BankBox: Online Banking Practice for Older Adults

Mehran Hossain
hossa125@myumanitoba.ca
University of Manitoba
Winnipeg, Manitoba, Canada

Celine Latulipe
celine.latulipe@umanitoba.ca
University of Manitoba
Winnipeg, Manitoba, Canada

Abstract

Online banking has become essential for managing finances, yet many individuals encounter barriers when learning to use these systems. This includes older adults, some of whom have lower technical self-efficacy, which can lead to reliance on family or friends and often involves unsafe financial practices, such as the sharing of passwords or other sensitive information. Existing learning resources for online banking provide limited opportunities for building self-efficacy and lack support for hands-on practice on realistic interfaces. To address this, we developed BankBox, a sandbox environment that simulates the interfaces of Canadian banks and allows users to practice common online banking tasks such as e-transfers or bill payments. BankBox focuses on enabling users to learn independently, without risk, on an interface that closely matches their actual bank. This work introduces BankBox and presents its design and evaluation through user studies with older adults. Findings show that sandbox-based practice can support skill development and improve self-efficacy for online banking through repetition, task completion validation, and increased familiarity with the interface. We discuss how different learning modes affect user experience, and highlight implications for designing sandbox-based learning tools. The system is accessible through a standard web browser at https://bankbox.cs.umanitoba.ca/.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; *User studies.*

Keywords

online banking, older adults, self-efficacy, practice, sandbox learning

ACM Reference Format:
Mehran Hossain and Celine Latulipe. 2026. BankBox: Online Banking Practice for Older Adults. In *Proceedings of Demo at Graphics Interface 2026 (GI '26).* ACM, New York, NY, USA, 2 pages. https://doi.org/XXXXXXX.XXXXXXX

1 Introduction

The use of digital banking has increased significantly over the past decade, especially following the COVID-19 pandemic. According to the Canadian Banking Association [1], the number of bank branches in Canada decreased by 9% between 2012 and 2022 and continues to decline. As this trend continues, online banking is becoming a necessary skill for financial well-being, yet resources to learn it remain limited. While support exists in the form of bank-offered tutorials and demos, they do not allow users to make mistakes, receive feedback, or experience realistic interfaces. Simulated learning platforms also exist but often lack scaffolding and use generic interfaces that do not match users' actual banks, limiting skill transfer.

Older adults are one group that may be disproportionately affected, adopting online banking at lower rates than other demographics [4]. Older adults who get assistance from family or friends may share sensitive information, which can increase vulnerability to misuse or fraud [8]. Based on these factors, we developed BankBox as a learning tool to build online banking self-efficacy and conducted user studies with 12 older adults. While we focus on older adults, other groups who are new to online banking could also benefit from using BankBox.

2 Related Work

Prior work has identified several barriers to older adults' adoption of online banking, including trust concerns, usability challenges, and limited digital skills [3, 4]. These barriers are often linked to lower self-efficacy, which can hinder independent use and contribute to reliance on others for assistance [6, 7]. Despite these challenges, older adults often express a willingness to learn, though many continue to rely on in-person banking due to perceived risks of digital systems [7].

Research on technology adoption highlights the role of perceived ease of use and usefulness in shaping user behavior [12]. Self-efficacy plays a central role in this process, influencing continued use of online banking systems [10].

Prior work on learning for older adults emphasizes flexible and interactive approaches, including self-paced learning, repetition, feedback, and appropriately timed assistance [5, 9]. Interactive and hands-on approaches have been shown to outperform passive instructional methods, leading to improved task completion and skill retention [11].

3 The BankBox System

BankBox is a web-based sandbox system designed to support safe, hands-on learning of online banking. It simulates the online banking interfaces of Canadian banks (currently CIBC and Scotiabank), allowing users to practice common tasks such as e-transfers and bill payments without using real accounts or money. The system is hosted on University of Manitoba servers and is accessible through a standard web browser. The design of BankBox is informed by principles of self-efficacy from Social Cognitive Theory [2], and is intended to support independent learning while accommodating

Demo at Graphics Interface 2026 (GI '26), Waterloo, ON, Canada

ACM ISBN 978-1-4503-XXXX-X/2018/06
https://doi.org/XXXXXXX.XXXXXXX

different preferences through both guided and exploratory interaction.

3.1 Learning Modes

Open Exploration: In this mode, users can freely navigate the banking interface and interact with features without guidance. This mode allows users to familiarize themselves with the layout and functionality at their own pace. This can also be a useful step before using guided learning, as users can see the plain interface before progressing to the guided version with more interface elements.
Guided Learning: This mode supports learning in a structured format by providing users with three modules, each containing a list of tasks to be completed. Guided learning includes:

- Task-based modules containing 5–6 tasks, with some overlap between modules to allow for repetition. Tasks are divided into smaller modules to make learning more approachable and reduce cognitive load.
- Modules are framed using personas (e.g., "Sam the librarian") with 2D avatars. This helps situate tasks in a real-world context (e.g., "Sam needs to pay a bill") and may reduce pressure by shifting focus away from the user and onto a simulated character.
- A hint system consisting of two types of hints: page hints that highlight the interface element needed to proceed with a task, and video hints that show how to complete the task.
- Feedback mechanisms: once users believe they have completed a task, they can click "Done" on the task pane, the system will then indicate whether the task was completed correctly or not.

Test Module: This mode provides a list of test tasks for users to attempt without any hints or direct feedback. Users can click a "See Results" button to see how many tasks they completed correctly.

4 User Study Evaluation

We conducted a user study with 12 older adults (65+) to evaluate how BankBox supports learning and self-efficacy. Participants had limited prior experience with online banking. Each session included a background survey, followed by interaction with BankBox through open exploration and guided learning, and a final test module to assess performance after practice. Semi-structured interviews were conducted to capture participant experiences.

4.1 Preliminary Results

Participants reported a strongly positive experience with BankBox, describing it as a useful and realistic environment for practicing online banking tasks. Guided learning was generally preferred, as structured tasks, hints, and feedback reduced uncertainty and provided support. Open exploration was valued by some participants who preferred trial-and-error learning, though others found it less approachable without guidance.

Practice contributed to improved confidence and efficiency, even for tasks not directly practiced. Participants commonly attributed increased confidence to repetition and familiarity with the interface. However, broader concerns related to security, scams, and institutional trust remained largely unchanged.

5 Conclusion

Our results so far demonstrate that BankBox has the potential to support safe, hands-on practice of online banking. Our findings suggest that the simulated sandbox environment, combining structured guidance with opportunities for independent exploration, can help users build confidence and familiarity with digital financial tools without fear of making mistakes and losing money. While our study participants already had some experience with online banking, the results point to potential benefits for individuals who are newer to online banking or face similar barriers. Currently we are working to evaluate BankBox with older adults who have no online banking experience. Beyond individual use, BankBox could be a support tool for teaching and support in group settings such as digital skills workshops, community programs, or assisted learning contexts. We are working to extend BankBox to include the other big banks and some credit unions. We will also add a two-factor authentication module to allow people to practice that functionality.

References

[1] [n. d.]. See the Latest Statistics on the Number of Bank Branches in Canada by Province. https://cba.ca/article/bank-branches-in-canada.

[2] A. Bandura. 1978. Reflections on self-efficacy. *Advances in Behaviour Research and Therapy* 1 (1978), 237–269. https://api.semanticscholar.org/CorpusID:143591518

[3] Chrysoula Gatsou, Anastasios Politis, and Dimitrios Zevgolis. 2017. Seniors' experiences with online banking. 623–627. doi:10.15439/2017F57

[4] Statistics Canada Government of Canada. 2024. The Daily — Trends in online banking and shopping. https://www150.statcan.gc.ca/n1/daily-quotidien/240321/dq240321b-eng.htm Last Modified: 2024-03-21.

[5] Yixin Jiang, Manushree Singhania, Teerapaun Tanprasert, and Joanna McGrenere. 2026. When To Help? Toward Non-Intrusive Struggle Detection to Support Older Adults Learning New Computer Tasks. In *Proceedings of the Extended Abstracts of the 2026 CHI Conference on Human Factors in Computing Systems*. ACM, Barcelona , Spain, 1–7. doi:10.1145/3772363.3798756

[6] Xiaofu Jin and Mingming Fan. 2022. "I Used To Carry A Wallet, Now I Just Need To Carry My Phone": Understanding Current Banking Practices and Challenges Among Older Adults in China. In *Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility*. ACM, Athens Greece, 1–16. doi:10.1145/3517428.3544820

[7] Xiaofu Jin, Emily Kuang, and Mingming Fan. 2021. "Too old to bank digitally? ": A Survey of Banking Practices and Challenges Among Older Adults in China. In *Designing Interactive Systems Conference 2021*. ACM, Virtual Event USA, 802–814. doi:10.1145/3461778.3462127

[8] Celine Latulipe, Ronnie Dsouza, and Murray Cumbers. 2022. Unofficial Proxies: How Close Others Help Older Adults with Banking. In *CHI Conference on Human Factors in Computing Systems*. ACM, New Orleans LA USA, 1–13. doi:10.1145/3491102.3501845

[9] Carolyn Pang, Zhiqin Collin Wang, Joanna McGrenere, Rock Leung, Jiamin Dai, and Karyn Moffatt. 2021. Technology Adoption and Learning Preferences for Older Adults: Evolving Perceptions, Ongoing Challenges, and Emerging Design Opportunities. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–13. doi:10.1145/3411764.3445702

[10] Begoña Peral-Peral, Ángel F. Villarejo-Ramos, and Jorge Arenas-Gaitán. 2020. Self-efficacy and anxiety as determinants of older adults' use of Internet Banking Services. *Universal Access in the Information Society* 19, 4 (Nov. 2020), 825–840. doi:10.1007/s10209-019-00691-w

[11] Wendy A. Rogers, Arthur D. Fisk, Sherry E. Mead, Neff Walker, and Elizabeth Fraser Cabrera. 1996. Training Older Adults to Use Automatic Teller Machines. *Human Factors* 38, 3 (1996), 425–433. arXiv:https://doi.org/10.1518/001872096778701935 doi:10.1518/001872096778701935 PMID: 8865767.

[12] Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred D. Davis. 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly* 27, 3 (2003), 425–478. doi:10.2307/30036540 Publisher: Management Information Systems Research Center, University of Minnesota.