

Motivation & Objective



CONTEXT: MINDS Me Too! Club staff spend 4.4 hours weekly on activity planning struggling with idea generation, volunteer coordination, and adaptation.

RESEARCH QUESTIONS:

- What activity-planning challenges affect MINDS staff efficiency and service quality?
- How does AI-assisted planning compare to traditional methods in efficiency and quality?
- What factors influence AI adoption in disability services, including multi-tool workflows?
- How does user expertise (system vs. domain) influence AI effectiveness?

OBJECTIVE:

Validate challenges → Develop AI → Implement → Establish adoption framework

Problem Identification

Mixed-methods needs assessment (N=6 staff, N=1 volunteer, 9 observations) identified **three** challenge clusters:

OPERATIONAL EFFICIENCY CRISIS

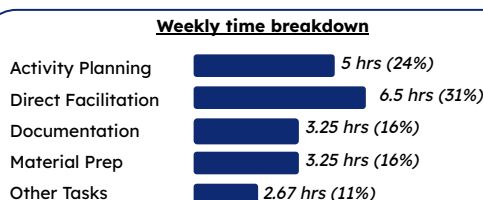
- 4.5 hrs/week planning
- 80% struggle with idea generation
- Rating: 3.67/4.0 (highest concern)

7 out of 10 people

Adequate: (3/10)
Inadequate: (7/10)

REAL-TIME ADAPTATION NEEDS

- On-the-spot modification pressures during sessions
- Contingency planning gaps for diverse abilities
- Three ability levels (Light/Medium/Severe)
- Rating: 2.33/4.0 difficulty



VOLUNTEER COORDINATION GAPS

- 71% inadequate briefing support
- Information fragmentation across platforms
- Rating: 2.50/4.0



Research Design

APPROACH: Pragmatic mixed-methods design combining qualitative and quantitative data to address real-world challenges in disability services.

THEORETICAL FRAMEWORK: Socio-Technical Systems Theory (Boström & Heinen, 1977), Technology Acceptance Model (Davis, 1989), Human-Centered AI principles (Shneiderman, 2020)

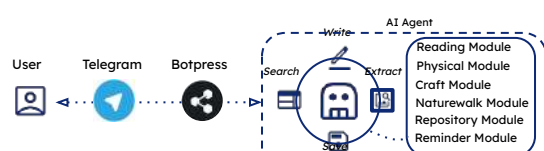
Need assessment (June 2025)

- Focus group (N=6 staff, 1.5 hrs)
- In-depth interview (N=1 volunteer, 48 min)
- Systematic observations (N=9 sessions, 23 hrs total)
- Pre-implementation survey (N=6)

Purpose: Validated problem clusters, baseline metrics

System Development (July 2025)

- 6-module AI assistant (Botpress + Telegram)
- Iterative development with feature refinement



Purpose: Functional Prototype

User Testing (Jul - Aug 2025)

- 3 iterations with N=7 professional users
- Informal conversational feedback
- Technical limitations & adoption barriers identified

Purpose: Methodology pivot rationale established

Implementation (Sept - Nov 2025)

- 4 real-world activities with program participants
- Expert system user + varying domain expertise
- Efficiency calculations vs. baseline

Purpose: Empirical validation

Observation Sessions



Google Form Survey



Botpress Workflow



Telegram Bot Conversation Analysis



Expert Implementation Sessions



Efficiency Calculation

Activity Type	Facilitator	Participant	Time (mins)	Rating
Reading	1	1	15	4.0
Physical	1	1	20	3.5
Craft	1	1	25	3.0
Nature	1	1	30	2.5
Repository	1	1	35	2.0
Reminders	1	1	40	1.5

Solution Development

Modules Capabilities

READING NLB catalog search, book synopsis generation, discussion prompts for 3 ability levels, accessibility adaptations, volunteer briefing materials	PHYSICAL Exercises with safety protocols, equipment lists, ability-level modifications, venue recommendations	CRAFT Step-by-step instructions, material alternatives, sensory considerations, visual aids generation	NATURE NParks integration, accessible route planning, educational content, contingency scenarios	REPOSITORY Activity storage, search functionality, sharing protocols (NOTE: incomplete)	REMINDERS Scheduling support for staff coordination (NOTE: incomplete)
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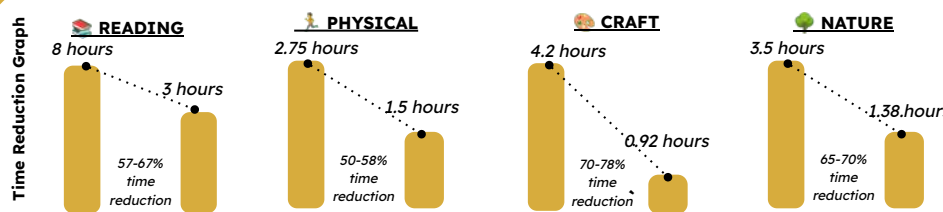
User Validation result (N=7, 3 iterations)

Strength Validated: - Natural conversation flow - Creative ideation (highest value for 80% "idea fatigue") - Singapore context accuracy - Ability-level differentiation - Resource discovery (NLB, NParks)	Performance Rating: Expert User: 5/5 Performance, 4/5 Quality Conservative (Novice): 3.5-4/5 Performance, 3/5 Quality	Critical limitation identified: - Session context loss (conversations reset) - Export functionality missing (cannot generate PDFs) 100% failure rate on first attempt - Repository saves summaries only, not full activities - No facilitator script generation (implementation gap)	Adaptation Barrier Discovery: - Novice users struggled with prompt optimization - Technical failures created workflow disruption - Multi-tool workarounds required (external PDF tools) - Training needs exceeded organizational capacity
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METHODOLOGY PIVOT: Shifted to expert-led implementation to demonstrate maximum potential while documenting realistic organizational requirements for adoption

Module	Key Feature	Success Metrics	Limitation
Reading	NLB Integration	3/5	Export Gap
Physical	Safety Protocol	4/5	Script Gap
Craft	Step by Step	4/5	Image Fail
Nature	NPark Routes	3/5	Context Loss

Implementation Sessions



KEY FINDING: THE ECOSYSTEM

APPROACH: Success required orchestrating multiple tools (Claude, Gamma, Gemini) rather than relying on the Bot alone. The Bot served as an ideation partner, while specialized tools handled refinement and visual creation.

Description	READING	PHYSICAL	CRAFT	NATURE
Participant	22	12	18	17
Date	Sep 18	Sep 25	Oct 14	Nov 12
Development time	3h -57-67%	1.5h -50-58%	0.9h -70-78%	1.38h -65-70%
Outcome	✓ Multi-tool	✗ facilitator gaps	✓ Optimal	✓ Safety excel
Location	Punggol Lib	Ubi CC	Woodland Lib	Toa Payoh

Implementation evolved across four activities (Reading, Physical, Craft, Nature Walk) with 12-22 participants each, progressively reducing development time from 3 hours to 1.38 hours as expertise gaps were identified and addressed. The sessions confirmed that AI excels at ideation and logistics, but requires expert-led refinement for quality, safety, and real-time adaptation.

Impact & Insight

AI AS IDEATION PARTNER, NOT STANDALONE

Pattern observed: Success occurred when AI used for creative brainstorming within multi-tool workflows (Bot for ideation, Claude for refinement, Gamma for presentations, Gemini for visuals), not as complete solution

Why this matters:

- Challenges automation narrative in disability services
- Positions AI as augmentation technology
- Validates need for professional integration

EXPERTISE-DEPENDENT VALUE PROPOSITION

Critical distinction discovered: System expertise ≠ domain expertise (both required for success)

Expert users

(62-64% gains):

- Navigate technical gaps
- Multi-tool workflows
- Accept iteration

Why this matters:

Professional AI adoption ≠ consumer adoption patterns. One-size-fits-all training inadequate.

Organizational implication:

Differentiated support model required - tiered training, ongoing infrastructure, realistic expectations about learning curves

Organizational implication:

Stop pursuing end-to-end automation → Instead invest in workflow integration strategies

PLATFORM CONSTRAINT: SHAPE OUTCOMES

Technical limitations disproportionately affected novice users, creating adoption barriers.

Why this matters:

Platform selection = strategic decision with direct consequences for adoption success, not just feature checklist exercise

Organizational implication:

Evaluate platforms beyond capabilities - consider workflow integration, user expertise requirements, organizational feasibility

Digital transformation paradox: Technology introduction intensifies (not reduces) need for organizational alignment, professional collaboration, support infrastructure validates socio-technical systems theory.

Expertise as mediating factor: Success determined not by AI capability alone, but by interaction between system expertise, domain expertise, and organizational support.

The "45-Minute Pattern" as metaphor: Even with quality planning, gaps emerge in implementation. This reveals fundamental tension - AI generates content efficiently but cannot anticipate real-world complexity requiring human judgment, improvisation, domain expertise.

Conclusion & Implication

KEY TAKEAWAY:

AI is not a one-stop solution - successful adoption requires adaptation to people, patience through iteration, multi-dimensional alignment, and professional integration. Technology must augment, not replace, human expertise.

Research Contributions

Theoretical:

- Empirical validation of socio-technical alignment in disability services
- Professional ≠ consumer adoption patterns
- Platform constraints as strategic factor
- Human-AI collaboration paradigm for human services

Methodological:

- Expert-led implementation approach for capability demonstration
- Expertise framework (system vs domain)

Practical Implications

For Organizations:

- Position AI as ideation partner
- Implement tiered training model
- Strategic platform selection
- Implementation support beyond content generation
- Build support infrastructure

For Digital Transformation:

- Workflow integration over automation
- Organizational alignment essential
- Person-centered approach preservation
- Realistic expectation management

EVIDENCE-BASED FRAMEWORK: AI adoption in social services serving vulnerable populations requires multi-dimensional alignment - not just technical capability, but people, processes, organizational culture, and support systems.



Acknowledgement

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