

# **Enhancing Tandem Language Learning Using an Interactive Tabletop**



**UNDERGRADUATE HONOURS THESIS  
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UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY**

**Erik Paluka**

**SUPERVISOR:  
Dr. Christopher Collins**

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## **Abstract**

Language learning is a difficult thing. Despite this, there exists many language learning models that help learners achieve their goal. One collaborative model is tandem language learning. It is based on the mutual exchange of language between partners. Using the collaborative nature of interactive tabletops, along with computer-assisted language learning software, the tandem language learning process can be enhanced. The goals of this thesis are to understand the tasks and context of tandem language learning, and with this knowledge, design and implement a tabletop software prototype that is meant to enhance the tandem language learning model.

To complete this task, I conducted a grounding study where I observed a tandem language learning environment, and interviewed its administrator and four participants. From this study, I created some design requirements for tandem language learning prototype design. With these design requirements in mind, I designed and implemented a software prototype for an interactive tabletop using the Java programming language.

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# **1 Introduction**

For the average person, tables are used extensively in normal life. A lot of the time, they are used as a gathering place for people to perform social activities such as eating meals together, conversing, and completing group work. The last example is of high significance to me as tables in our environment become increasingly computerized. The underlying technology in those interactive tables offers users a much greater opportunity to collaborate and perform group work. They now have a flexible medium, in the software sense, which can change on the fly based upon user input. Another advantage is that the input does not necessarily have to be the normal mouse and keyboard since they accept multi-touch as well. The problem is identifying and designing software that enables and enhances the collaboration that takes place around tables. To be successful, the designers of the software must first identify the specific task that the digital table will enhance. In my case, I have identified language learning and in particular, language learning between two people of differing languages, also known as tandem language learning.

## **1.1 Problem Statement and Motivation**

As the world becomes more connected, people are increasingly coming into contact with other cultures, and their respective languages. Not understanding the language of the person that you are connecting with creates a barrier. This barrier is profound as it limits your ability to communicate, which is at the heart of everything we do. To mediate this, we need to come up with new language learning models or enhance previously created ones. One model that has high potential for enhancement is tandem language learning. It is based on the mutual exchange of language knowledge between partners through interaction. Utilizing new technologies, such as multi-touch tables, to enhance this language learning model would give one a great opportunity to create a better language learning experience. The question that comes to rise is how can a multi-touch table enhance the exchange of language knowledge between two people with minimum understanding of each other?

## **1.2 Goals**

This thesis consists of two goals. The first goal is to understand the tasks and context of tandem language learning through conducting a study. The second goal is to design a software application prototype for a multi-touch table that enhances the exchange of language knowledge between two people with minimum understanding of each other, i.e. two people of differing languages. The software should take full advantage of the multi-touch table's capabilities by enabling multi-touch input, and through the fact that the table is the centre piece between the two users.

### **1.3 Thesis Overview**

In Section 2, I will explain in detail what tandem language learning is, and do an overview of interactive tabletops, as well as computer-assisted language learning. In Section 3, I will present my participatory observational study of a tandem language learning environment with an interview portion of its administrator and four participants. I will then summarize the results and present requirements for tandem language learning prototype design. I will go into detail about the design of my prototype in Section 4. In Section 5, I will go through the implementation details of my prototype. In Section 6, I will discuss future work and end with a conclusion in Section 7.

## **2 Background and Related Work**

### **2.1 Tandem Language Learning**

There are many benefits from learning a second language. It broadens potential career opportunities, teaches discipline, increases intelligence (there is a correlation between language learning and higher academic achievement on standardized test measures [1]), and countless other benefits. The problem is that second language acquisition comes with many challenges. It is very tedious and it takes a lot of effort, time and patience. For some, it is a lifelong learning process. Despite persistent effort and practice, most adult second language learners will never reach the same competence as native speakers of that language. It is even rare for children as well. There comes a point where the learner's progress towards the target language plateaus, also known as

fossilization [2]. Notwithstanding, fluency can still be achieved. Therefore, fluency should be the goal of language learning models.

There exist many models for teaching languages. These models vary from personal tutoring to computer-assisted language learning (CALL) software. Some are meant for multiple students learning at a time (e.g. students in a classroom setting) and others are meant for only one, such as the software application called “Rosetta Stone [3]”. The model that I am interested in is called “tandem language learning [4]” which consists of only two students, but the difference here is that each student is a teacher as well. It is collaborative learning model and is based on the mutual exchange of language between partners. Each student is a fluent speaker in the language the proponent wants to learn. Through interacting and conversing with each other, language skills are learned and improved. These include listening, writing, reading, and speaking skills in the foreign language, as well as translation skills. Another benefit is partners learn more about one another’s character, culture, and any other information that they reveal, thus it also facilitates intercultural learning.

Tandem language learning is based on two principles, the principle of reciprocity and the principle of learner autonomy [5]. The principle of reciprocity states that successful language learning in tandem relies on the reciprocal dependence and mutual support of the partners. Both partners should contribute equally to each other’s language learning, and should benefit to the same extent. Thus, learners should dedicate the same amount of time to each language. Since both partners are learning a language and benefiting from the reciprocal partnership, they will have fewer inhibitions in expressing themselves in the foreign language than they would in a solely student-teacher scenario.

The principle of learner autonomy, which tandem language is also based on, states that each partner is responsible for their own learning. Each partner decides what they want to learn and when, and they can only expect from their partner the support that they themselves have defined and asked for. Therefore, it is important to state, at the beginning of each tandem language learning session, what your learning goals are and how your partner can help you. Another reason why taking responsibility for one’s own learning is

important is that partners generally have different learning goals, and methods, since they will most likely have different learning experiences and needs.

Typical tandem language learning sessions will have both partners interacting in the same language for a specified period of time, usually 5 to 30 minutes, and then switch to another language for the same amount of time. The partners will switch back and forth between these two languages until the end of the learning session. Another way partners can structure their learning session is by having each person interact in the language they are trying to learn and only switch to another language in moments of confusion. The first method reduces the amount of language switching, allowing learners to concentrate on one language at a time. The second method allows learners to concentrate more on the language that they are learning.

Various tandem language learning services do exist which either rely on face-to-face communication like the “Conversation Café [6]”, on digital communication such as video conferencing, email, and instant messaging [7, 8], or on any type of communication media, which includes the previous ones listed as well as SMS, telephone, fax, and letters [9]. Currently, there is no face-to-face tandem language learning service or model that incorporates an interactive tabletop. This presents a great opportunity to conduct research into this area since the tandem collaboration model would work perfectly with an interactive tabletop’s collaboration characteristics.

## **2.2 Interactive Tabletops**

An interactive tabletop is a table with a projected screen or electronic visual display at its centre. Within the display area, it has the ability to detect the presence and location of touch points or objects. This enables the user to interact directly with what is displayed, without using a mouse, or any other intermediate device. This is the same technology that is found in tablet computers, wall displays and smartphones.

At the beginning stages of its development, interactive surfaces could only detect one touch point at a time. With much research being conducted into this area, different touch sensing technologies have evolved to enable the ability to recognize two or more

touch points, also known as multi-touch. This allowed users of this technology to perform high level gestures to interact with the surface. Such gestures include the standard pinch, zoom, multi-finger swipe, and rotate.

There are many examples of interactive tabletops including Microsoft Surface [10], Evoluce Multi-Touch Table [11], and TouchTable TT45 [12]. The one that relates to my work the most is the SMART Table [13]. It is an “interactive learning centre” meant to aid in educating young students. It comes pre-installed with customizable, ready-made activities, with the ability for teachers to create new ones. The activities are educational, and involve on-screen interactive elements that can be controlled through gestures. This allows students to collaborate together to complete a group task, which results in them building cognitive, social, and fine motor skills.

Having a table that displays on-screen interactive elements that can be controlled through gestures fits well with the tandem language learning model. A table creates a collaborative environment for its users, which tandem language learning is easily incorporated into since it is a collaborative learning model. Also, using gestures, especially pointing is fundamental in the way that humans interact with each other and learn. Some gestures, including pointing, meanings are universally known. As an example, if I point at a stick, you know that I am drawing attention to the stick. Thus, it gives an easy way for two people of differing languages to interact without having to understand each other’s lexicon.

### **2.3 Computer-Assisted Language Learning**

As mentioned before, another language learning model is computer-assisted language learning. It is described as “the search for and study of applications of the computer in language teaching and learning” [14]. Essentially, it is an approach to language learning and teaching through the use of a computer as an aid. It can aid in the presentation, reinforcement and assessment of material to be learned, and usually includes a substantial interactive element. Traditional CALL software presented information or a stimulus to the learner to which he/she must provide a response. Traditionally, the stimulus was in the form of text presented on the screen, with text input from the learner

being the response. With the immergence of Web 2.0, mobile devices, and faster computers with more memory, CALL's strength as a learning model has improved. This is due to the fact that CALL software can now include video, audio, images, and rich-interactive elements, and can be used anywhere when installed on a mobile device (Mobile Assisted Language Learning).

A lot of the functionalities that CALL software provides, if combined with tandem learning, creates an opportunity for greater knowledge gain than just tandem learning on its own. Taking a view at how "Rosetta Stone" teaches languages will tell you why. This software uses a combination of videos, images, text, and sound to teach various vocabulary terms and grammatical relations to the student. Students are better able to use the mnemonic technique called "Linkword [15]" to link elements in your native language to elements in another language. If tandem CALL software implemented on an interactive tabletop applied this technique, the best of both worlds would combine.

### **3 Grounding Study: The Impact of Technology on Collaborative Language Learning**

To design a proper prototype, I first needed to study and analyze the tandem language learning experience. This would allow me to identify the challenges faced in current tandem learning scenarios, and to choose which functionalities need to be included in my software design.

The tandem language learning environment that I chose to examine was the Conversation Café [6] at the University of Ontario Institute of Technology's Academic Success Centre. The Conversation Café was created for ESL students and is described as "a weekly drop-in opportunity to practice English speaking and listening skills as well as meet students from all over the world." Most of the participants are international students, so it also acts as a way for them to make connections and new friends. The Conversation Café is not a true tandem language learning environment, since the participants are only learning

one language, but it still operates on the same principles, namely conversing and interacting to achieve better language skills.

To study the Conversation Café, I chose to perform a participatory observational study, where I participated in the language learning experience with the other learners, while taking notes of my observations. I also interviewed the administrator of the Conversation Café, and 4 participants.

### **3.1 Observational Study**

The reason a participant observational study was performed was due to the fact that I wanted to experience the tandem language learning model first-hand. The study allowed me to gain insights that may have been missed through a normal observational study. Specifically, I wanted to find out how tandem language learners approach and meet each other, what they talk about, how do they get to know each other, how do their conversations end, how do they transition from one conversation to the next, their use of technology, if and how they use gestures, objects or technology to aid their conversations, how comfortable is the setting, and what causes uncomfortable/awkward situations.

The session that I attended lasted for an hour. It consisted of 16 participants, including myself and two administrators. The ratio of male to female was 3:1, and most participants were in the age range of 18 to 25 years old.

At the beginning of the session, coffee and tea were prepared and offered to the participants. Not all of the attendees knew each other as there are always new faces at each session. The participants that have previously established a relationship greeted each other and began to chat. Some of the new attendees introduced themselves to those who were around. When enough people arrived, the administrators signalled for everyone to have a seat around three tables that had been placed together. This became the setting in which the language learning took place. They basically gathered into one big group and had one conversation going at a time, which was very question based. Sometimes, the conversation did split into several conversations, but it was always brought back into one since the

participants found it hard to listen and communicate in more than one conversation at a time. The administrators acted as facilitators to help start the conversation, and help it flow whenever an awkward or uncomfortable situation arose, or when no one else had anything to say. They also tried to involve each participant, and make them feel more comfortable without taking too much control of the conversation, or talking for a long period of time.

At first, the atmosphere was a little awkward due to the fact that everyone was sitting around each other with no one talking. This was mitigated by the administrators starting the group conversation. I could somewhat tell through body language, which participants were new and which ones were regulars. The new attendees seemed more uncomfortable, timid, and quiet compared to the regular attendees. To help them get to know everyone, each participant introduced themselves, and stated where they were from, their name, and what university program they were in. This introduction seemed integral to the learning process, as it seemed to integrate the new attendees into the group, allowing them to feel more comfortable about expressing themselves. Therefore, they had more opportunities to practice their English.

After the initial introduction and with help from the administrators, new topics were discussed such as the differences between the participants' home countries versus Canada, their family, why they chose UOIT as their place of study, things related to their chosen university program, campus activities, recent global events, and opinions of Canada. New topics were introduced mainly by asking one individual a question related to that topic. Even when questions were targeted at more than one person, the administrators had to repeat the question to only one individual at a time. This was due to no one answering the question, and I believe this happened because of the large group setting increasing the level of timidity of the participants. Frequently, there was an uncomfortable pause after a participant finished answering a question, or discussing a topic, and no one else had anything to add. This was the administrators' cue to expand on the question or discussed topic, ask another participant the same question, introduce a similar topic, or completely change topics.

The large group setting made me feel a little uncomfortable as I was talking to many people whom I did not know (“many eyes” on me). I did not want to make eye contact with one individual for too long, and some individuals would break eye contact with me when I made eye contact with them. As time progressed, I felt more comfortable, and others seemed to grow more comfortable as well. The administrators were a big help. Their level of comfort made me feel more comfortable.

At the end of the session, many participants left, but some still remained. Naturally, the group split into a few smaller groups based on their location around the three tables. This caused the setting to become more comfortable, and participants seemed to participate in the conversations more.

I only noticed a few (2-4) participants use their mobile phones during the session. I could not tell for what use, as they seemed to only look and interact with it for short periods of time. No one used objects or technology to aid their conversations, although simple hand gestures were used to communicate location. This might be due to the fact that there were not many objects around that related to the topics discussed.

The low number of females attending the Conversation Café was a surprise to me. One administrator suggested that this was due to UOIT being a technology-based university; therefore it attracts more men than woman.

### **3.2 Interview Study**

After performing the observational study, I interviewed the administrator of the Conversation Café, and 4 participants individually while taking notes. I wanted to find out about their language learning and tandem language learning experiences, their experience of using technology to learn, and their thoughts and opinions of the Conversation Café. For the administrator, I also wanted to find out about her experience of administrating the Conversation Café. Two interviewees were female and three were male.

## Language Learning Experiences

The first section of the interview centered around the participants' general language learning experiences. All interviewees had experience learning a second language. The learning methods mentioned were watching television and films, interacting with other people, attending classes/courses, watching online tutorial videos, podcasts, reading, listening to audio tapes/files, pen-pals, and listening to music.

Participants found that classes/courses taught them a solid understanding of grammar, and vocabulary, and also improved their listening and writing skills. However, most participants thought that it did not give them enough opportunity to interact and converse with other people, and did not teach them slang.

Reading and listening to music as well as audio tapes/files were found to be useful as an introduction to the language. They helped to improve vocabulary, and specifically for reading, it was a good basis for writing. Again, participants did not like how there was no opportunity for interaction with other people, and it was found to not be a good medium to learn how to converse with other people. Also, it was visually lacking, and as one participant stated, "visuals always puts things into context."

Participants enjoyed watching television, films, online videos and podcasts to help them learn a language since it enabled them to connect situations visually with words, phrases, and their meanings. They also found it very helpful when they were given the ability to pause and replay, since this allowed them to review confusing phrases, or words. One participant pointed out that the most difficult thing in learning languages is learning how to interact with other people, and videos do not allow you to practice this interaction. You are not forced to "react and respond".

The most popular learning method used by the participants was interacting with other people. Participants liked this method as it allows you to get to know other people and their respective culture, improves listening skills as you get to experience different

accents, teaches you how to pronounce words, and you receive instant feedback through facial expressions, laughter, or verbal communication. If you are talking with someone that only knows the language that you are learning, then it forces you to speak and interact in that language, which increases your learning rate. The participants did reveal some problem with this method as well. If your conversation partner incorrectly pronounces words, or uses them in the incorrect context, then you will pick up and learn these bad habits. In addition, interacting with someone is not a structured learning experience. You have to rely on your own skill for making connections between meanings and words. Lastly, slang is bound to come up during interaction, and one participant found slang to be the hardest thing to get used to when learning a new language.

### Tandem Learning

The second section centered around the participants' tandem language learning experiences. All participants, except for one, had prior experience with this method of language learning. For each, it was conducted face-to-face with all having no structure, except for one.

The tandem language learning experiences with no structure were basically conversations. Each person would try to speak as long as they could in the language that they were learning, and when they got stuck, they would ask the other how to say certain things in that language. The tandem language learning experience with structure had both partners speak 5 minutes in one language, then would switch to the other language, and would continually do this until the end of their conversation. This pattern was broken for moments of confusion to help each other understand what was being said.

The participants revealed that the positive things about this learning method are as follows. Both participants are trying to learn a language, therefore, in social terms, it is easier since you have an equal relationship. Your partner knows that you are trying to learn a language, thus they are able to adjust the speed of the conversation and its difficulty.

Since you are interacting with someone else, the learning experience requires more attention and this translates into learning more things.

With respect to the negative aspects of tandem language learning, participants stated that there is no perfect model/structure of doing tandem language learning, it is hard to find a partner that is at the same language level, and you have to rely on your own skill for making connections between meanings and words.

Participants were asked what would make tandem language learning easier or better. One participant suggested a technology that translates the words of the partner as they converse with you for when you get confused. Also, a way to find a partner that is at the same language level as you, and if the conversation took place in a setting that helped inspire conversation topics or themes. Another participant would use drawings to communicate when something cannot be understood. Some technological aid, possibly with a visual component (picture, drawing, context), that would be used to describe what you are trying to say was suggested as well.

### Learning Through Technology

The third section centered around the participants' experiences with learning using technology. Three out of the five participants had prior experience using learning software. They included computer games for teaching math and vocabulary, a program that simulated conversations, an online dictionary, a tandem language learning website, and a website that plays audio recordings of words.

The computer games were based on completing problems within a time limit. They were too basic for the participant, as she already knew the concepts that were being taught, although, it did help her memorize those concepts.

The program that simulated conversations was text based, and helped the participant with writing. He wishes that the program accepted voice input, so he could practice his oral skills as well.

A participant used an online dictionary to learn as it gave him the ability to read a word, and its meaning, as well as hear its pronunciation. A website<sup>1</sup> that plays audio recordings of words was used to learn pronunciation as well.

A tandem language learning website [8] was used by one participant, and it consisted of basic language lessons, and the ability to have video conferencing, and text-based conversations with other language learners. This allowed the participant to connect and communicate with native speakers of the language that he was trying to learn. Users of the website also had the ability to record words, or phrases, and a native speaker would rate your grammar and pronunciation. The participant enjoyed the feedback, and interaction with native speakers.

Participants were asked if games are too childish for adults when used for learning new things. Three participants thought that it all depended on the type of game, and what the adult likes. Another participant thought that games are never too childish, and that it is good to keep the mind engaged especially through fun ways. The last participant thought that games were not an educative medium. He believed that learning through interacting with people is much better than playing games.

### Conversation Café

The fourth section of the interview centered around the participants' thoughts and opinions of the Conversation Café. For this section, the administrator was asked an additional few questions related to administrating the Conversation Café.

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<sup>1</sup> Forvo: <http://www.forvo.com/>

The administrators stated that her role in the learning process is to help the conversations flow, get the people that are not involved to join in, make sure there are no silent or awkward periods, and help smooth over students' speaking if they are stumbling or cannot find the right words. She tries not to control the conversations, but be in the side lines. Her main difficulties with administrating the Conversation Café are scheduling the time and day of the sessions as to maximize the number of attendees, as well as the lack of females. Sometimes, she gets the attendees to play games, but there is less of a need to play them as the students get to know each other and become comfortable. She mentioned two games where in one, an attendee makes three statements where one of them is false, and other people have to guess which one is false. The other game involves having everyone write down a statement, such as a life standard or belief, and people have to connect the statements with its author.

Participants liked the Conversation Café since it allowed them to meet new people and make friends, learn about different cultures and countries, and their differences, get other people's opinions on different topics, and practice their English.

Topics that participants talk about during the Conversation Café are politics, educational systems, personal life and experiences, comparing things in different cultures and countries, school, and whatever is on their mind that day.

Some participants thought that meeting new people or speaking to others would be made easier if instead of having a large group of people situated around a table, the group was split up into many smaller groups. It would give a better opportunity, and create a more secure context for trying out speaking skills as there are fewer eyes on you, and mistakes would be less embarrassing. Others suggested an introduction seminar for newcomers, so they know what to expect, and some games or artifacts (such as a board with pictures) to inspire conversation topics. One participant noted that if you get over the initial introduction, and period of getting to know your conversation partner, then the setting becomes comfortable and the conversation will flow.

## Tandem Language Learning Activities

In the last section, participants were given a list of activities meant to be performed using the tandem language learning method. The top activities that participants would most likely participate in were talking about themselves, their family, their profession, their country, listening to music, telling a story, looking at photos, and watching a video.

Talking about yourself, your family, your profession, and your country was popular since participants found it easy and comfortable to do. Participants expressed that they would participate in listening to music since it is fun, everyone likes music and rhythm, and people are interested in other people's taste in music. Telling a story was said to be fun, and easy to talk about if it is personal. Participants would participate in watching a video since you are able to read and listen at the same time. If you do not understand something, you can match it with the context of the situation. Photos and videos were both said to be good since they can give you topics for conversation, and are very visual.

The top activity that participants would not participate in was talking about politics since it can create conflicts between conversation partners. Two participants felt the same way towards talking about global events. It was also stated that it is not easy to defend your opinions in a language that you are trying to learn. For reading, it was mentioned that the material should be low level since it is difficult to read well when you learning a new language.

The participants were then asked to pick the best activities for learning a new language. One participant chose reading a news article as his number one choice since it helps you learn grammar, vocabulary, and writing skills. Another participant thought that learning and singing a song would be best since it is fun and helps pronunciation. One participant said anything with a visual component such as videos, photos, news articles, and comic strips. Another participant picked videos as well. Two participants thought that telling a story was a great way to learn a new language since it teaches you to be fluent, gives you the courage to express yourself, and exercises your explanation skills. Another

participant picked talking about yourself, your family, your profession, your culture, and asking questions.

The participants were then asked what other activities would be good for tandem language learning. One participant suggested an activity where you compose a poem or song with your partner (things that you could build together). Another participant thought that experiencing culture, and contrasting it with another one was a good idea. A participant suggested that the location could be the activity, such as going to a coffee shop, or an amusement park. Another participant believed that anything involving speaking or reading would be good.

### **3.3 Summary of Results**

The observational study revealed some interesting things about language learning and tandem language learning. It showed that an initial introduction between conversation partners is important for the learning process as it allows partners to become comfortable. This comfortability creates a more secure context for trying out speaking skills. The study also revealed that having a conversation facilitator is important for people that are shy or do not have a strong relationship with each other. This is because the conversation facilitator helps the conversations, and thus the learning process, to flow and continue whenever an awkward, uncomfortable, or silent period arises. The conversation facilitator does this by expanding on the current topic of discussion, suggesting new topics of discussion, and involving and helping participants in the conversations. Finally, the observational study revealed a list of discussion topics that participants of tandem language learning have participated in.

In the interview portion of the study, interaction with people was the most popular method of learning, which is great since tabletop interfaces enable interaction between partners. The study revealed a number of proposed enhancements to the tandem language learning process, which heavily relate to my work. These included ways for helping partners understand each other such as a technology that translates the words of your

partner as they converse with you for when you get confused. Another one was some technological aid, possibly with a visual component (picture, drawing, context), that would be used to describe what you are trying to say. Another enhancement that was suggested was something that helps to inspire conversation topics or themes. The study also revealed that most participants do not think games are too childish for adults when used for learning. This is important as it suggests that a tandem language learning prototype could incorporate games to enhance the learning process.

Participants in the study revealed that the main reason they participate in the tandem language learning environment (Conversation Café) is not to practice their language skills, but to interact with other people. The process of making new friends and learning new things makes it enjoyable for them. This shows how good tandem language learning is as a learning process. Participants are having fun while learning, which is key to success. The final major thing that the study revealed was a list of possible topics of discussion. This also included which topics are favoured and which topics are inappropriate for tandem language learning.

As observed from my study, the characteristics of the target user for my prototype includes someone that is trying to learn a new language, who has at least some basic knowledge of that language, and enjoys interacting with others to complete a goal. Users will most likely not have a strong relationship with their tandem learning partner, and their personalities will range from shy and quiet to outgoing.

### **3.4 Requirements**

For someone designing a prototype involving tandem language learning, its main requirement should be to improve or enhance the interaction that takes place between partners. This interaction is important since it is the method by which partners complete their desired goal (learning or improving language skills). The study has shown that improving the interaction between conversation partners is done through the use of a conversation facilitator. Therefore, tandem language learning prototype designs should

include functionalities that suggest or inspire new topics or themes of discussion, helps the conversation about a specific topic flow and continue, and mediates silent, awkward and uncomfortable moments. Activities, including games, with a visual component should be used to help accomplish this.

Topics that many people find sensitive, such as politics, should be avoided to reduce the chance of angry altercations between partners. Users should be allowed to structure their tandem language learning session, thus having the option for both users to interact in the same language for a specified amount of time, then switch languages, and the option of having both users interact in different languages at the same time. This can be done by allowing users to select the same language, as well as switch their chosen language whenever they want to. The prototype design should also include an introduction phase to allow partners to become comfortable with each other, and some aid such as a translator, pictures, or drawing capability to help partners understand each other in times of confusion.

## **4 Design**

The design of my software prototype is supported by background research into the area of tandem language learning, interactive surfaces, computer-assisted language learning, as well as my grounding study. The design went through iterative development using PowerPoint (See Appendix: 9.1 Prototype Design Using PowerPoint) to come up with the final design.

Since the software will be used by two users simultaneously, the screen space is designed to be split in two horizontally; one side of the screen for each user. Tandem language learning involves people learning different languages, thus the software starts out by allowing users to choose which language they want to learn. From then on, the text on a user's screen space is shown only in their chosen language. This will aid them in learning how to read their chosen language. If a user does not know a word, they can always ask their partner, thus it also facilitates conversations. The prototype also allows users to

change languages, or structure the tandem language learning process by having both users choose the same language and switch back and forth between another one whenever they wish.

After the users have chosen their languages, they go through an introduction phase. The grounding study revealed that this phase is important for the learning process as it allows partners to become comfortable, which creates a more secure context for trying out speaking skills. The introduction helps partners get to know each other, gets them to discuss what areas of the language they are trying to improve upon so they can help each other out in those areas, and finally, gets them to create provisions of error correction. The last one is important since participants in tandem language learning are bound to make mistakes, and having your partner correct you is how you can learn to correct those mistakes.

The key goal of the software prototype is to enhance the tandem language learning process. To that extent, the software is made to not be the main focus of the people that use it. It acts like the administrators of the Conversation Café; a facilitator of conversations, but staying in the side lines. To achieve this, my prototype suggests topics of conversations, and helps those conversations flow. The topics consist of the most popular ones discussed at the Conversation Café, as well as in the interview portion of the grounding study. The topic of politics is avoided as to not create conflict between partners, since many participants in the interview portion of the grounding study warned against it.

To help the conversations flow, the prototype contains activities associated with the topics. The grounding study suggests that activities with a visual component are best suited to learning, and this is reflected in the most popular activities mentioned by participants (pictures, news articles, and videos). Thus, I included these activities in the prototype design.

The activities could be pre-planned or automatically created. If they were pre-planned, the lesson/activity planners could force users to talk about specific things, use a certain grammatical tense, or use specific vocabulary. This allows the planners to make sure users cover all areas of the language that they are learning. The activities would be

structured, and never be out of date as questions would not talk about recent events or information. The problem is that planning activities would require someone to actually plan them, therefore the question of who should be the one planning these activities would need to be answered. Automatic activities would use up to date information, and would be more fun for users as it can include pop culture and social media. The problem is that the software would require an internet connection, and would be unstructured with no focus on curriculum/learning outcomes. I chose to design the prototype with automatically created activities since the software is meant enhance the conversations between partners. Constraining the conversations through structure might hinder the learning experience. The users should be able to talk about whatever they want, when they want. Also, automatically created activities allow the activities to be different each time the users use the software since the activities would include up-to-date information. For these reasons, the pictures, news articles, and videos will be downloaded from the internet whenever the users select them as an activity.

I have also designed Twitter and a web search activity as well. Twitter was chosen since it allows the users of the prototype to view what other people are talking about at that very moment, which in turn could inspire new topics of discussion. A web search activity was chosen as well since it gives freedom to the users for discovering topics of discussion on their own. All of these activities have additional sub-activities associated with them like discussion questions to further facilitate conversations. The activities and sub-activities are made as to not be too engaging, since this might cause users to focus on them. After all, engrossing software could foster social awkwardness or distract partners from interacting with each other.

#### **4.1 User Registration**

The first thing I needed to do was create a way that allows users to choose the languages that they wanted to learn. I call this part of the prototype the user registration. All text in this section is in English, since it is a widely known language. First, users must create a profile or select an already created profile (Figure 1). To create a profile, the user

must draw his or her name, or an image. This was chosen instead of having a user type their name, since virtual keyboards take up a lot of screen space and can be hard to use. When using the software at a later time, the user can select their profile from the list by using a swipe gesture or arrow buttons to travel through the list. After creating or selecting a profile, a user is given a choice of languages to choose from. Since I am bilingual in French and English, the prototype is designed for just these two language options. After both users have chosen their respective language that they want to learn, they go on to the introduction phase.

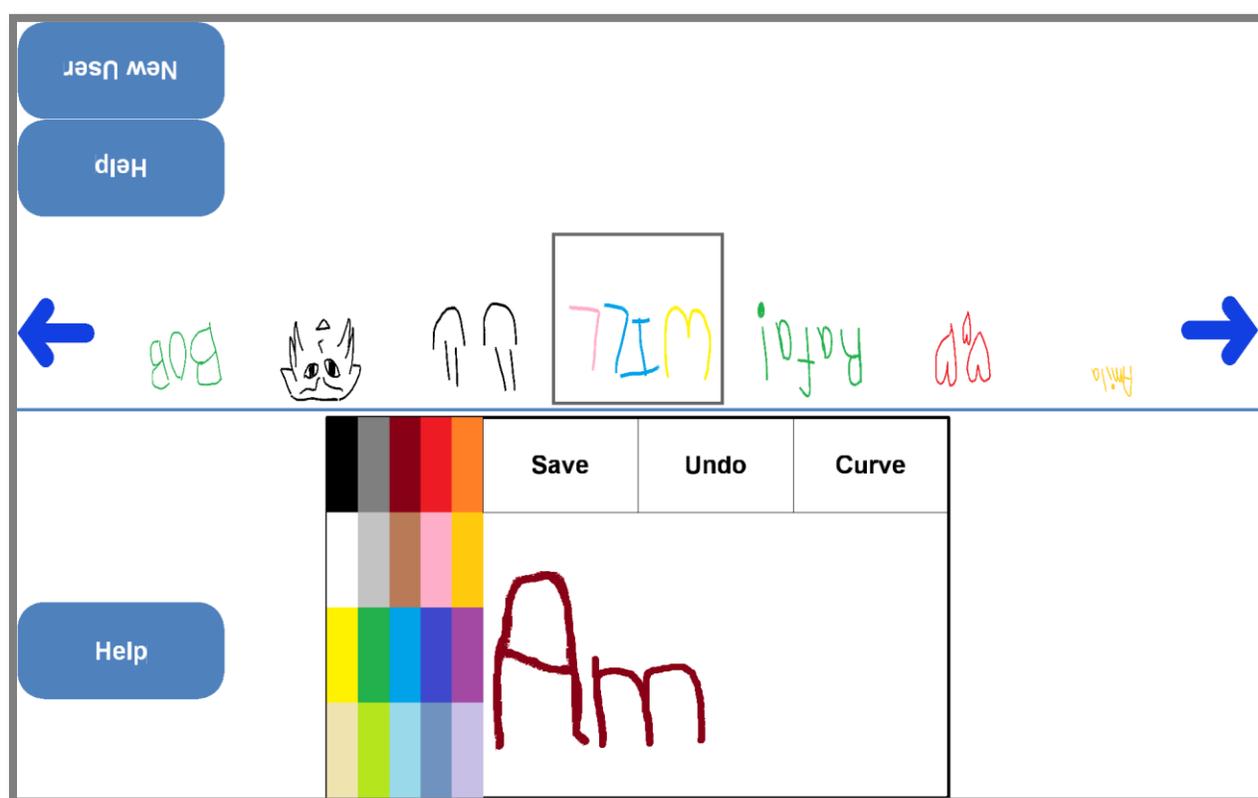


Figure 1: The initial screen where users select or create a profile, and choose a language.  
Top: Selecting a stored profile. Bottom: Creating a profile

## 4.2 Introduction Phase

The introduction phase consists of suggestions and questions for helping users get to know each other, as well as suggestions for optimizing the tandem language learning process (Figure 2). Such questions include asking where their partner is from, how old

they are, where they live, what is their profession, and where they attended school last and for what. Users are prompted to discuss their interests and hobbies, why they are learning their chosen language, what areas of the language they are trying to improve upon, and how their partner can help them improve upon those areas. Users are also prompted to discuss how they will correct each other’s language mistakes.

<p>Prochaine</p> <p>Plus de Questions</p>	<ul style="list-style-type: none"> <li>- Discutez pourquoi vous essayez d'apprendre cette langue.</li> <li>- Discutez de vos intérêts et passe-temps.</li> <li>- Où êtes-vous allé à l'école et pour quoi?</li> <li>- Quelle est votre profession?</li> <li>- Où habitez-vous?</li> <li>- Quel âge avez-vous?</li> <li>- De quel pays venez vous?</li> <li>- Te familiariser avec votre partenaire, demander-les.</li> <li>- Présentez-vous.</li> </ul>
<p>More Questions</p> <p>Next</p>	<ul style="list-style-type: none"> <li>- Introduce yourself.</li> <li>- Get to know your partner. Ask them:             <ul style="list-style-type: none"> <li>- Where are you from?</li> <li>- How old are you?</li> <li>- Where do you live?</li> <li>- What is your profession?</li> <li>- Where did you last attend school and for what?</li> </ul> </li> <li>- Discuss your interests and hobbies.</li> <li>- Discuss why you are learning this language.</li> </ul>

Figure 2: The introduction phase where users get to know each other, and discuss how they can help each other learn.

### 4.3 Topic and Activity Selection

In this section of the prototype, users must choose a topic of discussion, and an associated activity. Users are shown a graph, with each node containing a topic. The top and bottom of the screen consists of activity buttons, but they are disabled until the users choose a topic. The edges of the graph depict a suggested route that users should take as they go from topic to topic. The coloured bar inside each node implies spatially and through colour which activities are available for a specific node. The unavailable activities have

their section coloured grey in the bar. The top of the activity buttons are coloured the same colour as their section in the coloured bar. The colours for the bar were chosen using ColorBrewer [16].

Whenever the users must choose a topic or activity, they must both agree. To enable this, each user must be touching the same topic node for it to be selected. When a topic is selected, the colour of the node turns green and the activities available for that topic are enabled (Figure 3). The reason not all activities are available for all topics is to demonstrate how a final version of this software might include activities that would not work well with certain topics. An example is having Google maps as an activity. A topic such as “Movies” would not be suited well for a map based activity. If the users switch topics, then the colour of the node that was previously selected turns to a faded out blue to indicate that the users have previously selected this node. This is to encourage users to explore different topics, which when done, allows them to learn a wider variety of things.

If users would like to change languages, both users have to select their “New Language” button. To choose an activity, users must select the activity button on their screen space. When both users have chosen the same activity, the screen switches to the selected activity screen.

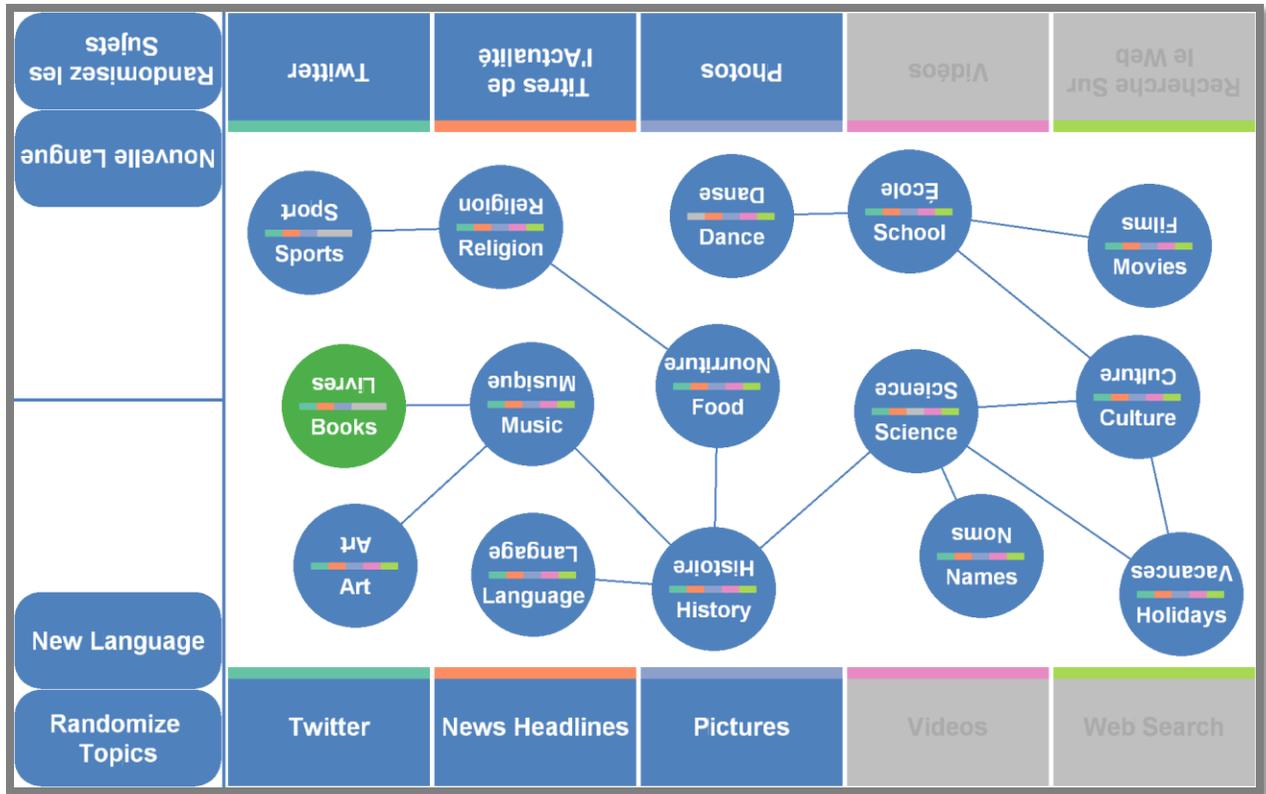


Figure 3: The screen where users must choose a topic and an activity associated with the chosen topic. The topic “Books” is currently chosen.

#### 4.4 Twitter Activity

When users select the Twitter activity, they are each given a list of Tweets related to the chosen topic, and in their respective chosen language (Figure 4). These Tweets are downloaded from Twitter in real-time using the Twitter API. The Tweets are given for users to read over, discuss, and to inspire conversations. Users can get more Tweets by selecting the “More Tweets” button.



**Figure 4: Twitter activity.**  
Tweets that relate to the chosen topic in each user's selected language are displayed.

#### 4.5 News Headlines Activity

When users select the News Headlines activity, a list of news headlines related to the chosen topic are given to each user. The New York Times API is used download up-to-date news article information in real-time. If a user selects a news headline, the author, date, associated picture (if available), and a few sentences of the article are shown to the user (Figure 5). The New York Times API only gives the first few sentences of articles, most likely to make interested parties visit their site to view the entire article and advertisements. A user can select the "More Headlines" button to retrieve more new headlines. The news headlines are given for users to read over, discuss, and to inspire conversations.

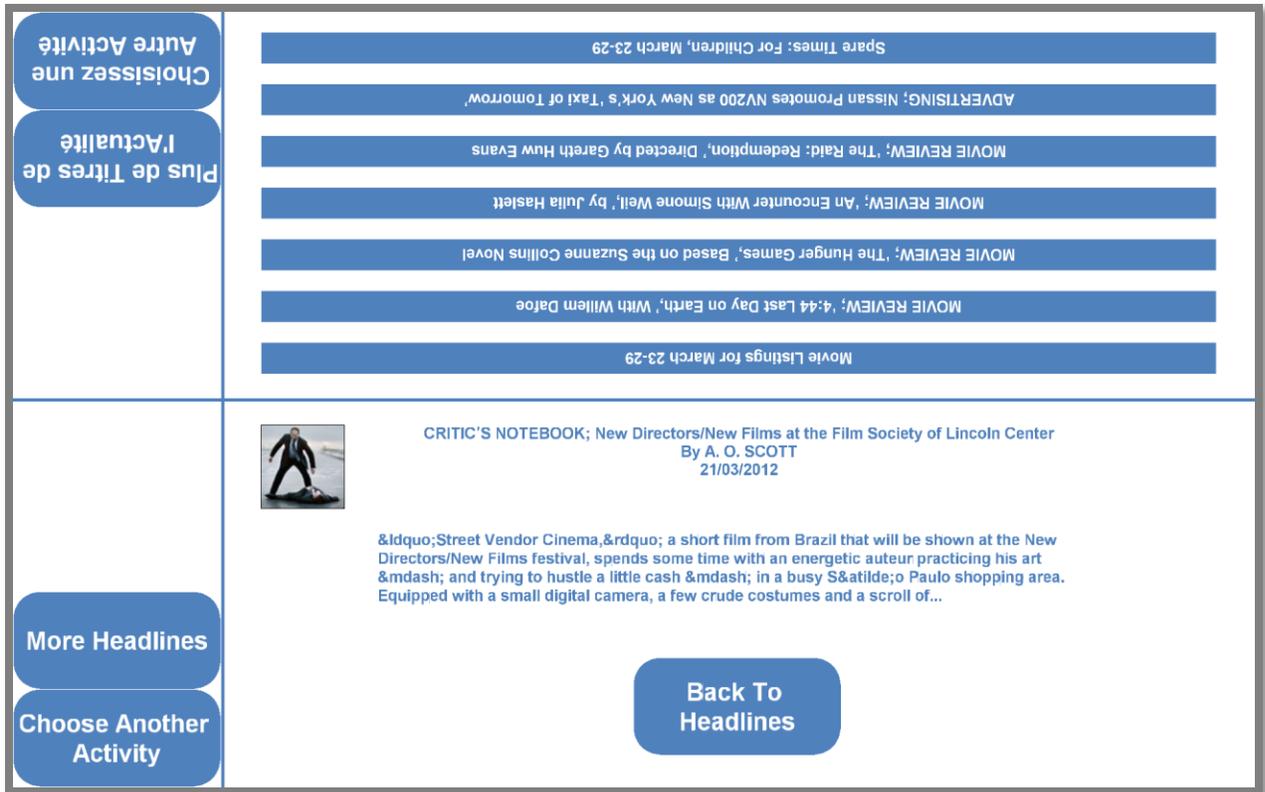


Figure 5: News Headlines Activity.  
New Headlines are selected using the New York Time's API.

#### 4.6 Picture Activity

When users select the Picture activity, a group of photos related to the chosen topic are downloaded in real-time from Flickr (Figure 6). These pictures can be dragged, rotated, and scaled using high level gestures. To download new pictures and replace the current ones, each user must select the "More Pictures" button in their respective screen space. The pictures are meant to inspire conversations.



**Figure 6: Picture Activity.**  
Pictures that relate to the chosen topic are selected using the Flickr API.

## 4.7 Discussion

My prototype design satisfies most of the requirements that I discovered through research. Its main objective is to enhance the tandem language learning process for its users, and it does this by facilitating their conversations. To help users choose a topic of discussion, the prototype is designed to give a list of selectable topics displayed using an undirected graph. The topic of politics is avoided to reduce the chance of angry altercations between partners since many find it a sensitive subject. To aid the conversation, of a selected topic, flow and continue, each topic has activities associated with it. They include Twitter, news headlines, pictures, videos, and web search, all of which have a visual component. To help partners become comfortable with each other, the prototype's design includes an introduction phase. Users are able to structure their tandem language learning

session, since the prototype is designed to allow them to select the same or different languages, and allows them to switch their language choice during the session.

Out of the list of requirements gathered from my grounding study, the one thing that my prototype's design does not include is an aid such as a translator or drawing capability to help partners understand each other in times of confusion. This was not included due to time constraints.

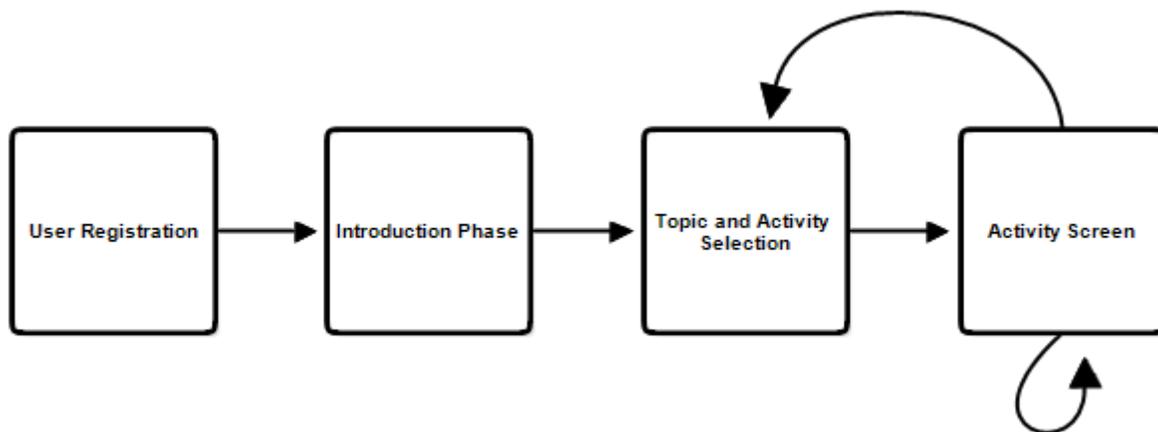


Figure 7: Process Diagram of the prototype.

## 5 Implementation

The prototype was implemented in Java using the Simple Multi-Touch toolkit. I created Simple Multi-Touch during the summer of 2011 as a research assistant under the supervision of Dr. Christopher Collins and Dr. Mark Hancock. Simple Multi-Touch was implemented in Processing [17], and it is a simplified software framework for the fast prototyping of multi-touch applications. Applications are developed by creating different “zones” that respond to touch input, and high level gestures.

The Tweets in the Twitter activity are downloaded from Twitter in real-time using Twitter4j<sup>2</sup>, which is a Java library for the Twitter API. Tweets that relate to the chosen topic are selected by setting the search query term to the chosen topic. The Tweets are made language specific by setting the “lang” parameter in the search query that is sent to Twitter.

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<sup>2</sup> <http://twitter4j.org>

For the news headlines activity, I used the New York Times API and JSON to download up-to-date news article information in real-time. For the pictures activity, I used flickrj<sup>3</sup>, which is a Java library for the Flickr API, to download pictures from Flickr in real-time.

## 6 Future Work

There is a lot of work that can still be done for this prototype. Currently, only the English and French language options are available. The prototype should be made to include many other different language options as possible. At the moment, the videos and web search activities have not been implemented. The videos activity would consist of a video relating to the chosen topic, and would be downloaded from YouTube using their API. Only one video would be shown at a time to increase interaction between users. A sidebar of related videos would be created to allow users to select more videos to watch. The web search activity would consist of a customized browser for both users. The browser would search for web pages relating to the chosen topic, and the users would be able view and interact with them. The customized browser should be made simple and optimized for touch input.

In the user registration part of the software, when a user creates a profile, his or her usage data should be saved to their profile. This includes the languages that the user has previously chosen. When users select an activity involving words, a sub-activity could be that a user is able to select a word or phrase that he/she finds confusing or difficult. This word or phrase is highlighted and appears in the middle of the screen for both users to see. The other user now has to find the word or phrase in his/her chosen language, and select it. The users can then discuss the word or phrase, and help each other understand its meaning. The words or phrases that a user finds difficult can then be saved to their profile. The next time they login, the activities can be geared towards helping the users learn the words or phrases that they previously had difficulty with. Also, when users of the software

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<sup>3</sup> <http://flickrj.sourceforge.net/>

have previously been partners during a past session, the state of the past session should be reloaded. This would allow users to end their session, and return to it in the future.

Another sub-activity that was not implemented was the discussion questions relating to each activity. The problem with the discussion questions is how should these questions be created? Should they be so high level that they will relate to every media item (e.g. every picture such as “What is this picture about?”). Or should the questions be specific to each item? If the questions were specific, it would require image and text processing.

The choice of topics given to the users is currently random. Users should have the ability to either have their topics randomized, be based on their interests and hobbies, or some other criteria. Also, during topic selection, the suggested route using the graph edges is arbitrary. Future work could be done to choose which route would be best to optimize the language experience for both users. The prototype could possibly ask both users for their interest and hobbies, and based on that, create a suggested route of topics starting from the most popular choices. If the users choose random topics, these questions must be answered: how should suggested routes be created, and which topic should be suggested as the starting point for those routes?

In the current implementation, the news headlines activity is only in one language. This is due to the New York Times being available only in English. For users that choose a language other than English, the next step would be to either automatically translate the New York Times articles into their chosen language, or download them from another news source that supports the chosen language. Another option all together is to download only the front pages of newspapers, which can be done using Newseum<sup>4</sup>. Newseum displays front pages of more than 800 newspapers worldwide, and many are in different languages.

In the Twitter activity, a lot of the Tweets have links to images, videos or websites. The prototype should be made to allow users to select a link and display its contents. The prototype can be further extended by including other activities such as a radio activity

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<sup>4</sup> <http://www.newseum.org/>

where users listen to music or conversations from the internet. This would aid users with their listening skills, and inspire topics of discussion. For helping users with pronunciation, the Forvo API could be used for a pronunciation activity. Forvo<sup>5</sup> is an online pronunciation guide where audio recordings of words in many different languages are available. Google Maps would be a good activity since it could be created with an overlay relating to the chosen topic. As an example, if the users chose “holidays” as their topic, the map could show which holidays are celebrated in each country. Another activity could be a slang guide, where slang related to the chosen topic is displayed. This might be an important activity, since a participant of the interview portion of my grounding study, stated that slang is one of the hardest things to learn when learning a new language. A game based activity could be added as well, and it is a good option for users since many find learning through games more fun. The one thing is that the game must not be made too engaging as to distract users from interacting with each other.

To aid learning, a facility for making notes, drawing, and highlighting should be included in the prototype. Making notes would help users to remember important concepts, meanings of difficult words, among other things. Drawing would help the users in understanding each other when explaining. Highlighting would allow users to mark difficult words or phrases.

Another thing that could be included is if the medium that the prototype is running on has a microphone installed, this microphone could be used to listen for silence. When a period of silence is detected, the software could suggest a new topic of discussion for the users. This would be very beneficial for users who are quiet or shy. The microphone could also be used to tell if one user is talking a lot more than his/her partner, and if so, the software could prompt the users to balance participation.

One final thing that should be done is a user study to show that the prototype does in fact enhance the tandem language learning process. Background research and my grounding study are used as a guide in designing the prototype, but only a user study can tell if the prototype has reached its goal.

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<sup>5</sup> <http://www.forvo.com/>

## 7 Conclusion

I have designed and implemented a software prototype for a multi-touch table that is meant to enhance the process of tandem language learning (Figure 8). Its main focus is to facilitate conversations between partners without captivating their attention. The prototype demonstrates the effectiveness of collaborative work through the use of a multi-touch table. Its design went through several iterations and is supported by background research as well as my grounding study. The grounding study consisted of a participant observational study of a tandem language learning environment. The study also included an interview portion where the administrator and four participants of the tandem learning environment were interviewed.

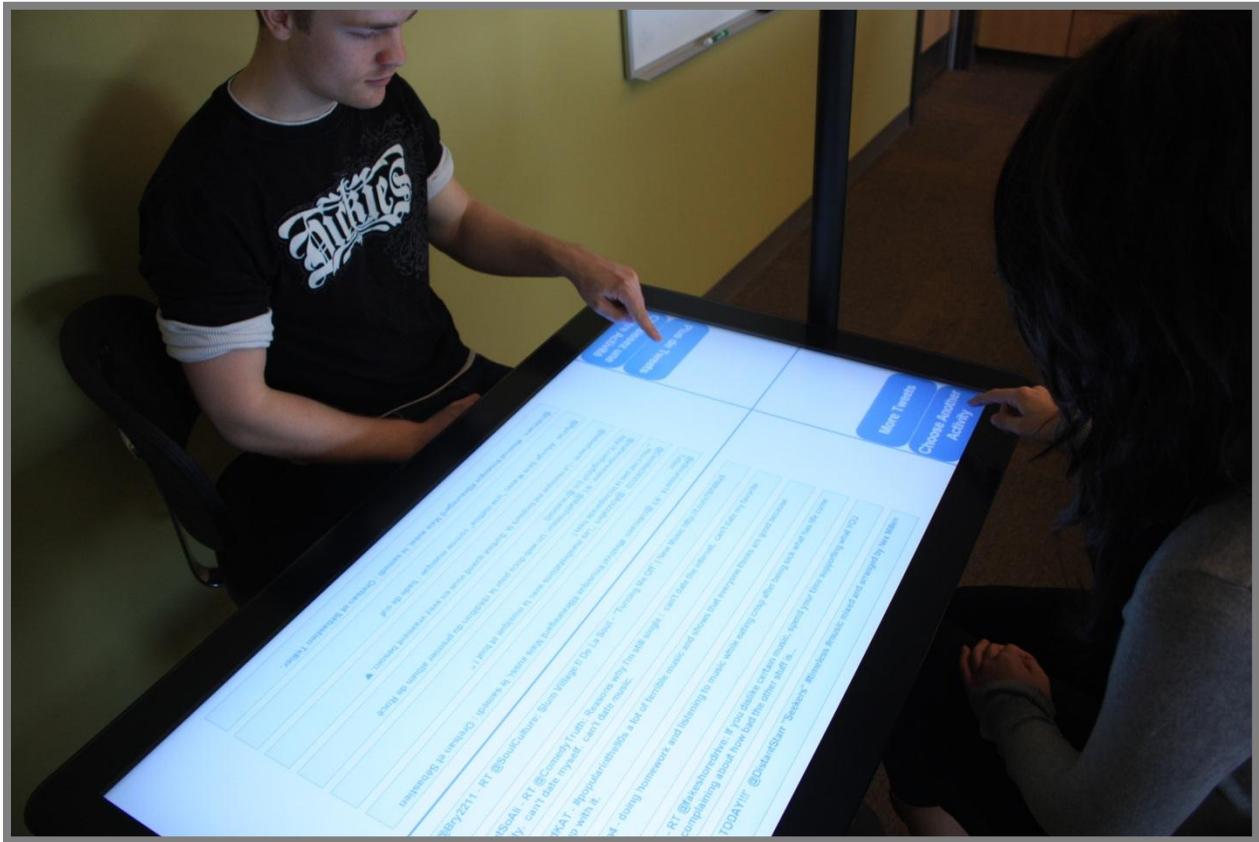


Figure 8: Two people using the prototype

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## 9 Appendix

### 9.1 Prototype Design Using PowerPoint

The design of my prototype went through iterative development using PowerPoint. Slides are linked together through user interface elements such as buttons. When a user interface element is clicked on with a mouse, it will simulate the software's response by switching to another slide. This new slide shows the new state of the software. Here are three images showing the PowerPoint design of my prototype. The first image shows the user registration part of my prototype. The second image shows the news headlines activity. The third image shows the topic and activity selection part of my prototype.

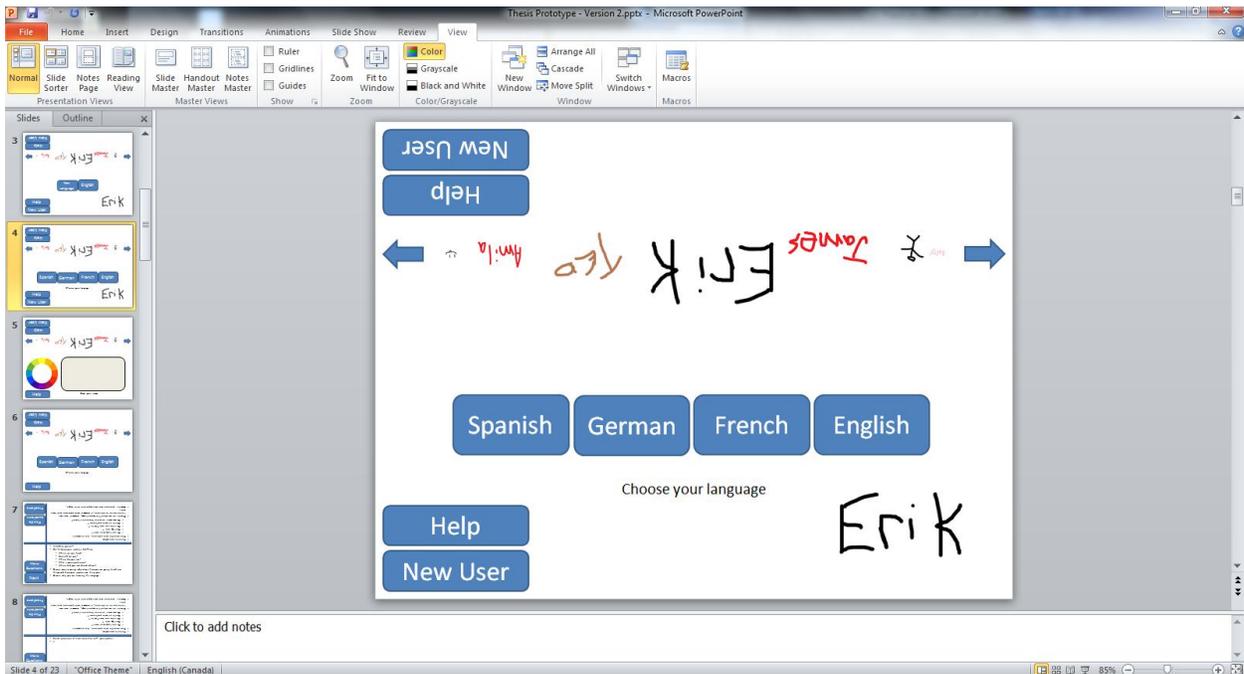


Figure 9: PowerPoint design of the User Registration part of my prototype.



## **9.2 Grounding Study Protocol**

### **9.21 Observation Plan for Conversation Café and In-Person Tandem Learning Sessions**

*Notes in italics are directions to the interviewer.*

#### **Introduction Comments/Purpose of the Study**

*Introduce yourself*

I will be observing you as part of a study. The study is for Erik Paluka's senior undergraduate thesis project in Computer Science at the University of Ontario Institute of Technology. We are designing and implementing a computer-assisted tandem language learning application on the multi-touch tabletop. To do this, we need to study other tandem language learning environments, such as the Conversation Café, to identify the functionalities that need to be included in our software design.

#### **Data Being Collected**

The data that we are collecting is mainly about the participants' experience in the Conversation Café including language use.

#### **Consent Form**

To participate in this study, you must read, agree to, and sign a consent form. The consent form explains the study, the investigators, and the procedures, which is just an observation in this case. It also states that participants will get no compensation, all questions are optional, participants are free to withdraw at any time without explanation, and all materials and results will be anonymous, and, in particular, that participants' name and any identifying or identified information will not be associated with the data.

*Look for:*

*How do people approach/meet each other?*

*What do they talk about?*

*The ratio of male to female (as assumed through looking at participants – may be inaccurate).*

*The general age distribution (as observed through looking at participants – may be inaccurate).*

*How comfortable the setting is?*

*Where is the setting?*

*How many people there are?*

*How do conversations end, and how do participants transition to the next conversation?*

*The use of technology, either for the purposes of learning, or peripheral uses during the café meetings (e.g. checking email).*

## **9.22 Interview Protocol: Language Instructor**

*Notes in italics are directions to the interviewer.*

### **Introduction Comments/Purpose of the Study**

*Introduce yourself*

I will be interviewing you as part of a study. The study is for Erik Paluka's senior undergraduate thesis project in Computer Science at the University of Ontario Institute of Technology. We are designing and implementing a computer-assisted tandem language learning application on the multi-touch tabletop. To do this, we need to study other tandem language learning environments, such as the Conversation Café, to identify the functionalities that need to be included in our software design.

### **Data Being Collected**

The data that we are collecting is mainly about your experience in administrating tandem learning and in participating in tandem language learning. We will also collect data concerning your language use and skill, technology usage and familiarity, and demographics.

### **Consent Form**

To participate in this study, you must read, agree, and sign a consent form. The consent form explains the study, the investigators, and the procedures, which is just an interview in this case. It also states that participants will get no compensation, all questions are optional, participants are free to withdraw at any time without explanation, and all materials and results will be anonymous, and, in particular, that participants' name and any identifying or identified information will not be associated with the data.

### **Demographics**

What is your native tongue?

What language(s) do you speak fluently?

What language(s) are you are trying to learn?

Where are you from?

What is your profession?

Does your profession have a language requirement?

### **Language Learning Experiences**

Have you tried to learn another language before?

*If yes:* How did you learn?

*If participant has difficulty thinking of anything, suggest:* CALL (computer assisted language learning) software, a course, talking to friends, tandem learning, bilingual dictionary, Skype

*If yes:* What were the good things about that medium that helped you learn, and what were the bad things? What would you change?

### **Tandem Learning**

Have you had any prior experience with tandem learning?

*If participant does not know the term 'tandem learning', explain it as follows:*

Tandem language learning is a way to learn a new language or improve foreign language skills. It is based on the mutual exchange of language between partners. Each partner is a fluent speaker in the language the proponent wants to learn. Basically, it is when two people of differing languages talk to each other to learn each other's language.

*If yes:* Please explain your tandem learning experience? (Looking for: in person/online, how they found a partner, was it a friend or stranger, what did they talk about). What were the good things about tandem learning that helped you learn, and what were the bad things? What things would make tandem language learning easier or better?

*If no:* Was there a reason you did not use this learning method in the past?

*If participant has difficulty thinking of a reason, suggest:* Not enough time, no way to find a learning partner, shyness, didn't know what they would talk about

### **Learning Through Technology**

Have you used any sort of learning software before?

*If yes:* What did it involve? How did it help you learn? What were the good things about it? What were the bad things about it? If you could change something about it, what would you change and why?

Have you used any sort of language learning software before?

*If yes:* What did it involve? How did it help you learn? What were the good things about it? What were the bad things about it? If you could change something about it, what would you change and why?

What types of video games do you like to play?

Have you ever played any type of educational video game?

*If yes:* What type of educational game was it? What was the purpose of the game? Did you learn something from it? How did it help you learn?

What experience do you have with using games for learning new things?

Are games too childish for adults when used for learning?

### **Conversation Café**

How long have you been administrating the Conversation Café for?

What are the difficulties with administrating the Conversation Café?

What are the positives of the Conversation Café?

What are the negatives of the Conversation Café?

What would you change about the Conversation Café and why?

How often do you participate in the Conversation Café?

How do you approach someone that you want to talk to and what do you say to get the conversation going?

What do you talk about to people in the Conversation Café?

What would make meeting people in the Conversation Café easier/better?

What would make talking to people in the Conversation Café easier/better?

What are the positives and negatives of the Conversation Café?

What happens when you cannot think of anything else to say to someone whom you are talking to?

### **Tandem Language Learning Activities**

*Give list of activities to the interviewee:* Here is a list of tandem language learning activities. Activities are performed in either language.

#### List of tandem language learning activities

- Tell a story
- Read a news article
- Learn/sing a song
- Listen to music
- Learn/perform a dance
- Complete school/home work
- Watch a video
- Look at photos
- Talk about yourself, family, and profession
- Ask your partner questions
- Talk about global events
- Talk about your country
- Talk about politics

Which activities would you most likely participate in and why?

Which activities would you not want to participate in and why?

Which activities would help someone the best at learning a new language?

What other activities would be good for tandem language learning?

### **Closing**

Anything else you would like to add about your language learning experiences?

Do you have any questions for me?

You have agreed to participate in this study, and agreed and signed the consent form. Participants will get no compensation, all questions are optional, participants are free to withdraw at any time without explanation, and all materials and results will be anonymous, and, in particular, that participants' name and any identifying or identified information will not be associated with the data.

*Give interviewee a sheet with the investigators' contact information: If you have any follow up questions or would like to withdraw your participation, then you can always contact us.*

### **9.23 Interview Protocol: In-Person Tandem Learning Participants**

*Notes in italics are directions to the interviewer.*

#### **Introduction Comments/Purpose of the Study**

*Introduce yourself*

I will be interviewing you as part of a study. The study is for Erik Paluka's senior undergraduate thesis project in Computer Science at the University of Ontario Institute of Technology. We are designing and implementing a computer-assisted tandem language learning application on the multi-touch tabletop. To do this, we need to study other tandem language learning environments, such as the Conversation Café, to identify the functionalities that need to be included in our software design.

#### **Data Being Collected**

The data that we are collecting is mainly about the participants' experience in tandem learning especially tandem language learning. We will also collect data concerning the participants' language use and skill, technology usage and familiarity, and demographics.

#### **Consent Form**

To participate in this study, you must read, agree, and sign a consent form. The consent form explains the study, the investigators, and the procedures, which is just an interview in this case. It also states that participants will get no compensation, all questions are optional, participants are free to withdraw at any time without explanation, and all materials and results will be anonymous, and, in particular, that participants' name and any identifying or identified information will not be associated with the data.

#### **Demographics**

What is your native tongue?

What language(s) do you speak fluently?

What language(s) are you are trying to learn?

Are you an international or domestic student?

Where are you from?

What school do you attend?

What program are you in? Year in your program?

Does your program have a language requirement?

### **Language Learning Experiences**

Have you tried to learn another language before?

*If yes:* How did you learn?

*If participant has difficulty thinking of anything, suggest:* CALL (computer assisted language learning) software, a course, talking to friends, tandem learning, bilingual dictionary, Skype

*If yes:* What were the good things about that medium that helped you learn, and what were the bad things? What would you change?

### **Tandem Learning**

Have you had any prior experience with tandem learning?

*If participant does not know the term 'tandem learning', explain it as follows:*

Tandem language learning is a way to learn a new language or improve foreign language skills. It is based on the mutual exchange of language between partners. Each partner is a fluent speaker in the language the proponent wants to learn. Basically, it is when two people of differing languages talk to each other to learn each other's language.

*If yes:* Please explain your tandem learning experience? (Looking for: in person/online, how they found a partner, was it a friend or stranger, what did they talk about). What were the good things about tandem learning that helped you learn, and what were the bad things? What things would make tandem language learning easier or better?

*If no:* Was there a reason you did not use this learning method in the past?

*If participant has difficulty thinking of a reason, suggest:* Not enough time, no way to find a learning partner, shyness, didn't know what they would talk about

### **Learning Through Technology**

Have you used any sort of learning software before?

*If yes:* What did it involve? How did it help you learn? What were the good things about it? What were the bad things about it? If you could change something about it, what would you change and why?

Have you used any sort of language learning software before?

*If yes:* What did it involve? How did it help you learn? What were the good things about it? What were the bad things about it? If you could change something about it, what would you change and why?

What types of video games do you like to play?

Have you ever played any type of educational video game?

*If yes:* What type of educational game was it? What was the purpose of the game? Did you learn something from it?

What experience do you have with using games for learning new things?

Are games too childish for adults when used for learning?

### **Conversation Cafe**

How often do you come to the Conversation Café or is it their first time?

How do you approach someone that you want to talk to and what do you say to get the conversation going?

What do you talk about to people in the Conversation Café?

What would make meeting people in the Conversation Café easier/better?

What would make talking to people in the Conversation Café easier/better?

Why do you come to the Conversation Café?

What are the positives and negatives of the Conversation Café?

What happens when you cannot think of anything else to say to someone whom you are talking to?

### **Tandem Language Learning Activities**

*Give list of activities to the interviewee:* Here is a list of tandem language learning activities. Activities are performed in either language.

List of tandem language learning activities

- Tell a story
- Read a news article
- Learn/sing a song
- Listen to music
- Learn/perform a dance
- Complete school/home work
- Watch a video
- Look at photos
- Talk about yourself, family, and profession
- Ask your partner questions
- Talk about global events
- Talk about your country
- Talk about politics

Which activities would you most likely participate in and why?

Which activities would you not want to participate in and why?

Which activities would help someone the best at learning a new language?

What other activities would be good for tandem language learning?

### **Closing**

Anything else you would like to add about your language learning experiences?

Do you have any questions for me?

You have agreed to participate in this study, and agreed and signed the consent form. Participants will get no compensation, all questions are optional, participants are free to withdraw at any time without explanation, and all materials and results will be anonymous, and, in particular, that participants' name and any identifying or identified information will not be associated with the data.

*Give interviewee a sheet with the investigators' contact information: If you have any follow up questions or would like to withdraw your participation, then you can always contact us.*