Developing DigiWish: The Co-Creation of a Visual Strengths-Based Training Tool for Digital Skills

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Digital skills have become a prerequisite for social inclusion in the era of digital transformation. However, many adults, particularly those with low reading literacy, struggle with digital skills. This paper describes the development and testing of DigiWish: a tool that coaches can use to help adults with low reading literacy identify personal and motivating digital learning goals and to work towards these goals. We followed an iterative, user-centered design methodology: An initial prototype of DigiWish was developed and evaluated with community coaches. Feedback from this co-creation session informed a second prototype: a visual and strengths-based tool. Subsequent field testing of the second prototype by coaches suggests DigiWish can help engage and motivate learners. Coaches and volunteers reported that the tool is useful, accessible, and motivating. The paper provides directions for future development and use of DigiWish and similar tools.

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1 Introduction

Digital transformation is reshaping how we work, learn, and participate in society, making digital skills essential for all citizens (de Vries, Piotrowski, & de Vreese, 2025). Digital skills, and similar concepts such as digital literacy, have been defined and operationalized in different ways. In this paper, we refer to digital skills as the abilities required to use Information Society Technology for work, leisure, and communication (Carretero, Vuorikari, & Punie, 2017).

Governments have set ambitious targets regarding the digital skills of citizens. For example, the EU's Digital Decade aims for 80% of citizens to attain basic digital skills by 2030 (European Commission, 2025). However, a significant portion of the population currently lacks basic digital skills. In 2023, 44% of EU residents aged 16–74 did not have the basic digital skills required to participate in the digitalized society (Eurostat, 2023). Persons who have difficulty reading are particularly at risk of exclusion in the digital realm, as low reading literacy is a strong predictor of low digital skills (van Deursen & van Dijk, 2016). Unfortunately, digital skills training often fails to reach and involve people with low levels of reading literacy (Choudhary & Bansal, 2022). Yet, effective digital skills training tailored to people who have trouble reading is essential for ensuring that digital transformation is inclusive rather than widening social divides. The aim of this research is therefore to develop a tool that aids the learning of digital skills in a way that matches the wishes, preferences, and abilities of people who find reading difficult or burdensome. This paper describes the development and testing of this tool: DigiWish (DigiWens in Dutch).

2 Literature Review

Improving digital skills among low-literate adults is a multifaceted challenge that requires tailored tools and participatory development approaches (Choudhary & Bansal, 2022). One challenge is that conventional digital skills training and assessment tools often assume a baseline level of reading literacy. For example, the DigIQ online test in the Netherlands allows people (aged 10 and up) to evaluate their digital skills and receive personalized advice about how to improve (de Vries et al., 2025). However, text-based self-assessments like the DigIQ have trouble engaging adults who struggle with reading (de Vries et al., 2025). For people with

low reading literacy levels, the use of spoken communication, plain language and/or visual aids is a more useful alternative to text-based assessments (Kim & Lee, 2016).

Research indicates that effective digital skill programs for low-literate adults should incorporate tools that not only align with their reading literacy levels, but also with their learning preferences. For instance, the Digital Learning Ecology (DLE) framework emphasizes the importance of context, design, and motivation in creating mobile learning solutions that engage low-literate adults (Nedungadi et al., 2020). Similarly, a study on digital skill training for older adults highlights the effectiveness of personalized, volunteer-led programs that improve digital skills through one-on-one interactions, suggesting that tailored approaches can significantly enhance learning outcomes (Ngiam et al., 2022). Previous research thus emphasizes the need for interactive, personalized, and contextually relevant learning experiences.

Moreover, research shows that a participatory development approach is necessary for understanding what motivates and aids learners (Halvorsrud et al., 2021). Involving learners and trainers in the design process can make the tools developed more relevant and effective. For example, Smith and colleagues (2022) used co-design to create an Integrated Digital Literacy and Language Toolkit, which promotes meaningful learning among vulnerable migrant students in higher education. Furthermore, a study on mobile learning support tools for low-literacy adults found that involving users in the design process increased their motivation and confidence (Munteanu et al., 2014). We thus opted for a co-design approach to develop a highly visual tool for interactive, personalized, and contextually relevant learning in one-on-one interaction.

3 Methods

The project was a collaboration between a university research team and community partners, including a public library and adult education organizations. Our research followed a design science and participatory co-design methodology, consisting of two development iterations. The end-users targeted were adults who have difficulty reading (low literacy) and who likely have unmet digital learning needs. Because directly involving low-literate adults in early design can be challenging and demanding for them, we engaged intermediaries – namely, volunteers and coaches who work with the target group – in the co-creation of the prototypes.

The first prototype was developed together with a design company based on a literature review and explorative interviews. This prototype was then evaluated and built-upon in a three-hour co-creation session. Five experts (three youth social workers, one special education media coach, and one mental health support worker) participated in the co-creation workshop for Prototype 1. During this workshop, participants simulated using the first DigiWish prototype in pairs (one acting as coach, one as the learner) and provided feedback through guided discussion. We collected notes on their observations, experiences, and suggestions. This qualitative feedback was analyzed thematically to identify key issues and improvement opportunities. In essence, the workshop doubled as both a usability test and a design brainstorming session, consistent with participatory design methods.

Based on the feedback and ideas from the co-creation session, we developed a second prototype, together with the same design company. We then tested the second prototype in the field by distributing the Prototype 2 kit to volunteer digital coaches at two community organizations (a public library and a digital inclusion and employment coaching program). These practitioners used DigiWish with their clients during one-on-one coaching sessions. We conducted semi-structured interviews (in person and via email) with the coaches and volunteers. The interview questions covered how they used DigiWish, what the client's reaction was, and suggestions for improvement. The interviewees were people who had not joined the co-creation workshop.

For the co-creation session, written notes and audiotapes were reviewed and compared by two members of the research team and key points were grouped (e.g. comments about "language too difficult" were grouped under an Accessibility theme). For the field test interviews, we summarized written and verbal feedback from interviews and clustered comments to identify common sentiments (such as overall usefulness, specific liked features, or issues in certain contexts). We triangulated these insights with our observations from design meetings to formulate the results. The iterative nature of our methodology – design, test, redesign, and test – follows principles of agile development in educational technology.

Ethical procedures were observed: participants gave informed consent to participate in design sessions or interviews, and the focus was on tool utility rather than personal data of end-users. Ethical approval for these procedures was obtained at the University of Amsterdam.

4 Results

We present the findings in four parts: (1) the development of a first prototype; (2) feedback from the Prototype 1 testing and co-creation session; (3) the redesign resulting in prototype 2; and (4) evaluation of Prototype 2 in the field.

4.1 Prototype 1 Development

We began by (a) reviewing prior digital skills tools and literature on accessible design and (b) brainstorming with practitioners who work with digital skill learners with low reading literacy. Based on our findings, we concluded that the tool should be a **highly accessible (visual), motivating**, **personalized**, **non-threatening experience** that could be facilitated by a coach and **tailored to an individual's life context**. More specifically, the tool should be designed to help people articulate what they wish to learn to do online and motivate them to take first steps toward that goal. Experts also recommended that the tool should not be digital, but rather a **tangible conversational** tool, as people with low digital skills may avoid computers.

Incorporating these best practices from the literature and recommendations and experiences of practitioners, we conceptualized DigiWish Prototype 1 as a **tangible** card-based toolkit. To tap into **personal intrinsic motivation** and **tailor to an individual's life context**, the content of the cards was organized around seven life domains – drawing from the "Wheel of Life" framework (Swart, 2022) commonly used in coaching (domains included Health, Work/School, Family & Friends, Identity, Leisure, Community Participation, and Love/Romance). We created 40 prompt cards for **conversations**, each representing a topic within one of these domains (for example, a card for "Travel" under the domain of Leisure). On the front of each card, we printed a relatable picture depicting the topic, to serve as a **visual** "talking piece". On the back, we listed a few simple questions that a coach

could ask to explore the person's interests or needs in that area, including apps or online tools related to the topic.

The intended use was that a coach and learner would go through the cards together: The pictures would spark discussion about what the learner wishes to do or improve in their life, and the coach could then help identify a digital wish that is **personally meaningful** to the learner (e.g. "I want to video chat with my grandchildren" or "I'd like to learn to use online maps.") The aim was to have a **non-threatening** tool that was not quizzing their current skills, but rather uncovering a motivation that could drive learning.

4.2 Co-Creation Workshop (Prototype 1)

We tested and discussed the first prototype in a co-creation workshop. Participants in this co-creation workshop responded favorably to the concept of using visual life-domain cards. They agreed that this approach "has potential." The images acted as icebreakers, helping practitioners start a conversation in a learner-centric way. Despite this promise, the session uncovered several critical issues: First, the textual prompts on the back of the cards were too complex and abstract for the target group. The coaches felt that questions like "What would you like to learn online in this area?" were not concrete enough to elicit specific answers from learners, especially those who may have trouble articulating needs. In some cases, the wording was too difficult. One coach remarked that: "Spoken language can also be a problem for persons who have a preference for working in a visual way," indicating that even if the learner isn't reading, the coach's reliance on reading complicated questions aloud could be a barrier. The participants suggested simplifying language drastically and relying even more on imagery or examples to guide conversation.

Second, participants highlighted a lack of a clear pathway to action. While Prototype 1 helped identify a goal (e.g. the person wants to be able to shop online safely), it did not help break that goal into actionable learning steps. One participant remarked about the questions on the back of the cards: "How does it feel if someone comes to you for help and you answer their question with another question? Why not a solution?" Participants expressed the need for bridging to actual learning opportunities, such as referencing appropriate courses, apps, or tutorials once a wish is identified.

Third, another key theme was the importance of a strengths-based approach. Co-creation attendees stressed the importance of beginning with what someone already can do, instead of emphasizing what they cannot. They shared that many low-literate adults have accumulated "splinter skills" – partial digital skills developed informally – and that acknowledging these can empower the learner. For example, one person might not use email but is proficient at sending WhatsApp voice messages; another can navigate by a transit app but not by general map apps. DigiWish should capitalize on these existing competencies, celebrating any skill the person already has, however small, to build confidence before introducing new steps.

Lastly, flexibility was identified as crucial. The group noted that different facilitators have different styles and different clients have unique preferences and existing skills. One participant gave an example: "One person plans a trip with Google Maps, another with the train company app. The tool must be flexible to accommodate multiple ways to reach similar goals." Another participant said: "Wouldn't it be great if someone else can draw and paste alongside you?" This emphasized that DigiWish should not enforce a single learning sequence but rather allow adaptability. In summary, in the words of one participant, the ideal tool would be "Something that is accessible, positive, not too difficult, and with not too much text."

Figure 1: Testing the first prototype

4.3 Prototype 2 Development

Based on the co-creation findings, we developed Prototype 2, aiming to address the shortcomings of the initial version: simplify and reduce text; add mechanisms to go from wish to plan; use a format that highlights user strengths; and ensure the tool

can be adapted to various contexts. Prototype 2 was developed in collaboration with the same design partner, ensuring continuity and professional polish in the materials.

Table 1: Evolution of DigiWish prototypes through co-creation feedback.

Aspect	Prototype 1	Prototype 2
Purpose	Help coach **discover the learner's digital wish** (goal) by exploring life domains and interests. Emphasis on inspiration and motivation rather than on testing skills.	Help coach and learner **define a wish and outline a learning path** with concrete steps to achieve it. Emphasis on both motivation and planning next actions.
Format & Content	40 physical **cards** across 7 life domains (Wheel of Life categories). Each card has a picture on the front and several prompting questions on the back. The cards serve as visual conversation starters about what the person finds important or wants to improve in life.	Card-based toolkit **including "wish" cards** (with pictures, fewer words), new **"step" cards** to write down or select actions, and a **"board"** to provide insight into existing skills and steps for which actions learning and/or help is needed. Strong visual design with images and icons, significantly reduced text. Provides a **flexible** template to jointly create a sequence of learning steps toward the user's goal while also emphasizing existing **strengths**.
Facilitation	**Coach-driven questioning** using text prompts (learner does not need to read but must process spoken questions). The interaction is relatively open-ended: coach and learner discuss interests sparked by the cards, aiming to identify a concrete digital skill learning goal.	**Collaborative**: coach and learner both select cards. The learner can choose or draw images that resonate; coach uses simple prompts or examples if needed. Once a digital wish is chosen, they *co-create* a plan by ordering step cards or drawing a path. More hands-on engagement for the learner (e.g., physically placing cards) to accommodate **creative and visual** thinkers.
Feedback from Testing	**Potential seen**, but several issues: (a) Questions on cards were still too abstract and language-heavy for some – making the tool "too verbal" despite images. Some users might find spoken questions daunting if they prefer non-verbal learning. (b) Lack of clarity on translating wishes to actionable learning (c) More emphasis needed on acknowledging what learners *can already do* to boost confidence	**Highly positive** reception: coaches/volunteers found Prototype 2 **very useful, helpful and motivating** in guiding conversations and planning. The tool was flexible to different contexts. Overall, it addressed most issues from Prototype 1: **less language-focused, concrete learning actions** as output, and a **strengths-based and motivating** process. Minor suggestions were made **and incorporated in a free download**, so users can print the DigiWish themselves or in a copy shop.

The second prototype's design emphasized even more minimal text and more visual guidance, based on the feedback of the coaches that the first prototype was too language-based. For example, we removed the back-of-card questions and instead provided short prompts or icons to guide the conversation. Furthermore, while Prototype 1 was about inspiration (finding a wish), participants noted it lacked

support for translating that wish into action. To this end, Prototype 2 introduced a new element: "step cards" that help break down a goal or wish into smaller steps or learning actions. The step cards show different applications, websites, and devices, which can be used to reach a desired goal or wish. In prototype 2, once a learner's goal has been identified using the "wish cards" of prototype 1, the coach and learner together outline an action plan. They might select or write down a first step (e.g. Using the camera app") on a step card, then a next step (e.g. "Attach a photo to email"), and so on, creating a visual sequence or "roadmap" of the steps required to reach the goal. The steps can differ per goal and also per person even with the same goal or wish. There are also empty step cards to draw additional steps on. This makes the tool flexible and allows learners to make use of their "splinter skills." Furthermore, the steps can be structured on a newly developed "board" into what a person can do already by themselves, what they can do with help, and what they can learn to do. The "learn to do" category can offer inspiration for concrete learning goals that are in line with the learner's personal goals and motivation. Also, by including a category with what one can do already, we incorporated the explicit recommendation from the co-creation session to use positive, strengths-based framing. In the guiding manual, the DigiWish also explicitly prompts coaches to start by acknowledging what the learner already can do, avoiding a deficit-focused approach. Table 1 summarizes the two prototype iterations of DigiWish and how the design evolved.

Figure 2: The second prototype

4.4 Field Evaluation Results (Prototype 2)

The second prototype of DigiWish was met with enthusiastic feedback from the coaches and volunteers who integrated it into their sessions. Evaluators reported that the tool helped them engage clients in discussing digital skills in a "playful but effective" manner. Coaches found DigiWish valuable in uncovering learners' needs and motivations. "It's a handy and simple tool that we will definitely use more often," said one library volunteer. The tool was helpful particularly for people who did not know what they wanted to learn, which according to interviewees happens frequently. "The theme cards helped to start the conversation." Furthermore, the tool was found to be easy to use and accessible. As one volunteer remarked: "It's not complicated. After a sort learning moment, you can start straight away." DigiWish was also found to fit well with the organizations' usual way of working as "It fits better than a questionnaire, which puts visitors off."

The introduction of step cards and board were praised for bringing structure and motivating action. Coaches reported that clients could literally see their path forward laid out on the table, which made the learning process more tangible. "It was perfect to make the priorities and learning order clear," noted one volunteer, referring to how the step-by-step plan provides a shared understanding of where to start and what to do next. He continued: "A nice overview for the client that we keep expanding with relevant step cards… I was very satisfied with the result, and our client was too. We immediately scheduled a follow-up appointment to work on clearing her phone and then moving her photos to her laptop. She also took a picture of the board herself." Other coaches mentioned as a positive point "the three strokes on the board, which make clear what can be learned." This illustrates how DigiWish not only identifies a goal but actively facilitates the planning of learning activities, which is a critical outcome.

Respondents also highlighted the positive tone and strengths-based approach of DigiWish as a benefit. One coach remarked: "' *I can do this'* is good because it works from a positive strengths analysis." The field test also confirmed that the second version of the DigiWish was flexible, as intended. Different facilitators adapted DigiWish to their style, which the tool allowed. For example, some took out all the step cards at once, whereas others made a pre-selection. DigiWish was flexible enough to accommodate both approaches.

While the overall feedback was very positive, participants also provided suggestions. For example, because we used stock images and icons, a couple of coaches mentioned that not every image was immediately clear or culturally perfect for every client. Furthermore, one volunteer expressed preferring to "start doing straight away, rather than just talking." Other suggestions included: making cards in multiple languages, including a way to categorize learning goals into learn now versus for the future, a method to gain more insight into the network of persons who can help the learner with digital skills, and a box or pouch to keep the DigiWish cards tidy and structured. Importantly, no one suggested the need for more text or instructions, implying our minimalist approach to text was on target.

In summary, Prototype 2's evaluation suggests that DigiWish is a user-friendly tool for engaging low-literate adults in learning digital skills. It is promising for creating a positive experience for learners and provides coaches with a clear method to identify needs and plan training. The findings also point to potential enhancements. Some of the more minor alterations were made before the DigiWish was shared as a free download for printing. Other suggestions may be incorporated in potential future iterations.

5 Discussion

5.1 From assessment to empowerment

Traditional digital literacy programs often begin by assessing what learners do not know, which can inadvertently discourage those with low self-confidence. DigiWish instead starts with a learner's aspirations and existing strengths to chart a path forward. Rather than merely testing skills at program intake, facilitators can use tools like DigiWish to have a constructive dialogue with learners, thereby personalizing learning goals and pathways. The enthusiastic response from coaches to this approach suggests that empowerment-based approach may be a better fit than assessment for this audience. This finding aligns with theories of adult learning, which emphasize the importance of self-directed goals and immediate relevance for adult learners (Howard et al., 2020).

5.2 Limitations and recommendations

It is important to also acknowledge the limitations of our study and tool. First, our evaluation was qualitative and involved a relatively small number of participants. While the feedback is encouraging, further research with both coaches and learners is needed to assess effectiveness for learning on the short and long-term. A next step could be a longitudinal study tracking learners who have gone through the DigiWish process, to see if it leads to higher involvement and retention in digital education programs or greater self-efficacy and usage of digital services. Second, as with any tool, one size may not fit all. The feedback hinted that slight variations of DigiWish might better serve different contexts (e.g. an adaptation for jobseekers versus one for senior citizens, each with context-specific imagery and example tasks). We hope further testing and use by other organizations will lead to further improvements and upscaling of DigiWish, potentially also in other languages and contexts.

One question open to exploration is whether the DigiWish methodology may also be useful as a tool in digital inclusion and digital skills research. Researchers studying digital skills and learning could explore if (an adaptation of) DigiWish offers a useful substitute for text-based assessments of digital skills. This could be a less threatening and more motivating alternative to "testing", particularly for certain groups in society who are currently underrepresented in digital skills research. We can also envision that a variation of the DigiWish methodology, i.e., visualizing pathways to reach a goal and identifying where a person gets "stuck," may be useful in uncovering (in)accessibility issues of digital tools and processes.

6 Conclusion

We have developed and tested DigiWish, an innovative co-created tool aimed at improving digital skills among adults with low reading literacy. Through two cycles of design and feedback, DigiWish evolved from a concept to a practical aid that community coaches have evaluated as accessible and motivating for learners. The tool shifts the focus from testing knowledge to inspiring a desire to learn, and it helps translate that desire into a concrete learning path. DigiWish in its current form is a prototype and there are still improvements to be made. However, as we have seen the usefulness of DigiWish in its current form, we have developed a free download version, which anyone can print themselves or at a copy shop (including

print instructions).We hope this work inspires further research and action toward inclusive digital empowerment.

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