

Design Thinking Approach to Developing Empathetic, Reflective and Inclusive Learners in K-12 Education: A Case Study

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Abstract: The 21st century demands education that equips learners with the skills to address global challenges, such as inequality, environmental sustainability, and social justice. Design thinking (DT) and Project-based Learning (PBL) have emerged as an innovative pedagogical approach to develop critical thinking, empathy, and problem-solving abilities. This study explores the integration of DT and PBL in K-12 curricula by focusing on a case study involving 6th grade learners addressing social challenges through the FIDS (Feel, Imagine, Do, Share) framework. The study employed a qualitative approach, analysing reflections and semi-structured interviews with learners and teachers engaged in a client project. The findings revealed the development of cognitive and socio-emotional competencies, including empathy, creativity, critical thinking, and collaboration, in the learners. However, challenges included balancing academic rigour with project demands, but iterative reflection sessions fostered resilience and adaptability. Integrating DT and PBL with citizenship curricula cultivates socially responsible learners who are empowered to navigate complex challenges. By embedding experiential and reflective learning into curricula, DT and PBL enable learners to become empathetic, action-oriented changemakers by aligning education with global needs for equity and innovation. This approach bridges theoretical knowledge with constructive applications, addressing gaps in traditional teaching methods. While this single-site case study limits generalisability, the replicable FIDS framework provides a scalable model for diverse educational contexts.

Keywords: Design thinking, empathy, inclusivity, citizenship, project-based learning

Introduction

The global world faces issues including food security, access to clean drinking water, discrimination against marginalised groups, and threats such as global warming, the destruction of ecosystems, and the loss of biodiversity. The world needs skilled individuals to make informed, evidence-based judgments. Globally, all learners must engage in design thinking (DT) and project-based learning (PBL), cultivating their capacity to utilise and implement innovative concepts and methodologies for informed decision-making. The discipline requires educational settings that enhance students' capacity to articulate events and issues while devising solutions to obstacles through DT, PBL, and citizenship (for being socially responsible) processes.

Integrating PBL with DT enhances students' critical thinking abilities by fostering creativity and honing problem-solving skills. Students employing these integrated methods demonstrated improved interdisciplinary learning, independent thinking, creativity, superior teamwork and collaboration, and a greater capacity to address complex real-world challenges effectively (Maknuunah et al., 2021). It promotes advanced cognitive abilities along with interpersonal and intrapersonal competencies (Quint & Condliffe, 2018). DT, originally grounded in the realms of design and innovation, has broadened its influence into education by advocating human-centred problem-solving frameworks that develop empathy, iterative explanations, and practical applications. Research indicates that DT amplifies learners' abilities to navigate complex challenges through creativity and critical reasoning (Dorst, 2010; Kolko, 2010). Similarly, PBL encourages learners to engage in hands-on experiences that link academic learning with social application, preparing them to confront real-world issues through inquiry, collaboration, and reflection (Bell, 2010; Häkkinen et al., 2017; Meyer & Wurdinger, 2016). The integration of DT and PBL presents a comprehensive pedagogical model to nurture the skills required for an interconnected and dynamic world (Goldman & Kabayadondo, 2017; Hennessey & Mueller, 2020).

This study builds on these frameworks by integrating DT and PBL within a citizenship programme in K-12 curricula to foster responsible learners. Citizenship education highlights ethical decision-making, community engagement, and nurturing empathy and inclusivity by providing a context for exploring these concepts (Tawil, 2013; UNESCO, 2014). Previous research stresses the transformative potential of experiential learning (EL) in developing attributes such as problem-solving and empathy required for innovation (Calavia et al., 2023; Dorland, 2024; Stock et al., 2018), yet gaps remain in understanding how such approaches can be systematically integrated and scaled within diverse educational contexts.

The objectives of this study were to investigate the impact of DT and PBL on learners' cognitive and socio-emotional development and explore how these frameworks can be

applied to foster citizenship. Using a case study of 6th-grade learners and teachers at Riverside School in Ahmedabad, India, the research examines how learners engage with an NGO for a client project addressing social issues through the FIDS (Feel, Imagine, Do, Share) framework. This framework facilitated a structured, student-led approach to problem-solving, allowing learners to apply concepts learnt in the classroom to real-world challenges and reflect on their learning and growth.

This research contributes to the growing discourse on innovative pedagogies that bridge academic learning with real-world impact by addressing the intersection of DT, PBL, and citizenship. The study highlights the importance of equipping learners with intellectual, moral, and civic competencies. It emphasises the role of education in preparing them to be drivers of their learning and solve complex challenges.

Design Thinking (DT)

The concept of DT and its applications have expanded beyond traditional design fields, reaching areas such as business, management, government, healthcare, and education (Dorst, 2010; Gheerawo, 2018; Pande & Bharathi, 2020; Silva et al., 2020). DT is characterised by a creative and iterative problem-solving process that significantly differs from conventional methods, with abductive reasoning as an integral part of DT (Dorst, 2010; Kolko, 2010). This approach begins with identifying a desired value or outcome and determining how to achieve it, enabling designers to frame and reframe problems and explore new possibilities for innovation (Dorst, 2010). DT enhances problem-solving capabilities, improves team collaboration, and focuses more on innovative user-centric solutions (Berglund & Leifer, 2017; Haldal, 2023).

DT is a cognitive framework that addresses complex problems through an analytical and innovative human-centred approach, emphasising empathy, collaboration, experimentation, and iteration, leading to innovative solutions (Bender-Salazar, 2023; Brown, 2008; M. P. Carroll, 2014; Dorst & Cross, 2001; Razzouk & Shute, 2012). It is a comprehensive process and paradigm that encompasses a worldview, methods, tools, and a human-centred approach. The methods and tools involved are reflective practices, tangible synthesis, explorative learning, prototyping, and brainstorming (Laursen & Tollestrup, 2017). DT has the potential to evolve into a discipline that prioritises cognitive, empathetic, ethical, and ecological concerns. By focusing on approaches that centre on mindfulness, reflection, holistic problem-solving and compassion in the design process, students can contribute to a more sustainable and equitable future with innovative solutions (James, 2017).

DT can challenge traditional school practices and lead to educational transformation (Hubbard & Datnow, 2020). Implementing DT in middle school education and subject learning enables students to explore various design processes, perceive themselves as

change agents, build creative confidence, and develop empathy (Bernardez & Alenton-Oracion, 2023; M. Carroll et al., 2010; Stock et al., 2018). It enhances learners' 21C skills, such as critical thinking, creativity, collaboration, and communication (Koh et al., 2015; Painter, 2018; Rusmann & Ejsing-Duun, 2022). Embedding DT into experiential learning (EL) improves creativity-positive learners, who are intuitive and curious (Dorland, 2024).

Project-based Learning (PBL)

There is a growing need for innovative teaching methods in an increasingly complex educational landscape. Traditional teaching methods often fail to prepare students for real-world challenges, but DT and project-based learning (PBL) offer a framework that fosters the skills necessary for 21st-century (21C) careers. The DT framework aligns with current shifts in education toward experiential and PBL (Hennessey & Mueller, 2020).

Furthermore, DT-PBL encourages critical thinking by requiring students to reflect on their problem-solving processes and adapt their strategies for execution (Jia et al., 2023; Maknuunah et al., 2021). Moreover, this approach promotes 21C skills by fostering problem-solving, communication, collaboration, teamwork, and leadership (Häkkinen et al., 2017). DT emphasises EL and the growth of skills relevant to identifying and framing problems, as well as empathy and creative thinking. The researchers suggest that applying PBL within an issue or area can facilitate the natural integration of DT (Calavia et al., 2023).

Through student-driven projects, PBL encourages self-awareness, independence, and accountability. It fosters autonomy and helps students navigate complex, real-world challenges (Meyer & Wurdinger, 2016). A study found that implementing PBL in K-12 education is a promising pedagogical method for fostering critical thinking, collaboration, and scientific inquiry (Annetta et al., 2019; Markula & Aksela, 2022). PBL involves learners in extensive research and knowledge creation, helping them tackle fundamental concepts within a particular area (Quint & Condliffe, 2018). Research indicates that educators view PBL as a methodology that enhances learning and motivation for both students and instructors, fostering collaboration and a sense of community engagement within schools. It facilitates student-centred learning by linking theory to practice (Aksela & Haatainen, 2019; Viro et al., 2020). However, studies have also revealed gaps in project execution without guidelines, inadequate teacher training, and a lack of subject-specific learning, particularly concerning resources (Aksela & Haatainen, 2019; Markula & Aksela, 2022; Viro et al., 2020). As the learners engage in reflection, they review their effectiveness in collaborative work, contributions, negotiation and listening skills, and receptiveness to teammates' ideas (Bell, 2010). This process also promotes life skills such as accountability, autonomy, collaboration, imaginative thinking, communication, and ethics (Meyer & Wurdinger, 2016).

Citizenship

Citizenship education seeks to prepare learners for their roles as active, informed, and responsible community members. In its report, UNESCO advocates for learner-centred education by engaging learners in critical thinking and participatory, experiential learning. It emphasises cross-cultural collaboration and highlights inclusive education, preparing learners to engage with sustainability goals and the interconnectedness of nations, cultures, and global challenges (Oxfam GB, 2015; Tawil, 2013; UNESCO, 2014), fostering meaningful and lifelong engagement. The curricula emphasise developing learners as agents of change for community participation (Oxfam GB, 2015).

Integrating sustainability and citizenship into education systems reflects the UN Sustainable Development Goals (SDGs), contributing to positive outcomes that emphasise interdisciplinary learning, community engagement, and collaborations between schools, local communities, and NGOs (Edwards et al., 2020). Global citizenship education (GCE) transcends traditional education by providing a value-based approach to learning that addresses global issues. However, it also indicates that integrating GCE into curricula is inconsistent with an insufficient focus on marginalised voices within the GCE discourse (Bosio et al., 2023). Further, its implementation depends heavily on resource management and teacher training, with varying definitions of GCE (Esser, 2023).

Incorporating PBL with GCE fosters the development of socially responsible citizens, promotes accountable and critical thinking, cultivates empathy, enhances self-efficacy, encourages active engagement, facilitates collaborative decision-making, nurtures problem-solving skills, and develops leadership abilities, ultimately inspiring a vision to address social challenges (Coma-Roselló et al., 2022). Actively involving learners in hands-on, reflective, and experiential learning, as well as interdisciplinary experiences, instils motivation to advocate for human rights and promotes active participation while developing empathy and communication skills. However, there is a lack of professional development for educators to implement holistic approaches (Chhatlani, 2023).

DT, PBL, and citizenship curricula promise to transform K-12 education. They promote critical thinking, empathy, and community engagement, empowering learners to navigate complex social challenges. Nonetheless, their integration requires systemic improvements in teacher training and preparedness, resource availability or access, and curricula design.

The Case and the Context

The case is observed through the lens of 30 school students and a Grade 6 teacher, as well as onsite observations conducted by the researcher over a six-month period. The

case had 30 middle school students in grade 6th and two homeroom teachers (HRTs) who conducted sessions on the citizenship program and mentored the students on a client project (PBL) as part of the citizenship curriculum of the school as research participants at Riverside School in Ahmedabad, Gujarat. Client projects are designed to illustrate to the learners that their learning is interlinked and not compartmentalised by various subjects (Riverside Learning Center, 2019). The client project was carried out in collaboration with a city-based non-governmental organisation (NGO). The NGO is an educational foundation that provides training to achieve equitable livelihoods and helps children and adults with special needs reach their full potential.

The school partners with the NGO regularly, enabling students to collaborate on various activities and gain an understanding of the issues the NGO addresses. For such collaboration, the school invited the Managing Trustee of the NGO for an interactive session with the grade 6 students. The discussion focused on how the NGO fosters an environment that respects the needs, capacities, and challenges of children with special needs while providing opportunities for their learning and development as citizens. During the discussion, it became apparent that the students could undertake a project for the NGO, which would be treated as a client project. The NGO wanted the learners to redesign the café on their premises.

The purpose of the citizenship curriculum is to enable learners to undergo various experiences that foster their development as better citizens and cultivate a sense of giving back to the community from the heart. The school's approach to citizenship is founded on ideas that instil strong values in learners, enabling them to utilise DT to develop procedures that cultivate citizens with an "I CAN" mindset (Riverside Learning Center, 2024). They learned about marginalised and underprivileged communities in India and researched various case studies. For their experiences, they undergo the 'hunger experience' to understand what it means to be hungry as there is a substantial population in India who are undernourished⁽ⁱ⁾, *agarbatti* (incense stick) experience to understand child labour, 'bathroom surplus experience' to understand that access to the bathroom is a privilege and not a right or, as in this case, the 'disability experience' to understand disability and feel a sense of gratitude for the body parts that one has. The teacher's role was to guide during the programme sessions, making this client project student-led.

Research Methodology

The methodology used for this case study is the DT framework developed by the Riverside School, a four-step, simplified, adaptive, iterative, and transferable framework conceptualised by the school in collaboration with IDEO (Rao et al., 2021). The framework model has a simple four-step **FEEL, IMAGINE, DO, SHARE(FIDS)** approach, as shown in Figure 1. It is a unique framework for children and adults to drive

change in their communities. It is iterative and fosters the 'I CAN' (Design Thinking) mindset in the children (Gudipati & Sethi, 2017), which is currently being practised at school.

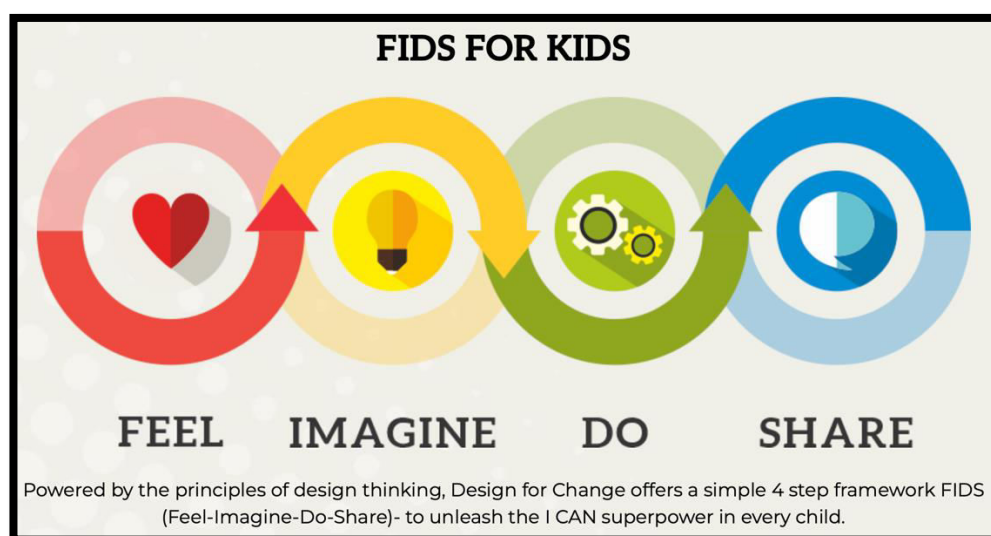


Figure 1: Design Thinking FIDS Framework Model. Source: dfcworld.org

As part of the school's citizenship curriculum and client project, students researched the UN SDGs to deepen their understanding of the given brief. The school's citizenship curriculum represents a journey from being "human to humane" through the guidance of the 5Es: empathy, ethics, excellence, elevation, and evolution ⁽ⁱⁱ⁾.

Feel

The first step of the DT-FIDS framework is to '**Feel**'. It enables the learners to grasp the challenges from the users' perspective and consider their perceptions and emotions. It builds 'empathy' in the learners and empowers them to actively engage in their communities (DFC Global Inc., 2024; Gudipati & Sethi, 2017).

The grade called themselves the inclusive class of the key stage and the '*dilkebande*' (People of the Heart). It meant they were inclusive people, but after a collective reflection session, they learnt that they were not as inclusive as they preached themselves to be. Hence, as part of their citizenship and for their '**FEEL**'. The learners researched the SDG goals in depth, focusing on Goal 10: Reduced Inequalities ⁽ⁱⁱⁱ⁾. The teacher also introduced them to the concept of inequality and disability through a short case study film featuring a boy with disability who could not attend school (Design for Change, 2012). This helped the learners establish the issue and understand it conceptually.

To advance their objective and fulfil the client's brief, the learners engaged with the special needs youths by visiting the NGO's facilities. The learners formed a bond with

the children with special needs, understood the fear and stigma related to disability, and developed empathy. This additionally facilitated their alignment with the SDG goal of 'Reduced Inequality'. To enhance their understanding, the learners created an immersive 'disability experience' in which they co-created ideas using FIDS, selecting four special abilities: leg binding, blindfolding, hand restraint at the back, and mouth closure, as shown in Figures 2-5. They resolved to remain in these states for the duration of the school day and participate in all scheduled school activities. There was significant interdependence and camaraderie as the learners assisted one another.



Figure 2 (top left): Physical disability with a leg tied; Figure 3 (top right): Camaraderie in the learners as they assisted one another; Figure 4 (bottom left): Visual disability with blindfolding; Figure 5 (bottom right): Physical disability with hand-tied behind the back. Photo credit: Rupali Pandit

The experience and reflection helped them refine their problem statement, which led them to the next step: 'IMAGINE'.

Imagine

The next step, **Imagine**, allows student groups to collaborate and generate innovative solutions or ideas for the challenges identified during the 'Feel' stage. It cultivates ethical principles in the learners and empowers them to assume responsibility. This mindset fosters the belief that they are not powerless, that change is achievable, and that they can act as catalysts for change. The learners are encouraged to brainstorm and think creatively (DFC Global Inc., 2024; Gudipati & Sethi, 2017).

The learners focused on the NGO and its guiding concept of inclusivity. The learners envisioned the transformations they aspired to achieve within themselves, i.e., to be more inclusive and raise awareness for their cause. In this phase, they consolidated their views and articulated them in a singular statement to commit throughout the project. Their 'Imagine' statement aimed to "Redesign the Café for the NGO youth to aid in acquiring vocational skills, enabling them to lead lives of dignity and respect." To facilitate this, they envisioned developing an etiquette training module and a menu design for meals, in conjunction with the café's renovation, and raising awareness of the café and the NGO's cause.

Do

The '**Do**' step helps the students realise and execute their ideas as prototypes, gain further insights, and iteratively reflect on their solutions based on user feedback. It fosters excellence in learners. Learners are given the freedom to experiment and put their ideas into action. This hands-on approach enhances their understanding and teaches them the importance of iteration and resilience in the face of failure (DFC Global Inc., 2024; Gudipati & Sethi, 2017).

In this phase, the learners divided themselves into four committees. The space committee was responsible for designing the space. They had the food committee accountable for designing the menu and teaching the specially-abled youth the steps required to prepare the food. The etiquette group created the training module to equip the NGO youth with vocational skills. The marketing group needed to do fundraising to execute the café project and raise awareness for their cause. After conceiving the various ideas for the café, the learners presented and pitched their concepts to the client. The client provided feedback and suggestions for changes to the project's feasibility and execution, making the process iterative. The learners prototyped ideas and planned activities which would be executed simultaneously.

During the phase, the learners designed multiple activities to spread awareness at 'Street Smart', also known as 'Happy Street'. Street Smart is an initiative that involves the closure of a primary city street for one day each month, allowing children and the community to engage in games, activities, and stalls in a secure environment (aProach,

2024). As part of the marketing team's activity, learners replicated the 'disability experience' from their 'Feel' phase and developed an activity or game based on it at Street Smart. Visiting children at Street Smart were paired, with either their legs bound, hands restrained behind their backs, or their eyes covered. The participating children were inquisitive about the rationale behind the activities and whether their teachers had instructed them to participate. Upon elucidating the NGO and its mission, the learners asserted that it is their cause to spread awareness to the fullest extent possible. The learners, with the help of the school's Hindi language teachers, scripted a Hindi *nukkadnatak* (street play) as one of their campaign activities. An expert with a drama and acting background also intervened, helping them to prepare for dialogue delivery and performing the play at Street Smart and other institutes, as shown in Figure 6. The script's storyline was based on a specially abled child.



Figure 6: Nukkadnatak (Street Play) practice by the learners. Photo credit: Rupali Pandit

To generate revenue through the marketing initiative, one of the learners organised a bake sale and created posters, flyers, and packaging for the event. Another learner displayed her artwork in an exhibition for sale and presented narratives for the cause.

For the café, the students worked on feasible and executable ideas - bringing in potted plants, creating a library, creating the NGO journey timeline, designing and making paper-based mobile structures, as shown in Figures 7 to 10, rearranging the seating area, designing the menu and recipes for the food, creating a relaxing zone in the premises, and designed and executed the training module on etiquette by training the specially abled NGO youth.

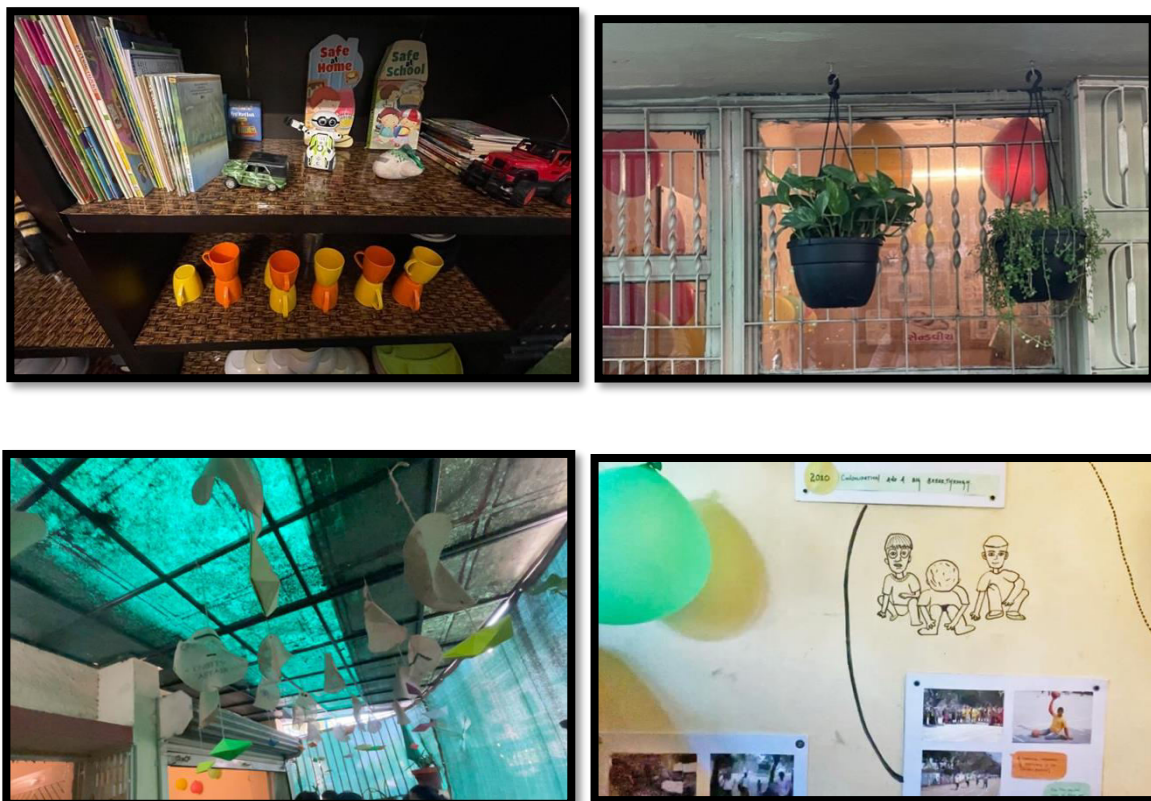
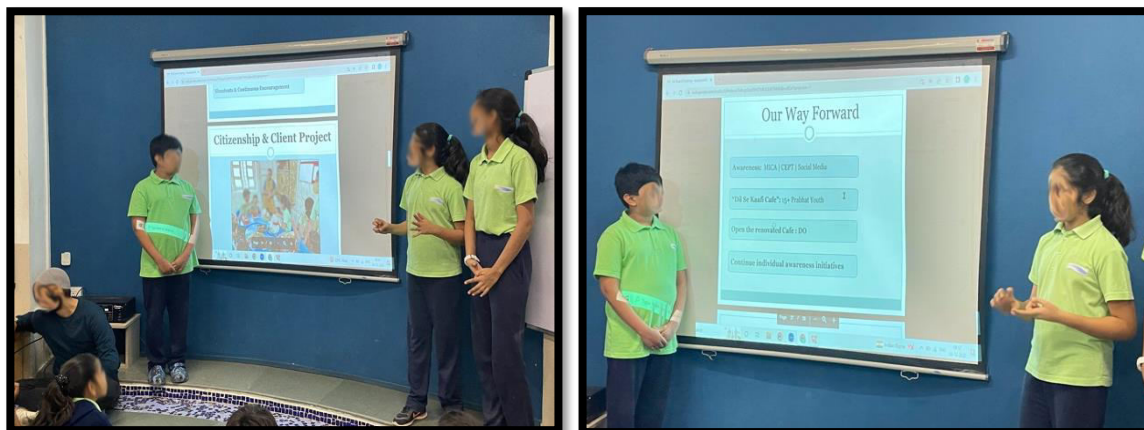


Figure 7 (top left): Creation of library at the NGO; Figure 8 (top right): Potted plants at the NGO; Figure 9 (bottom left): Paper mobil structures; Figure 10 (bottom right): NGO journey timeline. Photo credit: Rupali Pandit

Share

Finally, the ‘**SHARE**’ step encourages the students to share the impact of their ideas and solutions with the users and the community. It also focuses on communication and reflection. Students share their solutions and experiences with a broader audience, receiving feedback and reflecting on their learning journey. This step reinforces the value of collaboration and the impact of their contributions to society, asserting an ‘I CAN’ mindset (DFC Global Inc., 2024; Gudipati & Sethi, 2017).

Sharing involves conveying an understanding of the narrative of change. The learners communicated the implementation of the client project under the citizenship program to the school community, as shown in Figure 11, thereby inspiring others to engage in similar initiatives to bring about change. They also conveyed the impact that they have generated, affecting themselves, the children, and the parents who attended Street Smart. As shown in Figure 12, they aimed to continue spreading awareness as “A Way Forward” to a broader community beyond the school.

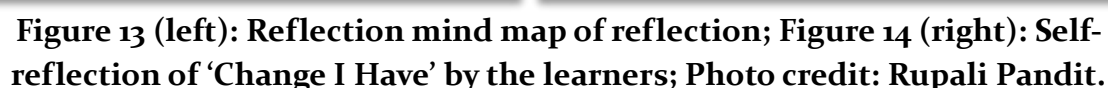


Figures 11 (left) and 12 (right): Learners share their change stories with the larger community. Photo credit: Rupali Pandit

Reflection

The school promotes reflection as a link between experience and learning. Each experience or session is followed by reflection to encourage self-directed learning and metacognition. Through the process of sharing and reflection, the learners develop a growth mindset (the learner by quest, 2017). Reflection enables them to assess their progress, recognising strengths and areas for improvement (Riverside Education Foundation, 2024).

In the client project reflection session, the teachers first moderated a mind map of the learning process as per Figure 13. They reflected on the skills and attitudes developed during the project and their gratitude for those who contributed to the project. Additionally, the teachers provided the learners with worksheets, wherein they did a self-reflection titled 'Changed I Have' to communicate the transformations they observed in themselves, as shown in Figure 14. During the session, the teachers summarised and discussed the key points, focusing on content learning, skills, attitudes, and the possibility of enhancing value as a humane citizen.



The qualitative analysis of the data was derived from two primary sources: responses from a Google form completed by 26 of the 30 Grade 6 students (reflection dataset) that consisted of the learners' reflections. Semi-structured interviews were conducted with 2 randomly selected Grade 6 students who had undertaken the client project, as well as with the 2 HRTs (teachers) of Grade 6. It captured individual perspectives on activities by integrating the FIDS framework. The interview transcripts and dataset recorded the teachers' and students' reflections on the client project and the school's citizenship programme. The data was analysed thematically to explore the curricula's core values and learning outcomes.

David Kolb's ELT underpins the focus on experiential learning in the transcript and dataset. ELT proposes that learning occurs through a cycle of concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Kolb, 2015). The theory is evident in the school's FIDS framework: Feel (Concrete experience)

–learners experience the realities of hunger and disability through simulations. Reflect (Reflective Observation) – Reflection sessions following activities. Imagine (Abstract conceptualisation) – to reimagine the café brief and Do and Share (Active experimentation) – actions taken to address challenges. TLT emphasises reflection and examination of assumptions, leading to personal growth and behavioural change (Mezirow, 1997). The school's reflective practices illustrate this theory. Codes such as reflection for personal growth and inclusivity derive from this framework. The FIDS framework reflects the principles of HCD, which prioritise empathy and creativity in solving real-world problems iteratively (IDEO, 2015). CTL provides learners with the opportunity to construct knowledge through active engagement with their environment and social interactions (Piaget, 1970; Vygotsky, 1934). The school's PBL approach emphasises collaboration and aligns with the theory that knowledge is co-created within a social context. Critical pedagogy emphasises the role of education in fostering critical awareness and empowering learners to challenge societal inequities (Freire, 1970). Codes related to skills acquisition are informed by the P21 framework (Partnership for 21st Century Learning, 2019).

Codes	Coded Categories	Themes
Reflective practices, Experiential simulations, Application of FIDS framework, Understanding privilege, Linking content learning to community immersions, Classroom-based reflections	Learning processes: Emphasises activities that foster empathy, understanding and connection	Building Citizenship through empathy and values Empowering change with design thinking
Empathy development, Ethical decision making, Gratitude, Respecting diversity, Responsibility, Heart-centered personal growth	Values and morality: Focuses on cultivating personal and social values through learning	Inclusivity and Community engagement Integrating learning with social impact
Partnering with NGO, Public awareness campaigns, Collaboration with differently-abled, Designing sustainable solutions, Spreading awareness via storytelling	Community interaction: Highlights interactions the promote inclusivity and societal engagement	Navigating challenges and reflection
Time and resource management, Problem-solving, Leadership, Event planning skills, Team-based project execution, Critical thinking and creativity	Skill acquisition: Skills developed through project-based and community-oriented activities	

Balancing content and character, Navigating project constraints, Overcoming biases and stereotypes, Adapting unforeseen delays, Managing interpersonal dynamics	Challenges and Adaptability: Challenges faced and resilience demonstrated by students during project	
Ownership, Promoting social justice, Advocacy for marginalised community, Active-participation in change making (student-led), Transforming challenges into growth	Empowerment and Advocacy: Emphasises student-led initiatives and their role as change agents	
Training initiatives, Creating inclusive spaces, Developing and implementing modules, Creating sustainable solutions for social impact, Bridging content with real-life needs	Real-world application: Application of classroom learning to real-world contexts	
Peer-to-peer support, Teacher-student collaboration, Group collaboration, Inclusive team-based projects, Role-based committee structuring	Collaborative dynamics: Focuses on collaboration within and beyond classroom	

Table 1: Codes, Categories and Themes

Building Citizenship Through Empathy and Values

Empathy is at the core of curricula. Activities such as experiencing hunger and disability were designed to help learners put themselves in others' shoes, fostering a deeper understanding of marginalised communities. Student 6 reflected,

"The citizenship programme is where we step into someone else's shoes and feel what they are feeling". Similarly, Student 9 emphasised, "When you empathise with a person, you can understand their emotions and point of view (POV) better, thus helping you connect with them and stand up for their cause".

Teachers also mentioned the importance of these experiences. Teacher Bandhan remarked,

"So as a curriculum, the citizenship program is to make a child from a human to a humane citizen. Today, the need of the world is that education is something which can create a good human being". "We give this experience to the kids like a very small one: I

am putting myself in someone else's shoes to understand what they go through. To create a sense of empathy”.

This intentionality ensures that empathy becomes a lived experience rather than an abstract concept.

The programme encourages the learners to collaborate, make ethical decisions, and take responsibility for their actions. After recognising that their classroom lacked inclusivity, Student 22 stated,

“As a class, we realised that we are not including each other. That’s how we started the idea of partnering with the NGO. We thought we could include someone who is not like us but special, and we could make ethical choices by responding to the situation instead of reacting”.

Gratitude emerged as a significant value cultivated through the programme. Simulation activities helped the learners realise the privileges they often take for granted. Student 4 shared,

“I felt grateful after having the experience because I learnt that it’s important to RESPECT and to be happy with what I have”.

The programme also encourages the learners to grow individually and elevate others through collaborative action. Through the client project, they created opportunities for marginalised groups. Student 2 expressed pride, stating,

“I honestly felt empathetic towards people who have special needs, and it made me realise that we aren’t just doing the client project for the sake of it; we are changing people’s lives through it, so whatever we do, we do it together and with quality!”

The school’s effort to develop compassionate, socially responsible citizens is based on experiential and reflective learning through actionable projects. The programme instils values such as empathy, gratitude, reflection, and ethical decision-making, allowing the learners to grow emotionally and morally while using content learning to drive social change.

Empowering Change with Design Thinking

The school employs the FIDS framework to empower the learners to address real-world challenges in a structured and empathetic manner. This approach allows learners to connect emotionally with problems, ideate creative solutions, execute their plans, and inspire others by sharing their outcomes. The FIDS framework provides a systematic

methodology for addressing challenges. It emphasises the importance of empathy and action. Student 17 echoed this,

“We applied the FIDS process by doing it stepwise. For example, first, we would share our feelings about the situation and then imagine our best-case scenario. We would then put it into action and share it with the people around us!”

The ‘FEEL’ phase is where learners immerse themselves in the experiences of others, which helps build empathy as a foundation. It encourages the learners to connect emotionally with the people they aim to help. Activities like the disability experience allow learners to step into the shoes of others as they blindfold themselves to experience the daily challenges faced by differently-abled people. Student 2 reflected,

“I saw being able to talk as a privilege because I was mute for a day, and I could not express my emotions”.

Teacher Bhandhan highlights,

“So the experiences are part of the FEEL phase”.

The ‘IMAGINE’ phase encourages ideating creative solutions. The learners brainstorm and co-create innovative solutions to the problems they empathise with. For the café project, they envisioned a vocational training space to help differently-abled youth gain skills and independence. Student Pratibha emphasised,

“By the end of it, what we want to be, and what impact and change we want to create, we envision it”.

In the ‘DO’ phase, learners implemented their ideas through careful planning and collaboration. They created training modules, redesigned the café space, and raised funds. As Student 22 mentions,

“Our third step was our DO; we started our DO by renovating the place and training modules for NGO youth”.

The final phase, ‘SHARE,’ emphasised advocacy and allowed learners to communicate their work, raising awareness about inclusivity and inspiring others. Through street plays, campaigns, and storytelling, they highlighted the importance of inclusivity. Student 9 shared,

“Our Share or Change/Impact Story is where we take it a level further by sharing it with the people and taking it to a larger platform. When you have experience, the FIDS process can help in structuring it better as well as clearly showing us where we have reached”.

This demonstrates that the FIDS framework equips the learners to address challenges creatively with empathy. Mentored by the teachers, the learners transformed their understanding of social issues into actionable projects. The café project serves as an example of how DT, combined with empathy, innovation, and collaboration, can be integrated into the curriculum to drive meaningful change and inspire learners to become responsible and proactive changemakers.

Inclusivity and Community Engagement

The theme captures the school's priority of fostering a sense of belonging and collective responsibility among learners. Through structured experiential activities, collaborative projects, and reflection, the school enables the learners to understand diversity, inclusivity, and meaningful community engagement.

Inclusivity begins with the classroom environment, where the learners are encouraged to reflect on their actions and assumptions. After reflecting on their actions of exclusion, the learners revisited their mission of inclusivity. Student Pratibha shared,

“In our citizenship program, for our FEEL, we were called the inclusive class of the key stage and the dilkebande (people of the heart). It means that we are inclusive people, but after a reflection, we figured that we are not as inclusive as we preach to be or we thought we were”.

Teacher Bandhan iterated the importance of reflection in the class,

“It started with the fact ki(that) our class had a problem. That problem was that we kept calling ourselves di kebande(people of the heart), but we were not that. We were not applying what we were calling ourselves”.

Experiential activities, such as simulations and direct engagement with marginalised people, are crucial in developing empathy and inclusivity. The disability experience provided students with firsthand insights into the challenges faced by individuals with disabilities. Engagement with the NGO youth further deepened their understanding. Student 7 reflects on the collaborative project,

“I think all of us came together and planned this experience”.

The theme showcases the school's integration of reflective practices, immersive experiential activities, and meaningful partnerships, which help develop learners' understanding of inclusivity and collaboration and achieve social betterment. The café project and campaigns showcase how education can be a powerful tool for nurturing collective responsibility.

Integrating Learning with Social Impact

The theme emphasises the school's commitment to integrating academic growth with real-world applications to create a comprehensive education model. This approach ensures that learners understand that academic rigour, combined with real-world applications, prepares them for life. Learners bridge the gap between theoretical learning and meaningful action by engaging in client projects rooted in empathy, collaboration, problem-solving, and developing 21C skills.

The school prioritises a balance between content development and character building, as highlighted by Student Pooja:

"I think that it's really important to balance your content and character development because it's something that the school has been doing for long. And it's important because when you grow from your heart, you can experience things that you can't really experience when you are growing from your mind, like the empathy part."

]Through hands-on projects, the learners apply academic concepts to real-world contexts. Student Pratibha emphasised:

"We're learning the skills that are applied in the subjects or taught in the subjects as well." "Your scientific skills are used, your observation, your prediction, your hypothesis, and everything will come into place."

This integration of academics with community-based projects cultivates intellectual and emotional intelligence. It teaches the learners that education is a tool for contributing to society, fostering a mindset of accountability and service. Teachers viewed the collaboration as an opportunity for the learners to apply their learning in real-world contexts. Teacher Bandhan explained:

"I think all these subject concepts which we are learning and concepts which we are learning came into the picture when we finally did the client project"

The learners developed 21C skills such as collaboration, critical thinking, creativity, communication, leadership, adaptability, and time management. Dividing

responsibilities by creating committees, such as design, fundraising and training, allowed the learners to take ownership of specific tasks. Student Pooja remarked:

“The space committee was in charge of designing and generating the space. We had the food committee, which was in charge of designing the menu and teaching them how to make the food. We had the etiquette group, which created the training module to equip the NGO youth with the etiquette of vocational skills. One last group was the marketing for awareness and fundraising”.

Student Pratibha stated:

“We learned time management for sure”.

Student Pooja elaborates on the creativity skill:

“In the client project, when we were thinking about the design of the timeline, we had millions of ideas and like ideas we could've chosen from, but we decided on one idea, which was the most practical idea and making sure it looked good and it was easy to maintain it. That's where our creativity came in”.

Student Pratibha remarked on communication skills:

“Communication with the experts, with your own classmates, peers. With your teachers and peers. Also, during the pitch, we had to communicate our calls and our café”.

Student Pratibha explains collaboration skills:

“I would also add collaboration with the expert, our teachers, and our client, especially”.

Student Pratibha elaborates on critical thinking skills:

“The client project proposal that we had included a lot of critical thinking. We needed to have reasons why we wanted everything, and the things we wanted, why we wanted, if we could add something else, why didn't we add it? If there wasn't a reason, then why did you add it in the first place? And we had to be ready for whatever would come our way, and if we didn't know something, we had to think about it and think through it”.

The teachers recognise the importance of these skills in preparing the learners for future challenges. Teacher Bandhan stated:

“The way that they are questioning things shows that they are opinionated, vocalising it, and critical thinkers. I feel that this is something that the world now requires people to ask questions. The second thing, which I don't think we've seen in a lot of places, but I feel is adaptability as a 21st-century skill. We, as a school, aim to send out children from a space to have leadership qualities and be able to adapt to different situations. And basically, at the end of the day, the human to a humane idea”.

Navigating Challenges and Reflection

The theme highlights the school's priority on building resilience and self-awareness as part of the learning process. During the citizenship programme, learners faced challenges that required them to adapt and persevere. The learners turned their challenges into opportunities for learning and self-improvement. Reflection sessions helped them evaluate their progress and make connections. This focus exemplifies the programme's goal of fostering lifelong skills.

One of the challenges the learners faced was balancing their academic learning with the demands of the café project. Student Pooja shared:

“We were devoting a lot of time to our client project, so it was hard balancing with our studies a little. Even though we are learning a lot in the client project, like measuring, drafts, etc. So we are learning a lot. But, of course, academic growth is also important. So we are struggling a little bit”.

However, the reflection session helped them strike a balance. Student Pratibha states:

“We realised we've had so much in bits and pieces that we were not able to know that we've done so much”.

Student Pooja adds:

“With the reflection, that really helped because we could take a pause and see what we've done in content”.

The learners also faced external challenges, such as managing timelines, navigating resource limitations, and delays in procuring materials. Student Pratibha shares:

“We had a deadline, but it wasn't able to be met because of Diwali (festival of lights in India) happening and all the celebrations. The workers, the labourers, they were not willing to work”.

The learners developed resilience and confidence in their abilities by navigating challenges and engaging in reflection. Student Pratibha adds:

“We've learned to try and try again and again, no matter how many times we fail or don't succeed. And I think experience is the best teacher. When you learn from experience, that is when you can actually grow.”

Reflection is a cornerstone of the curriculum. It helps the learners internalise their experiences and connect them to broader life lessons. Student Pooja reflected:

“So that's when we learned the true value of our privileges.”

Student Pratibha states:

“The citizenship program in school is basically the journey of becoming human by chance to humane by design through the help of the five E's, which are empathy, ethics, excellence, elevation and evolution. We use this framework throughout the year, especially in our daily lives and in our reflections. We see how we have grown this year from where we were to where we are now. When we have grown in all of these elements, all five of them, we consider ourselves to have graduated from that grade.”

Discussions

The study explored the integration of DT with PBL cultivates empathy, reflection, and socially responsible learners in the context of citizenship curricula in K-12 education by applying their learnings to address real-world challenges. The findings reveal the impact of these methods in enhancing the learners' cognitive and socio-emotional competencies, aligning with Freire's (1970) critical pedagogy, which emphasises education as a means of promoting social equity and awareness. The FIDS framework is key in guiding the learners through the problem-solving process by developing ownership and accountability. These findings resonate with previous studies of (Berglund & Leifer, 2017; Dorst, 2010; Heldal, 2023; Razzouk & Shute, 2012), highlighting DT's capacity to enhance creative problem-solving and empathy. The emphasis on experiential learning aligns with findings (Calavia et al., 2023; Dorland, 2024; Hennessey & Mueller, 2020; Quint & Condliffe, 2018) that DT and PBL encourage deeper engagement and holistic development. Another significant finding was the role of the FIDS framework in structuring and guiding the learners' engagement with complex social issues. The iterative nature and reflective processes in this framework mirror those of Dorst and Cross (2001) and Heldal (2023), as well as Kolko's (2010) emphasis on abductive reasoning with DT, wherein learners reframed challenges. Laursen & Tollestrup's (2017) assertion that DT fosters innovative solutions through HCD is similar to the learner's approach to reimagining the NGO café as a vocational space. The study

also highlights the integration of DT and PBL to cultivate 21st-century skills, identified as necessary by Häkkinen et al. (2017), Koh et al. (2015), Partnership for 21st Century Learning (2019), Razzouk & Shute (2012), and Rusmann & Ejsing-Duun (2022) for thriving in this interconnected world. The learners demonstrated an ability to collaborate, work in teams, and make collective decisions when designing training modules, creating café menus, and executing marketing campaigns. These findings demonstrate that DT and PBL can effectively prepare learners for complex and dynamic social environments.

Moreover, the integration of citizenship into the curricula strengthens the moral aspect of learning. The learners engaged with issues of inequality and marginalisation, aligning their actions with the UN-SDG (United Nations, 2023). This emphasis on ethical reflection and social responsibility sets this study apart in the educational research landscape. Unlike conventional DT or PBL implementation, which prioritises technical skill development and problem-solving, this study stresses moral and civic growth, widening the pedagogical scope. This research further contributes a replicable model for integrating citizenship education in K-12 curricula using the FIDS framework. While prior studies by Bell (2010) and Quint & Condliffe (2018) highlight the effectiveness of PBL in fostering cognitive engagement, this study demonstrates the addition of DT in developing empathy and inclusivity.

The unique integration of DT and PBL in citizenship curricula differentiates this study from others. This study addresses gaps identified in existing literature for scaling these methods for diverse educational settings. Studies by (Aksela & Haatainen, 2019; Bell, 2010; Chhatlani, 2023; Markula & Aksela, 2022; Viro et al., 2020) noted the challenges of implementing PBL at scale due to resources and training constraints. The structured use of the FIDS framework and teacher mentoring provides a replicable model for combining content learning with community engagement that can be adapted across various contexts, filling a gap in the existing literature that often treats DT and PBL as isolated pedagogical strategies.

Conclusion and Recommendations

DT-PBL, integrated with citizenship at Riverside, develops content learning and character in the learners. They instil a sense of responsibility and empathy in the learners to be agents of change. DT encourages one to think further and solve problems. It has problem-solving and inclusivity with an 'I CAN' mindset and 21C skills that help to create a solution to a problem. DT and PBL have the potential to prepare learners as agents of change for personal and professional growth in an interconnected world.

The findings provide a case for integrating DT and PBL in K-12 curricula. Schools can adopt the FIDS framework to facilitate structured, student-led projects that develop

empathy, creativity, and community engagement to enhance social impact. Educators' professional development should focus on equipping them to implement these methodologies effectively, stressing reflective practices and ethical learning. Furthermore, partnerships with NGOs or community organisations can provide authentic contexts for students to apply their skills.

The study's context-specific design presents limitations as it is conducted in a single private school. However, future studies should address the scalability of this integrated approach across cross-cultural applications and diverse educational settings to expand the framework's global relevance. Researchers could explore how these methods can be adapted for different age groups and subject areas. Quantitative measures, such as academic performance and social impact metrics, could supplement qualitative insights for more comprehensive analysis. Moreover, longitudinal studies are needed to evaluate the long-term effects of these pedagogical strategies on learners' personal growth.

Informed consent

The work described in this study was performed with prior written informed consent from every participant. Pseudonyms are used for each participant mentioned in the study.

Conflict of Interest

The authors declare that there is no conflict of interest.

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End note

- I. In the 2024 Global Hunger Index, India is positioned 105th among the 127 countries with adequate data for calculating the 2024 GHI rankings. India's score of 27.3 on the 2024 Global Hunger Index indicates a **serious** level of hunger, with 13.7% of the population being undernourished (Global Hunger Index, 2024).
- II. ‘Empathy’ means stepping into someone else’s shoes and seeing the world through their eyes or perspective. ‘Ethics’ is making the right choice. ‘Excellence’ signifies the giving of one’s hundred per cent and being persistent. ‘Elevation’ motivates people and their peers, uplifting them. ‘Evolution’ refers to the process of personal development and transformation, resulting in a better version of oneself, which enables the pursuit of excellence. Hence, the concepts are interconnected.
- III. Inequality jeopardises long-term social and economic growth, undermines poverty alleviation, and erodes individuals’ feelings of fulfilment and self-worth. Diminishing intra- and inter-country inequality necessitates fair resource allocation, investment in education and skills enhancement, the execution of social protection initiatives, the eradication of prejudice, and assistance to marginalised populations (United Nations, 2023).