Extended Abstract

I-Potty Pro: Enhancing Toilet Independence Through Interactive Support for Preschool Children

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ABSTRACT

Teaching self-care independence, specifically toilet training, is crucial for preparing children for school readiness. However, parents and teachers often lack effective tools to guide children through this essential developmental milestone. I-Potty Pro offers an innovative solution with an occupational therapy-based approach to toilet training. What makes it unique is the integration of evidence-based strategies, techniques, and approaches not found in traditional tools. I-Potty Pro directly addresses delayed toilet independence, which can negatively affect a child's confidence and school readiness. It serves as an educational tool for parents, caregivers, and teachers, promoting self-care skills in preschool children through structured, interactive guidance. By leveraging technology, I-Potty Pro fosters independence while advancing early childhood development practices. A cognitive interview approach was conducted with three parents and two teachers to assess the app's usability. Results revealed that I-Potty Pro is "time-efficient" and "accessible ubiquitously by both parents and teachers". The app's scalability makes it suitable for widespread use in preschools, day care and homes. Further study will be conducted to evaluate the effectiveness of the I-Potty Pro application, providing empirical evidence to support its commercialization.

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1.0 Introduction

Over the past century, recommended toilet training methods in North America have alternated between two dominant approaches: rigid, adult-directed methods and more child-focused approaches. In 1962, Brazelton introduced the "child readiness" approach, which emphasizes gradual, child-centered training that respects the child's developmental pace (1).

Common challenges in toilet training include delayed initiation and inconsistent practices (2). Early training may be preferred in some cultures, while others may prioritize waiting until the child shows signs of readiness. These variations are shaped by parental expectations and societal pressures (2). The I-Potty Pro is designed to address these challenges, offering an innovative, interactive approach to promote independence in preschool children. Children who achieve self-care independence often demonstrate strong skills when parents provide appropriate opportunities for modelling and practice (3). These opportunities help children develop age-appropriate self-care abilities and improve their social skills during preschool, which are crucial for school readiness (2).

The I-Potty Pro simplifies toilet training using engaging technology that motivates children through visual cues and personalized feedback. It fosters positive habits in a supportive environment, reducing the frustration often seen with traditional methods. The I-Potty Pro combines consumer technology and healthcare support, enhancing children's independence and benefiting their emotional and cognitive growth through a connected app that provides parental guidance.

2.0 Innovation

This app consists of six tabs in Malay version as shown in Figure 1. Each tab is designed to assist teachers and parents in guiding children through toilet training, providing accessible information anytime and anywhere. All the content is organized and sourced from evidence-based studies. All critical aspects, such as the suitable age to start toilet training, tools, and materials needed, are included in the introduction. This app is easy to understand; however, it requires parents to have an email and internet connection to access it. The content is developed in Malay, as Bahasa Melayu is the national language of Malaysia. The intellectual property rights for I-Potty Pro, including copyright, are currently under application to secure its unique concept and technology **(**IP/PT/00252**).**

Figure 1: Interface of I-Potty Pro app.

3.0 Uniqueness

I-Potty Pro is innovative in its integration of occupational therapy principles with a digital platform, providing evidence-based, structured guidance for toilet training. Unlike traditional tools, I-Potty Pro offers an interactive, user-friendly interface that allows parents and teachers to access resources ubiquitously. The app's comprehensive approach covers all aspects of toilet training, from readiness skills to strategies and tips, ensuring that users have a complete toolkit at their fingertips. The techniques suggested include three combination techniques (4), the Child-Oriented Toilet Training Method, and Foxx and Azrin's Method of Toilet Training in Less Than One Day (1). Previous studies have validated all of these techniques. This unique combination of professional insight and digital accessibility sets I-Potty Pro apart from existing solutions, often requiring parents and teachers to search for information online or rely on paper materials. At the same time, we can support environmental sustainability by going paperless.

4.0 Commercialisation Potential

Grounded in established research on early childhood development, the app holds strong potential for collaboration with educational institutions and healthcare providers, reinforcing both its academic foundation and market viability. Its scalable design supports broad adoption across homes, preschools, and daycare centres. The app's key advantage lies in its evidence-based content and customizable features for children with special needs, including Autism. Potential business models include subscription plans, premium content, and institutional partnerships, supporting sustainable growth.

5.0 Impact on Quintuple Helix

I-Potty Pro promotes child independence and reduces caregiver stress, improving family well-being and school readiness. It contributes to academic research and training in early childhood development. For government, it aligns with Malaysia's Education 2030 Agenda and SDG 4. The app also drives innovation in EdTech and healthcare sectors, while supporting environmental sustainability through a fully digital, paperless approach.

6.0 Conclusion

I-Potty Pro offers an innovative, evidence-based solution to improve toilet training in early childhood through accessible digital technology. Integrating occupational therapy principles with interactive features supports child development, caregiver guidance, and inclusive education. Its scalability and relevance across home, school, and healthcare settings make it a valuable tool for widespread adoption and long-term impact.

Authorship contribution statement

Acknowledgments

Conflict of Interest

The authors declared that they have no conflicts of interest to disclose.

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