

# Universal Design for Learning: A case study into using art as an educational tool

Ananya Mishra

## Abstract

Universal Design for Learning (UDL) is a framework rooted in flexibility, accessibility, and learner centred pedagogy and offers a structured means of creating learning environments that accommodate this diversity. Within this framework, art emerges as a uniquely powerful educational tool: it transcends linguistic, cognitive, and sensory barriers, enabling children to communicate, explore, and understand concepts through multiple modes of representation. This research explores the integration of UDL principles into an art-based learning tool created in collaboration with children diagnosed with ASD and Down Syndrome. Through direct interaction and guided art sessions, their creative outputs were transformed into an educational book designed to be used within NGO-based learning environments. The project investigates not only the pedagogical value of art as a teaching methodology but also the practical process of co-creation, where learners' lived experiences, ways of expression, and sensory preferences shaped the final product. These principles together are what is used to engage these kids.

## Introduction

Inclusive education today demands approaches that recognise the diverse ways in which children learn, perceive, and express themselves. Universal Design for Learning (UDL) is a framework rooted in flexibility, accessibility, and learner centred pedagogy and offers a structured means of creating learning environments that accommodate this diversity. Within this framework, art emerges as a uniquely powerful educational tool: it transcends linguistic, cognitive, and sensory barriers, enabling children to communicate, explore, and understand concepts through multiple modes of representation. This becomes particularly significant when working with children with learning disabilities such as Autism Spectrum Disorder (ASD) and Down Syndrome, for whom conventional teaching methods often fail to provide adequate engagement or meaningful comprehension.

This research explores the integration of UDL principles into an art-based learning tool created in collaboration with children diagnosed with ASD and Down Syndrome. Through direct interaction and guided art sessions, their creative outputs were transformed into an educational book designed to be used within NGO-based learning environments. The project investigates not only the pedagogical value of art as a teaching methodology but also the practical process of co-creation, where learners' lived experiences, ways of expression, and sensory preferences shaped the final product. These principles together are what is used to engage these kids.

Beyond creation, the study documents the distribution of the book across multiple NGOs, its real world application, and the responses of key stakeholders including educators, therapists, parents, and the children themselves. Through a combination of quantitative surveys and qualitative interviews, the research evaluates the strengths, weaknesses, and overall educational impact of the book. The findings aim to contribute to the broader discourse on inclusive educational resources while offering a replicable model for future interventions bridging UDL and arts based pedagogy. Ultimately, this work proposes art not

merely as a creative exercise but as a transformative medium capable of fostering accessibility, engagement, and meaningful learning in diverse educational contexts.

### Methodology

The process of making this book began in a dim lit room of an NGO after a session spent teaching children about the solar system through drawings. The last few months were spent in similar workshops involving artistic practices as a form of teaching. Conversations with children revealed how they exchange artworks within each other as a form of learning at home, and this sparked the idea for ‘The World Around Us’, a book made by kids for kids. This involved collecting all the artwork made over the span of a year by children in different sessions and sorting them according to different themes. Then the compositions for each page were born from what was available. The concept was kept simple, explorations of various environments around us, from cities to jungles. Understanding how the learning style for children with learning disabilities differs (in the sense that they perform better when things are communicated in simple and straightforward manners), the book was made to cater to these children. By using their own creations, the process of reading the book was made to be more effortless, and the focus on visuals over text was aimed to help improve knowledge retention.

Distribution started with a small sample size, limited to five NGOs that had been worked with in the process of developing the book through workshops. Using funds raised through the initial project via various activities involving the NGOs over the span of a year, 10-15 copies were made for each NGO, depending on the class size. The books were then incorporated into regular lessons, and added to the resource bank of each NGO.

Furthermore, each participating NGO signed NOCs (No Objection Certificates), consenting to use of feedback data for an academic study. Two further variants were created based on whether or not they are willing to have their names and pictures used for publishing and social media purposes.

### Data Collection

Two methods of data collection were conducted, quantitative data collection (through surveys) and qualitative data collection (through interviews). Data was collected across various stakeholders; students, teachers, caregivers and parents/guardians.

#### *Quantitative Data Collection*

The aim of the quantitative interviews were to measure success across five parameters - engagement, understanding, relatability, creativity and learning. The questions were framed in an ‘agree or disagree’ format ranging from 1 (completely disagree) to 5 (completely agree), and the mean response was evaluated as the impact rating across each parameter.

The following are the questions asked in the quantitative survey:

On a scale of 1-5, how much do you agree with the following statements?

1. This book was more **engaging** than traditional methods.
2. This book was easier to **understand**.
3. The book was **relatable**.
4. The book inspired **creativity**.
5. The book inspired **learning**.

The data collected from 212 sample responses (across 5 participating NGOs) were then converted to statistics. A mean was calculated from each question using the method shown below. The age range for

the sample population was between 5-10 years old and the average was 7.8 years.

Mean =  $\Sigma x \div N$

[Mean = sum of data values (approval rating between 1-5)/ total number of values]

Mean values for each parameter:

1. Engagement - 4.4
2. Understanding - 4
3. Relatable - 4.9
4. Creativity - 4.3
5. Learning - 3.9

### **Qualitative Data Collection**

The qualitative interviews delved deeper into the impact, strengths and weaknesses of the book as an education tool. The groups interviewed were : parents/guardians/caregivers, teachers/NGO staff and students.

The following are the questions led with during qualitative interviews:

For teachers/NGO staff-

1. How did the children respond to the book compared to traditional teaching materials you usually use?
2. In what ways, if any, did the visual and art-based format influence children's engagement or attention during lessons?
3. Did you observe differences in comprehension or recall when lessons were taught using this book? Please elaborate.
4. How did the fact that the artwork was created by children themselves affect classroom dynamics or participation?
5. Do you feel the book aligns with the learning needs of children with ASD and Down Syndrome? Why or why not?

**For Parents/Guardians/Caregivers-**

1. Did your child talk about or refer to the book outside of the learning environment?
2. Have you noticed any changes in your child's interest in learning or drawing since using the book?
3. How accessible did you find the book for your child in terms of simplicity, visuals, and overall structure?
4. Did the book encourage shared interaction (reading, discussion, drawing) at home?
5. What aspects of the book do you think worked best for your child?

**Questions for Students-**

1. What did you like most about this book?
2. Was it fun or boring to use? Why?
3. Did you recognise drawings like the ones you make?
4. Did you want to draw or colour after reading the book?
5. Which page or picture do you remember the most?

The following are relevant excerpts from the qualitative interviews conducted (translated from Bengali/Hindi) -

*By Teachers/NGO staff*

"The children were noticeably more attentive. Usually, we need to verbally prompt them repeatedly, but with this book, they stayed engaged longer without intervention. The visuals seemed to guide them naturally through the lesson."

“Because the artwork looked familiar—imperfect, expressive, and childlike—the students did not feel intimidated. It removed the pressure to ‘get it right’ and encouraged participation, especially among children who are usually hesitant.”

“Comprehension improved because the content was broken down visually. Instead of abstract explanations, children could point, describe, and relate to images, which aligns well with UDL’s multiple means of representation.”

#### ***By Parents/Guardians/Caregivers***

“My child usually doesn’t talk much about what happens in class, but after this book was introduced, they brought it up at home and wanted to show us the pictures.”

“The book was easy for my child to follow because there wasn’t too much text. The pictures helped them understand without needing constant explanation.”

“It became more than a book—we ended up drawing together after reading it. That kind of engagement doesn’t usually happen with worksheets or textbooks.”

#### ***By Students (Interpreted Responses)***

“I like this one because it looks like my drawing.”

“I want to make a jungle like this.”

“This is city. I know this.”

“I remember the animals page. I drew animals after.”

(Responses were often verbal, gestural, or supported by facilitators, and interpreted based on engagement and repetition.)

#### **Analysis**

Looking at both the numerical data and the lived responses gathered during the study, it becomes clear that *The World Around Us* functioned effectively as an art-based learning tool grounded in UDL principles. The consistently high mean scores for engagement, relatability, and creativity reflect what was repeatedly observed during workshops and classroom sessions: children were drawn to the book in a way that traditional materials often fail to achieve. Relatability, which received the highest score, stood out as a particularly important factor. Seeing drawings that mirrored their own allowed children to approach the book without hesitation or fear of doing something “wrong.”

These quantitative findings are reinforced by the qualitative interviews. Teachers noted that children required fewer verbal prompts and stayed focused for longer periods, suggesting that the visual structure of the book supported more independent exploration. Parents describing their children referring to the book at home points towards learning extending beyond the classroom, something rarely observed with standard worksheets or textbooks. This spillover into domestic spaces highlights how familiarity and ownership can make learning feel less like a task and more like a shared experience.

At the same time, the slightly lower mean score for learning compared to engagement and relatability signals an important nuance. While the book was successful in initiating curiosity, conversation, and creative response, its impact was strongest when used alongside existing teaching methods rather than in isolation. This reinforces the idea that art-based tools, particularly for children with learning disabilities, are most effective when they support and enrich structured instruction rather than replace it entirely.

#### ***Strengths***

One of the strongest aspects of this project lies in the process of making the book itself. By building the content entirely from children’s artwork, the resource naturally aligned with how the children already

express, observe, and understand the world. This sense of familiarity reduced anxiety around participation and encouraged even typically withdrawn students to engage. Teachers repeatedly mentioned that children who were usually hesitant to speak or respond felt more comfortable pointing, describing, or drawing in response to the pages.

The simplicity of the book also played a significant role in its accessibility. With minimal text and a strong emphasis on visuals, the content remained clear without being overwhelming. This allowed children with varying levels of verbal and cognitive ability to interact with the same material in different ways. The flexibility with which educators were able to incorporate the book into their lessons—using it for discussion, observation, or as a starting point for drawing—further strengthened its usefulness within NGO learning environments.

Importantly, the book did not position learning as something external or imposed. Instead, it reflected the children back to themselves, reinforcing the idea that their ways of seeing and making sense of the world were valid and valuable.

### *Weaknesses*

While the outcomes of the project were largely positive, certain limitations became apparent during evaluation. The study was conducted within a relatively small network of NGOs that had already been involved in the workshops and creation process. This existing relationship may have influenced both familiarity with the material and the responses shared during feedback, limiting the extent to which the findings can be generalised.

Another limitation lies in the duration of observation. The data captures immediate engagement and short-term recall, but does not track long-term learning outcomes or developmental progression over time. Without longitudinal data, it is difficult to assess how sustained or cumulative the learning impact of the book might be.

Additionally, learning outcomes were largely interpreted through observation and stakeholder feedback rather than formal academic measures. While this approach was appropriate given the context and the needs of the children involved, it does place constraints on how learning is defined and measured within the study.

### *Drawbacks*

A key drawback of the project is the time-intensive nature of its development. The book emerged from months of workshops, interaction, and manual curation of artwork. While this depth of engagement is what gives the book its strength, it also presents challenges for scalability. Replicating this model would require sustained involvement, resources, and institutional support.

There is also an inherent risk in assuming that a single visual language or thematic structure will resonate equally with all children with ASD and Down Syndrome. Learning needs and sensory preferences vary widely, and while the book worked well in the contexts observed, it may not be universally effective without adaptation.

Finally, the emphasis on visuals, while intentional, means the book cannot function as a comprehensive teaching tool on its own. Its strength lies in complementing existing methods rather than replacing them, which must be acknowledged when considering its application.

## **Conclusion**

### *Future Implementations and Applications*

Future iterations of this project could build on the same framework while expanding its scope. Creating

theme-based versions of the book—focused on subjects such as science, daily routines, or emotional literacy—could allow the approach to be adapted across different learning goals. Introducing tactile elements or digital extensions may further support diverse sensory needs while staying aligned with UDL principles.

Longer-term studies observing children’s interaction with the book over extended periods would offer deeper insight into learning retention and developmental impact. The co-creation model could also be explored within more mainstream classroom settings, encouraging inclusive learning experiences that benefit both neurodivergent and neurotypical children.

### ***Impact in the Concerned Field***

Within the context of inclusive education and arts-based pedagogy, this project offers a grounded, practice-led example of how UDL principles can be applied in real learning environments. It highlights the role of art not as an add-on, but as a central mode of learning that supports accessibility, agency, and engagement. For NGOs and alternative education spaces, the study provides a model for developing low-cost, community-driven resources that respond directly to learners’ needs. More broadly, it contributes to ongoing conversations around inclusive pedagogy by demonstrating that meaningful learning often begins with recognition—of the learner, their voice, and their way of making sense of the world.

This study illustrates how art, when approached through the lens of Universal Design for Learning, can move beyond being a supplementary activity and instead become a meaningful educational medium. *The World Around Us* demonstrates that when children are positioned as contributors to learning materials, engagement and comprehension naturally follow. The book does not demand perfection or conformity; instead, it invites recognition, connection, and exploration.

While it may not serve as a standalone instructional resource, its value lies in addressing the gaps often left by conventional teaching methods—particularly for children with learning disabilities. By prioritising accessibility, familiarity, and expression, the project reimagines what inclusive educational resources can look like in practice.

### **Pages from the Book -**



