IAA Journal of Arts and Humanities 12(1):119-125, 2025. www.iaajournals.org
©IAAJOURNALS ISSN: 2636-7297
https://doi.org/10.59298/IAAJAH/2025/121119125 IAAJAH121

Design Thinking Approaches in Education Administration

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ABSTRACT

In an era marked by rapid change and increasing complexity, traditional approaches to educational administration often fall short in addressing the multifaceted challenges facing schools and educational institutions. This paper examines the integration of design thinking as a strategic, human-centered methodology for promoting adaptive leadership and fostering innovation within educational administration. Through a review of current practices, case studies, and theoretical insights, the paper highlights how the design thinking process—empathizing, defining, ideating, prototyping, and testing can transform how educational leaders understand problems, engage stakeholders, and implement sustainable solutions. It emphasizes the role of empathy, collaboration, and experimentation in developing contextually grounded, iterative responses to systemic challenges. The study also examines implementation barriers, leadership roles, and strategic supports necessary for embedding design thinking in educational culture. Ultimately, this research underscores the value of design thinking in cultivating resilient, creative, and responsive educational systems.

Keywords: Design Thinking, Educational Administration, Innovation in Education, Human-Centered Design, Adaptive Leadership, School Reform, Collaborative Problem Solving.

INTRODUCTION

Design thinking is a methodology aimed at understanding and enhancing processes, products, systems, and organizational culture. This research explores its use in developing adaptive solutions to complex challenges, focusing on how a school district employed design thinking. The study includes descriptions of the design thinking process and the expected outcomes that enhance educators' adaptive capacity for educational change. Moreover, it discusses implications for educational administration, limitations, and future research. As a human-centered, creative problem-solving approach, design thinking blends empathy with analytical insights on context and constraints. It fosters collective problem-solving to generate iterative solutions for open, human-centered challenges while considering relationships and structures involved. This methodology promotes a shared understanding of community challenges and encourages anticipation of change implications, helping to build the resolve necessary for pursuing transformation amid uncertainties and potential setbacks [1, 2].

The Importance of Design Thinking in Education

In a rapidly changing world, educational quality is evolving, necessitating school innovation and design thinking. Schools must prepare students for a complex environment shaped by globalization, financialization, ecology, and technology, especially the internet and artificial intelligence. This complexity demands a redesign of school structures, processes, and practices, prompting a reevaluation of fundamental educational issues, including the school's societal purpose, objectives, teaching methods, and learning strategies. This comprehensive change, known as school redesign, involves "designing as a process of rethinking." The modern educational landscape, influenced by multi-dimensional factors, has led to diverse responses to globalization and reconfigured educational systems, creating semi-independent, market-driven schools outside traditional governance levels. Educational design encompasses processes to create specific artifacts, unfolding through various methods such as visualizing and modeling. It emphasizes both the purposeful creation of these artifacts and their unpredictable nature. Artifacts can be material or abstract, including agreements or values. Thus, educational design underlines

the agency of designers in reforming schools within a context shaped by various socio-structural and agentic conditions [3, 4].

Key Principles of Design Thinking

Design thinking applies designerly methods to problem finding and solution making, guiding groups to empathize with users, define problems, generate ideas, build prototypes, and iterate based on feedback. This mindset encourages innovativeness, collaboration, and empathy, attracting interest in education. Educators engage with design thinking to tackle various issues, reflecting different applications and purposes. Its principles can assist in addressing challenges within educational organizations. Design thinking fosters inquiry and creativity, enabling actors to reframe challenges by expanding their view of local education agencies (LEAs), students, and educators. Often, these actors view learners' needs through the lens of existing conditions, limiting transformative possibilities. By encouraging exploration beyond current truths, design thinking can open up new avenues for improvement. The process prioritizes inquiry to develop a clearer understanding of challenges, which is often overlooked as organizations rush to solutions without investigating root causes. Design thinking's inquiry-driven approach may lead to better comprehension by rigorously differentiating known factors from conjectures, considering various causes, and collecting observational data. This thorough analysis can empower actors to develop more effective change initiatives to tackle educational challenges [5, 6].

Stages of the Design Thinking Process

The design thinking process is organized around five main stages: empathizing, defining, ideating, prototyping, and testing (or refining), in which facilitators guide educator teams through a series of activities intended to generate buy-in, instill hope, build empathy, advance knowledge, encourage creativity and experimentation, and encourage collaborative action through the development of locally relevant solutions for addressing systemic challenges. Broadly, the empathizing phase comprises activities intended to build buy-in for the process and instill hope to promote engagement, and advance knowledge and empathy for a specific educational system, challenge, or group of students. Together, the defining and ideating phases comprise activities that champion a "nothing is off the table" or "yes, and" stance where all strategies that might address the challenge are considered. The prototyping phase champions a pluralistic framing of experimentation and solutions. This "something" is a prototype. The testing (or refining) phase focuses on a call to action around a process rather than a solution. Throughout the processes of the five-stage model, facilitators create an environment that is grounded in empathy, generates optimism, embraces diverse ideas, propels experimentation, and grows a collective ownership of actions taken. Definitionally, design thinking draws on a rigorous evidence base to iteratively theorize, develop, implement, and refine tangible solutions to a vexing challenge widely experienced in contexts beyond education. Design thinking draws on multiple disciplines to inform a flexible social process through which stakeholder teams build their organizational capacity to collaboratively decide to evaluate, design, and locally enact a system-wide discontinuous change effort. The process contains both content and process factors that combine sequential activities with sufficient flexibility for application in diverse organizational contexts. Nonetheless, despite its prevalence in other fields, design thinking remains a reasonably new phenomenon in education. The literature on design thinking suggests that, for education, the process holds promise to help educators build their adaptive capacity for engagement in educational change efforts [7, 8].

Implementing Design Thinking in Educational Institutions

Despite its popularity in business, "design thinking" is a relatively new concept in education. Educators and researchers are advocating for its use as a collaborative method to tackle urgent issues like school improvement and reform. However, empirical research on its efficacy within educational organizations remains limited. Design thinking, characterized by creative problem-solving, embraces a human-centered approach that fosters active engagement, iteration, and collaboration in addressing complex problems. When applied effectively, design thinking can empower educators to build their capacity for change. It encourages a broader perspective on the roles of educators and students, focusing on goals that go beyond narrow measures like test scores. The process starts with a thorough examination of the underlying causes of challenges, enabling educators to gather research-based insights and engage in productive, blame-free discussions about implementing effective changes. It promotes collaboration among teachers and administrators, underscoring the complexities of educational transformation. Instead of merely providing resources or funding, engaging in the design thinking process allows educators to rethink and adapt their strategies for addressing persistent challenges. It emphasizes the distinction between technical and adaptive change, going beyond mere changes in policy or job descriptions. Through design thinking,

organizations can enhance their capacity for collective action, identifying root causes of challenges, experimenting with solutions, and continuously improving as they pursue organizational betterment. Given the increasingly complex challenges in education today, there is an urgent call to rethink how these dilemmas are understood and addressed [9, 10].

Case Studies of Successful Design Thinking in Education

Many higher education institutions face challenges like declining enrollment and budget constraints. The College of Science & Mathematics (CSM) at Ball State University (BSU) is no exception. CSM leaders aimed to initiate a change process for better outcomes. Unlike traditional models, design thinking (DT) was chosen as the framework due to its emphasis on end-user experiences and iterative learning. The CSM DT initiative utilized Chang's 5-step model to tackle challenges identified by CSM and its constituents. Interdisciplinary faculty and staff explored issues, framed problem statements, and prototyped solutions. Key outcomes include evaluating the effectiveness of DT in education, understanding the evolution of such initiatives, and gaining insights for theory about design processes in educational settings. Design thinking, a problem-solving approach used worldwide, was adopted at CSM to understand constituents' perceptions and address significant challenges. The team selected trained DT facilitators to guide faculty and staff in the initiative. Faculty engagement outside traditional classroom structures played a critical role in the initiative's success. They participated in project development to learn about DT, and after initial iterations, they were invited back to assess and enhance ongoing initiatives. As CSM continues with the DT process, involving larger groups of constituents will be essential for gaining long-term trust and support [11, 12].

Challenges In Adopting Design Thinking

Despite the potential of design thinking, there are challenges in its ongoing practice. Educators, after initial training, often revert to traditional discussions involving printed surveys and notes, focusing more on content than on the process itself. There is a lack of substantial change discussions that embrace a design thinking framework. While design thinking has transitioned from small groups to infographic representations placed throughout the district, this has led to less collaborative dialogue than intended. Enthusiasm for the outputs is evident, as many ideas have been shared rapidly. However, initial conversations that foster trust and understanding have been lacking; these conversations are crucial for addressing previously neglected issues. Intentional opportunities need to be created to focus on these conversations, which enhance awareness of attendees' experiences and behaviors. Such discussions should reflect the success criteria established in initial design sessions, promoting openness and empathy while gathering feedback on the perception of the design process across the district. Future challenges for design thinking include determining the necessary fidelity structures; concerns may arise over misalignment with classroom realities, potentially fostering fear among educators. Additionally, design thinking could be misused to further limited agendas, hampering broader discussions. Lastly, important theoretical discussions on design thinking and alternative approaches for addressing complexity in education are essential for its future development [13, 14].

Strategies For Overcoming Challenges

Education organizations and developers of design thinking training programs should take steps to address the widely cited challenges that educational designers face when engaging in design thinking. This paper outlines target areas of the design thinking process and outcomes, along with relevant strategies to help with addressing those challenges. Certain design principles focused on these strategies can be enacted so that design teams, in partnership with education organizations, can take steps to better align design thinking training programming with the needs of education organizations. Implementing such design principles will not guarantee success, but action toward improving practice and addressing existing pain points is the only way to move forward. Broadening the process, incentives, and support for gatherings over time, cultivating trust among participants, and developing knowledge of local and regional contexts are all necessary to overcome challenges related to the design thinking process. For challenges that relate to outcomes, design principles such as ensuring that the biggest needs of educational designers are considered first and making time for presentations during gatherings can help with maintaining focus on outcomes. These challenges and target areas may affect ways that design thinking is tackled across various settings, from K-12 schools and districts to higher education institutions, service centers, and non-profits. Designing a common understanding of goals for education organizations before gathering and between gatherings, identifying next steps before larger-scale work, and outlining data collection and dissemination can help with collaboration across designers and organizations. Finally, meeting spaces should be made accessible at all levels of scale with common

coverage expectations between gatherings and sympathy for life's other demands upheld. Ideally, those interested in new designs would meet at least every two weeks to try new designs, share feedback, and iterate upon desired elements. Organizing a grassy space for gathering is key, as this is not the case for a middle school, high school, or even university campus [15, 16].

Role of Leadership in Design Thinking

Educational administrators play distinct roles within educational organizations, leading to various challenges in their relationships and groupings. Research indicates differing interpretations among them regarding their roles in the design thinking process and the concept of design thinking itself. Perceptions of suitable facilitators for design thinking varied, but there was consensus on the importance of building-level leaders and external support, albeit with differing definitions of their roles and qualifications. While some administrators felt competent to lead the process, others preferred to engage outside experts. Concerns when selecting external facilitators included their educational experience, relatability to participants, ability to build rapport with internal facilitators, and trust-building strategies. Barriers to implementation primarily stemmed from the existing educational hierarchies, such as time constraints and inconsistent beliefs about the value of design thinking. Additionally, hierarchical and adversarial dynamics among educational administrators further complicated relationships. Similarly ranked administrators often held differing views on their interactions with peers, particularly those tied to state accountability measures, which some believed fostered a compliance-driven culture detrimental to design thinking. Honorific patterns were also notable among administrators in the highest positions, affecting overall dynamics [17, 18].

Collaboration and Teamwork in Design Thinking

The globally recognized design thinking methods are integral to education in many countries, highlighting the need to analyze their application in education administration. This research focuses on the integration of design thinking in the education administration of a metropolitan municipality in a country where it is commonly embraced in education. Key questions include how experts and practitioners assess the current state of design thinking methodologies. Examining these approaches is vital for fostering creativity and managing change. Approximately 850 cases were studied through ontology-based text mining and qualitative analysis, revealing significant design thinking practices in education administration and emphasizing the roles of empathy, communication, and time. Prior to the COVID-19 pandemic, design thinking was a prominent tool for promoting creativity. The shift to online education radically altered design thinking's role during the pandemic, making it a compelling yet underexplored area in educational research. There is a growing call among researchers and educators to incorporate design thinking, urging a shift in teaching and learning perspectives, with many lacking this mindset due to traditional educational training [19, 20].

Design Thinking and Curriculum Development

Design thinking (DT) is increasingly adopted in schools for curriculum development, emphasizing student-centered education. However, a clear framework for a design thinking curriculum is lacking, leading educators to integrate diverse practices from various contexts. This research proposes a framework for a design thinking curriculum for students aged 11–14, detailing curriculum characteristics and strategies for effective implementation. It provides design educators with directions for further research and practice. The popularity of design thinking spans education, business, and healthcare, and it's recognized as an effective secondary school curriculum approach promoting personal growth, autonomy, and creativity while aligning with 21st-century skills. Despite its benefits, the design thinking curriculum remains underexplored, primarily due to insufficient frameworks and supportive strategies. Successful DT models in design education suggest that the curriculum should encourage creative exploration, develop content knowledge and social intelligence, and remain non-prescriptive. Teaching methods should be culturally responsive and engaging, leveraging technology to enhance access to information and creativity. Incorporating societal input is crucial for making students feel like valued members of their communities, while complex pedagogies guide activities toward achieving learning objectives and strategies [21, 22].

Integrating Technology in Design Thinking

Design thinking relies on information technology for infrastructure support to produce new ideas effectively. This method employs an interactive approach for graphic computer-aided design (CAD), computer simulations, and the generation and evaluation of design concepts. Tools and platforms are utilized for design development, evaluation, and testing following process analysis. This includes computer-aided engineering (CAE), manufacturing (CAM), software (CASE), and web engineering

(CAWE), and encompasses simulation systems, virtual reality, and games. After analysis, algorithms based on mathematical concepts are created to determine outputs under changing parameters, simulating robust choices for distribution challenges, considering needs, costs, and profits. Simulations yield outcomes based on variable changes and algorithms, and optimization problems are examined through the smallest changes leading to inconsistency measures. Innovative and interactive platform designs are reported, with grid-based interfaces enabling explorations of spatially parameterized systems for instructive simulations. The versatility of computer simulation allows extraction of forms and functions from mathematical ideas, aiming to motivate playful interaction while offering structured design activities for learning. Steps or HCI expand McKenzie filters to 3-D Grainsaurus. Computers develop tools aiding feedback in support vector machines and decision trees, grounded in mathematical rigor and programming. Interactive macros assist in design revisions and feedback assessments using QFD. Computer tools enhance exploration of design space and validate design outcomes, promoting robustness and effectiveness. Conjugated algorithms or uniform mesh difference algorithms facilitate efficiency and stability in data simulation [23, 24].

Measuring The Impact of Design Thinking

The development of new impact measurement tools facilitates comparison among schools based on specific goals. Explicit intervention design, in collaboration with various stakeholders, is crucial for adoption across multiple schools and contexts. The implementation process and future studies on preparation, funding, and intervention conduct are highlighted. However, scaling a quasi-experiment presents challenges despite unique experiences. There is a strong inclination to administer extensive tests to capture detailed behaviors using both quantitative and qualitative methods. Yet, given the nature of educational innovations, research needs to be focused and manageable, with clear goals established beforehand. While hundreds of questions can be asked regarding school quality or organizational culture as variables, it is essential to select only a few key factors for feasible research. Success is contingent on choosing clear variables, and impact is defined by specific questions and reliable sub-variables tested at each school. Schools rely on overall positive outcomes, making it vital to enhance educational quality through design. Culture should not be seen in isolation; it influences behaviors within organizations, enabling the possibility to navigate conditions effectively [25, 26].

Future Trends in Design Thinking for Education

The creative economy's demand for innovation has led to the incorporation of design thinking into education. This exploration focuses on how to design collaborative professional learning environments for teachers through design-thinking activities within a professional learning community (PLC). Teachers face immense change and pressure from high-stakes testing and strict accountability, resulting in compliance and burnout. It's vital to challenge teachers' beliefs and practices during these educational reforms. Thus, understanding how principals can leverage design thinking to enhance collaborative learning environments in PLCs is essential. This study builds on the previous limited use of design thinking in teachers' professional growth, employing a one-year design experiment to create a three-phase design process for collaborative professional learning. The research utilizes design activities such as storyboarding, persona generation, and problem sharing to outline the construction of a professional learning environment. Insights from this process highlight the roles of school administrators and pre-service teachers as vital scaffolds for teacher development, creating a supportive network to foster professional learning and enhance educational outcomes [27-30].

Design Thinking and Student Engagement

As scholars increasingly advocate for incorporating public organizations in discussions about change, design thinking emerges as a promising method for generating innovative ideas. It prioritizes creativity and problem conceptualization while addressing root causes, enabling divergent thinking, prototyping, testing, and iteration to enhance solution development over traditional methods. Following its business success, interest in design thinking has spread to other sectors, particularly in education, where it is viewed as a potential catalyst for pedagogical and organizational change. Gaining a deeper understanding of design thinking and its relevance for educational organizations is essential. This approach focuses on identifying problems rather than jumping directly to solutions. By employing design thinking techniques, stakeholders can explore issues and uncover root causes more effectively. The methodology offers extensive brainstorming protocols, favoring interactive techniques like using post-it notes and creating prototypes over conventional documentation. This contrasts sharply with established procedures and emphasizes collaboration across diverse roles within an organization. Effective design thinking relies on contributions from all stakeholders, recognizing that organizations are intricate systems where change

can yield unexpected results. Consequently, organizational change is an adaptive, time-sensitive process that evolves as various components interact [31-34].

CONCLUSION

Design thinking presents a powerful and transformative approach for addressing complex and persistent challenges in educational administration. By fostering a culture of empathy, inquiry, collaboration, and iterative innovation, it enables educational leaders to move beyond reactive management toward proactive, adaptive solutions that are responsive to the evolving needs of students, educators, and communities. As demonstrated through successful case studies and emerging best practices, design thinking helps break down silos, encourages shared ownership of change processes, and enhances organizational capacity for sustained improvement. However, effective implementation requires intentional leadership, professional development, and structural support to overcome entrenched hierarchies, time constraints, and resistance to change. Educational institutions that embrace design thinking not only reimagine problem-solving but also reaffirm their commitment to a more inclusive, dynamic, and forward-thinking educational future. Further research and practice are needed to refine design thinking frameworks for diverse educational contexts and to build a stronger evidence base for their long-term impact on educational outcomes and institutional resilience.

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CITE AS: Nabirye Amina Okwir (2025). Design Thinking Approaches in Education Administration. IAA Journal of Arts and Humanities 12(1):119-125.
https://doi.org/10.59298/IAAJAH/2025/121119125