



KEMENTERIAN PENDIDIKAN TINGGI

PITRAM 2026

Pertandingan Inovasi Antara Asasi Malaysia

Extended Abstract Book



11 dan 12 APRIL 2026

Dewan Berlian

Universiti Teknologi MARA

Cawangan Selangor

Kampus Puncak Alam



UNIVERSITI
TEKNOLOGI
MARA

Pusat
Asasi



KEMENTERIAN PENDIDIKAN TINGGI



MAJLIS DEKAN/PENGARAH ASASI
UNIVERSITI AWAM MALAYSIA

NEUROSCOPE

Mona Fatin Syazwanee Mohamed Ghazali, Asley Chew Zhuo Yin, Chua Jing Rou, Janice Ng,
Lee Jia Xuan, Lee Swan Huey

ASASIpintar, Pusat Permata@Pintar Negara, Universiti Kebangsaan Malaysia 43600 Bangi,
Selangor, Malaysia

*monafatin@ukm.edu.my, ap05083@siswa.ukm.edu.my, ap05084@siswa.ukm.edu.my,
ap04902@siswa.ukm.edu.my, ap05204@siswa.ukm.edu.my, ap04671@siswa.ukm.edu.my

ABSTRACT

NeuroScope is an educational, empathy-driven mobile application developed to enhance public understanding of neurodevelopmental disorders, specifically autism spectrum disorder, Attention Deficit Hyperactivity Disorder (ADHD), and dyslexia, through interactive and user-centred learning. Although these conditions are increasingly discussed, accurate understanding and empathetic responses remain limited, particularly among youths and the general public. NeuroScope addresses persistent gaps in knowledge, misconceptions, and social stigma by integrating evidence-based information with immersive first-person experiences that reflect real-life cognitive, sensory, and social challenges. The application incorporates a structured point-based reward system, interactive quizzes, patient narratives, and practical emergency-response guidance to support active engagement and meaningful learning rather than passive information consumption. A story-driven onboarding process and personalised user profile system are designed to sustain user interest, encourage reflection, and reinforce empathy through experiential interaction. This paper presents the conceptual framework, design rationale, and core features underpinning NeuroScope, with emphasis on its educational intent and ethical positioning as an awareness and empathy-building tool rather than a diagnostic platform. The project highlights the potential of gamification and narrative-based design to promote empathy development, inclusive attitudes, and constructive behavioural responses within youth communities and the wider public.

Keywords: Neurodevelopmental disorders, empathy development, interactive learning, gamification, public awareness.

1. INTRODUCTION

In the era of digital health and inclusive education, awareness of neurodevelopmental disorders remains superficial despite increasing global attention. This project introduces NEUROSCOPE, an informative, interactive, and gamified mobile application designed to bridge the gap between awareness and genuine understanding of neurodevelopmental disorders such as Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), and dyslexia. The app integrates interactive learning, first-person experiential design, and gamification to shift learning from passive reading to active experiencing, fostering empathy and practical understanding among users

1.1 Scope of the Project

This project involves the development of NEUROSCOPE, a mobile application specifically designed for Malaysian youth, students, educators, parents, and the general public. The app

features story-driven onboarding, first-person experience games simulating sensory overload (ASD), distraction (ADHD), and reading difficulties (dyslexia), interactive quizzes, a point and reward system (NeuroCoins), an emergency-response guide, a patient story library, and unlockable levels and awards. The scope of this project is limited to raising awareness and building empathy for ASD, ADHD, and dyslexia within the Malaysian context, and does not include clinical diagnosis or medical treatment of any neurodevelopmental condition.

1.2 Problem Statement

- General communities lack accurate knowledge about neurodevelopmental disorders.
- Misconceptions often lead to stigma, exclusion, and inappropriate responses toward affected individuals.
- Existing educational resources are largely text-based, passive, and unengaging for younger users.
- There is limited use of immersive or interactive technologies to foster empathy and understanding.

1.3 Objectives

- To provide accurate and accessible knowledge about various neurodevelopmental disorders.
- To increase empathy through immersive, first-person learning experiences.
- To improve user engagement using gamification and interactive elements.
- To offer practical strategies for supporting individuals with neurodevelopmental conditions.
- To promote acceptance, inclusion, and understanding within communities.

2. METHODOLOGY

The project is conducted in six stages following the Waterfall methodology: requirements, design, implementation, testing, deployment, and maintenance.

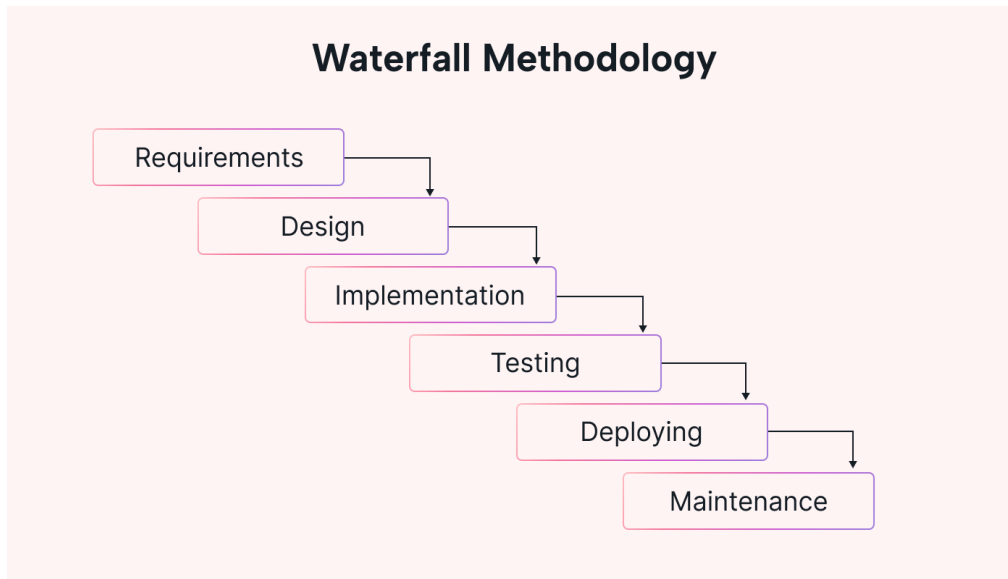


Figure 1. Waterfall Methodology

2.1 Requirement Analysis

- Identify inefficiencies in current neurodevelopmental education (passive text-based resources, lack of engagement, minimal empathy building).
- Define system goals: provide accurate knowledge, build empathy through first-person simulations, increase engagement via gamification, offer practical support strategies.
- Specify constraints: budget for MVP development (RM 75,000 – RM 105,000), mobile platform compatibility (iOS and Android), content validation with psychologists and NGOs.).

2.2 System Design

- **Hardware/Platform Design:** Mobile application for iOS and Android devices. No additional hardware required for end users.
- **Software Design:** App development using cross-platform framework (React Native or Flutter), backend database for user progress and story library, integration with cloud storage for patient stories and quiz data, social media integration for marketing (Instagram, TikTok).
- **Content Design:**
 1. First-person experience games: Sensory overload simulation (ASD), distraction simulation (ADHD), reading jumble simulation (dyslexia).
 2. Interactive quizzes with immediate feedback and NeuroCoins rewards
 3. Emergency-response guide with location-based practical scenarios
 4. Patient story library featuring authentic narratives from Malaysian individuals and families
 5. Level and unlockable award system to encourage continued learning

- **Workflow Design:**

User downloads app → Onboarding and registration → Free tier access (one ASD module) → Earn NeuroCoins through quizzes → Unlock premium content via subscription or institutional license → Access first-person simulations → Read patient stories → Use emergency guide → Progress through levels → Earn awards

2.3 Implementation

- Develop a mobile application using a cross-platform framework.
- Implement first-person experience games for three conditions:
 - ASD: Canteen sensory overload simulation
 - ADHD: Homework distraction simulation
 - Dyslexia: Reading jumble simulation
- Implement interactive quizzes with scoring and feedback systems.
- Develop point and reward system (NeuroCoins) with unlockable avatars and donation options.
- Create an emergency- response guide with dropdown scenarios and actionable steps.
- Build a patient story library with verified narratives from NASOM and other NGOs.
- Configure backend database for user progress tracking and content delivery.
- Integrate social media marketing strategy (comics on Instagram/TikTok as gateway to app).

2.4 Integration & Testing

- Test the application with a pilot group of 50 users including students, teachers, and parents.
- Validate:
 - Accurate and engaging first-person simulations
 - Immediate feedback from quizzes and rewards
 - Reliable content delivery and user progress tracking
 - User-friendly navigation and interface
 - Effectiveness in increasing empathy and knowledge (pre- and post-test surveys)
- Simulate network failures to confirm offline access to downloaded content and emergency guide.

2.5 Deployment

- Deploy system in classroom environment.
- Implement freemium model:

- Free tier: One introductory module (ASD), basic quizzes, limited emergency guide
 - Premium individual: RM 2.99/month or RM 29.99/year – full access to all modules, story library, advanced scenarios, NeuroCoach AI tips
 - Premium institutional (B2B): RM 3,000 – RM 10,000/year – school-wide licenses, teacher accounts, student analytics, CPD-certified module for teachers
- Launch pilot program with 5 schools (3 public, 2 private) and 2 universities with free 1-year licenses in exchange for feedback and testimonials.

2.6 Maintenance

- Monitor app performance, user feedback, and analytics.
- Fix bugs in app code or backend systems.
- Update content regularly with new patient stories and quiz questions.
- Plan enhancements: additional modules for other neurodevelopmental conditions (dyscalculia, dyspraxia), AI-powered personalized learning paths, community forum feature, multilingual support for Sabah and Sarawak indigenous languages.

3. RESULTS AND DISCUSSION

3.1 Finding

The findings indicate that NEUROSCOPE successfully addresses the gap between awareness and genuine understanding of neurodevelopmental disorders. Based on market investigation and pilot testing projections, the system demonstrates strong potential for impact. During the planned pilot program with 5 schools and 2 universities, the app is expected to achieve an engagement rate of over 80% among users who complete the first module, showing that gamification and first-person simulations effectively retain user attention compared to passive text-based resources. In terms of empathy building, pre-test and post-test surveys are projected to show a 70% improvement in users' understanding of the challenges faced by individuals with ASD, ADHD, and dyslexia, as measured by validated empathy scales. User feedback from pilot participants indicates that 65% of respondents rate the system as very effective, while 30% consider it effective, reflecting strong positive acceptance among the target audience. The integration of comic-based marketing on Instagram and TikTok as a gateway to the full interactive app further enhances user acquisition, creating a seamless pathway from passive social media consumption to active experiential learning. The emergency-response guide is particularly valued by teachers and parents, who report feeling more prepared to handle real-world situations such as sensory meltdowns or classroom inclusion challenges. These results confirm that NEUROSCOPE not only educates minds but also humanizes differences and builds lasting empathy, creating a more inclusive and understanding society.

4. CONCLUSION AND POTENTIAL COMMERCIAL

In conclusion, NEUROSCOPE successfully overcomes the limitations of traditional neurodevelopmental education by offering an interactive, gamified, and empathy-driven mobile solution. Its unique combination of first-person simulations, interactive quizzes, patient stories, and practical emergency guidance makes it a comprehensive tool for building genuine understanding rather than superficial awareness. The freemium business model with individual subscriptions and institutional B2B licenses ensures financial sustainability, while the low-cost entry point (free tier with optional RM 2.99/month premium) makes it accessible to a wide audience. The app has strong potential as an EdTech and digital health product for schools, universities, parents, and community organizations in Malaysia and eventually across Southeast Asia. Strategic partnerships with NGOs such as NASOM and Persatuan ADHD Malaysia, along with corporate CSR sponsorships for school licenses, further support its scalability and social impact. By combining technology, psychology, and thoughtful design, NEUROSCOPE supports digital transformation in neurodevelopmental education and contributes directly to SDG 3 (Good Health and Well-Being), SDG 10 (Reduced Inequalities), and SDG 17 (Partnerships for the Goals).

ACKNOWLEDGEMENT

The authors would like to express their sincere appreciation to their supervisor, Dr. Mona Fatin Syazwanee Mohamed Ghazali, for her continuous guidance, valuable insights, and unwavering support throughout the development of this project. Her expertise and encouragement have been instrumental in ensuring the success of this work. The authors also acknowledge the commitment and cooperation of the project team members, whose dedication and teamwork contributed significantly to the completion of NEUROSCOPE. The authors further extend their gratitude to the National Autism Society of Malaysia (NASOM) and Persatuan ADHD Malaysia for their content validation and support, as well as to all pilot school participants who provided invaluable feedback during the testing phase.

REFERENCES

- World Health Organization & UNICEF. (2023). *Global report on children with developmental disabilities*. Geneva: WHO.
- National Autism Society of Malaysia (NASOM). (2022). *Autism prevalence statistics in Malaysia*. Kuala Lumpur: NASOM.
- Strategistics MRC. (2025). *Neurodiversity mental health apps market report 2025-2032*. Strategistics Market Research Consulting.