The Usability of Massively Multiplayer Online Roleplaying Games: Designing for New Users

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ABSTRACT

This study examines the usability challenges faced by new players of massively multiplayer online role-playing games (MMORPGs), one of the fastest-growing segments of the video game industry. Played in completely online worlds, these games allow players to communicate with one another, form groups and communities, and compete in a variety of fantasy environments.

Nineteen subjects participated in an exploratory usability study of four games, three MMORPGs and a similar single-player game used for comparison. Results reveal that many people not usually considered as potential players of these games may be interested in them, but a wide variety of usability issues present serious problems for players inexperienced with the genre. Based on an analysis of the usability data and player feedback, specific recommendations are made to improve the experience of these games for new players. These results further demonstrate the applicability and importance of usability testing to video games.

Categories & Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces–*User-centered design*, *Evaluation/methodology*; K.8.0 [Personal Computing]: General – *Games*; H.5.1 [Information Interfaces and Presentation]: Multimedia Information Systems – *Artificial, augmented, and virtual realities*, *Evaluation/methodology*.

General Terms

Design, Experimentation

Keywords

Game usability, online game, roleplaying game, RPG, MMORPG, massively-multiplayer.

INTRODUCTION

One of the oldest and most successful genres of video games are role-playing games (RPGs), which have their roots in tabletop games such as *Dungeons & Dragons* [2]. The essential concept of these games is that players take on the personas of one or more characters in the game, using that character to interact with the game's environment. In the process of completing missions ('quests'), the player must manipulate objects in the game world, converse with other characters, and fight monsters.

As internet access became more widespread, the first text-based online games began to appear. One early type, multi-user dungeons (MUDs), allowed players to interact with one another and perform RPG-like tasks in a shared virtual environment [3]. In 1997, *Ultima Online* developed this concept further, introducing one of the first successful graphical online roleplaying games [2]. A number of similar titles soon followed, forming the genre today known as massively-multiplayer online role-playing games (MMORPGs). Modern MMORPGs retain the player interaction and shared environments of their MUD predecessors, while providing a more detailed graphical interface and a wider variety of gameplay options similar to offline RPGs. MMORPGs also retain the open-ended nature of MUDs: although players can choose to accept and complete small-scale missions, there are no predefined victory or loss conditions for the game. Much of the attraction of these games stems from their nature as a virtual community, as many players spend hours online chatting with friends, forming clubs and associations (guilds), and improving their character gradually over time.

Although currently successful, the economic model of MMORPGs depends heavily on player subscription fees [5]. Recent studies have shown that most players subscribe only to one game [17], and the number of new players entering the genre is growing far more slowly than the number of titles being produced [5,15]. This means that the success of future titles depends on their ability to attract new players outside the traditional audience of experienced, devoted players (the 'hard-core' market) [14]. Attracting these players may prove difficult: the interface and gameplay elements of MMORPGs have been heavily focused on features of interest to their core audience, which may pose significant usability issues for more casual

gamers. But these issues, like the usability of games in general, remain relatively unstudied.

The Usability of Games

Although software and web usability literature has grown exponentially over the past decade, little research has been conducted specifically on the usability of video games [7]. One of the first companies to seriously consider the usability of games was Microsoft Games Studio, which has developed a full-time User-testing Group [8]. Although most of their results beyond case studies remain private [10,13], their papers confirm that software usability methods can be applied to games to improve user satisfaction and decrease task-based failure and error rates among users [8,9,10,13]. Traditional usability testing involving individual participants and trained observers was found to be "an excellent method to discover problems… and to understand the thoughts and beliefs of participants and how they affect their interaction with the game" [8]. Their testing typically involves small numbers of participants tested for about two hours on a particular product. They justified this approach in a review of the software usability literature, noting that "Observing 4-5 participants will uncover approximately 80% of the problems in a user interface that have a high likelihood of detection" [10]. As Jakob Nielsen notes, such "discount" usability practices can produce significant improvements in product usability at a lower cost than more rigorous formal testing, despite possessing less statistical power [12].

The nature of MMORPGs themselves make a systematic study of their usability unusually challenging. Unlike other software and many games, which are published in discrete versions, MMORPGs exist in a continuous state of revision, with developers constantly identifying bugs, modifying rules, and adding features. Among the potential updates are interface changes, which may include anything from modified icons to a complete restructuring of the game's menu system and visual appearance. The frequency of such changes makes meaningful analysis of any particular game difficult, as the interface studied is likely to be obsolete soon afterwards, and may well change during the course of testing.

A more wide-ranging analysis of several MMORPGs could produce more broadly applicable results. A large number of basic gameplay tasks are defined by the nature of genre, and usability testing can analyze how well existing designs support the performance of such tasks, evaluate the satisfaction of users performing them, and make comparisons between different implementations of particular features. This would allow for the possibility of generalizing user evaluations and perceptions across the genre, broadening usability recommendations beyond the scope of any individual interface design.

METHOD

Because of the limited amount of prior research in this field, we conducted an exploratory study of four games across a small sample population of players new to the genre of MMORPGs. While this limited approach does not provide the level of detail necessary for statistical analysis, we felt that it could assess the applicability of usability tests to this genre, as well as provide a broad overview of the kinds of opinions and problems faced by new users.

Participants

A pool of subjects was recruited by word-of-mouth and phone interviews. Participants were briefly screened to ensure that they owned a personal computer (either PC or Macintosh), possessed a basic level of computer and internet literacy, and had never owned or regularly played any games in this genre. In order to study potential users outside the genre's current 20-40 age demographic [16], subjects within this range were also excluded. Neither ethnic/cultural background nor socioeconomic status was considered as a factor in the recruitment of subjects.

Based on these criteria, a final group of 19 participants were invited to participate in this research. The sample population included 11 males and 8 females, including 14 subjects 20 years of age or younger, and 5 subjects 40 years of age or older. Subjects were paid a total of $15 for their participation.

Products Studied

Four games, three MMORPGs and one single-player RPG included for comparison, were selected for testing. The three MMORPGs were selected from among the five most popular games in the genre at the time of testing. *EverQuest* (EQ) [6] remains the most popular and best-known MMORPG, with almost 450,000 subscribers to its fantasy world. *Anarchy Online* (AO) [1] offers a science fiction setting unusual among games in the genre. *Dark Age of Camelot* (DAoC) [4], the newest MMORPG studied, uses a variety of mythologies and detailed graphics to enhance its fantasy environment. The single-player RPG selected for comparison was *Neverwinter Nights* (NN) [11], a fantasy game with a similar visual interface and gameplay tasks, but a primarily offline environment.

Tasks

After selecting the games to be studied, a usability inspection of the games was performed to generate a list of user tasks. Tasks were selected to be brief, essential aspects of gameplay present in at least three of the four games studied (Table 1).

Metrics

Task success or failure was judged on the basis of the degree of assistance needed by the player to complete the task (no assistance/limited prompting/explicit directions) and the players' opinions of the task both during and after completion.

Category	Task
System	Install the game to the default location.
Interface	Use an item in the shortcut bar.
Interface	Find the in-game help screen
Game Interaction	Fight and kill a monster.
Character Interaction	Buy an item from a merchant

Table 1. Sample Usability Tasks

A series of user questionnaires was also developed to assess player opinions about a variety of issues related to video games and the MMORPG genre, as well as to provide starting points for debriefing discussions. Over the course of the testing process, these included issues such as previous computer and gaming experience, personal interests, criteria for purchasing games, design issues impacting gameplay, online membership fees, and interaction with other players in the game world.

Procedure
Due to the nature of the products being studied, the usability testing process was designed to accommodate the most natural gameplay setting possible. After consenting to participate in this research, subjects were given the option to test the game on their personal computer or one provided by the researcher. About three-quarters of testers chose to play on the researcher's system, a Dell Inspiron 8000 Notebook with a 1Ghz Pentium processor, 512kb RAM, NVIDIA GeForce2 Go video card, and cable internet connection, which had been set up in a home environment. Testing was conducted over a series of three sessions, each lasting about an hour and a half.

At the beginning of the first testing session, participants were briefly introduced to the type of games being studied. They were then presented with the four games in a random order and asked to "think aloud" as they examined each box. Participants were then asked to select one game to play for the remaining sessions. This procedure was designed to simulate the purchase of a game by the user, as well as eliciting any preexisting opinions or biases participants may have held towards this type of game.

At the beginning of each testing period, the participants completed one of the user questionnaires. They then moved to the computer they had selected for the testing. The researcher took a seat to one side, within view of the screen but a few feet from the user's position. Participants were reminded to "think aloud" as they played the game, while their words and actions were recorded by the researcher. Participants were further prompted to discuss their situation if they stopped speaking for a short period of time or otherwise stopped making progress. If a subject became stuck on an assigned task, and its completion was required

to progress further, they were provided with a mild suggestion or different approach to the problem (limited prompting). If they still proved unsuccessful, more explicit directions were provided until the task was complete. After completing each task, participants were prompted to discuss the approaches they had tried to complete it and their opinions of the task.

Due to the unpredictable nature of the game world, tasks were not given in an explicit order to the subjects; instead, they were introduced as they became relevant to the situation within the game. Usability issues encountered during periods of free exploration were also noted.

Following each testing session, subjects were debriefed by the researcher about any problems that had occurred during the session. Participants were then asked to complete another questionnaire about the gaming environment and received their compensation for the session.

RESULTS
Of the 19 subjects, 3 chose *Anarchy Online*, 4 chose *Neverwinter Nights*, 5 chose *EverQuest*, and 7 chose *Dark Age of Camelot*. Five chose to play the game they had selected on their own computer.

User Questionnaires

Computer & Video Game Literacy
On an 80-point scale of computer literacy issues related to MMORPGs, participants were well-distributed around a moderate level of expertise (M=42, SD=18). Participants also reported being willing to play a game for about an hour in a single sitting (M=77 minutes), within the range of moderate gamers. Slightly less than half (7/19) listed games as one of their major reasons for using the computer.

Games & Leisure Activities
Participants were well-distributed in their choice of leisure activities. The only significant result was that most (10/19) reported an interest in games traditionally considered 'casual,' including arcade, adventure, and puzzle games. Tetris was often specifically written in.

Market Preferences
Subjects were asked to rate specific sentence fragments found on MMORPG software boxes on a six point scale, with 0 being 'would not buy' and 5 'more likely to buy.' Participants rated almost all such sentences neutrally. The only exceptions to these were "Monthly Fee Required" and "Additional Online Fees Required," both of which received a heavily negative response (m=1.0, SD=0.9).

Aspects of Design
Participants were asked to rank the importance of ten game design attributes and to compare their chosen game with others they had played on each attribute. There was no consensus regarding the 'most important' design attributes. Compared to other games, MMORPGs were rated average

in terms of all attributes except "easy to learn," for which they received a poor rating (M=7.8/10, SD=2.7, M_d=10). Interestingly, there was a substantial difference in the answers to this question given by players of *Neverwinter Nights* (M=3.5) and those given by players of other games (M=8.7).

Game Subscriptions

Players were asked how much they would be willing to pay per month for their game or another game like it. Three price options were presented to players, one at a time, in descending order. Only one participant said he would be willing to pay $15/month to play, but eight more said they could agree to $10, and five more accepted $5. Overall, 14/19 participants were willing to consider paying some sort of monthly fee to play an MMORPG, a result which seems to contrast with those obtained in the *Market Preferences* questionnaire. Despite this generally supportive opinion, few (4/19) felt that they could convince their friends to pay to play these games. Also, consistent with previous research [17], most players said they would only be willing to pay a fee for one game at a time.

A number of alternative revenue strategies were then presented as possibilities. Players were unanimously opposed the idea of paying small fees (micropayments) for particular in-game features. They were more evenly divided on the question of hourly fees as opposed to monthly subscriptions, with 8/19 interested in paying by the hour. Surprisingly, despite their reported problems and frustrations with the game, 12/19 participants said they would consider purchasing the game they had played during testing.

Player-Player Interactions

Only one participant was able to successfully join a group during the course of this study. Although many felt that the game might be "more fun in groups," 7/19 reported feeling too insecure or inexperienced with the game to be willing to join a group of other players.

Usability Test Results & Analysis

Usability issues arising both from assigned tasks and free exploration were recorded during each session, transcribed, and later tabulated to form a composite problem listing (Table 2). Usability issues were rated as 'critical' if the issue was severe enough to halt player progress and require assistance in most or all occurrences, 'major' if the problem severely slowed progress or often required assistance, or 'minor' if subjects were generally able to complete the task with only limited prompting.

Documentation, Installation, and Setup Issues

Players were generally frustrated by the reliance of MMORPGs on their manuals to explain interface and game concepts. Of the subjects in this study, less than half (8/19) took advantage of the option to read the game's manual. Half of those (4/8) later reported being dissatisfied with the manual as a guide to the game, especially citing their length, complexity, and tendency to overemphasize the game's story at the cost of describing "what you can do and how to do it." These opinions were borne out by the usability data, which showed no significant difference in the overall error rate between players who had read the manual and those who had not. Based on discussions with participants who had chosen to read the manuals, it appears they had hoped to find a tutorial-like walkthrough of how to use the game, especially when no in-game tutorial was available. This would be a welcome addition to most manuals, especially since it could provide a meaningful context for the manual's interface descriptions.

Dark Age of Camelot comes with a keyboard reference chart, detailing the game's settings for a variety of shortcut keys and over 60 'slash commands,' short typed input preceded by a '/' character which perform an in-game action, such as sitting or specifying the range of a message spoken by the player. Together with the visible game interface, these key shortcuts and typed commands control the player's interaction with all of the MMORPGs. All three MMORPGs included a partial listing of such shortcuts and commands in their manuals, but *Camelot*'s separate key chart was the only one to receive widespread notice. Several participants reported feeling "overwhelmed" just looking at it, and most kept it nearby for reference during gameplay. This created complications of its own, as these interface systems partially, but not completely, overlap one another: there is a keyboard shortcut and onscreen button for accessing game menus (but no slash command); a keyboard shortcut to enter combat mode (but no onscreen button or slash command); and a slash command and an onscreen button for inviting other players to join your group (but no keyboard shortcut). In short, no one interface mechanism controls all game functions, and most players spent several minutes of testing time looking for nonexistent keyboard shortcuts or slash commands for particular actions. A similar situation exists in all of the MMORPGs studied, and severely impacted the progress 5/15 players. Only *Neverwinter Nights* does not include typed commands as a significant part of its interface. Minimally, MMORPGs should allow for customizable shortcut keys. In many cases, functions currently assigned to slash commands could be reassigned to shortcut keys, onscreen buttons, or both, thereby eliminating an interface method and removing a confusing duplication of functionality.

The installation process for all four games was standardized and unremarkable, allowing even the least experienced of the testers to complete it without significant difficulty.

All of the games studied were playable on computers with a dial-up internet connection, and there were relatively few problems due to network lag during gameplay. The most substantial drawback to these connections was the difficulty of completing the frequent patch downloads required to keep the software up to date. This was most noticeable

Usability Issue	Games Involved	Severity	Users Affected[1]	Suggested Resolution
Attempts to buy/sell/equip items were often unsuccessful.	All	Critical	15/19	Allow drag-and-drop use of items on characters, as attempted by most subjects.
Difficult to interact with computer-controlled characters.	All	Critical	11/19	Use a conversation text with hyperlinks, rather than typed commands.
In-game help is not offered, rarely useful, or difficult to find.	All	Critical	11/19	Include an in-game tutorial and context-sensitive help for all reasonable objects.
Modal combat system is unlike other games, too confusing.	AO, DAoC, EQ	Critical	10/15	Prevent player from disengaging with an enemy, or use a different combat model.
The use of shortcut keys, typed input, and buttons make locating and executing actions difficult.	AO, DAoC, EQ	Critical	5/15	Reduce or eliminate typed commands as an interface option. Allow players to customize shortcuts and menu options.
Manuals aren't adequate to describe game features, play.[2]	AO, DAoC, EQ	Critical	4/8	Adopt a 'tutorial-like' writing style. Use in-game help & tutorials more effectively.
Text was often difficult to read.	All	Major	13/19	Allow scalability, color customizations.
Game terminology not explained	All	Major	12/19	Provide context-sensitive help.
Player-player interaction limited, hard to join a group.	AO, DAoC, EQ	Major	8/15	Use audio feedback to indicate chat events, automate group-forming process (DAoC).
Unanticipated changes in the interface often went unnoticed.	All	Major	7/19	Use audio and/or visual feedback to alert players to significant changes.
Limited feedback for non-combat action success or failure.	All	Major	5/19	Use audio or graphical feedback to notify users of the results of their actions.
Camera was difficult to control.	All	Minor	12/19	Use a fixed position to limit user mistakes.
Server selection process doesn't explain the user's options.	DAoC, EQ	Minor	9/12	Offer a default setting, or at least explain what the choice means & why it matters.
Trouble shifting between mouse and keyboard for actions.	AO, DAoC, EQ	Minor	5/15	Eliminate typed commands; include most or all actions in the onscreen interface.
When dragging an item, assumed the mouse focus was the item, not the cursor.	AO, DAoC, EQ	Minor	4/15	Have the cursor snap to the center, not the corner, of the object being dragged.
Trouble targeting creatures and/or items.	DAoC, EQ	Minor	4/19	Allow targeting by clicking on character names, expand targetable radius of player.
Users skimmed or didn't read large blocks of text.	AO, DAoC, NN	Minor	4/19	Present text in small, manageable increments.

Table 2. MMORPG Usability Issues Identified

[1] Total size <19 indicates that the problem condition was not present in one or more games.

[2] A total of 8 subjects read the manual for their game. No players of Neverwinter Nights chose to read its manual.

immediately after installing the game, when all of the patches since the game's initial release had to be downloaded. One tester reported that it took *EverQuest* 7 hours to complete its patch download on his machine, another spent two 10-hour sessions patching *Camelot* when the first download was interrupted.

After installing and patching the game, both *Camelot* and *EverQuest* require players to select a server—one of the centralized computers responsible for controlling the game world—on which to play, but fail to meaningfully describe what a server is or why this decision matters. This selection process is made more complicated by the fact that the servers are named after characters from their respective mythologies, further confusing players as to the significance of the decision. In all, 9/12 players who encountered this screen became confused about its purpose and required some degree of prompting to proceed into the game. A default selection could easily be provided to allow most users to simply skip this step.

Immediately thereafter, players entered the game's character creation process. In this set of screens, players are expected to choose their character's profession and assign 'points' to various statistics—strength, health, magic power—that determine the character's abilities. *Anarchy*, *Camelot*, and *Neverwinter* all offer some form of context-sensitive help with this, but 12/19 participants still became confused with some aspect of this terminology. Subjects were often unsure how particular statistics would affect their character or what the differences between the character professions were. Alone among the games, *Neverwinter* offers options for players to take 'recommended' values for the various statistics, or to bypass this process altogether by playing a character that had been created by the designers. Of the four participants who selected *Neverwinter*, two chose to use a premade character, and one accepted the game's recommended values, significantly speeding this process for them. These would seem to be excellent solutions to the problem, and could be reasonably applied to MMORPGs.

Tasks & Gameplay

Within the games themselves, players quickly became adept at moving their characters around the game world, although 12/19 experienced some difficulty controlling the camera that follows the player's character, such as an inability to rotate it around their character or to keep it at a consistent level of zoom. Most were able to identify, open, and close in-game menus without difficulty, but 7/19 failed to notice unanticipated changes in the interface. This caused players to frequently miss important pieces of information, such as chat messages or changes to their character's health indicator. This could easily be corrected by providing some feedback to the player, as animations and audio clues were generally successful in indicating events to players elsewhere in the games.

Another common problem, experienced by 13/19 subjects, was that many areas of text—on buttons, labeling items, and in the chat window—were simply difficult to read. A portion of this is attributable to color-contrast issues, such as the difficulty many users had reading the yellow text messages on the light background of *EverQuest*'s scrolling text window. In other cases, it seemed as if clarity had been sacrificed for artistry: many games use translucent windows, which can allow changes in background color to make text harder to see. Another possible cause of this problem was the extremely tiny font size used by many games in their attempts to put as much information into various windows and panels as possible. Scalable fonts or user-configurable color schemes could eliminate many of these problems, although many aspects of the interface would have to be similarly scalable to accommodate the additional text.

Eleven subjects were unable to obtain in-game help for a problem when they wanted it. *Camelot* provided a FAQ-like system with only a minimal amount of information, while *EverQuest*'s help system was too extensive—as an almost direct transcription of the manual, it was actually harder to navigate than its physical counterpart, with almost none of the additional benefits that hyperlinking could provide. Context-sensitive help fared little better: *Camelot*'s 'identify' key command (Click + Ctrl-Shift-I) wasn't even listed on its otherwise exhaustive key reference chart, and *EverQuest*'s right-click-and-hold had so substantial a delay time that many players never even found it. *Anarchy Online* fared significantly better, with a respectable in-game help system that included both context-sensitive tips for new players and a rigorously enforced Shift-Click key combination for more detailed information on almost anything. This key command was repeatedly suggested in the game world by a variety of hovering help boxes, allowing most users to recall it and access help as needed. Although *Neverwinter* has no in-game help system (though it does include limited context-sensitive help for items), only one of its four testers felt this was a problem; the detailed tutorial which opens the game seemed to provide adequate guidance for most situations. The combination of an in-game tutorial and an easily-accessible, context-sensitive help system could resolve many player questions and provide a more solid introduction to the game as a whole.

Combat, one of the central activities in the game world, also posed a problem for many players. In MMORPGs, players have little direct control over hand-to-hand combat; their characters are typically toggled in and out of a special combat mode through the use of a shortcut key. Many players (10/19) incorrectly associated their character's weapon swinging—a function of being in the combat mode—as a direct result of pressing the key, causing them to tap it repeatedly in combat situations. Although a natural action used in many games, this strategy causes the MMORPG system to toggle the character in and out of

combat mode repeatedly, usually preventing them from attacking. This typically resulted in the death of the player's character and a great deal of confusion among the participants as to the source of the problem. *Neverwinter Nights* uses a similar combat mode but instead requires the player to click on the target they wish to attack, a small but significant difference: None of the four *Neverwinter* players experienced this problem. This issue could be addressed by simply preventing the player from canceling combat mode once an attack had begun (just disabling the key), but a better alternative might be changing from a key-triggered combat mode to an onscreen button or click-type combat mode. Further study would be needed to determine the optimal solution to this problem.

Perhaps the most troubling usability failure for the genre came in the form of communication difficulties. MMORPG players are expected to converse with game-controlled characters for basic utility tasks such as buying and selling items, as well as to obtain quests and learn about the game world, yet 11/19 subjects struggled with this. The primary difficulty encountered by most players was their tendency to try using the built-in chat window to 'type at' the character, evidently expecting the game to identify the target of their question, interpret their message, and answer accordingly. *EverQuest* actually attempts this on a very limited scale, but as none of the players—even those who read the manual—were aware of the prescribed dialogue structure and keywords, they found themselves completely unable to communicate: none of *EverQuest*'s testers were able to complete communication tasks without assistance. As an alternative, *Camelot* and *Neverwinter* both include a special dialogue window with hyperlinks to additional conversation topics, which their players were able to use with only minimal problems.

Communication with human-controlled characters fared little better. These interactions are handled through the game's chat system, which resembles a limited instant messaging program. Unfortunately, chat messages in these windows appear without notice, causing almost all testers to overlook them entirely. These windows are also used for a variety of game status messages, often causing a message from another player to be scrolled out of view before it can be read. Only one subject in this study noticed a chat message, responded to it, and went on to join a group with other players. As this is one of the fundamental aspects of the genre, these difficulties are particularly troubling. At the minimum, player-spoken messages should be accompanied by an audio clue, and status messages should be moved to another window or indicated graphically instead. Other methods should also be found to encourage players to interact, such as *Camelot*'s group-finding window.

Surprisingly, the most frequent and frustrating problem experienced by the participants came in attempting simple interactions with items in the game. In the games being studied, the player's items are kept in an inventory, a window with 'slots' containing icons of the items,

sometimes labeled by a text description. As one of the most basic tasks, all players were asked players were asked to pick up items to put in their inventory, 'equip' (ready for use) appropriate items, attempt to sell items, and attempt to buy items. The first task is accomplished simply by clicking on the desired item where it appears on the field, and almost all participants (17/19) completed this successfully. But 15/19 players experienced an inordinate amount of difficulty at the other tasks. Instead of searching for and manipulating the equipment window(s), many players tried to equip items by dragging them from their inventory and dropping them onto their characters. Selling was attempted by dragging items from their inventory to a merchant, and buying similarly from the merchant's inventory to their characters. Curiously, these behaviors are completely undefined by these games; the game provides no feedback, simply returning the item to its position in the inventory from which it came. Many subjects failed to notice that anything had gone wrong. Those players who did realize there was a problem were often unable to diagnose it, frequently repeating the process several times before requesting assistance. In many ways, this problem is demonstrative of many of the usability issues encountered in this study: an issue experienced players may have little or no trouble with, but which could be fixed relatively easily and with substantial benefits to the satisfaction of new users.

DISCUSSION
By applying the techniques of usability research, this exploratory study demonstrates that a variety of genre-wide usability issues exist among current MMORPGs that may be limiting their potential audience. It also supports the application of usability principles in the context of the gaming environment, suggesting that the heuristics and research methodologies used for other software should have a prominent role in the design and testing of video games.

Usability as a Factor in Audience Development
The results of *Game Subscriptions* Questionnaire, in which 12/19 testers said they would consider purchasing the game they had played during the testing process, would seem to hold out hope that moderate and casual gamers might be induced to try games in the MMORPG genre. Based on these exploratory results, it seems safe to say that a greater emphasis on the usability of MMORPGs has the potential to significantly increase the satisfaction of new players and improve their overall experience of the genre.

The *Market Research* and *Game Subscriptions* results present divergent views of the willingness of new users to pay the subscription fees required by the genre. The *Research* questionnaire strongly suggests that new players may be hesitant about a subscription model, but when presented with specific price points and an understanding of why subscriptions are required, as in the *Subscriptions* questionnaire, most seem willing to consider it. Usability may have a role to play in this decision, as a positive initial

experience with a game during its trial period is likely to encourage that player to become a subscriber.

Perhaps the most significant usability issue uncovered was the serious lack of communication between new users and other players during the course of this study. As this kind of interaction is the hallmark of the MMORPG genre, its absence is particularly troubling. Again, a greater emphasis on usability may be able to address this problem. A number of the usability issues already noted in this study have ties to communication, including problems with text readability and the absence of feedback when messages are sent and received. Furthermore, the insecurities mentioned by subjects in the *Player-Player Interactions* questionnaire may well be related to the many interface and interaction usability issues that made learning to play the game so difficult. A greater focus on the overall usability of a game, perhaps in combination with in-game tutorials or assistance, may allow new players to feel more comfortable and confident in their approach to the game world.

Further Research

Research in the field of game usability is a recent development, and a great deal of further study remains to be done. A variety of demographic factors, such as age and gender, may have an impact on the usability problems faced by particular groups. Prior experience with games, both within and outside of a particular genre may also have an affect on a game's perceived usability. Particularly among complex games like MMORPGs, techniques are needed to increase the memorability of complex game actions, and respond effectively to user errors. Actual comparisons of interface elements and features may also be useful, potentially leading to the development of heuristics for the design of MMORPG interfaces and gameplay. We hope that the many disciplines of HCI will be able to contribute to the development of game research as a topic of serious academic inquiry.

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