# TableTalk Poker: An Online Social Gaming Environment for Seniors

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## ABSTRACT
In this paper we describe TableTalk Poker, an online social gaming environment designed for seniors. In addition to text chat among all the players, the system supports voice conversations between each player and a non-playing partner, who may assume various roles such as peer, mentor, or learner. This paper reports on our user-centred design process, which included significant field work; the resulting system design; and the results of preliminary testing. We found that allowing seniors' participation by assuming various roles improves game accessibility and aids learning. Our pilot subjects enjoy this playing format and the opportunities for conversation that it provides.

## Categories and Subject Descriptors
D.2.10 [**Design**]: Methodologies and Representation, H.5.2 [**User Interfaces**]: User-centred design, K.8.0 [**General**]: Games, I.2.6 [**Learning**]: Knowledge acquisition

## General Terms
Experimentation, human factors, design

## Keywords
Seniors, online games, roles, poker, social interaction, learning, game engagement, casual games, serious games.

## 1. INTRODUCTION
Seniors represent the fastest growing group of Internet users [1], a large number of which also play games online [2], including games designed to promote mental or physical fitness [3,4]. Games, however, could be of benefit to a greater number of seniors if not for several deterrents. These include small text size, busy screens, fast games, lack of time between each game, inadequate support for beginners, and poorly designed mechanisms for social interaction. Social interaction is especially important for this population, as seniors are faced with shrinking social networks and isolation, resulting in ill effects on the psyche and further deterioration of health [5].

The long-term goal of our project is to build an environment that eliminates the above deterrents while supporting an array of games. In this paper, we present our first step towards this goal: a pilot version of Texas Hold'em Poker. We chose poker not only because it has exploded in popularity in recent years, but also this multiplayer game is inherently social. Understanding opponents

is as important as the cards themselves, furthering the need for player-to-player communication. As well, because our target population does not traditionally play Texas Hold'em Poker, this choice will minimize learning biases and properly reflect a senior's initial foray into new online games. The complexity and depth of the game makes learning a critical task.

To address the importance of social interaction for seniors, we designed a poker environment for this population. This paper first reviews existing systems, then describes our research in the field observing people at play and summarizes our findings. We then describe our user-centred design process and the resulting system. This system, TableTalk Poker, is an online poker environment designed to support social interaction through text and voice-based communications. Each player can be paired with a partner who may be a peer discussing strategy, a mentor providing assistance, or an individual seeking to learn. We conclude by sketching the research methodology we will use to measure the effects this environment has on learning, enjoyment, engagement in the game, and social engagement.

## 2. EXISTING SYSTEMS
We define gaming environments here as spaces that act as transition points to any number of games. In some instances, these areas are where a large portion of the social interaction actually takes place. Players are able to maintain their alternate persona between games, as they chat and build relationships with others in the system. We will explore here a few of these environments and the games they support.

### 2.1 Casual Games
*Yahoo! Games* or *Shockwave Games* are representative of the casual online gaming environment. Hundreds of Flash games are available, including puzzle, strategy, word, sports, and adventure games. These short-lasting games can be very addictive. Yet these sites are plagued with accessibility issues. Ads and pop-ups clutter the screen, while unfamiliar games fight for one's attention. Even content delivery is inconsistent, as some games require download, while others do not. Furthermore, the casual nature of these games result in few mechanisms for learning. Some games throw a user directly into the action with little or no guidance, resulting in an intimidating first experience.

Aside from the aforementioned accessibility issues, these sites typically lack social elements. Games are geared for the single-player experience, and even the environments themselves do not allow for chatting amongst the community.

*Doof*, until recently, represented a new wave of gaming sites, which incorporated social elements with casual online gaming. Players had profiles that tracked their achievements in the hundreds of games available and were able to challenge others, as well as chat and share pictures. *Doof* included an intuitive interface and simple, enjoyable games. However the focus still was on single-player experiences. Unfortunately, in early 2010, *Doof* changed its design, eliminating many of these social features. Figure 1 shows the earlier user interface. User profiles can be seen on the right and invitations to play are in the middle.



**Figure 1: The Doof environment pools elements of social networks with games**

## 2.2 Social Games

*Facebook* has become a significant presence in the online gaming world. Focusing on players' existing social networks, popular games such as *Farmville* and *Restaurant City* immerse player characters in a virtual world. They can manage a restaurant or farm in real time and play with their friends cooperatively or competitively as they try to develop their virtual world. Though these games may help strengthen existing bonds, they are thematically geared for younger audiences and are representative of a different genre than those on which we are focusing.

## 2.3 Console Games

Console games represent those played on a television or similar device, where interactions with these games are done through a controller specific to each system. Currently three consoles dominate this market: *Nintendo Wii, Microsoft Xbox 360, and Sony Playstation 3*. Industry reports suggest that 42% of American households have a gaming console [6] and as of December 31, 2009, 67.45 million *Nintendo Wii* systems have been sold worldwide [7].

The *Nintendo Wii* has received special attention, as it has made games accessible to the masses. The *Wii* using position and acceleration sensing allows for natural intuitive gestures when interacting with games, as opposed to indirect manipulation using the *Xbox or Playstation* controllers. Games such as Wii Bowling and Tiger Woods Golf, for example, allow for players to physically use throwing and swinging motions as they would in the actual sport.

Moreover, Voida and Greenberg [8] found that consoles create great social meeting places for gamers of varying ages, interests, and expertises. This of course is great for co-located gaming, however many seniors live in isolation and in fact a 2008 survey

showed that only 2% of the senior gaming population actually play console games [2].

## 2.4 Virtual Environments

Virtual Environments, such as *Sony Playstation Home or Second Life,* immerse their community in a rich 3D environment where users (represented as customized avatars) are able to roam freely and interact socially (see Figure 2). Community members are able to listen to music, watch movies, and play games (such as chess, pool, and bowling) which are embedded in the environment. This provides context for conversations as avatars can speak with one another by typing their messages. While *Sony Playstation Home* includes gaming, the focus of the system is to provide an alternate reality.



**Figure 2: Playstation Home allows people to roam a virtual world with games embedded in the environment**

## 2.5 Online Poker Environments

Current online poker games are focused only on card play and the human element is lost. The subtleties in gestures, facial expressions, and conversation have been replaced with a calculating, number-crunching game, where players rely on winning probability, odds and betting patterns to make informed decisions.

Sites have tried to compensate for this missing human element by allowing users to select emotions that your virtual player can emote. Opponents are then supposed to pick up on these deliberate *tells* (player cues that infer information about their hands) to improve their chances of winning. Unfortunately this tends to be very unnatural as *tells* are generally inadvertent in the physical game. In general, nonverbal communication (facial expression, body language) is essential in poker but is greatly limited in the virtual space [9]. Figure 3 shows the player view of *PKR Poker*, where users are able to select an expression to communicate on the bottom of the screen.

On top of this, hands start and end very quickly. This high speed of play further limits possibilities for social interaction. There is no time to chat or make friends. In effect, the online game has not yet capitalized on the social potential of this game.

**Figure 3: PKR Poker aims to model the physical game, focusing on the subtleties of the game referred to as tells.**

# 3. EXPLORATORY FIELD WORK

To discover how games are learned and played, we conducted three field studies. To better understand group dynamics of seniors at play, we observed seniors playing Wii bowling in a group setting. To gain insight into the accessibility limitations of current online games, we observed a 58-year-old woman attempting to play a game on *Yahoo!* for the first time. Finally, to understand game learning in the physical world, we ran a structured learning session with grad students playing in-person poker. Following the description of these studies, we will extract design themes, and in Section 4, discuss how they were integrated into our system.

## 3.1 Visiting Yee Hong Senior Centre

In our initial field study, we visited *Yee Hong*, a long-term care facility for seniors in the Greater Toronto area. Our intention was to better understand what sorts of social activities large groups of seniors participate in and how these events are organized, and to observe these groups at play. In two visits, we were able to interview a lead administrator and two activity co-ordinators. We shadowed the caregivers at work, and managed to sit in on one of the group's weekly Wii Bowling sessions.

In this large seniors' facility, a coordinator is in charge of organizing and running activities on each floor.

As described by one caregiver, seniors often come into the centre depressed, lonely, and feeling abandoned by their children. Social workers help them build new relationships by introducing them to people and using activities as icebreakers. To do this, each resident is interviewed, gauging interests, hobbies, and experiences. Activity coordinators build a customized program for each resident, matching them with similar seniors. Activities also need to cater to the physical disabilities of participants and are often limited to 25 to 45 minutes, in order to mitigate overexertion.

Among the activities that residents participate in, Mahjong is a popular choice. Even though this game is typically played for money, the seniors play for fun. Caregivers noted that activities help boost self-esteem, coinciding with the findings from Clark, Ebran, Graham and Thornton [10]. Even Alzheimer's patients play Mahjong. The caregivers noted that from the outside looking

in, it would be difficult to discern exactly what game they were playing. Players were claiming victories with incomplete hands, and acting out of turn. However, this series of seemingly incoherent events made perfect sense to the players and they experienced great enjoyment from the game.

Once a week, each floor partakes in a weekly *Nintendo Wii Bowling* session, which the caregiver noted was very popular with the residents. During one of our visits, we were fortunate to sit in on one of their games. The entertainment room, where this was held, accommodates up to 50 people, half of which were in wheelchairs or similar devices. As participants waited patiently, the system and game were set up by the staff on a 50-inch television. Among the four players, three languages were spoken: Cantonese, English and Mandarin. All four players bowled over 100 (though they were assisted by the coordinator), and it was a great lift to their self-esteem.

Even more interesting to us, was the involvement of the non-players. Nearly 30 residents attended the event, yet only four of them actively interacted with the game. The spectators cheered on the players, clapping and commenting on their play. Some spectators were even verbally betting on whether players would get a strike or not. The coordinator also played an intricate role in the session. Having worked there for three years, she knew everyone by name and called on the players when it was their turn. She helped them play and acted as commentator for the larger group.

These observations of such high levels of engagement and participation from non-players motivated us to focus on secondary roles such as spectators in our system design. This is an important finding because adequate support for this is missing from games, especially for this population.

## 3.2 A Senior's Introduction to Yahoo! Games

We observed a healthy-ageing adult female in her late fifties play an online game on *Yahoo!* for the first time. The subject was asked to choose any game that might be of interest and play, as researchers watched and tried to provide as little assistance as possible. The initial task of finding a game was not trivial. The wall of game choices, coupled with distracting ads demanding her attention, froze our subject. Names such as *Bejeweled, Diner Dash, and Burger Shop* sounded foreign to her, and the hundreds of games and their variants intimidated our subject. Gravitating to something understandable, the subject eventually settled on the word games category. After several failed attempts at running a game, she eventually managed to get into a game of *Word Racer* in which players compete to identify the greatest number of words in a jumble over a given duration. Instructions were described in one paragraph, but lacked sufficient detail to make the subject comfortable. In the game, she was matched up against two more seasoned opponents, causing her to score poorly. The subject found the experience to be discouraging and she was embarrassed by her play.

This study suggests that a game environment needs to be simplified and each game should be equally accessible. Online games need to account for the well-documented, age-related changes of older adults [11]. Fonts need to be bigger and distracters need to be removed. The "right" decisions need to be made for the end user to support learning and provide a more guided experience.

## 3.3 Novices Learning Poker

We ran an observational study simulating a casual poker game. Our subjects consisted of graduate students, two absolute beginners and three experienced users. The idea was that our findings could guide us in translating effective and natural real-world poker teaching methods to a web environment.

Each of the learners was first given a brief overview of poker so as to avoid overwhelming them once the game started. Teachers then played open-handed, allowing everyone to see their cards, as they narrated their thought process. Learners observed and were encouraged to ask questions. When ready, learners joined the game open-handed, again directing questions to the teachers. After a couple of hands, learners began to play closed-handed but were allowed to consult advisors who were not involved in the game. After building enough confidence, learners played a few closed-hands without any additional help.

Researchers took notes, and conducted informal interviews with the learners. The questions were used to gauge how comfortable they were learning from strangers, and which teaching methods they found the most effective.

The learners liked the gradual learning system and found it contributed to their confidence and comfort. They also enjoyed being able to ask questions and having the teachers and advisors divulge the motivations behind their actions. Though the advisors were helpful, the learners found it difficult to ask them detailed questions discreetly in front of their opponents. A great part of the open communication between learner and teacher/advisor was that these conversations drove more and more questions, a lot of which could not have been scripted for them beforehand.

Though this one-hour session was not enough for the learners to suddenly become experts, they did feel more comfortable with the game.

This study helped us better understand the needs of new users, and suggested the importance of roles such as mentor or learner to support both learning and social engagement.

## 3.4 Conclusions from Field Work

### 3.4.1 Usability

Designing compelling online game experiences for a senior population is difficult. Seniors are faced with numerous age-related challenges such as deterioration in vision, hearing, perception, memory, comprehension, information processing, and motor dexterity. Moreover, the web itself is littered with inconsistencies. Terminology, navigation, and organization vary between sites and even change over time, posing an even greater barrier to seniors [12].

In North American gaming culture, users are accustomed to having control over their experience. Not uncommon, games require that users choose among the different game modes, adjust game settings, and modify personal preferences before a game is played. As players, we constantly evaluate a tree of questions in order to have a game that is customized just for us. However for a population where this may all be new, choice results in added effort and uncertainty, detracting from the enjoyment of the experience [13].

One must consider that the current generation of seniors did not grow up with computer technology, let alone the same type of gaming experience that the younger generation is accustomed to. There remains a youth-bias in technology. Designers tend to design for their own demographic, rather than for those in later life with different wants and needs [14].

### 3.4.2 Roles in Gaming

Games are often thought of as isolated activities strictly among players. However, from our observations in the senior's centre, we found that this is not true. Games extend beyond players. Overlooked are the various secondary roles afforded by games that "non-players" participate in. Roles such as coach, teacher, learner, and spectator surround any one game, and by accounting for them, one could engage a larger audience of participants, making games accessible to even non-experts. Furthered by our study of novices learning poker, non-playing partners also create a tremendous opportunity for guided learning.

Montola and Wearn [15] group these participants as players and non-players. Non-players include spectators and bystanders. Focusing on non-player roles seems very fitting for this older demographic, as games can sometimes be intimidating. Yet our field work suggests that we need to consider a larger set of roles including, for example, mentors and learners. These roles should provide a more gentle segue into games, while opening channels of communication and encouraging learning.

## 4. SYSTEM OVERVIEW

We designed TableTalk Poker, a Texas Hold'em environment, for adults over sixty. The system supports multiple tables, with a maximum of five players per table, and each player is allowed one partner. Users logging into the system are presented with a set of introductory screens on how to play Poker, before choosing to play or partnering up with another player. Computer players are also present in the system, used primarily for testing purposes; they act fairly smart and may be used in the future to fill empty spots when participants may be away.

The system also supports voice communication among player/partner pairs via Skype and text communication from player to their opponents. We considered supporting voice or video chat among all players. However, they would need to carefully manage their voice communication to ensure that private information intended for their partner was not shared with the entire table, and this would distract from gameplay. We therefore decided to defer such options to future work.

### 4.1 Texas Hold'em Poker

Texas Hold'em Poker consists of two cards dealt face down to each player and five community cards placed face up in the middle for all the players. The five community cards are placed on the table in three rounds (flop, turn and river). After each round, users have the option of betting. The winner of a hand is determined by the best five-card hand that can be made from a combination of the players' two cards and the five shared cards in the middle. The winning player wins the pot amount (the accumulation of bets from all players). Success in Poker is measured in the long term, users need to be strategic when deciding when to bet, call, raise or fold.

### 4.2 Partners and Roles

For our study, we decided to focus on the interactions between a player and partner (who could be a learner, teacher or peer). We have also built support for spectators, allowing one to see open hands and percentage chances of winning (as they do on television). However for this study, we have deactivated this functionality as we determined it would be difficult to make the

role engaging in a laboratory setting. Also we felt that a lot of the interactions that spectators may have with their peers would be duplicated in the player-partner relationship. Yet we would like to include spectators in the future.

## 4.3 User Interface

For our initial designs, we tried to make things as clear as possible to the end user. We wanted to provide hinting and we sought to reduce extraneous clutter. Furthermore, we wanted to promote conversation and considered the idea of chat bubbles which would denote who spoke and draw attention to the conversation, as opposed to a chat window off to the side that we felt would only waste space and discourage talking.



**Figure 4: Initial appearance of the poker system**

However when we showed an early design (Figure 4) to an avid poker player in her mid-fifties, her first reaction was "This is intimidating." Motivated by this, we decided to redesign a more accessible system.

Drawing motivation from existing software solutions designed for the elderly, such as PointerWare [16] and Eldy [17], we realized that we need to both minimize clutter and minimize the number of decisions users had to make, allowing for only a few actionable items at a given time. We needed to better account for visual impairments and use larger fonts, and we needed to sometimes make the smart choice for the user.

Noting the design difficulties from Massimi et. al, of prototyping with seniors [18], we used instead three adult women with no online gaming experience as proxies. We used paper prototyping to allow us to work more closely with users and better understand their wants. We used transparencies, water-soluble markers, and sticky notes to dynamically create interfaces and define desired user interactions.

Before we began, each participant was given a briefing on the basics of poker, ensuring that participants understood the concepts of betting rounds, potential actions, and goal of the game. To start, we first created three rough paper variants of the system and showed the participants. We simulated games with sticky notes and asked participants to perform tasks along the way: Raise a bet, check, call, fold and chat to another player. Participants were encouraged to move things around, and add buttons, text, and screens on the fly. Participants were asked to speak out loud, as they worked through the series of events they expected to occur

("select text area on the bottom", "type message", "press send"). Researchers looked for any gaps in the interaction and noted any desired changes in the layout. Repeating this for all three of our designs, the researchers noted each participant's preferences.

The participants enjoyed the experience and found it very engaging. The use of paper made it easier to iterate on ideas and reduced attachment to particular designs. Interestingly, all three participants converged on roughly the same final design. The final design had elements from all three initial variants with heavy influence from the ad hoc ideas from participants.

See Figures 5 and 6 for a sense of the final design of TableTalk.



**Figure 5: TableTalk Poker uses a more minimalist design approach and an inviting colour scheme.**



**Figure 6: The user action brings decision-making to the forefront, dimming all unnecessary information.**

The interface uses distinctive colours to match actionable items. For example, orange is used to suggest a raise action. When the system is viewed at a glance these colours assist in distinguishing player and opponent actions. This carries into the different roles where colour is used to distinguish a player and partner at the game table. Some colours were deliberately chosen for their connotations beyond the context of the game. Green suggests proceeding, while red suggests error.

The layout opts for a minimal approach to the design of a game environment. The approach of focused gameplay is carried into actionable dialogues that present the player with possible options on their turn. This dialogue is presented in the foreground as the game environment recedes. The layout can be conceived as an augmentation of a first-person's perspective. Instead of adapting a traditional third-person approach, the environment puts players at the table with the most immediate, personal items closest to the

player. Opponents are seated around the table as in a traditional game. This arrangement maximizes space for player's cards and community cards. Also, chat functions are placed in this space to focus the player on their hand.

## 4.4 Gameplay

We allotted breaks between rounds, to allow players to reflect on the last hand and create an opportunity for conversation between partners and players. Users were also given as much time as needed and were not rushed to make decisions.

## 4.5 Architecture and Implementation

TableTalk Poker is a Flash-based web application, and hence is platform and browser independent. For simplicity of our study, voice communication is done via Skype (installed and setup beforehand), to allow for quick two-way conversation between a player and his or her partner.

The back-end of our system is done using Ruby on Rails, while the front-end is a combination of Adobe Flex and Flash. The game environment itself is done in Flex, which holds the layout of the table and avatars, while games done in Flash can be essentially swapped in and out.

To manage the multiplayer aspect of the game, we used a host-client approach, where the first player into the game would automatically be assigned as the host machine and its code would sync game states or non-deterministic game events with all clients. This was essentially done using Red5, an open source Flash server, where shared objects would essentially be sent to the Red5 server and be redistributed to all clients connected to it. This was also used for synching text chat messages to the table.

## 4.6 Iterative design and usability testing

In order to understand the merits of our system and needs of our users, we have been working with pilot subjects from Ryerson University's LIFE program (a continual education program for individuals over 50). The participants' ages range from 72 to 86 and their experience with online gaming varies significantly from avid to none at all. All subjects however are very excited at the prospect of building a gaming environment that encourages the creation of new social ties with the possibility of challenging and improving their cognitive abilities.

We scheduled participants once a week for one hour, and got the participants to play against the computer, against each other, or with each other (virtually or physically). We voice recorded each session, noting problems that users may be having, subtle dynamics when players worked together, conversations that tended to arise, and functionality used (or not used). We sometimes had informal discussions on what features they would like to see added and how these features would appear and be used. Researchers then improved the system each week, making adjustments based on the feedback from the seniors.

### 4.6.1 Preliminary Findings

This testing has been invaluable to us. We discovered and corrected bugs in the system, but more importantly, the feedback led to several design changes to account for physical disabilities and game understanding. One of the participants, for example, has developed tremors in her hands over the years, and finer movements like mouse dragging (which we were using for a raise slider) was very difficult for her. So instead, we opted for a button approach, which made things a lot simpler.

Another reoccurring usability theme was the poker language. Terms such as *check, raise, call and fold* were not as obvious as we anticipated. Participants would often forget what they meant and the implication of their actions. This led us to building in hinting on mouse hovers, and also simplifying the language whenever possible. It was incredible to see the improved understanding by changing *raise* to *bet*.

The most interesting results came from observing the social dynamics between players and the strategies they employed in the games.

Beginner players would ignore the public chat all together, as they were focused on the game itself, while more experienced online gamers looked to chat whenever possible. In earlier sessions, almost all players employed a very short-term poker strategy, focusing on winning every hand even when the best option was to fold. However, when players did win there was great jubilation and sense of accomplishment, reinforcing the aggressive or passive strategy they were using (which sometimes backfired on them). In later sessions however, participants started to understand that success in poker is measured in the long term and so would be more conservative when they did not have a reasonable hand.

We also found that the dynamics drastically changed as the subject was paired with a more experienced user, a peer, or a less experienced one. The more experienced player tended to lead the strategy more often than not, while the learner passively accepted the decisions. The learners surprisingly did not seem to mind this. One subject was too scared to do the wrong thing as a player, and too embarrassed to ask a "stupid" question, but enjoyed watching and learning from someone else. Among peers, a negotiation process tended to arise. It appeared that these behaviours are directly correlated to individual confidence, as these behaviours trended to peer-peer type relationships as users became more comfortable with the game itself from week to week. To account for these variations in behaviour in natural environments, we will include confederates in our study design who have been primed to behave in a particular way such as asking questions or explaining strategies.

We also found that there were often lulls between games, as players would get caught up in unrelated conversations. We found this to be good and necessary for fostering relationships, and this encouraged us to enforce breaks between games to allow for this interaction. Currently a thirty-second break time is awarded after each hand and five-minute breaks awarded every 30 hands. This contrasts with the no breaks/rest time typically found in online games.

We have incorporated all ideas and insights from this work into the design of our system, and are currently doing final testing before we run a formal experimental evaluation. We shall now sketch the design of this study, the measures to be used, and the conjectures we intend to test.

## 5. SUMMARY AND FUTURE WORK

We have described TableTalk Poker, an online social gaming environment designed for seniors. One novel aspect of our design is its focus on player-partner interactions, where a partner can be a peer, mentor or learner.

We have designed a research methodology for evaluating whether our system with added partner roles and voice communication

between these players and partners could improve game engagement, learning and social interaction.

We are asking participants to play Texas Hold'em in TableTalk Poker. Participants will be broken into two groups:

1.  One group will use the full system in which players have conversational partners who can assume various roles.

2.  There will also be a control group in which players have no partners.

To measure learning effects of our system, we will administer a poker questionnaire touching on subjects of strategy and game rules. For measuring relationship strength between partners, we will use a standard social engagement questionnaire assessing interpersonal attraction [19]. In terms of relationships between opponents, we will use social community questionnaires, measuring how attached one is to this community. Finally the game enjoyment and engagement questionnaire will rely mainly on flow theory, evaluating how lost in the experience users were when playing on the system [20].

Finally, we will conduct an informal interview with each participant in both groups, qualitatively assessing their experiences with the system and their relationships with their opponents and partners.

We shall report on the results of this study in a subsequent publication.

## 5. ACKNOWLEDGMENTS

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