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Facilities Beyond Physical Spaces: A Case for the Intentional Design and Use of Learning Space

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Journal of Cases in Educational Leadership
2023, Vol. 26(3) 16–28
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DOI: 10.1177/15554589231171858
journals.sagepub.com/home/jel



Yanira Oliveras-Ortiz¹ 

Abstract

In 2022, the state department released new standards and a competency-based education curriculum. Simultaneously, the Toledo Creek School District has experienced an unprecedented shift in the student population demographics. The shift has resulted in two distinct zones, east and west, with income averages on the two extremes of the income spectrum. Given the shift in both the curriculum and demographics, the superintendent in consultation with stakeholders decided to implement project-based learning (PBL) as the district's instructional model. PBL has a significant research-based supporting implement for authentic learning as intended by the new standards and better supporting deeper learning among all students. One barrier to implementation is the existence of aging facilities. The poor quality of the facilities has caused tension among the district's stakeholders. This case study aims to promote an understanding of issues related to school facilities, and bond and facilities planning for the intentional design and purposeful use of learning spaces aligned with a constructivist instructional model, in this case PBL. How can conflicting views be leveraged to engage stakeholders in productive discourse about school facilities that results in the equitable use of financial and physical resources?

Keywords

project-based learning, standards-based curriculum, demographics, equity, facilities, school bonds

¹The University of Texas at Tyler, USA

Corresponding Author:

Yanira Oliveras-Ortiz, The University of Texas at Tyler, Tyler, TX 75799-6601, USA.
Email: yoliverasortiz@uttyler.edu

Background

The Toledo Creek School District (TCSD) is 20 miles north of a major city. For decades, the wealthy have chosen to live in the school district due to the students' performance on the state's standardized exams, and the school board's engagement in the community. The TCSD is known for low turnover rate among district personnel and administration including the superintendent. The superintendent, a White male, has been at the helm of the district for over two decades. Teachers are revered as experts and appreciated by the community. The school board has also experienced a low turnover rate over the last two decades. Seven years ago, the student demographics of the TCSD were 90% White, 5% Hispanic, 4.5% Asian, 0.5% African American, and Other ethnic groups. None of the families in the district qualified as economically disadvantaged; the school district had never received federal funds.

According to the latest state report card, the student demographics for TCSD were 61% White, 25% Hispanic, 9% Asian, 5% African American, and Other ethnic groups. For the first time in the district's history, 28% of the students qualified for free or reduced price lunches and were coded as economically disadvantaged. The abrupt shift in the demographics is the result of the development of new affordable housing and apartment complexes near new business parks and business warehouses developed to the west of Toledo Creek. The housing developments near the business parks have allowed families with lower income to move into the district to be close to their workplace, which has resulted in a significant student population growth requiring additional instructional space. Most of the students of color and economically disadvantaged families live in the apartment complexes.

In addition to the shift in the demographics and the growing student population, the school superintendent has publicly stated his intent to implement project-based learning (PBL) with a focus on science, technology, engineering, and mathematics (STEM) across the district. Hence, conversations regarding the current facilities and learning spaces, and the need for a bond election have been taking place. In a formal statement, the superintendent has outlined his new vision for the district. He has urged his staff to reach out to families new to the district to ensure parent and family involvement remains a priority; the culture of the district has consistently valued parent and community involvement. The superintendent has historically credited the community's involvement for the TCSD students' consistently high academic achievement, coupled with TCSD's solid curriculum. The superintendent's recent announcement has disturbed long-time residents, and resulted in contentious conversations and opposing views regarding the superintendent's new vision to change curricula. Moreover, his ideas do not align with the traditional learning environments that have produced decades of successful graduates.

Project-Based Learning

The implementation of PBL will have implications for all schools, new and existing, as PBL is significantly different than the traditional teacher-centered practices the district has used for years. PBL is a cognitive constructivist or an information-processing

approach to education (Hmelo-Silver, 2004; Norman & Schmidt, 1992; Schmidt, 1993; Schmidt et al., 1989; Schwartz & Bransford, 1998). It allows students to guide their learning through inquiry and collaborative work (Bell, 2010; Markham et al., 2003). PBL is also shown to develop deeper learning of content (Odell & Pedersen, 2020). The model has become the instructional model preferred by educators and used in classrooms across the world (Weatherby, 2007).

Teachers in PBL classrooms become facilitators of learning as they abandon their role as disseminators of knowledge (Barrows, 2002; Ozel, 2013). They design projects through which students grapple and research real-world problems while taking responsibility for their own learning (Barrows, 2002; Slough & Milam, 2013) by setting personal learning goals (Wood, 2003). Students engage in authentic work-related learning experiences (Buck Institute for Education, 2013) rather than irrelevant or isolated learning experiences. The expectations and opportunities students are afforded through PBL develop the students' creativity, management, and collaboration skills (Nielsen et al., 2010),

Given the complexity and interdisciplinary nature of PBL, projects are generally completed over an extended period. Teachers integrate standards from multiple content areas to maximize time and design authentic projects. Students are given guiding questions, rubrics, and a timeline among other organizational and instructional resources to facilitate student-driven learning. As the facilitator of learning, the teacher guides students through questioning while also addressing specific skills and/or gaps in the students' knowledge through workshops. Workshops are small group mini-lessons for a targeted group of students, or whole group mini-lessons to introduce a new important concept or skill. Individual and group accountability are critical components of PBL; not only are students and their teammates held accountable for their participation in the project, but students are also held responsible and must individually demonstrate mastery of the content. To develop the students' soft skills, such as collaboration and speaking/presentation skills, projects culminate with the creation of a group-developed product and a presentation of the product to a real audience. Given the interdependence nature of PBL, students have expressed the need for spaces situatable for collaboration as well as independent work (Oliveras-Ortiz et al., 2019). Moreover, students have reported the importance of ease of access to instructional resources and technology to facilitate research and problem-solving (Oliveras-Ortiz et al., 2019).

School Facilities

The school district consists of 13 elementary schools, five middle schools, and one comprehensive high school. Toledo Elementary, Flowers Elementary, and Forest Middle School are the three schools near the new business parks, on the west side of the district. They are the three oldest buildings in the district, requiring portable buildings. Multiple additions to these campuses have resulted in classrooms without to natural light; moreover, grade levels and/or departments are spread out throughout the buildings due to the reactive nature of the expansions rather than purposeful planning of these facilities. Toledo Creek High School is aging. As the district has grown, there have been many additions to the existing high school building. However, given the size, a master plan allows for additions. The most recent modernization provided for

departmentalization but does not align with the new vision, the implementation of PBL as the main instructional model.

During the last state legislative session, the legislature approved new guidelines and square footage requirements for academic learning spaces. The oldest schools in the district have multiple spaces that do not meet the minimum requirements. The high school has classrooms and science labs that do not meet the state requirements.

The Community

The business community has evolved. Companies in science, technology, and engineering-related fields have relocated their offices to the business parks on the west side of town. Business members are actively involved in the district, schools, and the city council. Business executives and employees are active partners and most companies in the business park have signed Partners in Education agreements with multiple schools in the district. The business community has actively pursued and facilitated opportunities for the district's students to complete internships at their local business facilities.

Bond Planning: Stakeholders' Perspectives

Superintendent

The superintendent has successfully led the district and the community through two bond elections during his 23 years as superintendent of the TCSD.

He has expressed his intention to request authorization from the school board to call for a bond election with the main goal of updating school facilities, not only to ensure compliance with the new state regulations, but mainly to promote project-based learning (PBL). He has expressed his desire to move away from the district's tradition of teacher-centered instruction and shift the focus to the development of technological and soft skills students will need to succeed in today's workforce. The superintendent has clearly stated his intention to engage all stakeholders in the bond and facilities planning process. He has met with the school board, community members, and district and campus administrators. He has instructed school principals to share his plans to garner input from all stakeholders throughout the school community. The proposed bond election will be the district's first bond election in 8 years, and in the superintendent's estimate, the largest in the history of the district. When asked about the target areas and schools he would like to renovate or replace, the superintendent has said that before sharing his ideas, he would like to hear from the students, teachers, school administrators, parents, and community and business members. He has a vision but wants to ensure his ideas are aligned with the needs of the district and his most important stakeholders—the students and teachers of the TCSD.

School Board

The board consists of seven members, five male and two female members, all White, who have owned businesses and lived in the district for an average of 25 years. The board is

divided in their vision with a group the district's traditions upheld by the east residents, and other supportive of the west and the diversity the new families bring to the district.

Upon learning about the superintendent's intent to call a bond election, three board members have been outspoken about their vision for the future of the district's facilities—to take into consideration the desires of the business community who have provided significant financial and resource contributions for decades. They have made comments regarding the district's healthy financial status, due to the income and taxes their businesses bring to the district.

Three other board members have indicated that their priority will be understanding the district's instructional needs. They have stated they will consider the business communities' opinions, but their focus will be on the needs of the district to fulfill the superintendent's vision as the workforce continues to evolve and require specialized educational experiences. The seventh board member has abstained from making public comments until she has additional information.

Business Community

Business owners from across the districts have expressed their desire to see a new high school with specialized spaces to promote science, technology, engineering, and mathematics (STEM)-related careers. They have proposed the district consider purchasing land near the business complex to facilitate transportation to the businesses for student internships, supporting the newest enrollees. If funds are plentiful, they support replacement schools at the oldest sites, but prefer building a new high school and remodeling the rooms in the older schools that do not meet the new state requirements if funds are limited.

Some community members have proposed the idea of using the current high school buildings as district offices, a day care for teachers' children, and perhaps outsourcing other sections of the building to local businesses. A small group of business owners disagree and have expressed their concern regarding the need for a high school rather than focusing on the replacement of the oldest schools in the district. They feel it important to ensure all students, regardless of their financial and ethnic background, receive access to the best learning spaces, equipped with appropriate resources and technology. Business owners understand that a new high school would eventually serve all students in the district, but they will require additional information regarding the proposed bond, and how the funds would be used, to ensure equitable use of the district's financial, physical, and instructional resources.

Parents and Other Community Members

Community members and parents have expressed their desire for additional information about PBL and how it will impact their children's performance on the state's standardized tests. Although some parents have attempted to explain that the tests are not the most important issue, community members have been vocal about the need for accountability and their belief that the exams are the only way they know how well the district's schools are doing.

Some parents and community members have suggested the oldest campuses be remodeled with the goal of ensuring all classrooms meet compliance with the new state regulations but will not support new schools near the business park. Furthermore, some community members suggested that the district include a proposal to purchase the small apartment complex, claiming imminent domain, to demolish the apartments and extend the existing middle school. By purchasing the apartment complex and expanding the current building, the district will eliminate the portable buildings at this site while decreasing the enrollment in the three schools near the business parks forcing families to relocate to another district.

Although a small group, some parents from the most affluent areas in Toledo Creek have expressed their opposition to intentionally attempting to relocate these families. They indicated they appreciate the diversity the new business parks have brought to the district. However, the community members who proposed the relocation plan indicated that students from economically disadvantaged families bring challenges that the teachers are not equipped to handle given the district's history and previous demographics. The opposing parents responded to that particular concern by saying it is the district's responsibility to train and support teachers who do not have the knowledge and skills needed to work with students from diverse backgrounds.

Some critics of the superintendent have expressed their frustration with him given his ambiguity regarding his request to call for a bond election. They have said the superintendent should not have announced his intent without a clear plan in place. They accused him of a lack of leadership and vision. On the other hand, his supporters have stated their approval of the superintendent's willingness to get all stakeholders' input before expressing his vision. They believe that by being vague, the superintendent is not trying to influence others, but rather allowing each member of the school community to draw their own conclusions. His critics have argued that he is responsible for guiding the community and should be capable of purporting a plan that is educationally sound and in alignment with the district's needs and goals. The superintendent has not issued any response regarding the reasoning behind his decision to be vague at this point during the process.

School Administrators and Faculty

The high school principal and teachers have expressed a desire for a new building. They have indicated that the existing facilities are not conducive to the type of collaborative, project-based instruction the superintendent expects teachers to implement. Moreover, some high school teachers are excited about the potential for STEM-focused pathways at the high school. However, others are indifferent and have indicated that they will continue to do what they have been doing for years. They have cited their state standardized exam scores, which are historically some of the highest in the state, as the reason to argue against the need for change or the idea of changing their teaching practices.

The school principals and teachers at Toledo Elementary, Flowers Elementary, and Forest Middle School have asked that new replacement buildings be included in the

proposed bond. The principals, with the support of their principal peers from other schools in the district, have proposed that the new buildings be built on the same site to avoid the need to acquire new land in their communities—nearly impossible due to overpopulation in the area after the construction of the business parks. An active group of teachers from these three schools requested an item be added to the information section of a board meeting. Their request was granted as part of the superintendent's informational report to the board. The group presented the superintendent and school board with research related to learning spaces and the impact they have on engagement and teaching and learning. Their presentation included research related to project-based learning and the importance of equity, especially considering the district's changing student demographics. They also shared information about the importance of access to appropriate technology and instructional resources, increased student engagement in newly designed spaces, the teachers' ability to challenge students in purposefully designed spaces, and the impact intentionally designed learning spaces has on teachers' efficacy.

Final Thoughts

School systems are charged with providing students with access to a high-quality education. The plethora of issues that impact an education system and ultimately the education students receive seems to be infinite. Educational leaders often focus on teaching and learning, teacher retention, parent and community engagement, the annual budget, and many other issues that seem to be more under their control. However, purposefully designed spaces and the adequate design and use of learning spaces are critical issues that the literature and school leaders often overlook. These critical issues are especially disregarded when dealing with tension in the community and with the implementation of constructive, student-centered instructional models such as project-based learning. The author hopes that this case study has sparked the readers' interest and commitment to ensuring the equitable use of physical and financial resources to provide all students with an excellent education.

Critical Issues for Consideration

As part of the bond planning process, the district staff has been asked to consider issues of equity in the district and how bond funds could be used to address any disparities and/or enhance the district's equitable practices. Answer the following questions and prepare a narrative to present your views regarding the district's current equity status. The narrative must be supported by existing literature and research:

- What are the conditions of the elementary and middle school facilities where economically disadvantaged, and students of colors are enrolled?
- How are the conditions of the elementary and middle schools similar and different from other facilities in the district?

- Compare the access to facilities, resources, and opportunities students of color have versus the rest of the district. Are facilities, resources, and opportunities aligned across the district regardless of student demographics?
- What message will the decisions regarding the bond referendum send to the families and business community regarding the district's values related to diversity?
- How could the bond be utilized to demonstrate that all students and families are equally valued by the district?

Scenarios for Deliberation

Facilities and Bond Planning

Scenario A. The bond planning committee has reached a compromise and will not be proposing the full amount they had originally considered. By reducing the amount, they aim to increase the chances of a successful bond election. They have appointed an ad hoc committee to develop a bond referendum that maximizes the current facilities and resources while extending the impact of the bond funds. Develop a proposal that answers the following questions and use the literature to support the proposed bond referendum:

- What are the critical items that must be included in the bond referendum to implement PBL while promoting equity across the district? Justify your decisions.
- How will each component of the referendum addresses/supports the superintendent's challenge to move from teacher-centered instructional practices to PBL? Use details to support your case.

Scenario B. Given the controversy surrounding the bond referendum, once the planning committee finalized their work, the superintendent asked them to develop an alternate plan to maximize the current facilities and resources in the event the bond fails. Develop a contingency plan that answers the following questions and use the literature to support the proposed contingency plan:

- What is needed to promote facilities and resources equity across the district? Justify your decisions.
- How will the plan support the superintendent's intent to move from teacher-centered instructional practices to PBL?

Debate: Take a Stance

Option A. Assume the role of a community member and write a narrative or create a presentation that articulates your stance regarding the bond election and the district's priorities. When reporting your stance, address issues related to equity, learning

spaces, and PBL. Use the literature to ground your ideas so that you can confidently describe and detail the district's needs as they align with your opinions. Moreover, present the inverse argument and what it would take for you to come to an agreement with an opposing view. This is important as you will need to be prepared to overcome opinions of others when you share your presentation or narrative at public events, or with a neighbor. Demonstrate the questions or opposing views one might say to you.

Option B. Assume the role of a school leader and make a case for new elementary and middle schools, including reasons for building new elementary and middle schools instead of a new high school. How will this option support equity, the design of learning spaces aligned to research, and the implementation of PBL?

Option C. Assume the role of a high school teacher and make a case for new high school, including reasons for building a new high school instead of new elementary and middle schools. How will this option support equity, the design of learning spaces aligned to research, and the implementation of PBL? What would it mean to you as a facilitator of learning?

Questions for in-Class Discussion or Online Discussion Board

- How do you determine the district priorities and the plan for the bond without alienating the board and community members?
- Make a case for/against each side based on your state's learning space requirements.
- How can the community's support be acquired?
- What steps should be taken to advocate and leverage business relationships?
- How will new versus renovated buildings be designed to promote equity in the district and community?
- Discuss instructional leadership in the bond and design of spaces philosophy.
- How can students of color be engaged to leverage the need for equity regarding intentionally designed learning spaces?

Teaching Notes: Information Shared at the School Board Meeting

Equity

Given the rapidly changing district demographics, it is critical that every member of the community understands the importance of educational equity and the implications it has for the school district. Equity is a dynamic and complex process meant to make things fair and equal keeping in mind the point of departure for a distributive and relational perspectives (Andreasson et al., 2015; Raffo, 2011, 2013). In education, equity focuses on meeting the needs of all students (Andreasson et al. 2015) with the understanding that every student brings different perspectives and experiences, therefore

different needs, including the augmented needs and gaps resulting from limited English proficiency and financial disadvantages. Educators must adapt instruction to meet students' needs, but equally important is the need for educational policy to require educational equity. Furthermore, given the root of the gaps and needs of children from disadvantaged backgrounds, the needs must also be addressed by the community and in the local school board policies. Implementing practices and actions that promote equity is a social issue, not just an educational matter. As the business and school communities consider the proposed upcoming bond election, issues of equity to challenge the status quo ought to be at the center of all discourse.

Student Engagement and Learning Efficiency

Purposefully designed spaces are not only ideal for PBL, but research suggests that they enhance the learning experiences of students. In a study conducted at two elementary schools, Oliveras-Ortiz et al. (2021) interviewed 10- and 11-year-old students who shared the impact going to school in replacement buildings had on their learning. A fifth-grade boy stated, "The old school was all dark and gloomy, and I didn't want to go to school. Now, I feel like I want to go to school. I love being in the new building." Other students indicated that the new building gives them a feeling of freedom and comfort. A student said that in the old building, "In the classrooms, it felt like we were trapped. In this school, it's more open. We can see the light, the sun because of the windows" (Oliveras-Ortiz et al., 2021, p. 176).

In the same study, Oliveras-Ortiz et al. (2021) found that students were aware of the impact the new spaces had on their learning and mood. Students reported an increased sense of pride in being part of their school, engagement, effort, and commitment to learning; they reported they wanted to make their teachers proud (Oliveras-Ortiz et al., 2021). While a positive learning environment is critical, and all stakeholders wish for students to be excited about their school and the spaces they have access to, the need for purposefully designed learning spaces goes beyond making students feel good while at school. Intentionally designed, innovative spaces can positively impact learning by allowing students to collaborate, which is difficult in traditional classrooms, by facilitating student-centered lessons and decreasing teacher preparation and set up time (Gurzynski-Weiss et al., 2015) when compared to the use of traditional classrooms for collaborative learning or PBL. However, teacher training and preparation to use innovative spaces are critical; if teachers continue to design and implement teacher-centered lessons, the new spaces will be irrelevant (Bousslama & Kalota, 2013; Dittoe, 2002).

The classroom, a physical reality, can support or hinder teaching and learning (Dittoe, 2002). When used as intended, the classroom can facilitate the implementation of learning opportunities through which students create their own knowledge promoting deeper learning (Stoltzfus & Libarkin, 2016). "Teachers need the types of learning environments that support their designed lessons to promote the collaboration and communication skills that students must develop before entering college and the workforce" (Oliveras-Ortiz et al., 2021, p. 179).

In another study conducted at an energy-career focused high school where PBL is the preferred instructional model, students also reported increased levels of engagement and commitment to learning (Oliveras-Ortiz et al., 2019). Moreover, they indicated appreciation for the ease of use of learning spaces which increased their perceived learning efficiency. The students' anecdotes of their learning in the new learning spaces suggest that the purposefully designed spaces positively impacted their learning by facilitating the use of spaces and instructional materials. Students had easy access to the needed space and resources to engage in collaborative projects (Oliveras-Ortiz et al., 2019). Students noticed the positive difference in their ability to engage in collaborative work in the purposefully designed learning spaces when compared to their PBL experiences in the previous building, which consisted of traditional classrooms in an old elementary repurposed building. During interviews conducted at the old elementary building, students reported that they did not expect to experience any changes in their learning once moving to the new building given that their teachers would be the same and PBL would continue to be the instructional model. However, once in the new purposefully designed spaces, students acknowledged significant differences in their commitment to learn because of the new spaces and available instructional and technology resources (Oliveras-Ortiz et al., 2019).

Teachers' Self-Efficacy and Learning Spaces

Having the adequate spaces and resources to implement an instructional model such as PBL is critical. However, learning spaces do not automatically equate to effective instructional practices and learning. In 2021, all faculty members at an intentionally designed STEM high school participated in a self-efficacy study. Self-efficacy is one's perception of one's ability to perform a task (Bandura, 1997). Teachers' self-efficacy is the teachers' perceptions of their ability to teach and perform the tasks and solve problems related to teaching and learning. The high school "participants reported statistically significant improvements in their ability to help students value learning, foster student creativity, and provide appropriate challenges for high-ability students" (Oliveras-Ortiz et al., 2022) after moving into the new building and having access to the spaces aligned to the instructional model. When asked to explain the differences in their perceived efficacy, two themes emerged as the main reasons teachers believed their efficacy had improved: (a) access to appropriate spaces and instructional resources, and (b) the campus culture and collaborative environment (Oliveras-Ortiz et al., 2023).

Author's Note

The author's research cited throughout the case is research conducted in collaboration with VLK Architects.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Yanira Oliveras-Ortiz  <https://orcid.org/0000-0003-0052-6224>

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Author Biography

Yanira Oliveras-Ortiz is an associate professor and the assistant director of the School of Education at The University of Texas at Tyler. Prior to joining the UT Tyler faculty, she spent 20 years in K–12 education where she served as a teacher, curriculum coordinator, and school principal. Her research agenda and service focuses on the advancement instructional leadership and supervisors in Belize. She is the recipient of a CARSI grant from the US Embassy Belmopan to collaborate with the Belize Ministry of Education in building teachers and school leaders' instructional capacity. She holds a BS in Elementary Education, MEd and PhD in Curriculum and Instruction from Penn State University.