects describe the impetus for recent innovations in school designs?
- 3) What aspects of business workplace elements, especially collaborative spaces, found their way into new school design and construction?
- 4) How do social exchange theories intersect workplace and school design models?

Summary of Findings

School districts are finding a growing responsibility to ensure that new school design mirrors innovative and proven research-based instructional processes reinforced by trending structural elements. Stakeholders are insistent that new buildings are efficient, appropriately outfitted for growing populations, and ultimately ensure collaborative, effective instruction. This study aimed at determining who influences integration of structural and aesthetic elements and

how social constructs are impacted. Investigating new school design, primarily with minimal changes over the last century, safeguards our schools from reactively responding with radical and ineffective learning environments.

This study addressed the depth of influence among educational professionals and architectural trends on the incorporation of innovative and collaborative space elements. Including these trending spatial elements brings into question their effectiveness and purpose when evaluating social constructs at each level and among stakeholder groups. Interview questions probed for connections between trending corporate structural features and school design.

Semi-structured interviews with architectural professionals, District leadership, current building administrators and teachers, and Steering Committee members provided their experience during the new school design and implementation phase. River Valley provided an excellent case study situation with three new innovative school openings, at each educational level, within a three-year span. Qualitative research design presented the best opportunity through analysis of each individual's perceived design influence and their reflections post-construction. This study interpreted personal reflections and assigned meaning from each experience as connecting themes began to emerge. Additional photographic and statistical information was collected through the River Valley School District and the Kansas Department of Education.

The following section reviews specific elements of the research questions and how the study informs future discussion.

Research Question One. Research question one investigated which architectural elements were found most often in recent school designs. Overwhelmingly, the infusion of glass

was noted as most prevalent within River Valley schools. Traditional solid wall classrooms had been replaced with substantial glass adding increased building visibility. Glass created a transparency climate, allowing for the same natural environmental variables as previous 1900's "open air schools" (Baker, 2012; C. Tanner & Lackney, 2005). Staff and student visibility provided accountability measures and opportunities for extensive collegial collaboration.

There was some concern that visibility provided additional access and structural supports were not adequately communicated. However, the District's infrastructure focus and human capital outweighed communication deficiencies. As Dorn et al. (2014) reminded, safety features can be integrated seamlessly without negating aesthetics and each building masked safety features by showcasing wood walls, neutral colors, and exposed beams. Some of these choices were reflective of budgetary decisions, but as several participants expressed, mirrored the change in retail and workplace aesthetics.

Spatial Practice Within Flexible Classrooms. Traditional classroom descriptors had changed and both students and workplace employees expected fluidity, thriving in multi-purposed and collaborative locations. These adaptable spaces charged teachers with understanding their instructional space purpose, differentiating their lessons accordingly, and choosing the optimal learning environment (Boys, 2010; Katsikakis, 2017; Lippman, 2013; Ondrashek, 2017; Wong et al., 1992). This "spatial practice analysis" (Wong et al., 1992) created opportunities for combining both formal and informal learning environments, enhancing brain stimulation (Boys, 2010; Harrison & Cairns, 2008). Incorporating multi-functional spaces throughout these new buildings would ensure that future programmatic changes would not find the building space lacking.

Commons spaces provided unstructured student interactions and mixed student population groups, thus establishing school culture and community (McShane et al., 2012). Several staff members shared that the commons served as an activity hub and all learning was unified through this space. Social Design Theory (SDT) (Lave & Wenger-Trayner, 1991) reinforces this thrust into a “sociocultural practice” whereby students engage with the community and are afforded structures of interaction (the Commons). Including Thornburg’s (2014) four learning spaces: Campfire (lecture space), Watering Hole (conversation space), Cave (reflection space), and Life (Experiential Space) into River Valley’s new builds established mobile social structures within those spaces (Chernyak-Hai & Rabenu, 2018).

The incorporation of “learning stairs” into each new school design held confusion reminiscent of Sommer and Olsen’s (1980) study of the “soft classroom.” The “learning stairs” promised stronger collaborative practices, yet some educators found their instructional use limited when privacy and focus were pivotal. Stakeholder groups acknowledged that the stairs reinforce the paradigm “learning is everywhere,” encouraging instructional flexibility. This aligns with Social Design Theorists’ (Lave & Wenger-Trayner, 1991; Long & Ehrmann, 2005) rationale that substantial learning occurs when students are given informal, conversational areas and opportunities for unstructured peer interaction

Research Question Two. The second research question sought to isolate the stimulus for recent school design innovations. Every study participant acknowledged corporate design elements found their way into new school construction, as mirrored by institutional workplace design changes (Upitis, 2004). Employees moved from the 1950’s cubicle workplace to an inclusive, flexible work setting just as schools have transitioned into blended multi-functional learning spaces (Baker, 2012). Some participants struggled with this question as most did not

work in the corporate world and couldn't initially relate. However, study evidence collected illustrated that corporate design change precluded school design theories.

Interestingly, there was inconsistency between participants as to their perceived influence on the final school design. River Valley leadership prided itself on incorporating substantial stakeholder input prior to design completion. However, teachers' and building administrators' perceived influence was merely secondary to district leadership. Implementation fidelity became challenging at times as the rationale and purpose of structural elements weren't always communicated. There was substantial system-wide design input which helped to spread the building's alignment with the District's strategic plan.

Research Question Three. Research question three illustrated which business workplace elements, especially collaborative spaces, found their way into new school design. Collaboration, mobility, and flexibility were named as priority business characteristics and reinforced 21st century workplace paradigm shifts (Chernyak-Hai & Rabenu, 2018).

Workspace Autonomy. River Valley's emphasis on collaborating with diverse populations mirrors business models using interpersonal connections outside of structured workspaces (K. Cook & Whitmeyer, 1992; K. S. Cook et al., 1987; Harrison & Cairns, 2008). The limitations of overly structured school and work environments include poor collaborative and problem solving skills which directly impact productivity (Stryker et al., 2011). As many employees are granted location freedom (Chernyak-Hai & Rabenu, 2018; K. S. Cook et al., 1987), River Valley's new design provided varied learning locations throughout the school. Teachers found their mobility freeing when collaborating and developing interpersonal relationships across content areas. SDT (C Kenneth Tanner, 2009; Upitis, 2004) would see this workplace freedom as motivational and improving workplace morale for both students and

teachers (Baker, 2012; Baldry & Hallier, 2010). Combining collaborative instructional practices with design enable River Valley's students to navigate a global workforce and prioritize flexibility as a life-long skill.

Mobile workspaces are indicative of current employer trends (Katsikakis, 2017). Whereas elementary settings are more stationary than transient high school populations, mobility is scaffolded among classrooms, workspaces, and instructional settings. Students' ability to create learning spaces on stairs, landings, in small group conferences settings, blended learning labs, and coffee house seating testifies to the schools' mobile infrastructure. Technology accessibility is sometimes slow to catch up when student learning is ambulatory, but is an essential infrastructure elements aiding schools' communicative practices (Stryker et al., 2011).

Research Question Four. The final research question posed how workplace and school design models intersect with social exchange theories. Homans' (1958) initial Social Exchange Theory (SET) is illustrated clearly through River Valley's new structures which frame student and staff interactions. These school social structures, reminiscent of current workplace patterns provide low-risk settings fostering interpersonal relationships (K. Cook & Whitmeyer, 1992; Ribarsky, 2013). More informal workspace and classroom designs cultivated more peer-to-peer dialogue but might have resulted from the coupling of Project Based Learning (PBL) in two of the schools.

Converging Social Dynamics. Millennials are comfortable in fluid learning and workspaces making it exceedingly difficult to develop deep, meaningful relationships (Chernyak-Hai & Rabenu, 2018). River Valley, recognizing this variance in social norms, structured their new building around smaller community groups. As the modern workforce more autonomy and fewer redirects, student structures follow that path, encouraging more peer

collaboration. Individualized study has created a culture of “leader-member mutual trust” (Chernyak-Hai & Rabenu, 2018, p. 462) indicative of current SET organizational characteristics (K. Cook & Whitmeyer, 1992; Homans, 1958). Contemporary workplaces require collaborative skill development and providing smaller student communities allows River Valley students for positive social exchanges.

Informal social groups are found throughout River Valley’s new buildings and the use of sliding glass doors, small and large conference areas, and coffeehouse seating allows students to manipulate their environment as needed. However, transitioning students and staff would sometimes leave furniture in disarray causing the space to be unprepared for an incoming class. Ensuring that the space is adaptable to meet students’ requires accountability for supporting the spatial structure (Guidry et al., 2009; Lave & Wenger-Trayner, 1991). Providing smaller, informal settings, complete with glass enclosures, frames social experiences as more student-focused, just as workplace dynamics are employee driven (Rands & Gansemer-Topf, 2017; Vaagaasar, 2018) The social neighborhood infrastructure provides a smaller community supports enabling staff to monitor struggling students (Badayai, 2012) curtailing potential issues proactively.

Teachers and administrators find that team collaboration was much more frequent in the new buildings compared to their prior experiences. With mobile instructional space, teachers were forced to interact with those outside their content area, thus strengthening student support and shared accountability across multiple content areas (Pogodzinski, 2014). Collective workspaces give teachers and employees time for informal professional development and dialogue (Rands & Gansemer-Topf, 2017; Vaagaasar, 2018). Working in collective teacher

workrooms pushed teachers to challenge the instructional status quo and experiment with new ideas and suggestions put forward by colleagues.

Discussion of Results

This study illuminated the driving forces behind new school design and how those workplace design models intersect. As collaborative design elements become more prevalent, appropriate implementation can impact schools' social structures. As discussed in Chapter One, collaborative space design influences both students' soft skill development and school-wide culture (Lippman, 2015; Rosenthal, 2002). When structural elements are implemented with fidelity, stakeholders are assured buildings possess strong instructional practices and there is a sense that capital outlay commitments are secure. However, there is still a measure of ambiguity regarding how multi-functional spaces should be best utilized. These spatial practices are often determined at the building level, thus negating the initial space intent (Benade, 2017). Study participants mirrored this thought in their inconsistent perceptions of personal design influence.

Influence Perceptions. The study revealed discrepancies of perceived influence among study participants. District leadership and architects shared that extensive input was derived from all stakeholders evidenced by tangible design changes. However, this was inconsistent with teacher and administrative reviews. Teachers were unsure of the intended nature of certain learning spaces and that implementation practices were determined by building staff. Each individual viewed their own participation as minimal and expressed that the collective processes outweighed their individual impact. Administrators at the elementary and middle level found their influence extended mostly to aesthetics. With extensive staffing needs, high school principals were hired early, a variable which allowed for more opportunities for demonstrable design changes.

The study architects affirmed their sensitivity to the needs of the user and spent time identifying the District's end goals. Their architectural strategy coupled beautiful design with efficiency in both physical systems and usability (Badayai, 2012; Boys, 2010). Incorporating too much innovation at the expense of the user creates a failed design and ultimately undermines instructional effectiveness. As Districts partner with architects to create inventive learning spaces, stakeholders will require fiscally responsible design decisions backed by comprehensive research-based practices.

Incorporating Structural Elements. Structural elements included both in workplace and school design paint a picture of collaborative, yet substantially individualized work. Some would argue that the incorporation of one negates the other. However, the nature of individualized flexible work mirrors workplace trends and establishes an instructional flexibility not seen in earlier school room design. Earlier studies mirrored findings that a balance of collaborative and individualized work settings enable more substantial worker productivity. Collaboration provided more diverse social structures and prepared students as they assimilate into a competitive, global workforce.

Incorporating glass proved surprisingly impactful for study participants. Glass created a wider social structure, developing a sense of community along with student and staff accountability. Several tenets follow glass integration. New building supervisory structures expanded allowing for variety student groupings and shared accountability. Visible learning finds substantial academic success when teachers share student responsibility and work collaboratively. Visibility of all students enhances this structure and enables the school to utilize their human capital more effectively.

Special Populations and Infrastructure Development. Each building's special population received traditional space allotments, but the growing enrollment created unforeseen privacy and confidentiality issues. Confidential space options came at a cost as collaborative and multi-functional spaces took priority. The current design needs more forward thinking as populations increase and programming additions tax building space resources (Baker, 2012; C. Kenneth Tanner, 2014). Although gathering feedback from all content area teachers is difficult, architects and district leaders need input on this growing segment of the school population.

Innovative structural elements, such as blended labs and learning stairs are growing in popularity. With district directives, teachers began to use these non-traditional building features with little communication of their intended purpose. Administrative leaders recognized this lapse and accommodated by providing building-developed space integration ideas. Strategic professional development upon opening would engage teachers with the building design, allowing them processing time and opportunities to question architects' rationale.

Limitations and Future Research

It is imperative that this study is not generalized to school districts throughout the nation. Although the participant sample involved subjects at every instructional level, projects were confined to one mid-western Kansas school district. Further research can increase the scope by sampling building projects from districts of varying size, demographics, and socio-economic levels. These additional variables make transference to other school districts inequitable. Considerations should be made to incorporate school buildings that serve special populations, including trade practices, alternative education, and non-instructional spaces.

Delimitations

This study involved educational professionals from a single Kansas school district with varied experiences in school design, educational proficiencies, and content areas. Additionally, the architects in this study served only K-12 districts with instructional space design, aiding in possible biases. As the study only analyzed impact on recent district construction integrating instructional settings, non-instructional or administration buildings were not included.

Recommendations for Future Research

This study adds to the literature on integration of collaborative space design. It is difficult separating physical structural design from integrated flexible furniture. Without the incorporation of structural anchors, educators can utilize flexible furniture to dictate work zones and collaborative spaces. However, optimal design layouts are difficult to obtain and are reflective of a wealth of instructional variables. As with physical design features, there is ambiguity as to the priority influences on selection, installation, and implementation of varied pieces. Research is needed to isolate whether furniture selections are based on instructional effectiveness or design popularity.

New school openings initially center around the hiring of building leader who is tasked with creating a school community and highlighting innovative instructional spaces. However, as this study uncovered, there are contradictions as to the depth of design influence new building leaders have. Dependent on district size, building principals may have more impact that larger districts. With more stakeholders, principals may fall short of influencing design and tend to focus more on infrastructure. This study serves as foundational data on principal perceptions related to new building design.

Some design choices in this study raised questions regarding sensitive inclusion elements. Gender neutral bathrooms were debated at the opening of Lower Valley and community social

norms were discussed. Comprehensive architectural design looks at the inclusion of these features, but there is substantial influence by the community. River Valley's conservative educational approach was not ready for transformation but poses the question of how architectural firms guide that conversation and ultimately make design decisions.

Exploration of fundamental design influence would be beneficial to determine the origins of collaborative workplace and school design. There are significant gaps in learning theory related to the inclusion of such design elements leading suppositions to a hidden curriculum. Exploring the rational myths associated with aesthetic organizational styles could unveil societal impulses which find their way into instructional processes. Further discussion with architectural professionals would provide substantial insight into the "corporate chic" initiative and whether educational theories truly support its popularity.

With so many undefined instructional spaces, research is needed to determine how these spaces can be used more efficiently. Questions arise to whether there is an organic impulse to utilize spaces as historically dictated. The Learning Stairs classroom resembles Socrates' teaching environment, however teachers are still floundering when analyzing their own instructional purpose and the spatial practice needed. Analyzing the undefined space practices could provide data necessary to narrow the gap between perceived intent and actual instructional impact.

Conclusions

The findings from this study align with district and national trends relating to collaborative space design. As districts continue to either renovate aging facilities or design entirely new spaces, architects, district leaders, and educators will combine determining best practices and how students will interact. With a substantial financial responsibility, districts are

increasing held accountable for effective building designs meeting community and employer needs. Districts that ensure building design influencers have instructional experience and provide substantial rationale for innovative elements will maintain their position as an educational community leader.

Professional development related to building design is lacking and educators are asked to provide expertise with equipment and space never before accessible. This study has illuminated the fact that teachers often are lost with how new spaces should be utilized in a manner consistent with their purpose. Administrators and district leadership can then adapt their professional trainings reflecting this need. Student management and infrastructure decisions are dependent on how the vision of the school is carried out once the District takes ownership. Extensive visibility within these buildings have success variables which need to be acknowledged. Infusing accountability practices, such as mobile classrooms and glass surround learning space, change how educators view their instructional leader role and administrators' accessibility within the school.

This study's findings will inform school design decision makers as to their role in bringing innovation to their buildings. Understanding the rationale and influencers bringing educational initiatives to the table will control financial investments and ensure that effective practices are infused with innovative design, reflective of 21st century workplace skills.

REFERENCES

- Aldrich, H. E., & Fiol, C. M. (1994). Fools rush in? The institutional context of industry creation. *Academy of management review*, 19(4), 645-670.
- Anderson, P. J., & Hartley, M. L. E. (2018). Flexible Seating: Let's Get the Wiggles Out. *Tennessee Educational Leadership*, 55.
- Badayai, A. R. A. (2012). A theoretical framework and analytical discussion on uncongenial physical workplace environment and job performance among workers in industrial sectors. *Procedia-Social and Behavioral Sciences*, 42, 486-495.
- Baker, L. (2012). A History of School Design and Its Indoor Environmental Standards, 1900 to Today. *National Clearinghouse for Educational Facilities*.
- Baldry, C., & Hallier, J. (2010). Welcome to the house of fun: Work space and social identity. *Economic and Industrial Democracy*, 31(1), 150-172.
- Benade, L. (2017). Is the classroom obsolete in the twenty-first century? AU - Benade, Leon. *Educational Philosophy and Theory*, 49(8), 796-807.
- Boys, J. (2010). *Towards creative learning spaces: Re-thinking the architecture of post-compulsory education*: Routledge.
- Burgoyne, M. E., & Ketcham, C. J. (2015). Observation of Classroom Performance Using Therapy Balls as a Substitute for Chairs in Elementary School Children. *Journal of Education and Training Studies*, 3(4), 42-48.
- Bush, T. (2019). Active Learning Fosters Soft Skills in Students. Retrieved from Active Learning Fosters Soft Skills in Students website:
<https://www.steelcase.com/research/articles/topics/active-learning/active-learning-fosters-soft-skills-students/>
- Chernyak-Hai, L., & Rabenu, E. (2018). The new era workplace relationships: Is social exchange theory still relevant? *Industrial and Organizational Psychology*, 11(3), 456-481.
- Cheryan, S., Ziegler, S. A., Plaut, V. C., & Meltzoff, A. N. (2014). Designing Classrooms to Maximize Student Achievement. *Policy Insights from the Behavioral and Brain Sciences*, 1(1), 4-12.
- Cook, K., & Whitmeyer, J. (1992). Two Approaches to Social Structure: Exchange Theory and Network Analysis. *Annual review of sociology*, 18, 109-127.
- Cook, K. S., Emerson, R. M., Cook, K. S., & Emerson, R. M. d. (1987). Social exchange theory. In. Beverly Hills, Calif.: Beverly Hills, Calif. : SAGE Publications.

- Creswell, J. W. (2013). *Research designs: qualitative, quantitative and mixed method approaches*.
- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. *American sociological review*, 48(2), 147-160.
- Dorn, M., Atlas, R., Schneider, T., Dorn, C., Nguyen, P., & Statterly, S. (2014). Seven Important Building Design Features to Enhance School Safety and Security [Press release]. Retrieved from <https://www.doe.in.gov/sites/default/files/safety/seven-important-building-design-features-enhance-school-safety-and-security-issaa-2014.pdf>
- Fennelly, L. J., & Perry, M. (2014). *The handbook for school safety and security: Best practices and procedures*: Butterworth-Heinemann.
- Foster, P. N. (2002). Using Case-Study Analysis in Technology Education Research. *Journal of career and technical education*, 19(1), 32-46.
- Fram, S. (2013). The Constant Comparative Analysis Method Outside of Grounded Theory. *The Qualitative Report*, 18(1), 1-25.
- Genzuk, M. (2003). A synthesis of ethnographic research. *Occasional Papers Series. Center for Multilingual, Multicultural Research (Eds.). Center for Multilingual, Multicultural Research, Rossier School of Education, University of Southern California. Los Angeles*, 1-10.
- Gibson, V. (2003). Flexible working needs flexible space? Towards an alternative workplace strategy. *Journal of Property Investment & Finance*, 21(1), 12-22.
- Guidry, J., Kennedy, M. D., & Zald, M. N. (2009). *Globalizations and social movements*: University of Michigan Press.
- Hamilton, L., & Corbett-Whittier, C. (2012). *Using case study in education research*: Sage.
- Harrison, A., & Cairns, A. (2008). *The changing academic workplace*. Retrieved from United Kingdom: <https://ipddirectedstudies.files.wordpress.com/2011/01/the-changing-academic-workplace-degw-27-10-08.pdf>
- Heerwagen, J. H., Heubach, J. G., Montgomery, J., & Weimer, W. C. (1995). Environmental design, work, and well being: managing occupational stress through changes in the workplace environment. *Aaohn Journal*, 43(9), 458-468.
- Hille, T. (2011). *Modern schools: A century of design for education*: John Wiley & Sons.
- Hoepfl, M. C. (1997). Choosing qualitative research: A primer for technology education researchers. *Volume 9 Issue 1 (fall 1997)*.

- Holy, T. C. (1935). Needed research in the field of school buildings and equipment. *Review of Educational Research*, 5(4), 406-411.
- Homans, G. C. (1958). Social behavior as exchange. *American journal of sociology*, 63(6), 597-606.
- Kansas State Department of Education, K. (2019). Building Report Card. Retrieved 11/5/19 http://ksreportcard.ksde.org/demographics.aspx?org_no=D0233&rptType=2
- Katsikakis, D. (2017). Flexible Architecture for Evolving Work Practices. *Architectural Design*, 87(5), 68-75.
- Kolb, S. M. (2012). Grounded theory and the constant comparative method: Valid research strategies for educators. *Journal of Emerging Trends in Educational Research and Policy Studies*, 3(1), 83-86.
- Kupritz, V. W. (1998). Privacy in the work place: The impact of building design. *Journal of Environmental Psychology*, 18(4), 341-356.
- Lave, J., & Wenger-Trayner, E. (1991). Situated learning : legitimate peripheral participation. In E. Wenger & E. Wenger-Trayner (Eds.). Cambridge [England] New York: Cambridge England New York : Cambridge University Press.
- Lefebvre, H., & Nicholson-Smith, D. (1991). *The production of space* (Vol. 142): Oxford Blackwell.
- Leonard, P. (2013). Changing organizational space: Green? Or lean and mean? *Sociology*, 47(2), 333-349.
- Lippman, P. C. (2013). Collaborative Spaces. *THE journal : technological horizons in education*, 40(1), 32-37.
- Lippman, P. C. (2015, Jan 2015). Designing Collaborative Spaces for Schools. *The Education Digest*, 80, 39-44.
- Long, P. D., & Ehrmann, S. C. (2005). The future of the learning space: breaking out of the box. *EDUCAUSE review*, 40(4), 42-58.
- Mann, J. L. (2019). Swivel, Rock and Roll: The: The Effects of Flexible Seating on Student Engagement. 78.
- Markusen, J. (2016). All in on flexible seating and why you should be too: A principal's perspective. *Legacy Elementary Blogspot*. Retrieved from <http://legacyelementary.blogspot.com/2016/02/all-in-on-flexible-seating-and-why-you.html>

- Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41): Sage publications.
- Maxwell, L. E. (1999). School Building Renovation and Student Performance: One District's Experience.
- McDowell, I. (2010). Measures of self-perceived well-being. *Journal of psychosomatic research*, 69(1), 69-79.
- McShane, I., Watkins, J., & Meredyth, D. (2012). Schools as Community Hubs: Policy Contexts, Educational Rationales, and Design Challenges. *Australian Association for Research in Education*.
- Merriam, S. B. (1998). *Qualitative Research and Case Study Applications in Education. Revised and Expanded from "Case Study Research in Education."*: ERIC.
- Merriam, S. B., & Grenier, R. S. (2019). *Qualitative research in practice: Examples for discussion and analysis*: John Wiley & Sons.
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*: John Wiley & Sons.
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 83(2), 340-363.
- Molnar, M. (2019). *When Will K-12 Classrooms Scrap Those Age-Old, Rigid Desk-Chairs?* Retrieved from <https://marketbrief.edweek.org/marketplace-k-12/when-will-k-12-classrooms-scrap-those-age-old-rigid-desk-chairs/>
- Neill, S., & Etheridge, R. (2008). Flexible learning spaces: The integration of pedagogy, physical design, and instructional technology. *Marketing education review*, 18(1), 47-53.
- Neilson, C. A. (2014). The effect of school construction on test scores, school enrollment, and home prices. *Journal of public economics*, 120(c), 18-31.
- Oliver, S. G., & Kostouros, P. (2014). Desks in Rows. *Transformative Dialogues: Teaching & Learning Journal*, 7(3).
- Ondrashek, N. (2017). *21st century learning*. (Masters), Northwestern College, Orange City, IA.
- Peshkin, A. (1988). In search of subjectivity—one's own. *Educational Researcher*, 17(7), 17-21.
- Podolny, J. M., & Baron, J. N. (1997). Resources and relationships: Social networks and mobility in the workplace. *American sociological review*, 673-693.

- Pogodzinski, B. (2014). Collegial support and novice teachers' perceptions of working conditions. *Journal of Educational Change*, 15(4), 467-489.
- Rands, M. L., & Gansemer-Topf, A. M. (2017). The room itself is active: How classroom design impacts student engagement. *Journal of Learning Spaces*, 6(1), 26.
- Ribarsky, E. (2013). Choose your own adventure: Examining social exchange theory and relational choices. *Communication Teacher*, 27(1), 29-32.
- Rosenthal, R. (2002). Covert communication in classrooms, clinics, courtrooms, and cubicles. *American psychologist*, 57(11), 839.
- Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, 38(2), 437-460.
- Simmons, K., Carpenter, L., Crenshaw, S., & Hinton, V. M. (2015). Exploration of Classroom Seating Arrangement and Student Behavior in a Second Grade Classroom. *Georgia Educational Researcher*, 12(1), 51-68.
- Sommer, R., & Olsen, H. (1980). The Soft Classroom. *Environment and Behavior*, 12(1), 3-16.
- Stake, R. E. (2005). Qualitative case studies.
- Stryker, J. B., Santoro, M. D., & Farris, G. F. (2011). Creating collaboration opportunity: Designing the physical workplace to promote high-tech team communication. *IEEE transactions on engineering management*, 59(4), 609-620.
- Sullivan, C. C. (2012). Classroom Furniture - The Third Teacher. *Buildings*, 106(2), 24.
- Tanner, C., & Lackney, J. (2005). Educational architecture; School facilities planning, design, construction, and management. Retrieved September 23, 2008, from <http://> In.
- Tanner, C. K. (2008). Explaining relationships among student outcomes and the school's physical environment. *Journal of advanced academics*, 19(3), 444-471.
- Tanner, C. K. (2009). Effects of school design on student outcomes. *Journal of Educational Administration*, 47(3), 381-399.
- Tanner, C. K. (2014). The Interface among Educational Outcomes and School Environment. *Educational Planning*, 21(3), 19.
- Thornburg, D. (2014). *From the campfire to the holodeck : creating engaging and powerful 21st century learning environments* (First edition.. ed.): San Francisco : Jossey-Bass.

- Uline, C., & Tschannen-Moran, M. (2008). The walls speak: The interplay of quality facilities, school climate, and student achievement. *Journal of Educational Administration*, 46(1), 55-73.
- Upitis, R. (2004). School architecture and complexity. *Complicity: An International Journal of Complexity and Education*, 1(1).
- Vaagaasar, A. L. (2018). Managing collaborative space in multi-partner projects AU - Kokkonen, Anne. *Construction Management and Economics*, 36(2), 83-95.
- Wasserman, V. (2011). To be (alike) or not to be (at all): aesthetic isomorphism in organisational spaces. *International Journal of Work Organisation and Emotion*, 4(1), 22-41.
- Weaver, R. R., & Qi, J. (2005). Classroom organization and participation: College students' perceptions. *The Journal of Higher Education*, 76(5), 570-601.
- Wong, C. Y., Sommer, R., & Cook, E. J. (1992). The soft classroom 17 years later. *Journal of Environmental Psychology*, 12(4), 336-343.
- Xaba, M. (2006). An investigation into the basic safety and security status of schools' physical environments. *South African Journal of Education*, 26(4), 565-580.
- Zhou, J., Shin, S. J., Brass, D. J., Choi, J., & Zhang, Z.-X. (2009). Social networks, personal values, and creativity: Evidence for curvilinear and interaction effects. *Journal of Applied Psychology*, 94(6), 1544.
- Zimmerman, M. J. (2007). Feldman on the Nature and Value of Pleasure. *Philosophical Studies*, 136(3), 425-437.

Appendix A Adult Informed Consent Statement

Study: Social Exchanges Found in Collaborative School Space Design

KEY INFORMATION

- This project is studying the influence of architectural and educational professionals on new school design and construction in regard to cooperative learning spaces. Analysis will be conducted on how educational design has mirrored workplace design and the social constructs that permeate both systems.
- Your participation in this research project is completely voluntary.
- Your participation will take 45-60 minutes.
- You will be asked to do the following procedures: Participate in a semi-structured interview; more information on the procedures can be found below.
- There are no risks or discomforts with this research study.
- No benefits will be received for participating in this study. This study will benefit school districts as they develop collaborative spaces in new school buildings.
- Your alternative to participating in this research study is not to participate.

DETAILED INFORMATION

INTRODUCTION

The Department of Educational Leadership and Policy Studies at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

This study will explore the influence of architectural and educational professionals on new school design and construction in regard to cooperative learning spaces. This case study will analyze new school builds at the elementary, middle, and high school level. Analysis will be conducted on how educational design has mirrored workplace design and the social constructs that permeate both systems.

PROCEDURES

You will be asked to share your insights on new school design with an emphasis on collaborative spaces through an interview lasting between 45-60 minutes. You may be contacted with a few follow-up questions at a later date. With your permission, the interview will be audio recorded and transcribed by me for later analysis. You have the option of stopping the recording at any time. All data collected during this study will remain in my secure, password-protected computer until the end of my dissertation study, after which the audio and related files will be destroyed.

RISKS

There are no risks anticipated by participating in this study.

BENEFITS

This study will benefit school districts and architectural firms as they understand the implication of school design incorporating greater opportunities for student interaction, collaboration, and engagement.

PAYMENT TO PARTICIPANTS

There are no payments for participants in this study.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use a study number or a pseudonym rather than your name. Your identifiable information will not be shared unless (a) it is required by law or university policy, or

(b) you give written permission. Data obtained through this study will be kept until the end of my dissertation study (January 2021).

PRIVATE INFORMATION (DATA) AND/OR BIOSPECIMENS

No private information or biospecimens will be collected during the course of this study.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to: *Julie Sluyter, 15800 W. Indian Creek Parkway, Olathe, KS 66062.*

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385, write the Human Research Protection Program (HRPP), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name	Date
Participant's Signature	

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Appendix B
Interview Protocol: Architects and Interior Designers
Interview Questions

1. Tell me a little about your professional background
2. Will you talk about any experience you have with school design (Probe for years of experience, area of emphasis, interactions with educational professionals and students, experience with instructional research related to design)
3. Describing open-concept, flexible school space, why do you believe these types of designs are becoming more popular in school districts?
4. How does your understanding of collaboration and social structures influence your design?
5. How does the local community, which the school serves, relate to the building's design? (probe for social and economic response)
6. What are your top five priorities when designing a school and how are those determined/prioritized?
7. To what degree do educational professionals give input in the design of new and renovated construction of schools?
8. How do you provide consistent collaborative space with such varying design purposes?
9. What is your vision for how teachers will use this collaborative/flexible space? What challenges have you found post-construction that you would change in upcoming design models?
10. How does ADA requirements for mobility impact your building design model? (ADA, Quiet Spaces, Sensory Concerns)
11. Aesthetics are an important selling point. How do you balance aesthetics with safety? What components of safety initiatives carry over from workplace design to school design?
12. Do you see any relationship between corporate design and school design? If so, what? What elements of corporate design tend to show up in school design?
13. What design elements are the most geared towards interpersonal group processes? Why?
14. How do you determine the allocations for collaborative space and individualized areas?
15. What else would you want educators, administrators, or community members to know about the school design process?

Appendix C

Interview Protocols: Educational Professionals

1. Tell me a little about your professional background. (Probe for years of experience, instructional content areas)
2. Describe the physical school buildings that you have worked in. (Probe for demographic information, description of classroom space) (Probe: Did they transition from a new school back to an older building?)
3. What challenges have you found post-construction that you would change in upcoming design models? (Differentiate between interior furniture and facility design)
4. Describe flexible space commonalities among the new district buildings. Why do you believe these types of designs are becoming more popular in this school district? What is your impression of new school construction in neighboring school districts? Do they align with River Valley?
5. How does your understanding of collaboration, engagement strategies, and student social structures influence your use of this space?
6. To what degree did you have input on the design of the new school? What components do you love and what do you wish the designers would have known prior to the completion? How much input do you believe was given by educational professions in the design of this school?
7. If you were given a blank paper with unlimited finances, what would be your top five priorities when designing a new school?
8. How does the mobility of classrooms/teachers/students impact your instruction and ability to use the space?
9. There are many open areas and space that is undefined. What do you believe is the purpose and how do teachers utilize this space? How is that space purpose communicated to you?
10. How does safety play into the new designs? How do you know your school is safe? What components do you feel were added to ensure safety of students and staff? How effective is this design element?
11. How were you informed of the safety elements in the building design?
12. Aesthetics is what sells design. How do you balance aesthetics with safety components?
13. What do you see are the relationships between corporate design and school design, if any? What elements of workplace design would be similar to school design?
14. (If experienced in another setting) How do the traffic patterns differ in a new school compared to your former school? What differences do you see in student interactions with the design of this school?
15. Where is the most used area? Why do you think students gravitate to that area?
16. Describe the depth of interaction you see between students. How do you think the way the school was designed helps this interaction – or hurts these interactions?
17. What would you want architects, school board members, and the community to know about new school design?