TRANSFORM GRANT RESEARCH PROJECT

Trauma-Informed Design Evaluation Tool for K-12 Schools

RESEARCH TEAM:
J. Davis Harte, Ph.D.
Janet Roche, MDS
Christine Coward, MA
Molly Pierce, MS, OTR/L
Kelsey Jones, MDS Candidate

INSTITUTION:
Boston Architectural College

AMERICAN SOCIETY OF INTERIOR DESIGNERS FOUNDATION

EXECUTIVE SUMMARY

Trauma-informed design (TiD) techniques can help schools mitigate potential triggers for both students and staff. More importantly, it can help students feel safe, build resilience, strengthen their emotional regulation, avoid behaviors resulting in harsh disciplinary measures, and better access educational opportunities for increased learning. And yet, despite trauma's prevalence and this opportunity to mitigate stress and enhance learning, trauma-informed design remains an evolving field, with varying conceptual frameworks proposed by TiD practitioners like HOK,[1] Shopworks,[2] and Jill Pable.[3] Existing design approaches, such as inclusive, sensory, therapeutic, resilient, salutogenic, and biophilic design inform these conceptual frameworks and various TiD approaches, but as more designers apply these approaches, the need for a scalable, adaptable set of design imperatives becomes essential.

This project brought together designers, educators, and researchers to (1) define a consistent language to help educators and trauma-informed care practitioners better communicate their needs to designers, (2) increase an understanding of how environmental conditions may raise student and staff stress levels in K-12 schools, and (3) develop an interior-focused, trauma-informed evaluation tool to consistently guide users through a self-reflective process focused on their existing design conditions.

TOOLKIT SUMMARY

The *Trauma-informed Design Evaluation Tool for K-12 Schools (TiDEvalK12)*[4] was developed in an iterative research process, reviewing existing approaches and collaborating with over 100 primary, middle, and high-school educators, practitioners, academics, and designers. It provides a lens through which users can better understand the relationship between spatial and interior design elements, student experiences, and behaviors. Several key design implications, important to new school design, remodels, and renovations, are identified and outlined for a more consistent means of self-reflection and evaluation of proposed changes.

KEY DESIGN IMPLICATIONS

Based on the information provided by the schools:

- Students experienced dysregulation most commonly in six areas. **Designers should pay particular attention to hallways, classrooms, cafeterias, bathrooms, outdoor spaces, and gymnasiums**, given students identified these spaces as the most challenging.
- Overall, respondents reported that their playgrounds could not accommodate a wide range of students and abilities. **Designers should ensure that playgrounds and other**

outdoor spaces can safely and comfortably accommodate all students to encourage active movement and play since outdoor spaces are on the list of places in which students tend to struggle the most.

- On average, schools with specialty classrooms reported that the bathrooms in these program areas did not adequately support the needs of students with disabilities or have enough room to support a student with limited mobility. **Designers should ensure that areas of a school supporting programs for students with disabilities and limited mobility meet ADA accessibility recommendations.**

- Most surveyed schools reported that educators have a basic understanding of trauma-informed care concepts but are not well versed in the more nuanced and complex application of these concepts in day-to-day practice. In addition, other school staff often receive less, or no training, in this topic, and teachers do not feel fully supported in engaging in self-care practices. While this may not seem like a design implication, if all staff are not fully trained in how to implement trauma-informed practices and supported in exercising appropriate self-care, trauma-informed design changes will only yield marginal results. **Designers who wish to bring a trauma-informed design approach to schools should encourage school-wide training, administrative support, and care of staff.**

Based on the information provided by the designers:

- Poor lighting was common throughout the schools. **Designers should focus on increasing access to natural light** through the school's spaces and provide lighting options with dimmers, when possible. Lighting should not feel institutional; fluorescent lighting should be minimized; **and designers should ensure sufficient lighting levels throughout all areas of the school.**

- Large spaces, including cafeterias, auditoriums, and gymnasiums, frequently included design elements that could contribute to high noise levels. **Designers may wish to avoid furniture and finishes with hard surfaces, upon which noise and sound reverberate, and consider adding noise mitigating features, such as acoustic panels.** Ceiling elements, gathering spaces, smaller learning areas, or nooks can be created within large open areas to help mitigate noise and create interest.

- Spaces evaluated often lacked private or smaller areas of refuge, in which students could retreat. **Designers should consider adding nooks, comfort corners, break areas for staff and students, and extra seating and study areas throughout the school.**

- School signage could be improved to make it easy for people to navigate. **Signage should be inclusive of, and welcoming to, people of all genders, races, ethnicities, and abilities, and it should be placed at a height accessible to the student population as well as adults.** It should be friendly and age appropriate.

- Biophilic aspects, or design features that increase connectivity to the natural environment, were not very common in the evaluated school spaces. **Designers should look to include natural finishes and connect to views of nature wherever possible.**

- Some of the evaluated spaces did not convey a strong sense of community. **Designers should include school colors, mascots, and logos throughout the space, and when choosing art for the school, they should find ways to feature student art.** It should not feel institutional. Instead, it should represent the student community and result in a comfortable, bright, welcoming, and warm feeling.

TRAUMA-INFORMED DESIGN EVALUATION TOOL FOR K-12 SCHOOLS

BACKGROUND

Trauma is an epidemic, resulting from life-threatening events and/or harmful circumstances. It can be experienced physically and/or emotionally and leave lasting negative effects on health and well-being. Past trauma can be triggered by later experiences, which can be indirectly related or unrelated to prior experiences. Individuals can perceive past trauma as 'current,' initiating a biological 'fight, flight, or freeze' response, prioritizing survival, and dampening higher brain functions. Further, toxic and chronic stress can cause lasting brain changes,[5] impact memory, and alter biochemistry levels. This can lead to long-term dysregulation of nervous systems and impaired ability to modulate emotional highs or lows outside the 'Window of Tolerance'.[6] Thus, toxic stress can cause lasting physical and neurobiological changes. In 2010, studies demonstrate that individuals exposed to toxic stress exhibit 'problems in cognitive control and learning,' according to the National Scientific Council on the Developing Child.

A standardized assessment for measuring the quantity and degree of trauma in children is the Adverse Childhood Experiences (ACE) scale. Recently, the U.S. Health Resources and Services Administration (HRSA) Maternal and Child Health (MCH) Bureau reported that one in three children, ages 0-17, had experienced at least one ACE, including 14.1% who experienced two or more ACEs,[7] and the Centers for Disease Control and Prevention reported six out of ten adults have experienced childhood adversities (ACEs) that may burden their health.[8]

Trauma can affect emotional regulation, social intelligence, self-control, rational thought, and memory, as well as impact a student's ability to comply with behavioral expectations, which may lead to increased school disciplinary actions. Additional responses to traumatic events can include difficulty concentrating, rumination, racing thoughts, time/space distortion, difficulty making decisions, and suicidal ideation, according to the Center for Substance Abuse Treatment. Students, families, and school staff need therapeutic interventions, including trauma-informed design, to help mitigate impact on student's intellectual, social, emotional, and behavioral dysregulation.

If students are not provided with both a safe environment and the skills necessary to reduce their stress levels, then they will not be able to access and fully engage in the educational opportunities provided by their schools. Helping students with trauma can also help other students, teachers, and administrators by creating a more conducive environment for teaching and learning for all. Trauma-informed design becomes essential then to the design of school spaces.

The first step in applying Trauma-informed Design guidelines is appropriately evaluating the space, considering concurrently both the physical environment and the behaviors of the students in that environment. Our team proposed a new design evaluation tool to evaluate the physical spaces easily, sensitively, and effectively.

METHODOLOGY

The team recruited schools to partner and participate in the research project via email campaigns, social media posts, and direct communications through existing personal, professional, and social networks. In all, 9 schools participated in the study.

After completing the Internal Review Board (IRB) process and obtaining ethical approval, the team used a mixed-methods approach, which included:

- Review of current literature and available resources[9]
- Two-part survey on trauma-informed care practices and trauma-informed design
- Focused interviews with designated staff and educators to clarify survey response, discuss areas of the school that seemed challenging, and ask about trauma-informed care practices

- Collection of school facility information, including floor plans, physical and sensory measurements, photos, and videos to capture entrances, counseling offices, hallways, classrooms, cafeterias, sensory rooms, storage areas, bathrooms, playgrounds, and other outdoor areas
- Miro Board for designers to use when annotating photos and survey results and identifying elements that might *help* or *hurt* stress levels in the space

Schools provided information about their practices, buildings, grounds, student behaviors and potential triggers. This information was then reviewed by designers, who analyzed photographic and other special evidence and provided feedback based on their perspective about design elements that could impact the stress levels within the spaces. For 7 months, the team collected, sorted, and synthesized data, resulting in a research-informed and evidence-based evaluation tool.

KEY FEATURES OF THE TOOLKIT

The current *TiDEvalK12* provides a lens through which we can better understand the relationship between spatial elements, student experiences and resulting behaviors. The tool incorporates the *Substance Abuse and Mental Health Association's (SAMHSA) Six Key Principles of a Trauma-Informed Approach* and identifies the following domains, or areas of importance, in prioritizing safety and subsequently mitigating stress levels in schools:

- *Wayfinding* to provide direction and orientation, including visual spatial cues, labels, symbols, signage, colors, paths, and patterns
- *Biophilia / Connection to Nature*, including the use of natural materials, patterns, and other phenomena
- *Acoustics*, balancing resonance
- *Lighting*, both natural and artificial
- *Visibility*, ensuring clear sight lines, adjustable window coverings and sufficient lighting
- *Accessibility,* e.g., ADA code compliance
- *Inclusion*, providing equal assess to opportunities, resources and spaces for all people who might otherwise be excluded, oppressed, or marginalized
- *Choice and Flexibility,* related to spatial flexibility and a student's practice of autonomy and equitable access
- *Community / Culture,* related to a sense of belonging and their identities reflected, welcomed, and celebrated
- *Comfort and Aesthetics,* including the sensory load of the space
- *Movement and Play,* which are important for developing self-regulation, promoting language, cognition and social competence

Each domain is explored through a list of questions, which are scored and weighted to reflect their importance in a trauma-informed design approach. The questions are designed to push participants to evaluate the state of their existing environment. After evaluating each domain independently, points are aggregated and then assigned a rating of red (meaning the domain needs to be addressed), yellow (meaning the domain has some successes as well as some areas for growth) or green (meaning the domain exhibits proficiency).

The tool encourages users to make comments on their observations in specific areas and locations within the school environment to help users build their understanding of the unique design aspects in their school spaces, considering differences between the classroom and the gym, and a comment section to gather qualitative data from perception and personal experience is included.

TiDEvalK12 was intentionally developed to bridge the language gap that often exists between designers and educators. It was drafted to be easily accessible without any background knowledge. It explains the intent of each section, how each can be used, and incorporates descriptive explanations so that a common understanding can be shared by all users.

NEXT STEPS

The research team is excited about its dissemination and use. *TiDEvalK12* is expected to yield a new kind of information, for both designers and schools, outlining possible changes that could be made to the physical environment to reduce the stress levels of students and staff.

Many possibilities remain for further research.

- The research team is particularly eager to create a corresponding toolkit, outlining possible design ideas, which can be incorporated into the existing physical structure of schools to help address the domains identified by the *TiDEvalK12*. Using a designer's lens, we hope to spotlight stressors and potential trauma triggers that will then lead to evidence-based design recommendations to neutralize or mitigate these design feature triggers.
- In addition, they are exploring the possibilities of a longitudinal study, which would have a school complete an assessment using the tool, make recommended changes, and compare pre- and post-occupancy data. The team anticipates that over time, schools with implemented changes would see a reduction in harsh disciplinary measures, including seclusion, restraint, suspension, and expulsion and as a result, see increased academic performance.

RESEARCH BIO

J. Davis Harte, MSc, PhD, WELL AP, is the Director of the Design for Human Health master's program at the Boston Architectural College. She is co-leader of the Global Birth Environment Design Network (GBEDN) and co-founder of the Trauma informed Design Society. She is an educator, advocate, practitioner, and speaker, bridging trauma-informed design spaces, children's places, and birth environments with brain, neuroscientific and environmental psychological knowledge. Davis holds a PhD in Health from the University of Technology Sydney, investigating *The Childbirth Supporter Study*, and her Master of Science in Human Environments investigated preschool children's attentional behaviors.

Janet Roche, MDS, is a faculty member of the Boston Architectural College and co-founder of the Trauma-Informed Design Society. In addition to her Master's in Design for Human Health from the BAC, Janet holds a BSc in Social Work from Boston University and a Certificate of Business and Management from Harvard University Extension School. She owns Janet Roche Designs, specializing in universal design and the design of environments for those who are aging-in-place or seeking accommodations. A longtime advocate for dignity in design, Janet is also the host of Inclusive Designers Podcast, a collaborative forum for designers to share creative ideas for different human conditions.

Christine Cowart, MA, is a dually certified trauma professional, co-founder of the Trauma-Informed Design Society, and human services policy analyst, focusing on justice systems and family services. Her career includes working as a legislative analyst in two states, analyzing programs for the New York State Division of Parole, and serving as a contract and grant specialist for the Vermont Department for Children and Families, where she co-chaired a racial equity workgroup. She is currently the policy manager for the Vermont Department of Corrections, where she is helping to implement a department-wide trauma-informed approach. Driven to share this information with the general public, Christine founded *Coward Trauma Informed Partnership* to help others implement trauma-informed practices.

Molly Pierce, MS, OTR/L, has been a Pediatric Occupational Therapist (OT) for 35 years, specializing in neurodevelopment and sensory processing/integration. She is currently working as a school-based OT, supporting K-12 students while pursuing graduate level coursework at the Boston Architectural College in the Design for Human health program. She holds a master's in arts management and certificate in nonprofit management, with a focus on arts and design for human health. Molly served as adjunct faculty for 23 years, with the Oregon Health & Science University's Child Development and Rehabilitation Center, offering graduate-level instruction to their Special Education and Early Intervention programs.

Kelsey Jones, MDS Candidate, is an Interior Designer and a student seeking her Masters of Design for Human Health at the Boston Architectural College. She recently moved to Boston, originally from Seattle, WA, where she received her Bachelor of Arts in Interior Design from Seattle Pacific University. She has been practicing for 10 years within retail lighting, high-end residential, commercial architecture, and non-profit work, centered on housing and community centers. The non-profit work introduced Kelsey to the practices of Trauma-Informed Design and has directed her focus on creative design solutions that center the experiences of users and strive for well-being through the built environment.

OTHER CONTRIBUTORS

David O'Coimin is a product and experience designer, digital nomad, and social-minded founder with a passion for people, places, and planet, based in Amsterdam. Driven by a sense of urgency to grasp the change-moment, David is helping organizations realize the full inclusive potential of their space for the people who use them. His mantra is 'Design for the extreme benefits the mean.'

Laura Shook Guzman, LMFT, is a somatic psychotherapist, trauma specialist, and thought leader for workplace wellness and entrepreneurial mental health. An early adopter of coworking, Laura launched Soma Vida in 2008, making it the world's first coworking community to incorporate wellness and trauma-informed design principles. In 2016, Laura partnered with coworking thought leader, Iris Kavanagh, to launch Women Who Cowork. Laura's educational background includes a BA in Psychology from The University of Texas, Austin, and a MA in Clinical Psychology from Pepperdine University. She has completed advanced training in Somatic Experiencing and is currently licensed in the State of Texas as a Marriage and Family Therapist.

Erin K. Peavey, AIA, WELL AP, EDAC, LSSYB, is a design researcher and architect at HKS, Inc. and host of the podcast, *Shared Space*. She is an architect, author, and facilitator bridging the gap between research and practice with a focus on fostering human health and well-being by design. In her leadership role at HKS, she helps integrate research and practice to advance the creation and communication of knowledge across the globe. Before joining HKS, she was a senior researcher and medical planner at HOK in NY, a research consultant with the Center for Health Design at the Georgia Institute of Technology, and a research fellow with the Center for Advanced Research and Evaluation.

Kerri Brady, Fay Perez, and Rob Robbins of Huckabee believe learning environments play a significant role in the success of students and are committed to delivering well-crafted learning environments designed to produce more confident, engaged, and accomplished students.

ENDNOTES

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