

Amy Poh Ai Ling  
Huong Kai Hee  
Fitriah Azizan *Editors*

# Proceedings of the Malaysia-Japan Visionaries Conference 2024

Integration and Innovation across  
Diverse Disciplines

 Springer

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Editors

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Disciplines

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*Editors*

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# Foreword

## **MJVC International Proceeding 2026 Publication: ‘Proceedings of the Malaysia-Japan Visionaries Conference 2024—Integration and Innovation Across Diverse Disciplines’**

It gives me great pleasure to contribute this foreword to the Proceedings of the Malaysia-Japan Visionaries Conference (MJVC) 2024, a publication that reflects the growing depth and breadth of a bilateral partnership rooted in shared values, mutual respect, and a common pursuit of progress.

MJVC 2024 brought together some of the most forward-thinking minds from both Malaysia and Japan, spanning diverse disciplines and sectors. The conference served not just as a platform for intellectual exchange, but as a bridge connecting innovation with implementation—where ideas meet action, and research informs real-world solutions. From green technologies and artificial intelligence to sustainable urbanism, biotechnology, and digital futures, the themes explored speak to our shared ambition to build societies that are future-ready, resilient, and inclusive.

What makes this volume particularly significant is the calibre and diversity of contributions. With 76 selected papers out of 92 submissions, the proceedings reflect the thoughtful, evidence-based work of scholars, policymakers, and practitioners alike. Many of the topics—ranging from cross-border innovation ecosystems to demographic transitions—align closely with the evolving strategic priorities of both countries.

Malaysia and Japan have long enjoyed a special relationship, and this collaboration in research and development continues to grow in strength and scope. Whether in renewable energy, smart manufacturing, or the life sciences, our joint efforts are translating into meaningful innovations with far-reaching impact—enhancing industries, informing public policy, and generating knowledge that transcends borders.

The role of industry-academia collaboration is also worth highlighting. The 2024 conference demonstrated how governments, universities, research institutes, and private sector players from both nations are building new, agile models of cooperation that drives entrepreneurship, advance Industry 4.0, and nurture the talent we need to meet future challenges head-on.

TalentCorp is proud to support this ecosystem through initiatives such as Malaysia at Heart, or MyHeart. Through the MyHeart Mobility Grant, we enabled 16 Malaysian researchers to present their work on an international stage, reflecting our commitment to empowering home-grown talent and fostering brain circulation. This aligns with our broader mission to future-proof Malaysia's workforce by promoting cross-border collaboration, knowledge exchange, and global exposure.

We see MJVC 2024 as a much-needed strategic platform that contributes to Malaysia's long-term competitiveness and human capital development. By strengthening linkages between our institutions, we are investing in a future where innovation and cooperation are the bedrock of national and regional progress.

To all readers, I encourage you to explore this volume not just as a record of what has been discussed, but as a springboard for what is yet to come. Let it be a source of inspiration for continued inquiry, deeper collaboration, and bolder solutions.

Congratulations to the organisers, contributors, and partners of MJVC 2024. May the knowledge shared here continue to spark positive changes in the years ahead.

Group Chief Executive Officer, Talent  
Corporation Malaysia Berhad (TalentCorp),  
Petaling Jaya, Selangor, Malaysia  
29 March 2025

Thomas Mathew

# Foreword

It is both an honour and a privilege to extend my heartfelt congratulations on the successful conclusion of the Malaysia-Japan Visionaries Conference (MJVC) 2024, held from 14 to 16 September 2024 at the University of Tokyo, Hongo Campus. This academic conference marks another significant milestone in the flourishing relationship between Malaysia and Japan, which has evolved since the inception of the Look East Policy (LEP) in 1981. Through the LEP, Malaysia has greatly benefited from Japan's education system, resulting in the transfer of vital skills, work culture, and knowledge. The MJVC embodies this legacy of mutual respect and cooperation.

The MJVC 2024, organized by the Malaysia-Japan Academic Association (MJAA) and co-hosted by the Department of Technology Management for Innovation at the University of Tokyo, exemplifies the essence of this enhanced cooperation. With over 525 participants and 110 presenters, the conference served as a vibrant platform to discuss a wide range of academic fields, including social sciences, business, law, medicine, science, technology, and engineering.

This publication, *Proceedings of the MJVC 2024—Integration and Innovation across Diverse Disciplines*, encapsulates the invaluable insights and groundbreaking research shared during the event. With 76 out of 92 papers accepted following a rigorous peer-review process, this volume will serve as an important resource for future academic collaborations, research initiatives, and policy discussions. The six key themes explored in this proceedings—Technology and Innovation, Environmental Science and Sustainability, Education and Social Development, Health, Medicine, and Biotechnology, Business and Economy, and Engineering, Material Science, and Industrial Applications—reflect transformative areas shaping the future of both Malaysia and Japan, as well as the global landscape. Initiatives such as Malaysia's Digital Free Trade Zone (DFTZ) and Japan's Society 5.0 emphasize technological advancements and cross-border collaboration in AI, big data, and IoT. It is hoped that this publication will serve as a stepping stone for ongoing initiatives such as these, furthering the pursuit of collaborative innovation.

Both nations share a commitment to environmental sustainability, with Malaysia's Low Carbon Economy Blueprint and Japan's goal of Net Zero Emissions by 2050.

In health and biotechnology, Malaysia's National Biotechnology Policy and Japan's Aging Society Solutions foster collaboration in medical research, while both countries explore new economic models through Malaysia's Shared Prosperity Vision 2030. The focus on education and social development highlights the need for inclusive growth, with both nations enhancing access to quality education, while policies like Malaysia's Industry4WRD and Japan's leadership in robotics and advanced materials drive innovation in manufacturing and infrastructure. Through continued collaboration, both countries can address global challenges and create sustainable progress in these vital sectors.

I would like to take this opportunity to express my sincere gratitude to all contributors, reviewers, and partners. Special thanks also to the organizing committee, whose dedication and hard work ensured the success of both the conference and this publication.

I have every confidence that the MJVC will continue to serve as a crucial platform for academic exchange, driving innovation and strengthening the strong ties between Malaysia and Japan. I look forward to its continued success in fostering intellectual and cultural ties for many years to come.

Ambassador of Malaysia to Japan, Embassy  
of Malaysia, Tokyo, Japan  
21 March 2025

His Excellency Dato'  
Shahril Effendi Abd. Ghany

# Preface

The Malaysia-Japan Visionaries Conference (MJVC) 2024, held from September 14 to 16, 2024, at the University of Tokyo, Hongo Campus, represented a significant milestone in fostering academic collaboration between Malaysia and Japan. Organized by the Malaysia-Japan Academic Association (MJAA) and co-hosted by the Department of Technology Management for Innovation at the University of Tokyo, the conference gathered researchers, industry leaders, and policymakers to explore cross-disciplinary collaboration and innovative solutions to address pressing global challenges. This publication, Proceedings of the MJVC 2024, encapsulates the spirit of the event, showcasing groundbreaking research and visionary insights that emerged during the conference.

The conference theme, “Wisdom is the Application of Knowledge,” reflected its mission to inspire meaningful dialogue, innovation, and lasting partnerships. With 525 participants, 379 direct and 146 indirect attendees, and 110 presenters, the event sparked dynamic discussions across multiple fields. In addition to the academic presentations, the conference featured a variety of activities, such as a career fair in collaboration with the Malaysian Students’ Association Japan (MSAJ), workshops, an entrepreneurship guidance session by JAGAM JJB, keynote lectures, and a lively panel discussion. Moreover, the conference was enriched by the STEPAN-UNESCO AI roadmap presentation, the launch of the UTM-MJIIT Alumni Japan Chapter, a Malaysia Day celebration, an award ceremony, and cultural programs that highlighted both Malaysian and Japanese traditions. These activities contributed significantly to the overall success of the event, making it a truly multidisciplinary and multicultural gathering.

The proceedings of MJVC 2024 reflect research across six key themes:

1. Technology and Innovation
2. Environmental Science and Sustainability
3. Education and Social Development
4. Health, Medicine, and Biotechnology
5. Business and Economy
6. Engineering, Material Science, and Industrial Applications

These themes are designed to align with emerging fields of knowledge, promoting collaboration and paving the way for groundbreaking discoveries in technology, sustainability, health, and beyond. The conference's strategic focus on these areas is poised to strengthen bilateral ties between Malaysia and Japan, fostering mutual growth and encouraging interdisciplinary efforts that will drive progress in these vital sectors.

A total of 92 full paper submissions were received for the conference, out of which 76 were accepted, resulting in an acceptance rate of 84.8%. Each submission underwent a rigorous peer-review process to ensure the highest quality of academic contributions. The comprehensive evaluation achieved a 100% decision rate, demonstrating the commitment to excellence that underscored the entire process. This volume of proceedings is part of the MJVC's ongoing initiative to develop a comprehensive body of work under the book project titled "Proceedings of the Malaysia-Japan Visionaries Conference 2024—Integration and Innovation across Diverse Disciplines." The title aptly reflects the overarching goal of envisioning the future of research collaboration and knowledge dissemination between the two nations. We trust that the insights shared in this publication will continue to inspire future collaborations, research initiatives, and policy discussions long after the conference.

We extend our deepest gratitude to all contributors, reviewers, and partners who made this publication possible, particularly Springer Nature, our esteemed publisher, whose support was crucial in bringing this project to fruition. We would also like to express our sincere thanks to the organizing committee, whose tireless efforts ensured the conference and the publication's success. We hope this volume serves as a valuable reference for researchers, policymakers, and practitioners, sparking new ideas and continuing the dialogue that began at MJVC 2024 for years to come.

Tokyo, Japan  
Yokohama, Japan  
Kawasaki, Japan  
31 March 2025

Amy Poh Ai Ling  
Huong Kai-Hee  
Fitriah Azizan

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# Keynote Speakers

Professor Kenji Tanaka, Resilience Engineering Research Center/Department of Technology Management for Innovation, Graduate School of Engineering, The University of Tokyo

*Keynote Title:* Engineering Social Systems: Innovations, Challenges, and Future Directions (Engineering Forefront)

Professor Ts. Dr. Ali Selamat, Acting Dean, Malaysia-Japan International Institute of Technology (MJIIT), Deputy Vice-Chancellor (Student Affairs & Alumni), Universiti Teknologi Malaysia (UTM)

*Keynote Title:* Advancing Collaboration and Exchange of Knowledge Between Malaysia and Japan for AI-Driven Innovation

Professor Masahiko Horie, Advisor at Japan Committee of International Union for Conservation of Nature (IUCN-J), Former Special Advisor to the President of Meiji University Visiting Researcher at Meiji University Institute of Global Affairs (MIGA), Formal Ambassador of Japan to Malaysia ex-Ambassador for Global Environmental Affairs

*Keynote Title:* Charting Progress: Current Twin Crisis of our Planet and Challenges of Sustainable Development Goals (SDGs)

# Panel Discussion

**Topic:** *Innovations Shaping the Future: Bridging Cultures and Industries*

This panel discussion aims to explore how innovative trends, technologies, and practices can be leveraged through industry-academia partnerships, cultural exchange programs, and interdisciplinary research to enhance collaboration between Japan and Malaysia. Esteemed academics and industry experts shared their insights, followed by a Q&A session to encourage interaction from all participants.

**Moderator:**

Professor Sze Yun Set, Project Professor at the Research Center for Advanced Science and Technology (RCAST), The University of Tokyo

**Panelist:**

Professor Emeritus Omar Farouk, Hiroshima City University  
Professor Sugimoto Ichiro, Soka University  
Professor Sha'ri Mohd Yusof, Meiji University  
Seng Chye Koek, President, Schüco Japan  
Cher Chen Lung, CEO, Grand Asia Investments

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# **Technology and Innovation**

# Experiences of Children with Dyslexia at School and Home Before Enrollment at an Approved School



Athirah Azhar, Dolly Paul Carlo, and Zamri Hassan

**Abstract** Children with learning difficulties are not exempted when enrolled at approved schools. The research objectives were to discover the experiences of dyslexic students in the learning process at school and home before their enrollment at approved schools. This qualitative study interviewed four students with dyslexia, recruited employing purposive sampling. The respondents fell within the age range between 15 and 20 years old. This study employed a thematic analysis. The study revealed that the respondents were fond of school due to their active involvement in sports and their appreciation for language subjects such as Malay Language and English Language, alongside other subjects like Mathematics and History. Based on the respondents' feelings and experiences, dyslexic students conveyed anger and sadness due to challenges they encountered in reading and writing. Despite facing challenges with literacy, they derived joy and happiness from socialising and interacting with friends and had a positive perception of their teachers. The respondents additionally revealed that they had good relationships with their parents or guardians at home. It was significant that they mentioned that their parents refrained from comparing them to their siblings; this undoubtedly fostered their sense of self-worth and emotional stability. Outside of their immediate support network (parents, teachers, close friends), dyslexic children encountered negative stigma primarily from individuals who placed a strong emphasis on academic performance and grades. The negative stigma and pressure associated with academic performance could influence behaviours perceived as negative or immoral. This highlighted the significance of comprehending and supporting dyslexic children beyond their academic achievements.

**Keywords** Dyslexic children · Dyslexic experiences · Juvenile offenders · Learning difficulties · Social work

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## 1 Introduction

Dyslexia is a specific learning difficulty frequently occurring in mainstream classrooms in schools. Dyslexia is characterised by the inability to convert the written images received through the eyes into coherent thoughts; individuals with dyslexia may appear ‘normal’ but face challenges in reading, writing and mathematics [1]. According to the Ministry of Education Malaysia, there were 13,302 children with dyslexia in government schools in 2020 [2]. It is plausible that there is a higher prevalence of children with dyslexia, particularly among those residing in rural areas, and limited awareness among schools and parents regarding this matter.

Most articles and research focused primarily on the perspectives of health professionals, teachers, and parents, neglecting to consider the viewpoint of dyslexic children, particularly those enrolling at approved schools. The objective of this study was to uncover the experiences of dyslexic children in the learning process at school and home before they were enrolled at approved schools. It was also crucial to understand the experiences they had encountered at home and school prior to their enrollment, as well as determine how best to support those children.

## 2 Literature Review

### 2.1 *Approved School*

According to the Child Act 2001, “approved school may be required for the education, training, detention of children to be sent there in pursuance of this Act” [3]. The Court For Children shall send the child to an approved school, based on the recommendation of the probation officer, if the following criteria are met [3]:

- “A child is found guilty of any offence
- The probation report submitted to the Court For Children shows that (i – the parents or guardian of the child is incapable of control over the child, ii – the child is in need of institutional rehabilitation)
- It appears to Court for Children that although the offence committed is not serious in nature but it is expedient that the child is subject to detention for such term, and discipline appears most conducive to his reformation”. (p.70)

The detention at approved schools lasts for a period of three years.

### 2.2 *Dyslexic Children at School and Home*

Inclusive education enabled dyslexic children to attend mainstream schools alongside their peers. In fact, this was a commendable endeavour to ensure that dyslexic children did not experience exclusion from the community. Their cognitive state

remained normal, and it was solely their learning approach that differed. Some dyslexic children were assisted by their teachers and friends within the educational institution. Regrettably, some of these individuals were subjected to ridicule or harassment by fellow students, resulting in their exclusion and a lack of necessary support from their teachers. Teachers' negative feelings are frequently exacerbated by their limited understanding of diverse learning methods in the inclusive classroom [4]. It was reported that the respondents experienced mockery and bullying from teachers throughout their time in school [5]. This has resulted in low self-esteem in the children at school [5, 6], frequently leaving them with feelings of inferiority and worthlessness [5], contributing to negative perceptions [4] and a lack of motivation as teachers consistently select the same literate and exemplary students [6]. Children with dyslexia yearned to become class leaders, but their aspirations were stifled by mainstream schools that only bestowed such positions upon students with exemplary academic records. Dyslexic students lamented feeling disregarded and isolated by the teachers during the selection of class monitors [6]. Dyslexic students once pondered about their future, only to be informed by their teacher that pursuing higher education was not a viable option due to their condition [5]. The findings were derived from interviews conducted with dyslexic children and their parents. It remains uncertain as to whether or not the teacher possessed knowledge regarding the child's condition. The majority of universities have specific entry requirements for students with learning difficulties. In Malaysia, those individuals are able to apply for admission to public universities if they possess a Malaysia Certificate of Education (SPM) and meet the entry requirements set by the university. Hence, it was paramount for teachers to establish a strong connection with their students in the classroom and possess a deep understanding of learning challenges. This enabled them to address any initial indications of such difficulties promptly. Students who acknowledged the difficulties experienced by their dyslexic peers were considerate, unlike those who were less acquainted and occasionally found amusement in the child's struggles, causing them to feel humiliated [7]. The Ministry of Education has implemented a commendable initiative through its Special Education Division, which involved the establishment of an inclusive education programme. Under this programme, children with special needs were provided with the opportunity to learn the same curriculum and be integrated into regular classrooms alongside their peers [8]. This action was genuinely remarkable, but there was a debate surrounding the ability of all school teachers to handle these children and whether they possessed the necessary knowledge about learning difficulties.

Being parents or guardians of children with learning difficulties proved to be a mentally and physically challenging endeavour. Furthermore, they were required to take on all duties regarding their children. Yet, numerous individuals were lacking in information, ability, time, and/or resources, especially when they had children with dyslexia [9]. Numerous individuals experienced a sense of shame and encountered challenges when attempting to engage in communication with teachers due to their children's underperformance. This occurrence was not limited to rural areas but extended to parents or guardians who lacked an educational background.

On the contrary, parents/guardians who were diligent and well-informed would have decided to enroll their dyslexic children in specialised schools/centres [9]. The educational difficulties of their children stemmed from a lack of effort or attention from parents [10]. Aware parents or guardians were familiar with the external manifestations, such as struggling with spelling, being hesitant to write, and lacking enthusiasm for reading [10]. In addition, the diagnosis of dyslexia was a source of relief and strength for parents, as it provided a rationale for their children's difficulties [10]. Mothers would support their dyslexic children upon their return from school, providing a calming environment to help them unwind. This often involved taking them swimming or offering reassuring words of comfort [7]. Mothers of dyslexic children also mentioned that their children coped with school stress by engaging in activities such as drawing, music, sports, and outdoor activities once they returned home [7]. Unfortunate dyslexic children who did not receive support from teachers, parents/guardians, or both often found themselves prone to delinquent behaviour. An article by [11] highlighted that children with dyslexia were prone to engage in delinquent behaviour due to several factors as follows:

- Dyslexic issues include different children with varying abilities in a remedial class, a lack of teacher comprehension of dyslexia needs, low self-confidence and a lack of assistance from other agencies regarding funding and learning facilities.
- Stigma towards people with dyslexia about them being slow learners, lazy, incapable and do not perform well in examinations.

(p.11)

### 3 Methods

A qualitative case study was conducted to investigate the experiences of dyslexic children during their learning process at school and home before they were enrolled at the approved school.

#### 3.1 *Dyslexia Screening Test*

A Dyslexia Screening Test (DST) was carried out at an approved school, specifically Sekolah Tunas Bakti in Kuching, Sarawak, Malaysia. A total of 44 boys from the school were divided into ten groups and were assisted by ten trained volunteers to carry out the test. The DST was referred from a book by a group of esteemed individuals, including Madam Sariah Amin from Dyslexia Association Malaysia, Mr. Saifuddin Mohtaram from Kolej Poly-Tech Mara Batu Pahat, and Dr. Ahmad Naik Chee Pee and Dr. Abdul Samad Shibghatullah from Universiti Teknikal

Malaysia (UTeM). It was specifically designed to test children with dyslexia between the ages of 7 and 12. The DST implemented modifications based on the research, tailored to adolescents aged 13 to 18.

The screening consisted of 11 tests. The researcher meticulously adhered to the tests. Nevertheless, some modifications and paraphrasing of the vocabulary in the tests were necessary in an effort to better suit individuals between the ages of 13 and 18. The reliability and validity of the test were assessed by conducting it with children from another approved school, specifically Sekolah Tunas Bakti in Miri Sarawak, Malaysia (for females). Prior to administering the actual screening test, consultation was sought from an expert on DST, Mr. Saifuddin Mohtaram. There were a total of 11 questions. Those participants who failed to answer five or more questions were considered to have dyslexia symptoms.

During the administration of the screening test, the researchers had not yet obtained information about the respondent's background. Among the 44 participants, it was suspected that eight of them had dyslexia. The researcher subsequently arranged a further appointment to interview a group of eight chosen participants. During the background check, it was discovered that four participants had not previously attended the school. Hence, the researcher excluded the four respondents, leading to only four participants being interviewed.

### 3.2 Participants

All participants were suspected to have specific learning difficulties, specifically dyslexia. Participant 1 (P1), aged 20, faced theft charges. He had the privilege of attending mainstream school for eight years (primary 1 – secondary 2). Participant 2 (P2), at the age of 14, faced charges for housebreaking. He was fortunate enough to have the opportunity to attend a mainstream school for six years (primary 1 – primary 6). Participant 3 (P3) was 17 years old and faced charges for housebreaking. He completed his education at a mainstream school (primary 1 – secondary 2). In addition, Participant 4 (P4) was 16 years old and faced charges of rape. He had the privilege of attending mainstream school for seven years (primary 1 – secondary 2). All participants were raised in rural or remote areas. None of them failed to provide a doctor's letter confirming their diagnosis of learning difficulties. Table 1 shows the participants' demographics.

**Table 1** Participant demographic

Participant	Age	Years attended mainstream school	Charged for
P1	20	8 years (primary 1—secondary 2)	Theft
P2	14	6 years (primary 1–6)	House breaking
P3	17	8 years (primary 1—secondary 2)	House breaking
P4	16	7 years (primary 1—secondary 2)	Rape

### **3.3 *Data Collection and Data Analysis***

Semi-structured interviews were conducted to gather data using purposive sampling. All participants were children with dyslexia. A questionnaire served as the research instrument, with interview questions divided into two sections: general experiences at school and at home. The questions also explored participants' learning experiences and the challenges they faced. All recorded interviews were transcribed for analysis, and the data were analysed using thematic analysis, which was considered well-suited for this study.

### **3.4 *Ethical Consideration***

Ethics were taken into account due to the involvement of vulnerable children in the interviews. Ethics clearance was obtained through approval from the Department of Social Welfare under the Ministry of Women, Family and Community Development Malaysia and Sekolah Tunas Bakti (STB), Kuching, Sarawak. Prior to the commencement of the interview, the interviewees were duly apprised that the interview would be subject to recording. Respondents were assured that their names would not be disclosed but utilised solely for the researcher's reference.

## **4 Results and Discussion**

### **4.1 *Dyslexic Children at School Prior to Enrollment at an Approved School***

The participants were enquired about their feelings when they were unable to read, write, and/or count. P1 expressed his anger but requested his friend's guidance, while P3 experienced a mix of anger and embarrassment yet persevered in diligently reading books. P2 experienced a sense of sadness due to his learning challenges and acquired the reading skill, whereas P4 was unresponsive to the inquiry. The reason behind the learning difficulties of these children might have eluded their understanding. Feelings of anger, sadness, frustration, and embarrassment in the long term could have resulted in a decline in self-esteem and a lack of motivation to study, leading to a reluctance to attend school. These activities may have captivated dyslexic children in the juvenile delinquent system due to their struggle with reading, which impeded their ability to learn [11]. Intervening with children who struggled with reading or were at a heightened risk of emotional and behavioural challenges was deemed crucial [12, 13]. When questioned about their teachers regarding their relationship or support given at school, all respondents provided affirmative responses. P1 expressed, "My teacher always smiles, turns on music and gives attention". P2 shared, "I feel happy and loved". P3 and P4 stated, "I like school". Evidently, teachers were well-informed about the child's condition and aware of their learning challenges. Teachers often found it

challenging to manage students with learning difficulties in a mainstream school. It was a demanding and laborious endeavour that demanded a great deal of effort. Teachers were left feeling drained by the necessity of exerting additional effort when their students included learners with dyslexia [14]. Skills, knowledge, patience, and experience held great importance. When enquired about their schoolmates, they were questioned about their relationship with their peers. P1 recounted that there had been “misunderstandings and fights at school”; P2 expressed that he had been “good with my friends at school”; P3 disclosed that he had “fought because of a girl”; and P4 opted not to respond to the inquiry. Withdrawal and low self-esteem were the consequences of mocking classmates who struggled or failed to read [6]. The participants were also enquired about their school-related aversions. P1 stated that he had always fought since primary 6. P2 expressed his dislike for the science subject. P3 mentioned his dislike due to the teacher’s fierce demeanour. Lastly, P4 expressed his dissatisfaction with the difficulty of studying. Disinterest in school resulted in joining the group that welcomed them [11]. The last inquiry regarding school pertained to their preferences and sentiments towards it. P1 actively participated in sports and experienced joy in the opportunity to socialise with friends at school. P2 expressed a preference for Malay Language, English Language, and Mathematics classes and found happiness in the company of friends at school. P3 revealed a fondness for Malay Language and History classes but did not respond when questioned about his feelings towards school. P4 declined to share their favourite aspect of school and expressed fear of reprimand from teachers. During the interview, it was discovered that teachers’ responses and attitudes, as well as the school environment, provided dyslexic children with valuable support. However, their primary obstacle lay in their struggles with learning and interactions with certain peers. Table 2 shows the experiences of dyslexic children at school before they enroll at an approved school.

**Table 2** Dyslexic children’s experience at school prior to enrollment at an approved school

Theme	P1	P2	P3	P4
Feelings when they cannot read, write and/or count	Angry, I asked my friend to teach me	Sad, learn how to read	Angry, embarrassed but I still read books, if I get one sentence I will write in book	(Did not answer)
About teachers	My teacher always smile, turns on music, gives attention	I am happy feel loved	I like school	I like school
About school mate	Misunderstanding, fight at school	Good with my friends at school	Fought because of girl	(Did not answer)
Dislike about school	Always fought since primary 6	Science subject	Teacher is very fierce	It is hard for me to study
Favor the most at school and feelings about school	Sport because all active. I was in 100 metres competition. Happy because I can meet my friends	I like Malay Language, English Language and Mathematics. Happy able to see my friends	I like Malay Language, History. (Did not answer)	(Did not answer) Scared. scold by teacher

## 4.2 *Dyslexic Children at Home Prior to Enrollment at an Approved School*

There was a lack of response from the participants when enquired about their families. P1 mentioned that he lived with his stepmother and father, while P2 stayed with his grandfather and grandmother. As for P3 and P4, they lived with both of their parents. All participants were raised from rural and remote areas. The researchers posited that the household income had been sufficient to sustain a livelihood. When enquired about their relationship with family, P1 responded that it was satisfactory, P2 and P3 expressed that it was good, and P4 refrained from responding. Some parents in rural areas might have been unaware of the term “learning difficulties”. The participants were also enquired whether or not their families were aware of their learning difficulties. P1, P3, and P4 affirmed their parents’ awareness, while P2 disclosed that his family was unaware. Support groups for parents, relational coping resources for managing day-to-day symptoms of dyslexia, and the implementation of supportive interventions in the school environment were recommended in a social work practice [9]. The final question pertained to whether or not their family members consistently compared them to their other siblings. P1, P2, and P3 declined; however, P4 expressed that his parents consistently compared him with his friends. The experiences of dyslexic children at home before enrolling at an approved school were depicted in Table 3.

In addition to receiving strong support from parents, the relationship between the family and the school was crucial, mainly when their children encountered learning difficulties. It has been stated that positive family-school relationships play an essential role in safeguarding the mental well-being of children and their mothers.

**Table 3** Dyslexic children’s experience at home prior to enrollment at an approved school

Theme	P1	P2	P3	P4
Relationship with family at home	Ok	Good	Good	(Did not answer)
Your family members know about your learning difficulties	Yes	Do not know	They know I cannot read but they do not know I cannot write	Yes
Family members discuss about your condition with school	Never	I do not know	Yes	(Did not answer)
Your family members always compare you with other siblings	No	No	No	They always compare myself with other friends

## 5 Conclusion

The participants' offence resulted in their enrollment at an approved school. They received an informal education, underwent training, and were determined to improve themselves for the future. The researchers posited that the participants had encountered challenges in their learning and lacked substantial support from their school or home, resulting in their eventual withdrawal. Dropping out of school could potentially result in engaging in juvenile delinquent behaviour. No one should be left behind in education. Within the research context, the participants resided in rural areas. Thus, it was the school's responsibility to guarantee the students' attendance in remedial classes, which were instructed by a teacher with a background in learning difficulties. An imperative was placed on establishing a nurturing and supportive environment for children with dyslexia in order to facilitate their development and well-being. It is imperative that the diagnosis be given due consideration and that both the children and their parents, teachers, and school be well-informed about their condition. In order to ensure the proper development of a dyslexic child, it was vital to have unwavering support from parents or guardians and the entire family. Additionally, the child greatly benefited from the attentive guidance and assistance their class teacher and the school provided. Enrolling the child in remedial classes at either the school or a specialised dyslexia centre proved highly advantageous. Equally important was the acceptance and inclusion of the child by their peers within the school environment.

## References

1. Persatuan Dyslexia Malaysia. <https://dyslexiamalaysia.org/>. Accessed 30 Aug 2024
2. Harun, R.: Keciciran: Apa nasib setengah juta pelajar disleksia Malaysia. Malaysiakini. <https://www.malaysiakini.com/news/651658>. Accessed 30 Aug 2024
3. Malaysia and International Law Book Services: Legal Research Board. Laws Of Malaysia Act 611 Child Act 2001. International law Book Services, Malaysia (2006)
4. O'Brien, T.: Understanding the socio-emotional impact of dyslexia in the inclusive classroom. In: Glazzard, J., Stones. (eds.) *Dyslexia*, pp. 151–160. IntechOpen, London (2021)
5. Nevill, T.P., Forsey, M.: "We are all thrown into one basket": dyslexia, schools and the (non) enactment of policies of inclusion. *Disabil. Stud. Q.* **42**(1) (2022)
6. Kachong'u, Z.J., Muzata, K.K.: Understanding dyslexia in the mainstream classroom: voices of 8th grade learners at Sihole combined school in Kalabo district. *J. Lexicogr. Termin.* **4**(1), 87–104 (2020)
7. Wilmot, A., Pizzey, H., Leitao, S., Hasking, P., Boyes, M.: Growing up with dyslexia: Child and parent perspectives on school struggles, self-esteem, and mental health. *Dyslexia.* **29**(1), 40–54 (2022)