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# TechBuddies: Engaging Students to Teach Retirees about Technology

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## ABSTRACT

Retirees suffer from impaired mobility, loss of friends and family, and loneliness. Although these problems could be mitigated through the use of digital communication devices and the internet, many retirees lack the skill and confidence to use them effectively. The existing community initiatives that aim to help retirees understand technology often lack volunteers to teach them. This is why we developed TechBuddies, a two-component system aimed at engaging more students as volunteers. The first component consists of an interactive display that raises awareness about volunteering opportunities by simulating an interaction between a retiree and the potential volunteer. The second component involves an app-based platform that facilitates communication about events and encourages long-term engagement. TechBuddies raises awareness about and provides a platform for inter-generational interactions between students and retirees who are interested in using it to pursue personal interests

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## Keywords

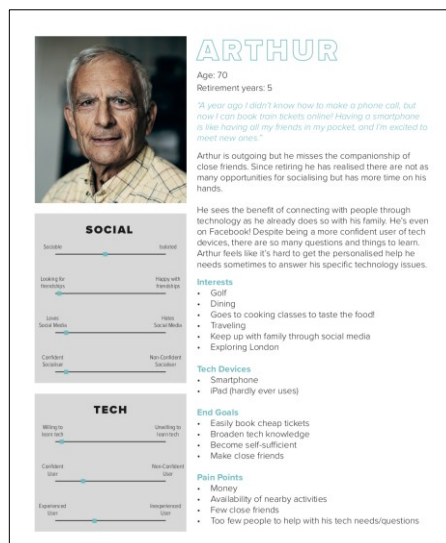
Retirees; students; teaching technology; community; interactive display; app

*“Some people come here [tech sessions], and they don’t see anybody, they just sit there all day waiting for help.” – Retiree*

*“Everyone here is so good to me, when I first came there was a young man who taught me, I told myself that I would never learn, and he taught me. It’s really boosted my confidence.” – Retiree*

*“My confidence [with technology] comes from the support I get from the volunteers here.” – Retiree*

Figure 1 – Example Persona



## 1 INTRODUCTION

Technology use is ever increasing, creating huge opportunities in education and communication, but some users are being left behind. In the UK alone, there are 4.5 million adults who have never accessed the internet, more than half of which are aged 75 [7]. Many older people lack confidence using technology, leaving them unable to take advantage of its connective abilities. Older people already face difficulties such as the loss of friends or family, limited mobility [1], and loneliness [5], all of which could be mitigated through the use of technology.

The success of technology teaching initiatives such as “Digitales Lernzentrum Berlin” (GER) [2] and Teach Seniors Tech (US) [8] demonstrate the need for such opportunities. However, they are still sparse and the number of individuals able to take part is still limited.

We collaborated with the Abbey Community Centre (ACC), which hosts sessions for helping retirees resolve technology related questions. After conducting several interviews with the host, retirees, and volunteers, we found that the main problem with the session was a lack of volunteers who were willing to teach the retirees.

We developed TechBuddies, an interactive two-component platform that highlights volunteering opportunities to potential volunteers, creates a stronger incentive to participate, provides the host with a structured system, and encourages long-term commitment.

## 2 RESEARCH & REQUIREMENTS GATHERING

### 2.1 Retirees

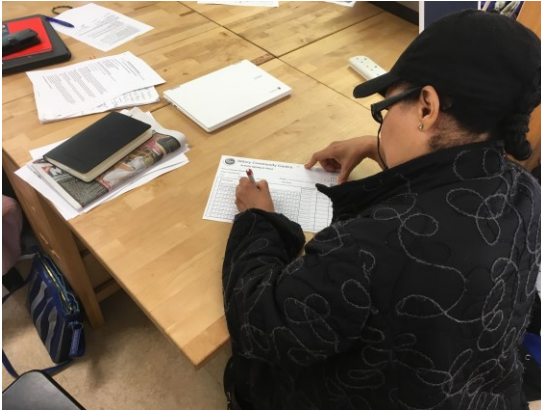
To gain insight into some of the challenges retirees face, we conducted an exploratory contextual inquiry by attending several retiree technology teaching sessions at the ACC. We helped retirees solve the problems they had with their devices to get a better understanding of the teaching session dynamics.

After the sessions, we conducted semi-structured interviews with nine retirees and two session hosts concerning retiree attendance, interests, and attitudes towards technology use. A follow-up phone interview was conducted with a session host to determine the rationales of volunteers attending the teaching sessions. Our findings were summarized in three personas (Figure 1) and analysed via thematic analysis and affinity diagrams, which revealed several key insights.

Firstly, the tech sessions lacked communication between attendees, as it was unclear how many volunteers and retirees were coming to each session. This affected both retirees and volunteers as they would not find out about a session cancellation until after arriving at the ACC. From this finding, we aimed to introduce a sign-up process to allow for better communication of event details and prevent unnecessary travel to the community centre.

Secondly, retirees were willing to learn from volunteers and practice how to use digital devices but took disorganized notes. In some situations, this made it difficult for retirees to locate relevant notes when practicing, and they sometimes struggled to complete a task (Figure 2).

**Figure 2** Retiree observation of note taking during sessions



**Figure 3** – Quotes from session hosts

*“I don’t really advertise the Saturday class anymore because it gets packed[...]If I do more advertising I’ll be overwhelmed by the people who need help with their technology.” –Session host 1*

*“We have lots of older people wanting to come in and use our service but we don’t have as many younger volunteers as we would like to have and sometimes it’s difficult to recruit those volunteers” – Session host 2*

Thirdly, retirees were highly motivated to make close friends or strengthen existing relationships through technology. They were also interested in using it to pursue personal interests such as cooking classes and traveling. This further demonstrates how there is a need for increasing the accessibility of technology for retirees.

Finally, after iterative user feedback, we found that there were not enough regular volunteers attending the ACC tech sessions. Although retirees were highly motivated to improve their tech-skills, they outnumbered the volunteers who were available to help them with their questions. This ratio of retirees to volunteers was so imbalanced that the host had to cease advertisement for the session to prevent feeling further overwhelmed by the number of retirees (*Figure 3*).

## 2.2 Students as Teachers

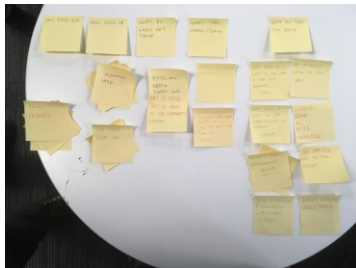
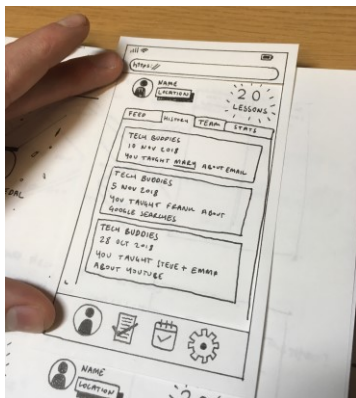
Because of the apparent need for more volunteers, we aimed to identify a user group that our final solution could involve in the volunteering process. As volunteers would have to be able to explain and teach basic concepts of technology, they would need to have sufficient English conversational skills and experience with digital devices. Additionally, they should have a pre-existing interest in volunteering opportunities. After much evaluation of various user groups, we opted for students at University College London (UCL). Considering the entry prerequisites for students at UCL, we were confident that the English and tech-knowledge requirements were met. Additionally, previous research shows that students are highly interested in volunteering opportunities [6].

We then conducted an online questionnaire that was advertised via social media. The questionnaire was targeted at UCL students and assessed their interests and current engagement in both volunteering opportunities and other activities. We gathered a total of 89 responses (38 men, 49 women, and two rather not disclose) from 18 national and 71 international students. The average age range was 22-23 years. The results indicated that students were interested in volunteering in the local community (71%) but did not feel integrated into the community (51%). In the case of international students, this was mainly due to language barriers (36%). Additionally, international students were actively trying to improve their English (76%), but were using methods (e.g., online courses) that did not provide as rich an experience as volunteering. Further, the results indicated that the main factors that would incentivise both national and international students to volunteer were the opportunity to improve their CVs (41%), and feeling rewarded after helping others (66%). More specific to international students were the opportunities within volunteering to improve English conversational skills (46%).

## 2.3 Requirements

These findings indicated a clear opportunity to bring together two communities that could mutually benefit from the connection. From the findings, the following list of core requirements were established:

1. Raise awareness about this volunteering opportunity to UCL students
2. Encourage long-term engagement with the community centre
3. Introduce more structure to the teaching sessions

**Figure 4** User Journey**Figure 5** App Wire Framing**Figure 6** Slider Notebook

## 2.4 Initial Ideas & User Feedback

Based on our findings, we brainstormed ideas that could fit into three sections: physical devices for retirees to interact with, digital devices for volunteers, and mechanisms to bring the two together. To merge our ideas, we created a task analysis of the user journey and organized our ideas to fit into the storyline (Figure 4). From this process, we narrowed in on three ideas using a weighted-factor scoring table.

### 2.4.1 The App

The first idea involved an application which enables students to sign up to teach at ACC tech sessions, see who else is going, and take notes on their personal learnings gained through the session. To evaluate and user-test our idea, we first created a medium-fidelity prototype of the app using sketches (Figure 5) and Pop (Figure 7 - left), a prototyping application. The user-test involved a think-aloud protocol in which users were asked to locate several features of the app.

While the app was seen as a good way to help students gauge who else was going, there were too many functions, some of which seemed to be overlapping such as the “feed” and “events” sections. This was indicative of a need to simplify our app and reduce the number of available functions. Additionally, some of the terminology was unfamiliar to students whose first language was not English. To address this, we made minor changes to the app design by combining the two overlapping functions and changing the terminology to cater to non-native English speakers. This resulted in our high-fidelity prototype of the app (Figure 7 - right).

### 2.4.2 Book & Board

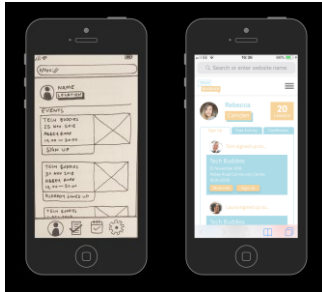
The second idea involved two physical devices for retirees to use to facilitate and track their learnings. Retirees would use a structured notebook with sliders to track their progress (Figure 6) and visualise it on a board displayed at the centre. This would add structure to retirees’ note-taking and provide a simple visualisation of their progress. However, user evaluations showed that retirees did not feel the need to track their progress while others were unwilling to publicly display their learnings at the centre. Thus, we decided to drop this idea and focused more on the main issue of bringing more volunteers into the centre, as addressed by the interactive display.

### 2.4.3 Interactive Display

The third idea was an interactive display located in the university to attract students’ attention and raise awareness about the volunteering opportunity. To help with brainstorming, we drew inspiration from existing informative and interactive public displays such as the Green Squeazy Balls [4] and tangible survey interfaces such as VoxBox [3].

Through two semi-structured interviews with current ACC volunteers, we found that the human-to-human interaction and the feeling of having helped someone were their main reasons to volunteer regularly.

**Figure 7** Low Fidelity (left) to High Fidelity Prototype (right)



### App User Testing

*“All the reasons from the interface would convince me to go volunteer” – student (China)*

*“I wouldn’t download an app, I have too many already. An online sign up or web-app would be better” – student (China)*

### Story Board Evaluation

*“I’d only interact with it if it was clear you were supposed to, like if there was a ‘Go ahead, answer me!’ type of thing” – student (UK)*

**Figure 8** Section of storyboard for evaluation with students



Thus, we wanted to simulate this experience to elicit similar feelings in prospective student volunteers. To evaluate this idea, we developed a user scenario and storyboard, and conducted seven semi-structured interviews with national and international UCL students (Figure 8). The idea was positively received by all students as it was perceived as novel and intriguing. Only one student expressed concerns about picking up a phone call from a stranger.

## 2.5 The Final Product

Our final product is Tech Buddies, a two-component system that aims to bring in more volunteers to teach retirees about their technology and encourage long-term volunteering.

The first component is an interactive display consisting of a physical phone and an interactive screen (Figure 9) that would be placed near student hotspots such as water fountains. The display should grab the attention of students and encourage them to volunteer at technology teaching sessions at local community centres. This would be done via a short simulation of the experience students will have when teaching at the community centre. The simulation uses pre-recorded footage and audio of a retiree briefly describing a problem. Students then interact with the display to help solve this problem, after which the retiree expresses their gratitude. This addresses university students’ pain point of being interested in but unaware of possible volunteering opportunities and gives them an idea about what teaching at the centre would be like. The second component is a web-based phone app (Figure 10) for volunteers that aims to facilitate the volunteering experience. The app can be used to log teaching sessions, see when other volunteers are signed up to teach, and take notes on personal learnings. These functions were included to address international students’ pain points of feeling unintegrated into the local community due to language barriers by offering a chance to participate in a volunteering experience that could help them practice English conversation.

### 2.5.1 User Scenario

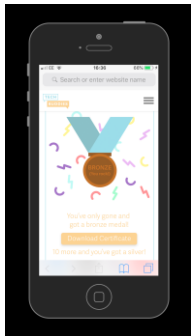
Students going to fill up their water bottle would notice that the display is inviting them to pick up the phone (Figure 9). After the student picks up the phone, they would be led through a 15 second technology teaching simulation with a recording of a retiree. The display then directs to a QR code that links to a web-based app. Students can then create an account, sign up for teaching sessions at a community centre, and see who else is going. Upon arrival at the community centre, students bring up their personalised QR code, which is automatically generated when they first make an account in the app. This QR code would then be presented to and scanned by a simple digital register at the community centre that automatically updates the session in the app. This design choice was made to ensure that volunteering sessions could not be faked. This not only allows students to track their own teaching experience, but also enables quantification of their volunteering work. This quantification is important when referencing their experience in their CV. To increase engagement in teaching, we decided to gamify this aspect of the app through unlockable certificates after specific numbers of teaching sessions (Figure 10).



**Figure 9** Students interact with display to learn about volunteering



**Figure 10** Web-App for students to sign up and track volunteering



## ACKNOWLEDGMENTS

We want to thank the members of the Abbey Road Community Centre and the students participating in research. We also want to thank our mentor Frederik Brudy for his advice and feedback.

## 3 DISCUSSION

TechBuddies raises awareness about and provides a platform for inter-generational interactions between students and retirees who are a part of the same local community.

Employing a user-centred approach, we identified interests and pain points of users and implemented these insights in our designs. Iterative user tests guided us through the design process and ensured that our final product would solve a real problem for real people.

Our solution allows the teaching sessions to be more than a one-sided experience where students give their time and retirees receive help. By engaging student interests, both parties are able to improve their respective skill-sets and create valuable experiences. Besides the mainly positive responses to TechBuddies, there are some limitations to our approach. Firstly, our storyboard evaluation indicated that students from East-Asian cultures might be hesitant to interact with our solution in semi-public settings, such as universities. Further, we tested our interactive display through storyboard evaluations with users, but we did not test it “in the wild”. Future iterations of TechBuddies should address such cross-cultural differences and go beyond storyboard evaluations. A final limitation of our solution is that the app is less accessible for retirees. Although it is mainly geared towards volunteers, retirees would also benefit from access to the sign-up features. Thus, it should be explored whether retirees are capable of using the app without major issues.

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