

## North Spark

A personalized app where kids on the spectrum  
create interest-based learning modules for  
cognitive, emotional, and social skills

For CSIS 3375 UX Design  
in Web & Mobile App,  
Section 001

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A Project Proposal Submitted to  
**Douglas College**  
New Westminster, BC, Canada

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by

### Group 1

| Name             | Role        | ID Number |
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## I. Introduction

North Spark is a mobile application that enables children on the autism spectrum, ages 4-16, to craft customized learning modules using flashcard decks centered around their special interests ranging from scientific topics like rocks, dinosaurs, animals to structures and facts like letters, numbers, maps or even historical events. With this platform, the goal is to empower them to master cognitive problem-solving, emotional awareness, and social understanding by employing various strategies that address their unique challenges.

North Spark will be the first app designed around the four functions of behavior or the so-called SEAT framework, which refers to Sensory, Escape, Attention, Tangible. Specifically, the software targets escape-maintained demand avoidance, sensory regulation needs, attention challenges, and motivation through preferred interests. The SEAT framework identifies these four behavioral functions as primary drivers of autistic children's responses to learning demands (Nelson et al., 2008). Unlike apps with generic content that trigger these behavioral functions, North Spark prevents them proactively through interest-driven content creation, sensory controls, choice-based interactions, and structured visual rewards.

North Spark reimagines learning for children on the autism spectrum by turning moments of frustration into meaningful engagement. A child who once shuts down at worksheet demands becomes an empowered creator—designing “Angry T-Rex Feelings” or “Train Station Turn-Taking” decks that channel special interests into purposeful learning. What begins as play evolves into self-directed skill building, as the child experiences autonomy, mastery, and joy. Parents and therapists witness a shift from passive participation to active exploration, where every session sparks curiosity, reinforces strengths, and builds confidence through personalized discovery.

The name North Spark reflects this mission—“*North*” draws from “North Star,” symbolizing guidance and direction, much like a learning compass helping each child find their own path. “*Spark*” represents the ignition of curiosity and sustained motivation that keeps the child moving forward on that journey. Together, North Spark stands for guiding every learner toward their unique potential—illuminating a way to learn, grow, and thrive so that everything is embodied in our motto: “**Learn what you love, your way.**”

## II. Background Research

### A. Statement of the Problem

Spencer and I started North Spark by sitting down as a team to brainstorm the most pressing challenges faced by children on the autism spectrum. As a father of twins who are autistic, and with Spencer also being on the spectrum, we have profound personal insights into the daily struggles we observe and the challenges we have lived through countless therapy sessions and homework battles. To validate and expand these observations, we gathered perspectives from friends, family, and other parents in our community while also conducting research into the autism learning barriers. This two-fold approach of considering the lived experience and literature validation revealed for us three interconnected UX problems that existing apps fail to solve comprehensively:

The first challenge is the **low engagement on non-preferred tasks**. My twins zone out after 2-3 minutes of generic worksheets, stimming or wandering when content lacks personal relevance or exceeds their attention capacity, which is typically around 3 to 7 minutes max. Autistic students show significantly lower classroom engagement linked to poorer academic outcomes (Sparapani et al., 2015; Mallory et al., 2021).

Secondly, **escape-maintained demand avoidance** triggers meltdowns and refusal behaviors spike when tasks feel overwhelming, meaningless, or forced without choice. Spencer's shutdowns during "boring" activities mirror what friends describe as their kids' escape responses. Research shows that there is 60-80% reduction in demand avoidance through choice and task breakdown (Cross River Therapy, 2023; Heartlinks ABA, 2025).

Lastly, **generic content ignores special interests**, forcing dinosaur-obsessed kids to learn generic farm animals, shutting down motivation despite their visual-spatial strengths. Family insights confirm kids can talk about trains for hours but won't touch schoolbooks. Studies prove that interest-based instruction boosts engagement 3x (Wood et al., 2025; Reframing Autism, 2025).

### B. Market Competitor Apps

We analyzed several leading competitor apps to understand their focus areas and limitations. This comparison highlights how North Spark differentiates itself by integrating personalized, interest-driven learning across all SEAT domains.

| App           | Primary Focus              | SEAT Coverage               | Key Limitations vs North Spark   |
|---------------|----------------------------|-----------------------------|--|
| TouchChat     | AAC communication          | Sensory (symbols)           | Communication only; no learning content creation; unlimited grids (overwhelms) |
| CentralReach  | Clinical ABA data tracking | All SEAT (therapist-driven) | Therapy software (\$ expensive); no child content creation; parent-unfriendly  |
| Otsimo        | Gamified cognitive games   | Attention (games)           | Generic content; ignores special interests; heavy gamification triggers escape |
| Special Words | Pre-made flashcards        | Attention (visual)          | Fixed content only; no sensory customization; no emotional/social skills       |
| Choiceworks   | Visual schedules           | Escape (structure)          | Behavior management only; no academics; no interest integration                |
| North Spark   | Interest-driven learning   | All SEAT proactively        | Child creates content; dual interfaces; analytics dashboard                    |

### C. Market Inspiration Apps

The design of North Spark draws from successful features in well-known apps. Each inspiration below illustrates how proven engagement methods were adapted to support learning in a child-friendly, therapeutic context.

| App            | Key Inspiration                           | North Spark Adaptation   |
|----------------|---|--|
| Duolingo       | Short burst learning (3-7 min) + streaks  | 3-7 flashcard limit per session; visual progress rings                   |
| TouchChat      | Symbol-based flashcards                   | Limited to 3-7 cards (vs unlimited grids); kid interface                 |
| CentralReach   | Scientific ABA tracking + discrete trials | Parent/therapist dashboard with analytics from child sessions            |
| Netflix/Amazon | Recommendation algorithms                 | AI flags dislikes (no animals if rejected); suggests based on engagement |
| Canva          | Drag-drop content creation                | Kid uploads rock/dinosaur pics for custom decks                          |

### III. PACT Framework & Value Proposition

North Spark is designed for children on the autism spectrum, along with their parents and therapists, who collaboratively shape each child's learning journey. The app supports activities that promote focused learning, communication, and creativity through personalized flashcards and play-based modules. Set in a supportive home or therapy context, North Spark enables tailored learning paths built around each child's interests and sensory preferences. Core technologies include an adaptive database of flashcards, AI-generated content aligned with likes and dislikes, and a data-driven dashboard for parental and therapist insights.

North Spark transforms traditional ABA and learning tools into an engaging, child-centered experience. By combining adaptive AI, data analytics, and creative content creation, the app empowers children to learn through their own interests while giving parents and therapists real-time visibility and control. The result is a personalized, motivating, and scientifically grounded environment for growth and connection.

Building on identified learning challenges—low engagement in non-preferred tasks, escape-maintained demand avoidance, and generic content overlooking special interests—North Spark targets key skills including visual and cognitive problem-solving, emotional awareness, and social understanding. Effective strategies incorporate visual rewards for reinforcement, structured yet gamified environments to sustain 3-7 minute sessions, and sensory stimulation aligned with preferences to prevent overstimulation (P. Kandhadai, personal communication, January 27, 2026). By tapping into each child's domain of interest, the app boosts motivation up to 3x while proactively addressing behavioral functions across SEAT domains.

Finally, here's the GitHub repo created for this project.

[https://github.com/dondemici/W26\\_3375\\_S1\\_G1\\_NorthSpark](https://github.com/dondemici/W26_3375_S1_G1_NorthSpark)

## IV. Project Contract

**Project:** North Spark – An adaptive app where kids on the spectrum create interest-based learning modules for cognitive, emotional, and social skills

**Date:** January 29, 2026

**Duration:** 2 Months

### 1. Team Members & Roles

All team members listed below agree to the terms and commitments outlined in this contract:

| Name             | Role                  |
|------------------|-----------------------|
| Dundee Adriatico | Team Lead             |
| Spencer Gosselin | Autism Representative |

### 2. Meeting Schedule & Commitment

- Weekly meetings: Monday at 11AM before class for 15-30 minutes
- Meeting format: In-person at Room 807
- Optional check-ins: As needed between scheduled meetings via Teams/Outlook
- Attendance expectation: All team members commit to attending 90% of scheduled meetings. Absences must be communicated 24 hours in advance.

### 3. Communication Protocols

- Primary platform: WhatsApp / Outlook / Teams
- Response time: Team members will respond to urgent messages within 24 hours
- Documentation: All decisions, action items, and updates will be logged in OneDrive shared folder
- Escalation: Conflicts or blockers will be addressed in team meetings within 48 hours

### 4. Roles & Responsibilities

Each team member agrees to:

- Complete assigned tasks by agreed-upon deadlines
- Communicate progress and blockers proactively
- Contribute equally to discussions and decision-making
- Support team members when workload is uneven
- Maintain professional and respectful conduct at all times


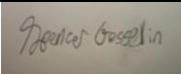
### 5. Deadlines & Deliverables

- Project milestones and deliverables will be tracked in a shared project timeline
- Each team member commits to meeting assigned deadlines or flagging delays 3+ days in advance
- If a deadline is missed, the responsible team member will provide a revised timeline and action plan

### Acknowledgment

By signing below, all team members confirm they have read, understood, and agree to uphold this contract. We commit to working collaboratively, professionally, and respectfully to deliver North Spark successfully.

Team Signatures:

| Name             | Signature   | Date        |
|------------------|---|-------------|
| Dundee Adriatico |  | 29 Jan 2026 |
| Spencer Gosselin |  | 30 Jan 2026 |



## V. Key Features

North Spark offers a focused set of features that make it both novel and highly practical for children on the autism spectrum and their support teams. Its design centers on transforming low-engagement, stressful learning moments into short, rewarding, interest-driven experiences.

### Key Features

- Dual interface innovation
  - Child-facing: Simple, symbol-based flashcard creator with 3–7 card bursts, streaks, and sensory-friendly controls.
  - Adult-facing: Parent/therapist dashboard with analytics on session duration, completion rates, interest engagement, and discrete trial data for IEPs and therapy reports.
- SEAT-aligned behavior support
  - Attention/Sensory: Short learning bursts (3–7 cards), Duolingo-style streaks, and sensory sliders to keep engagement high without overload.
  - Escape: Built-in “Break” button and choice menus that reduce demand avoidance while still tracking progress.
  - Tangible: Parent-uploaded special interests (e.g., trains, dinosaurs, rocks) drive content; low-engagement topics are automatically de-prioritized.
- Interest-driven content engine
  - Uploads of special interests and dislikes shape personalized decks and recommendations.
  - Recommendation logic mirrors streaming platforms by surfacing the most engaging topics while excluding rejected ones.
- Scientific tracking and reporting
  - Discrete trial-style data collection turns play sessions into measurable progress.

- Auto-generated progress summaries support IEP documentation and therapist reporting.
- Transformative experience synthesis
  - By mapping everyday UX problems (low engagement, demand avoidance, generic content) to SEAT functions and solving them with a dual-interface, interest-driven system, North Spark positions itself as a first-of-its-kind learning compass that lets children “learn what they love, their way.”

## VI. AI Use Section

| AI Tool Name | Version<br>Account Type | Specific Feature for which<br>the AI Tool was Used  | Value Addition<br><i>(What value did you add over<br/>and above what AI did for you?)</i>  |
|--------------|-------------------------|---|--|
| Perplexity   | Education Pro           | Asked AI to analyze competitor apps (TouchChat, CentralReach, Otsimo, Special Words, Choiceworks) and identify SEAT framework limitations vs North Spark's interest-driven approach | Provided specific app names and SEAT domains (Sensory, Escape, Attention, Tangible) from my research, plus clarified North Spark's dual-interface innovation that AI hadn't considered                     |
| Perplexity   | Education Pro           | Requested PACT framework analysis and value proposition drafting for autism learning app with flashcard database, AI recommendations, and parent/therapist dashboards               | Gave detailed user personas (kids on spectrum + parents/therapists), activity context (personalized learning paths), and technology specs (AI image generation from special interests) to shape the output |

## VII. Work Log

| Date        | Number of Hours | Responsible Person | Description of Work Done  |
|-------------|-----------------|--------------------|---|
| 5 Jan 2026  | 0.5             | All                | Group Creation  |
| 12 Jan 2026 | 0.5             | All                | Brainstorming session for potential apps to be working on                                 |
| 15 Jan 2026 | 0.5             | All                | Initial app discussion with Priya   |
| 24 Jan 2026 | 0.5             | All                | Tasks discussion  |
| 28 Jan 2026 | 3               | Dundee             | Creation of project proposal – Intro and Background Research                              |
| 29 Jan 2026 | 2.5             | Dundee             | Finalize project proposal – PACT, Value Proposition, Key Features<br>Github repo creation |
| 30 Jan 2026 | 1.5             | Dundee             | Finalize project proposal – Contract, AI Use and Worklog                                  |
| 31 Jan 2026 | 2               | Dundee             | Review and finalize initial draft   |

## VIII. References

Cross River Therapy. (2023). Understanding escape-maintained behaviors in autism. <https://www.crossrivertherapy.com/articles/understanding-escape-maintained-behaviors-in-autism>

Nelson, K., Dawson, J., Murphy, C., & Strain, P. (2008). The effects of matching law in combination with functional communication training on out-of-seat behavior in children with autism [Poster presentation]. Association for Behavior Analysis International, Annual Convention, Atlanta, GA, United States. <https://www.abainternational.org/events/autism/atlanta2008/autism-2008-program/poster-session-1.aspx>

Sparapani, P. F., et al. (2015). Measuring classroom engagement of autistic students. \*Journal of Positive Behavior Interventions\*. <https://doi.org/10.1177/1098300715589422>

Wood, R. (2025). Promoting classroom engagement through interest-based instruction. \*Journal of Autism and Developmental Disorders\*.

## IX. Appendix

### List of AI Prompts

| Prompts  |
|--|
| Given our project to create a personalized app for kids on the spectrum to learn, we identified 3 major challenges such as low motivation to learn for non-preferred activities, escapism behaviours and not taking into account special interests and dislikes, find relevant literature that would support each of those challenges. |
| Find other competitor apps aside from what we know so far like TouchChat and CentralReach and compare offerings to North Spark features.   |
| Refine our write-up in a way that does not omit the flow of our paragraphs as well as the main points we are conveying, check for grammatical errors and polish sentences that do not provide clarity.   |
| For the key features, organize the flow of presenting each item in a way that does not convey overwhelming functions considering the important points about our app such as the SEAT framework and taking into account the special interests and dislikes.   |