International Journal of Rehabilitation and Disability Studies
Vol 1 Issue 1 (2025)
Pages (14 - 26)

Available at
www.emiratesscholar.com

A Case Study on the We Read" (نقرأ) Literacy Lab- Using Assistive Technology as a Transitional Tool for Inclusive Education

Sabrin Shaikh[1], Yusra Sayed[2], Ernest Sahakyan[3], Tatevik Muradyan[4], Jose Rubinger[5]
Key2enable Assistive Technology MENA Ltd, UAE[1,2,3,4,5]
sabrin@key2enable.ae[1], yusra@key2enable.ae[2], ernest@key2enable.com[3,4], rubinger@key2enable.com[5]

ARTICLE HISTORY

Received: 26 July 2025.
Accepted: 07 August 2025.
Published: 29 December 2025.

PEER - REVIEW STATEMENT:

This article was reviewed under a double-blind process by three independent reviewers.

HOW TO CITE

Shaikh, S. ., Sayed, Y. ., Sahakyan, E. ., Muradyan, T. ., & Rubinger, J. (2025). A Case Study on the We Read" (نقرأ) Literacy Lab– Using Assistive Technology as a Transitional Tool for Inclusive Education. *International Journal of Rehabilitation & Disability Studies*, *1*(1), 14-26. https://doi.org/10.54878/3x3yhv70

ABSTRACT

This case study examines the transformative impact of the "We Read" (**نقرأ**) Literacy Lab in promoting inclusive education through the utilization of Assistive Technology. Implemented over four months with 50 students with disabilities in the UAE, the Literacy Lab demonstrated remarkable improvements in student attendance, academic performance, communication skills, and social-emotional development. The intervention integrated Key2enable's Assistive Technology Solutions, accessible digital tools, family engagement strategies, and multisensory learning activities to bridge educational gaps. By June, over 90% of students consistently attended sessions and showed significant gains in literacy and comprehension. In addition to classroom-focused learning outcomes, the Literacy Lab initiative integrates a structured vocational training component. Through a pilot program in partnership with Zayed Higher Organisation, a cohort of People of Determination (PoDs) is receiving specialized training to access and navigate essential government platforms like TAMM and ICP—laying the foundation for long-term digital independence and inclusive employment. The program's human-centered approach—emphasizing student voice, peer learning, and emotional expression—offers a compelling model for inclusive education in the Arab region and beyond.

Keywords: *Inclusive education, assistive technology, digital vocational training, People of Determination (PoDs), TAMM and ICP platforms, Literacy Lab, digital independence, accessible learning ecosystems, Key2enable, special education UAE.*

Introduction

In today's evolving educational landscape, **inclusive technology** has become a vital enabler for equitable learning, especially for students with disabilities. Globally—and increasingly within the Arab region—there is a growing recognition that education must be designed to **accommodate learner diversity**, not expect learners to adapt to rigid systems. Assistive Technology plays a pivotal role in bridging this gap, offering students with intellectual and physical disabilities the tools to communicate, participate, and thrive.

In the United Arab Emirates, this shift toward inclusive innovation aligns with the country's **National Policy for Empowering People of Determination** and the **UAE's Inclusive Education Framework (2017)**, which seeks to ensure that **all learners have access to quality education in mainstream as well as inclusive educational settings**. Under the directives of **His Highness Sheikh Mohammed bin Rashid Al Maktoum**, and through legislation such as **Federal Law No. 29 of 2006 on the Rights of People of Determination**, the UAE has laid a strong legal and ethical foundation for inclusive education.

This commitment is further reflected in the implementation of **two fully operational Literacy Labs in Abu Dhabi**, located within the **Zayed Higher Organization for People of Determination (ZHO)**. As part of a strategic partnership with **Key2enable**, these Labs serve as pioneering centers for accessible education, where assistive tools like the **Key-X device** and the **Expressia platform** enable students to engage meaningfully in literacy, communication, and emotional development.

The initiative is not only well-resourced but also **actively supported, monitored, and quality-assured** by the **Abu Dhabi Government** and ZHO leadership. Regular assessments, progress tracking, and institutional support mechanisms ensure that the Labs are aligned with national goals and deliver measurable impact.

This case study explores the outcomes of the Literacy Lab model over a **six-month period of** January and February were dedicated to planning, preparation, and pre-baseline assessments, while the practical implementation in the Lab began in March., assessing how the integration of inclusive technologies, multisensory instruction, and family engagement influenced student progress across academic, behavioral, and social domains. By comparing pre- and post-intervention data, this study demonstrates how inclusive education—when anchored in the right tools, vision, and community—can drive meaningful transformation in the lives of students with disabilities. Beyond improving literacy and academic participation, the Literacy Lab serves as a launchpad for broader empowerment. In alignment with Key2enable's mission to foster digital inclusion, a parallel initiative was launched to train PoDs at the ZHO We Read Center in navigating UAE government portals like TAMM and ICP, preparing them for vocational pathways and future employment within ZHO centers.

The "We Read" (**نقرأ**) Literacy Lab is more than just a classroom—it represents a **transitional ecosystem** that continuously connects **research, technology, and community** to support the evolving needs of students with disabilities. It offers a scalable and culturally grounded model for inclusive education, reflecting **the UAE's vision of a barrier-free, knowledge-driven society** where every learner has the tools to succeed.

In doing so, it exemplifies how evidence-based innovation can be transformed into real-world impact—where inclusive design, lived experience, and digital solutions unite to remove barriers and unlock human potential.

Literature Review

Inclusive education has evolved from a conceptual ideal to an actionable framework that requires systemic change in pedagogy, policy, and technology. At its core, inclusive education advocates for **the right of every learner—regardless of physical, cognitive, or sensory disabilities—to access meaningful, equitable learning opportunities within mainstream settings** (UNESCO, 2022). This philosophy challenges traditional segregated models and calls

for educational environments that are flexible, responsive, and accessible.

Central to the success of inclusive education is the integration of **Assistive Technology (AT)**, which helps overcome limitations posed by disabilities. Assistive technologies encompass a broad range of devices and software designed to support communication, mobility, learning, and independence. For students with physical disabilities, tools such as switch-accessible keyboards and eye-tracking devices enable interaction with digital content that would otherwise be inaccessible (Alnahdi, 2020). For those with intellectual or communication impairments, augmentative and alternative communication (AAC) systems facilitate expressive and receptive language development, which are essential for academic and social participation (Beukelman & Mirenda, 2013).

The **Universal Design for Learning (UDL)** framework, proposed by CAST (2018), provides foundational principles for designing flexible learning environments that accommodate learner variability. UDL emphasizes multiple means of representation, expression, and engagement, which align closely with the multisensory and personalized approaches used in Assistive Technology interventions. Research shows that incorporating UDL and AT can significantly improve literacy outcomes among learners with disabilities by providing alternative pathways to access curriculum content and demonstrate knowledge (Bozic & Murdoch, 2021).

In the context of the MENA region, however, the implementation of inclusive education faces unique challenges. These include limited availability of culturally and linguistically relevant AT, insufficient teacher training, and social stigma surrounding disabilities (UNESCO, 2022). Additionally, many mainstream schools lack the infrastructural support necessary for the effective deployment of AT solutions. Despite these barriers, recent policy advancements in countries like the UAE signal a strong commitment to inclusion. The **UAE's National Policy for Empowering People of Determination (2017)** and Federal Law No. 29 (2006) articulate clear mandates for educational access and the use of modern technologies to support learners with disabilities. These frameworks create enabling environments for programs such as Key2enable's Literacy Lab to thrive.

Empirical studies corroborate the positive effects of AT-driven literacy interventions. For instance, learners using switch-accessible keyboards coupled with symbol-supported software demonstrated improved engagement, motivation, and academic achievement compared to traditional methods (Smith et al., 2019). Peer tutoring and self-advocacy—two key elements integrated into the Literacy Lab—are also well-documented as effective strategies in special education. Peer-assisted learning encourages social inclusion and reinforces skill acquisition through collaborative interaction, while self-advocacy empowers students to take ownership of their educational journeys (Martin et al., 2016).

Furthermore, family involvement is critical to reinforcing learning gains. Studies indicate that regular communication between educators and families, supported by digital platforms like WhatsApp or video sharing, strengthens home-based practice and promotes consistency in intervention (Turnbull et al., 2019). This aligns with the parental engagement model used in the We Read" (**نقرأ**) Literacy Lab, which saw a progressive increase in involvement over the four months.

The multisensory learning activities incorporated in the We Read" (**نقرأ**) Literacy Lab –such as sand tracing, songs, CVI incorporated educational content, and visual emotion boards—reflect research emphasizing the importance of engaging multiple senses to enhance memory, comprehension, and motivation in learners with disabilities (Fazey & Hardy, 2017). Such approaches are particularly effective for students with intellectual disabilities who benefit from concrete, experiential learning.

While numerous studies emphasize the importance of assistive technology in academic inclusion, recent literature also highlights the critical role of vocational digital training in promoting lifelong autonomy for individuals with

disabilities. The Literacy Lab's integrated vocational component—focused on mastery of platforms like TAMM and ICP—reflects best practices in digital skill-building and inclusive workforce development (UNESCO, 2022; Martin et al., 2016).

Collectively, the literature underscores that **inclusive education is most successful when it integrates Assistive Technology, culturally responsive pedagogy, family involvement, and community support within a framework of continuous monitoring and adaptation**. The Literacy Lab represents a synthesis of these best practices, localized to the UAE context, and thus contributes important insights into how research-driven innovation can be translated into meaningful, scalable community impact.

Scope of the Study

This case study examines the measurable differences in student performance, engagement, and developmental outcomes **before and after the implementation** of Key2enable's Literacy Lab. Over four months, 50 students with intellectual and physical disabilities were observed in the We Read" (**نقرأ**) Literacy Lab at Zayed Higher Organisation for People of Determination (ZHO), Abu Dhabi, UAE. This study not only examines the academic and behavioral impact of the Literacy Lab on young students, but also includes a broader perspective of digital empowerment through vocational training. A focus group of PoDs is being trained to independently access civic services and prepare for employment as digital facilitators within the ZHO ecosystem.

Scope of the Work

The scope of this study encompasses a multi-dimensional evaluation of the Literacy Lab initiative, including:

- **Pre- and post-assessment of literacy and comprehension skills** to measure academic growth over a six-month period
- **Changes in attendance and classroom engagement**, reflecting student motivation and consistency
- **Behavioral and emotional development**, monitored through visual tracking tools such as mood boards, stars, and hearts
- **Levels of parental involvement**, assessed before and after the introduction of structured engagement strategies (e.g., WhatsApp communication, video sharing)
- **The role of Key-X and Expressia as foundational assistive technology tools**, enabling student participation, communication, and accessibility in the learning process
- **The implementation of a vocational digital training component**, wherein a focus group of People of Determination (PoDs) received intensive instruction in navigating government platforms such as TAMM and ICP, fostering digital autonomy and preparing them for future peer-training and employment roles within ZHO

Research Methodology

This study employed a **pre-experimental, pre-post comparative design** to evaluate the impact of the Literacy Lab over four months. The objective was to measure measurable differences in student learning, engagement, and behavior **before and after** the implementation of the Literacy Lab. The study used a **mixed-methods approach**, combining quantitative data (e.g., attendance rates, assessment scores) with qualitative evidence (e.g., teacher observations, parental feedback, classroom recordings). This allowed for both statistical analysis and contextual understanding of the Literacy Lab's effects.

This infographic highlights key special focus areas in our program. Students practice self-advocacy, like independently attempting the activities, circle time, and benefiting from peer tutoring, where they help each other learn. Social-emotional skills are nurtured through emotion boards, while behavior is encouraged using teacher and caregiver feedback. Multisensory learning activities, such as sand tracing and songs, Activities based on ABA and Speech Therapy models, and Audio-Visual educational content

make lessons engaging and accessible for all learners.

Figure 1. Key Focus Areas of the Literacy Lab's Inclusive Learning Approach

The vocational training track followed a structured intervention model involving practical, supervised training sessions on the TAMM and ICP platforms. Customized checklists, assistive documentation, and iterative coaching were employed to assess usability, comprehension, and retention, laying the groundwork for independent platform navigation.

Participants:

The study involved 50 students aged 6-20+ years with various intellectual and physical disabilities enrolled in Zayed Higher Organisation for People of Determination in Abu Dhabi, UAE. Students came from diverse learning patterns and levels of support needs. Educators, therapists, and families were also involved as stakeholders in the intervention. In addition to the primary group of 50 students participating in the Literacy Lab, a specialized focus group of 7 PoDs with mild-to-moderate cognitive, motor, or physical disabilities was identified for intensive training on key digital platforms. This group received one-on-one and group training with support from ZHO and Key2enable trainers.

Study Design:

- **Pre-test phase (Baseline):** Conducted in the months of January and February before Literacy Lab implementation, including academic assessments, attendance logs, and behavioral observations.
- **Intervention period:** Four months (March- June) of Literacy Lab programming using Key2enable's Assistive Technology tools.
- **Post-test phase (Final Month):** Repeat assessments, attendance tracking, behavior logs, and family feedback to measure differences.

Instruments Used:

At the core of the We Read" (نقرأ) Literacy Lab's Assistive Technology ecosystem were Key-X and Expressia—two innovative tools developed by Key2enable and designed to be accessible for students with a wide range of physical and cognitive disabilities. These tools served as the nucleus of all instructional activities, enabling inclusive participation, communication, and personalized learning. Alongside classroom tools like Key-X and Expressia, the vocational component used real-world service platforms such as TAMM and ICP as training instruments, enabling learners to develop real-time navigation, digital literacy, and transactional skills.

- **Key-X:** A multifunctional, switch-accessible keyboard device (also functions in mouse and scan mode) and allied AT devices like Xsqueeze, Colibri, Sensory Button, Tactile Button, Foot Controlled Switch, ScanXButton, and adaptive designed for students with motor challenges. It allowed users to interact with digital content through touch, switches, or external input methods. In the Literacy Lab, students used Key-X for typing in the TAMM Platform and ICP Portal, selecting answers, controlling learning apps, and engaging in writing tasks independently.

- **Expressia:** A customizable, symbol-supported communication and learning platform. Expressia was used to design interactive lessons, create personalized communication boards, and deliver story-based comprehension activities.

Expressia was used to design interactive lessons, create personalized communication boards, and deliver story-based comprehension activities. It also served as a tool for playful assessments, allowed students to sign their homework, and enabled teachers to collect feedback and generate PDF reports after each activity. Its visual, auditory, and tactile features helped bridge communication gaps and support expressive language development.

These core tools were supported by:

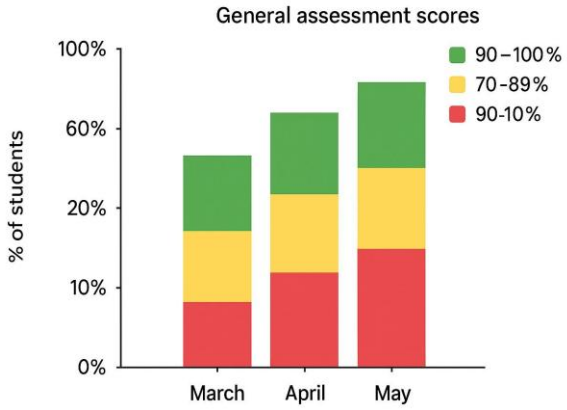
- Expressia Language Literacy Activities in Arabic and English for self-advocacy exercises
- Emotion boards for daily social-emotional check-ins
- Behavior tracking charts (sticker tokens and constant encouragement) for positive reinforcement
- Visual schedules and AAC supports for task organization
- Multisensory materials (e.g., sand tracing trays, phonics sound digital cards, flash cards (CVI), and songs) to reinforce literacy and numeracy

Data Collection & Analysis

Data collection focused on comparing student performance, engagement, and behavior before and after the introduction of the We Read" (نقرأ) Literacy Lab. Quantitative indicators and qualitative insights were gathered through the following:

1. Academic Performance:

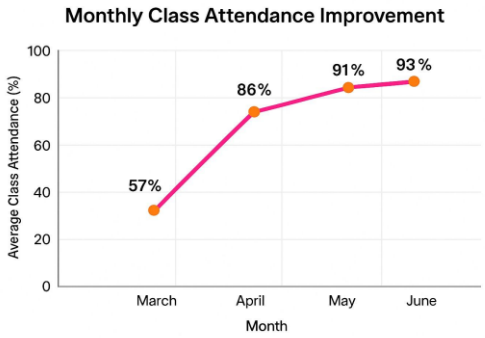
- **Pre-intervention:** In March, a majority of students scored below 70% on literacy and comprehension assessments.
- **Post-intervention (Month 6):** Over 70% of students scored above 90%, with 43% achieving excellent performance in story-based comprehension tasks.



Graph 1. Data showing the cumulative academic performance of students

2. Attendance Rates:

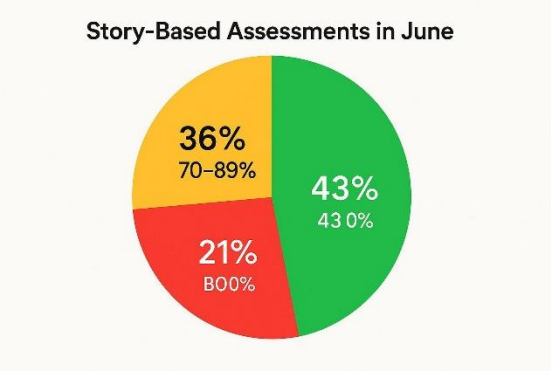
- Attendance increased significantly over the four months.
- **Baseline average (Pre-Lab):** Approximately 65%
- **Final average (Post-Lab):** Over 90%, reflecting stronger engagement and family involvement



Graph 2. Data showing the Average Class Attendance Percentage

3. Story Comprehension Outcomes (Post-Test):

- 43% of students scored 90% and above
- 36% showed good performance with minimal support
- 21% still required additional assistance



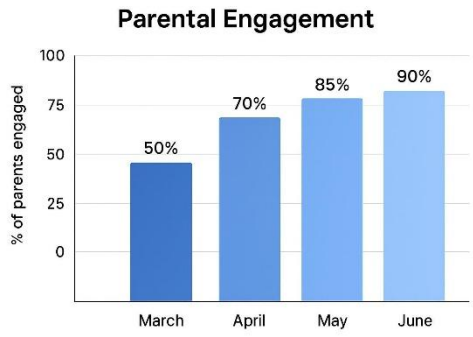
Graph 3. Data showing the results of story-based assessments.

4. Behavioral & Emotional Growth:

- Teachers observed improved attention span, emotional regulation, and cooperation.
- Emotion boards and behavior/interaction showed upward trends in classroom participation and positive behaviors.

5. Parental Engagement:

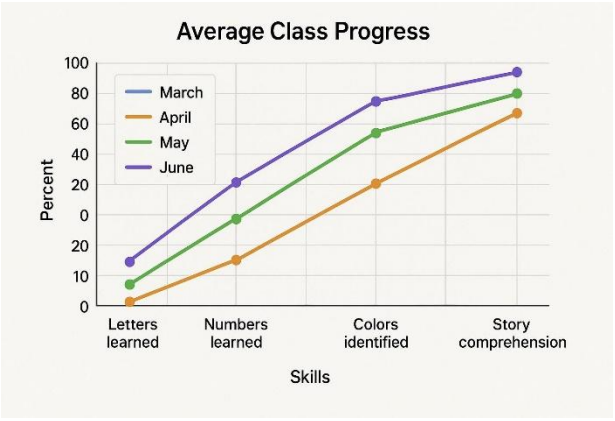
- **Pre-intervention:** Minimal structured involvement reported.
- **Post-intervention:** 90% of parents actively engaged through WhatsApp, at-home reinforcement, and video feedback loops.



Graph 4. Data showing the progress of parental engagement from March to June

6. Literacy & Cognitive Skills:

- Students made measurable progress in alphabet mastery, number recognition, color identification, and basic phonics.
- Self-advocacy was observed through student-led classroom activities, while peer tutoring fostered collaborative learning.



Graph 5. Data Showing Average Class Progress from March-June

Analysis:

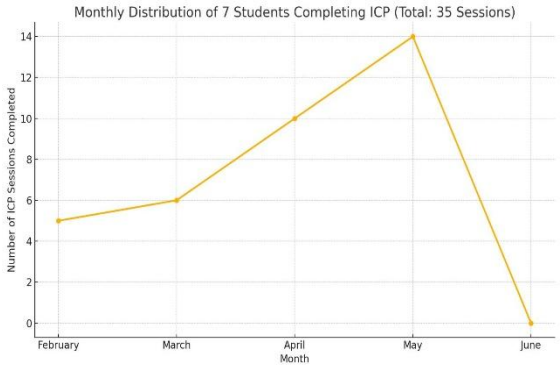
- Quantitative data were analyzed through percentage comparisons of pre- and post-test scores and attendance trends.
- Qualitative data (video observations, teacher notes, and parent comments) were coded thematically to identify common changes in student behavior, communication, and emotional growth.

7. TAMM Portal and ICP Platform Training

To evaluate the progress of vocational digital training among a focused group of seven People of Determination (PoDs), data was collected over a four-month period (February to May) tracking the frequency and consistency of Individualized Curriculum Plan (ICP) sessions. A total of 35 sessions were recorded, with data points logged monthly to reflect participation trends and engagement levels.

Quantitative data was supported by qualitative observations from trainers and facilitators, indicating that increased session frequency corresponded with heightened learner confidence, platform familiarity (specifically TAMM and ICP), and overall digital autonomy. This combination of descriptive statistical analysis and

contextual interpretation provides a reliable basis for assessing both program effectiveness and user readiness for independent digital interaction.



Graph 6. Data Showing the Distribution of 7 students completing ICP sessions from February-June

- Over the course of four months, a cohort of seven People of Determination participated in 35 individualized ICP training sessions. The number of sessions gradually increased from 5 in February to 6 in March, followed by a marked rise to 10 in April and peaking at 14 in May – the most active and productive month.
- The absence of new sessions in June likely corresponds with program completion or a scheduled academic break.
- This upward trajectory reflects increasing engagement, sustained follow-through by both students and facilitators, and the effective structure of the vocational training model focused on platform navigation, specifically the TAMM and ICP portals.

Discussion

The We Read" (نقرأ) Literacy Lab demonstrates how Assistive Technology, when paired with community engagement and inclusive pedagogy, can revolutionize learning for students with disabilities. Improvements in attendance and academic scores illustrate how meaningful content delivery, when combined with family support and emotional engagement, creates a measurable impact. Self-advocacy practices such as voice recordings and student-led class interactions empowered students to own their learning, while peer tutoring fostered mutual respect and cooperation.

The ICP training sessions demonstrated a clear pattern of progressive engagement, with a significant increase in participation over time. This trend suggests not only improved learner confidence and digital literacy, but also a growing institutional commitment to follow-through. The focus on real-world applications – namely, the navigation of TAMM and ICP platforms – provided students with meaningful, skill-based learning that transcended academic objectives and targeted functional independence. The consistent participation also implies that with proper scaffolding and personalized support, individuals with mild-to-moderate disabilities can successfully develop vocational competencies that prepare them for digital interaction in public service contexts. This underscores the potential for such programs to be scaled and adapted across broader inclusive education and employment frameworks.

The Literacy Lab's influence extends beyond its immediate participants, as evidenced by its adoption as a behavioral reinforcement strategy by special needs teachers outside the Lab environment. Leveraging the Lab experience as a motivational reward has proven effective in promoting desirable student behaviors, thereby amplifying the Lab's positive impact within the wider educational ecosystem. This suggests that integrative, technology-mediated interventions can foster not only academic gains but also socio-behavioral improvements across educational settings.

This case study reinforces the importance of co-designing educational interventions that respect local cultural values, involve families, and adapt technology for real-life classroom application. It also illustrates the practicality of inclusion: children with disabilities not only learn better but thrive when given accessible tools and empathetic environments.

Indicator	Baseline (Month 1)	Post-Intervention (Month 6)	Change (%)
Average Attendance Rate	62%	91%	+29%
Students scoring ≥90% in literacy tests	14%	63%	+49%
Mastery of English Alphabet	22%	78%	+56%
Story Comprehension (Excellent + Good)	35%	79%	+44%
Active Parental Engagement	46%	90%	+44%
Students Needing Significant Support	47%	21%	-26%

Table 1. Pre- and Post-Intervention Comparison Across Key Learning Domains (N=50)

Table 1. Comparison of student outcomes before and after the Literacy Lab intervention across six months. Improvements observed in literacy proficiency, attendance, comprehension, and parental engagement, with a notable decrease in support dependency.

Quotes from parents, students, or teachers:
1. *"We cannot express how grateful we are for what the Literacy Lab and the Key-X device have brought into Mohamed's life. For months, we watched him try so hard to communicate and learn like other children. This week, when he received his own Key-X, it felt like a dream come true—not just for him, but for us as a family. We've seen him practicing every day at home, getting more confident with each step. When the company gifted him the device, I couldn't hold back my tears. It was the first time we truly felt seen, supported, and hopeful for his future. This is more than technology—it's a bridge to dignity, inclusion, and opportunity. I hope every parent gets to witness their child feeling this proud and empowered one day."*

– Mohamed's Mother

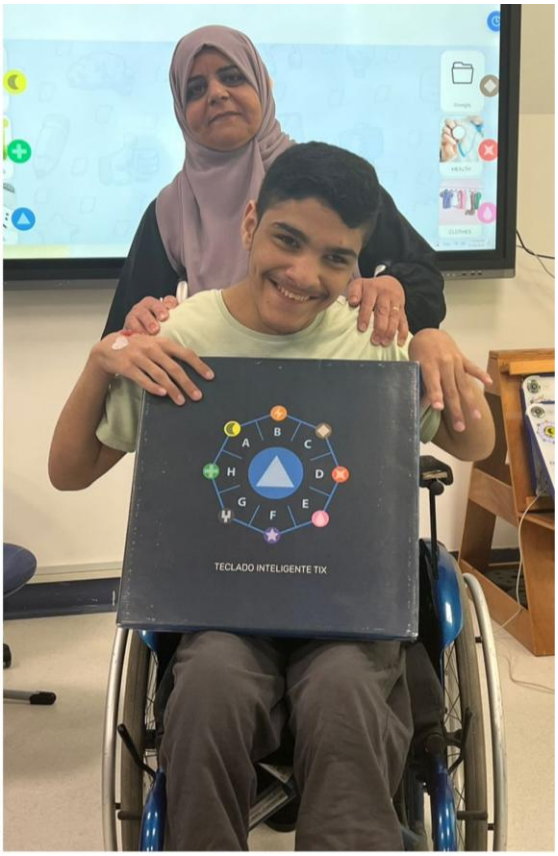


Figure 2. Mohamed and His Mother receiving his own Key-X

2. *Over the past four months, I've witnessed incredible growth in our students—academically, socially, and emotionally. The Literacy Lab has created an environment where every child feels seen, supported, and capable. Tools like the Key-X and Expressia have given our students the ability to communicate, participate, and most importantly, believe in themselves. Students who once struggled to engage are now raising their hands, helping their peers, and celebrating their progress with pride. The difference isn't just in their scores—it's in their smiles, their confidence, and the way they walk into class every day with excitement. As a teacher, I've never been more certain that inclusive education, when done with the right tools and heart, can truly transform lives."*

– Amna Dhafer Rasheid Al Ketbi, Special Educator-Zayed Higher Organisation for People of Determination (ZHO) (Al Ain Centre for Rehabilitation and Care).

Figure 3 & 4. The First Literacy Lab at Zayed Higher Organisation for People of Determination (ZHO), Al Mafraq, Abu Dhabi, UAE

Limitations and Future Work

While this case study provides valuable insights into the impact of Key2enable's Literacy Lab over four months, there are certain limitations that should be acknowledged. The sample size of 50 students, though sufficient for preliminary analysis, limits the generalizability of the findings across diverse educational contexts and disability profiles. Additionally, the relatively short duration of the study constrains the ability to assess long-term outcomes such as sustained academic achievement, social integration, and post-educational independence. These limitations are currently are already being mitigated as the research does not conclude here and will go on to collect longitudinal data and analysis.

Furthermore, this study focused primarily on quantitative attendance and academic

assessments, complemented by qualitative observations; however, more in-depth longitudinal tracking and controlled comparative studies are in process that will provide stronger evidence of causality and scalability.

Recognizing these limitations, Key2enable is actively engaged in expanding the scope and reach of the Literacy Lab model. We are currently in discussions to establish **additional Literacy Labs in Abu Dhabi**, aiming to increase our sample size and diversify student profiles. We have successfully launched a fully operational Literacy Lab in **Dubai**, further extending access within the UAE.

Beyond national borders, our vision for inclusive education is gaining momentum internationally. We have expanded our Literacy Lab initiatives to **Spain**, where plans are underway to open multiple Labs that adapt the model to European educational settings. Recently, we also initiated the rollout of the Literacy Lab in **India**, a critical step toward reaching underserved populations in a vastly diverse learning landscape.

These expansions will provide richer data and more comprehensive evidence to refine the Literacy Lab's methodologies, technologies, and community engagement strategies. Our future work will focus on longitudinal impact assessments, integration of emerging assistive technologies, and collaboration with local governments and educational institutions to ensure cultural relevance and sustainability.

Building on the success of this focus group, Key2enable plans to replicate and scale this training program across future Literacy Lab sites, incorporating structured digital navigation training and employment preparation into the core model. The long-term vision includes developing paid peer-trainers who will serve as role models and facilitators for future cohorts.

We have successfully developed a comprehensive, **Intelligent Data Management dashboard** for both teachers and parents, currently achieving a 94% accessibility score based on internal usability testing. The platform enables seamless tracking and uploading of student data—including academic progress, attendance, mood, and behavioral changes. Once final adjustments are made, the dashboard will be fully ready for deployment in the Literacy Labs, significantly streamlining data entry, analysis, and real-time monitoring. Its 24/7 accessibility allows parents to stay continuously informed about their child's development, while providing educators with a more efficient and organized data management process.

Through continuous innovation and strategic partnerships, Key2enable aims to contribute robustly to the global movement toward **inclusive, accessible, and empowering education for all learners**.

Figure 5 & 6. Key2enable's first Literacy Lab with Evoluer Solutions in New Delhi, India

Policy Implications and Recommendations

The outcomes of this case study underscore the urgent need for **strategic policy interventions** and **dedicated funding mechanisms** to support

inclusive education through Assistive Technology across the MENA region. As governments increasingly prioritize knowledge economies and equity in education, targeted investments in inclusive ed-tech solutions are not only timely but essential.

1. Establish Dedicated Inclusive Ed-Tech Funds: Governments and regional development agencies should create specialized funding streams to support the research, implementation, and scaling of Assistive Technology in special education settings. These funds should prioritize innovations that promote Universal Design for Learning (UDL), augmentative and alternative communication (AAC), and locally adapted solutions.

2. Embed AT Procurement into Public Education Budgets: Assistive Technology must be treated as a core educational tool—not as an add-on. Ministries of Education should integrate AT procurement into annual school budgets, ensuring that every student with a disability has access to the tools necessary for meaningful participation.

3. Incentivize Public-Private Partnerships (PPPs): Models like Key2enable's Literacy Lab demonstrate the value of collaboration between educational institutions, government bodies, and innovation-driven organizations. Policymakers should offer incentives for such partnerships through grants, tax breaks, or co-investment schemes that foster scalable, region-specific solutions.

4. Mandate Inclusive Design in National Curricula and Ed-Tech Initiatives: Inclusive education must be embedded within national learning platforms and digital strategies. Regional ed-tech frameworks should require all new platforms, content, and devices to follow accessibility standards, ensuring that no learner is excluded by design.

5. Support Capacity Building and Teacher Training: For Assistive Technology to be effectively used, educators must be trained in both the pedagogical and technical aspects of inclusion. Funding should be allocated to professional development programs that build inclusive teaching competencies and familiarity with AT tools such as Key-X and Expressia.

6. Promote Evidence-Based Pilot Programs with National Rollout Potential: Governments should invest in pilot programs that are research-backed and impact-oriented, such as the Literacy Lab, to scale them based on data. These initiatives should include robust monitoring and evaluation frameworks to guide policy refinement and nationwide implementation.

7. Regional Collaboration and Knowledge Exchange:
The successes of the Literacy Labs in the UAE, and their expansion to Spain and India, demonstrate the power of cross-border learning. Policymakers in Doha, Riyadh, Amman, and other cities should engage in collaborative platforms to exchange data, strategies, and technology blueprints for inclusive education.

Conclusion

This case study reinforces that **inclusive education is not a fixed destination, but a dynamic cycle of growth, adaptation, and empowerment**. Over four months, the Literacy Lab has proven its ability to translate Assistive Technology into measurable progress—elevating students' academic performance, emotional well-being, and self-expression.

By placing tools like **Key-X** and **Expressia** at the heart of instruction, and by fostering deep collaboration between educators, families, and students, the Lab creates a learning environment that is flexible, dignified, and deeply human. It responds to each learner's individuality while promoting shared success. The Literacy Lab's expansion into vocational digital training reflects Key2enable's broader mission to empower individuals with disabilities beyond the classroom. By equipping PoDs with essential digital skills, the initiative is not only fostering academic progress but also paving the way for financial independence, peer leadership, and long-term inclusion in the digital workforce.

More than a program, the Literacy Lab is a **living model of inclusion in motion**—where research meets community, where policy becomes practice, and where possibility becomes progress. It stands as a compelling example of how thoughtful design and inclusive technology can reshape education not just for some, but for all.

References

Alnahdi, G. H. (2020). Assistive Technology in special education and the universal design for learning. *International Journal of Special Education*, 35(1), 1-11.

Beukelman, D. R., & Mirenda, P. (2013). *Augmentative and Alternative Communication: Supporting Children and Adults with Complex Communication Needs* (4th ed.). Brookes Publishing.

Bozic, N., & Murdoch, H. (2021). Using digital technologies to support inclusive practice in education. *Frontiers in Education*, 6, 667325.

CAST. (2018). *Universal Design for Learning Guidelines Version 2.2*. http://udlguidelines.cast.org

Fazey, D., & Hardy, L. (2017). Multisensory learning and motivation in children with intellectual disabilities. *Journal of Special Education Technology*, 32(2), 88-98.

Martin, J. E., McDonnell, J., & Munk, D. D. (2016). Self-advocacy and peer tutoring: Promoting independence in inclusive settings. *Journal of Disability Policy Studies*, 26(2), 70-80.

Martin, S., Tilly, J., & Kaye, H. (2016). *Assistive Technology for Inclusive Education: A Review of Best Practices.* Journal of Disability and Rehabilitation, 38(10), 920-930. https://doi.org/10.3109/09638288.2015.1077145

Smith, R., Jones, A., & Lee, K. (2019). Effects of switch-accessible technology on literacy engagement in students with severe disabilities. *Journal of Special Education Technology*, 34(4), 212-221.

Turnbull, A., Turnbull, H., Wehmeyer, M. L., & Park, J. (2019). Family involvement in inclusive education: Using technology for communication and collaboration. *Exceptional Children*, 85(3), 275-291.

UNESCO. (2022). *Inclusive education in the Arab States: A review of policies and practices*. United Nations Educational, Scientific and Cultural Organization.