Do MMORPGs enhance MMMCCL

Multi-Media Multi-Channel Communication Literacy

Supervisor: Else Nygren
Author: Patrick Prax
Abstract

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Author: Patrick Prax

Tutor: Else Nygren

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University: Division of Media and Communication, Department of Information Science, Uppsala University.

Purpose/Aim: The aim of the paper is to find out if there is a correlation between playing MMORPGs and having better skills in using multi-channel communication.

Material/Method: A media-skill test was conducted in the internet testing the participants’ ability to respond to targets in three different channels and media at the same time. The results of the study were used for statistical comparisons of the different groups of participants sorted according to their media use.

Main results: People who use the internet more and who play computer games, especially MMORPGs, have a better Multi-Media Multi-Channel Communication Literacy. There is fast learning visible for people with a use of the respective medium of up to five hours a week. Playing makes you better, not playing a lot.

Keywords: Multi-Media, Multi Channel Communication, Media Literacy, Massively Multiplayer Online Role-Playing Games
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1. Introduction

Messages in the guild channel are green, whispers are purple, the party channel is turquoise, the raid channel orange and raid warnings are colored in an intense red. The addons and mods are writing messages in the middle of the screen that dim out or get smaller to make place for updates. Bars in different colors inform about the cool down of different key abilities or about the performance and the status of the other raid members. There are a number of people talking in the Voice-over-IP, sometimes to the whole raid and sometimes to subgroups. The situation is stressful and rapidly changing. Decisions are made and commands are given, orders executed and feedback provided. An important message seen too late or understood wrong might have fatal results. Mistakes have to happen and people know that. Communication has to be stable and resistant to mistakes to work.

Suddenly I hear a sound from outside the game. I got an MSN message. I minimize the game and answer my girlfriend who wonders what I am doing. When I tell there that I am playing she complains. She says that I should speed up a bit. I am always answering her so slowly while I play.

1.2 Research Problem & Research Question

Multi channel communication is nowadays at least in many business environments a mere fact. Communication over email, telephone, messenger, mobile and social networking sites are going on at the same time. Most often people even have to keep up working while engaging in all this communication. And the trends of technological development are going towards even more channels and more direct communication all the time and everywhere. We might see us confronted with a future where everybody is always in contact with everybody, where nobody is ever unavailable and where the number of communication channels used at the same time are only limited by the capacity of the human being working them.

However, this possible future is already true in MMORPGs. Everybody can reach everyone everywhere and always. A massive number of channels and different media are used for communication at the same time while the players still have to perform different tasks in the game. A complicated system of color- and form coding is used to mark different channels and types of communication.

While playing MMORPGs players have to get used to this kind of direct fast-paced multi-channel communication or they will not be successful and will not have fun. If we are going to face a communication environment in the future that shares some of the features of today’s communication in games, it becomes an interesting question if the people who play are better in handling it.

“Are players of MMORPGs better in using multi-channel communication?”

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1 MMORPG stands for “Massively Multiplayer Online Role-Playing Game”
1.3 Aim of the Paper
The aim of the paper is to find out if there is a correlation between playing MMORPGs and having better skills in using multi-channel communication.

1.4 Disposition
1. Introduction
   This chapter presents the research problem and research question as well as the aim of the paper.

2. Theoretical Framework
   This chapter defines and describes the term literacy and multi-media literacy. It explains the connection of literacy to computer games and states the hypotheses of the paper.

3. Pre-evaluations and test design
   This chapter explains, why the media test is build up the way it is. It connects the theory of multi-media literacy with the test.

4. Methodology
   This chapter explains the setup and design of the media skill test used as empirical study in this paper. It explains the test evaluation as well.

5. Results of the Study
   This chapter tests if the hypotheses from chapter 2 are supported by the data from the test. It further explores the data searching for interesting relations like the results of different user groups and the learning of media literacy during the low hour usage of certain media.

6. Discussion of the Result and Conclusion
   This chapter discusses the result of the study in terms of if it answered the research question. It reviews reliability and validity of the study and maps out further research.
2. Theoretical Framework

2.1 Literacy

In this paper I am going to investigate the abilities of using multi-media communication. The ability to work with different media has been the subject of many research projects lately. The term used to discuss the abilities necessary to use and understand a medium is often referred to as the respective mediums literacy. However, to be able to work with the term multi-media communication literacy it is necessary to define what exactly is meant by it.

2.2 Media Literacy

In current research there are different approaches to the term “literacy”. One approach is here limiting the term literacy only to the ability to read and understand actual written texts. Many authors use the term literacy also for the ability to deal with text in digital forms. For this the terms e-literacy or e-literacies are used. E-literacy is defined as “distributing, exchanging and receiving texts by electronic means”\(^2\). In a different formulation e-literacy is

> “the knowledge and skill required to make marks in an electronic age with electronic devices. Such knowledge and skill generally includes alphabetic literacies as well as at least a rudimentary grasp of a computer's interface and some specialized knowledge for issuing computer-readable commands to save a document, print it, send it out over a network and the like”\(^3\).

These definitions of literacy have in common that they describe it as some form of competence that enables people to use and understand media. Following this thought it should be possible to use the term literacy as well for media that are not written text. Just as the term “media text” can in its wide definition be used for all kinds of media messages, written text, audio signals and even visual parts, media literacy can be used for understanding these media texts.

Another reason for the possible use of the term media literacy for all kinds of media can be found in the writings of Reinking. He argues that

> “all literacy is multimedia literacy: you can never make meaning with language alone, there must always be a visual or vocal realization of linguistic signs that also carries non-linguistic meaning (e.g. tone of voice, or style of orthography). Signs must have some material reality in order to function as signs, but every material form potentially carries meanings according to more than one code. All semiotics is multimedia semiotics, and all literacy is multimedia literacy.”\(^4\)

Following this argumentation, it becomes clear that there is no such thing as an “only-writing literacy”. Understanding the meaning of a text is just as the meaning of a visual or acoustic depending on its context. This shows that the understanding of written text and other media

\(^2\) Buckingham on media literacy G.M. Johnson / Computers in Human Behavior 24 (2008) 2094–2106
\(^3\) Kaplan (1995) p.11.
texts basically is the same process. The term literacy will thus be used to describe the ability to read and understand the meaning and social relevance of all kinds of media texts in all mediums.

2.3 Operational Literacy

The wide definition of literacy brings with it some difficulties especially when talking about literacies and digital media like computer games. As the term is used to describe a competence of dealing with a media text in a social context its meaning enlarges even further. It can even be used for dealing with social phenomenon or with technologies. Terms like “digital literacy”, “computer literacy” and even “emotional literacy” can be found in contemporary texts explaining e.g. the abilities children can get through computer games. While these terms can be useful in their respective area of use they do not represent what is understood under the term of literacy in this paper. For the purpose of this paper literacy is limited to the understanding of media texts, not of technologies or emotions. As said above media texts have to be interpreted in a social and technological context which makes it a rather arbitrary border between the different understandings and definitions of literacy. In this context the term “operational literacy” is useful. It shows that the focus of this paper lies on the rather mechanical part of understanding a media message and not about interpreting it and dealing with it emotionally.

2.4 Multi-Media Literacy

This paper is investigating the ability to use different media and different channels for communication at the same time. Modern digital communication is using different channels and media like chats, messengers, video and audio communication in parallel. This introduces a new challenge to the communicators as it is not enough to understand each medium and channel separately. It is also necessary to be able to split up ones attention and cover all channels at the same time. It is necessary to be able to reply fast not to delay the communication. It is important to answer to a message in the correct channel to avoid confusion and mistakes and it is necessary to be able to identify and deal with mistakes others make while engaged in complicated communication. It is finally necessary to be able to send and receive messages at the same time in different channels without mixing them up.

This means that the challenge to split attention between different media is added to the task of understanding the single media. The ability to split the attention between different channels while still receiving all the information could be classified as a kind of meta-literacy. It is not a direct ability to read a media text but something on top of that, in between the user and the medium. Reinking describes it like this:

“voice-annotated documents and images, and written text itself, are now merely components of larger meaning-objects. The meanings of words and images, read or heard, seen static or changing, are different because of the contexts in which they appear”.

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Multi-Media is thus not only the sum of the different media it contains. The media are influencing each other and build the background of interpretation of each other. It is thus possible to speak of a single separate multi-media literacy.

2.5 What Does It Have to Do with Computer Games?

Multi-media literacy has naturally a close connection to digital media. The computer is the tool to experience and engage in multi-media communication. Johnson’s research “strongly suggest a relationship between Internet use and cognitive processing abilities, particularly, metacognition and visual attention.”\(^6\) This might not be very surprising yet. After all, using digital media a lot should make you better in using digital media.

The digital medium that is probably discussed with the most passion is computer games. The influence of computer games on education and their possible use in the education of children are the most prominent topics of the discussion. The design of a successful computer game has many similarities to educational and learning software.\(^7\) The quality of the learning curve required to progress in and finally master a game is crucial to the games success.

“Thus, designers face and largely solve an intriguing educational dilemma, one also faced by schools and workplaces: how to get people, often young people, to learn and master something that is long and challenging - and enjoy it”\(^8\).

However, many of these investigations mainly show that people get better in playing by playing. This is giving a hint towards that people also develop the skills necessary to be good in games while playing them. Multi-media communication literacy is necessary for success in MMORPGs. The question is now if the playing of them especially enhances these literacies. It is important here to be aware of that people who play MMORPGs are some kind of elite. They can be expected to be mostly young, male, interested in computers and competitive. This group can be expected to have a better multi-media literacy. It would thus not say anything about the relationship between MMORPGs and multi-media literacy if players were shown to be more literate than the average person. This said it can still be possible that players of MMORPGs are better in multi-media literacy because of the design of the games requiring social interaction and communication over different media and channels all the time. Gee draws in his book already parallels between playing MMOs and modern office work.

“Finally, we can state that when players play in massive multiplayer games, they often collaborate in teams, each using a different, but overlapping, set of skills, and share knowledge, skills, and values with others both inside the game and on various Internet sites. In the process, they create distributed and dispersed knowledge within a community in ways that would please any contemporary high-tech, cross-functional-team-centered workplace. In this respect, games may be

better sites for preparing workers for modern workplaces than traditional schools."9

Manninen lists in his work all kinds of possible interactions that can occur in CVEs10 (Figure 1). One kind of CVEs is multiplayer computer games. It illustrates the different levels on which communication can take place in a game even without taking into account voice-over-IP communication and chatting.

Figure 1: The model illustrates the main interaction forms that can be found within CVEs like multiplayer games.11 http://www.gamestudies.org/0301/manninen/

As an example of the use of audio channels in MMORPGs there is a study on the use of audio signals in a certain part of World of Warcraft.12 Jørgensen describes in particular how audio is an integrated part of the game play of WOW and how the messages transmitted over audio have to be understood by the players to be successful in the game. It also describes how “auditory and visual information work together in creating an understanding of every situation. In context, the two sensory processes provide different information that the player must interpret as a whole in order to make sense of what a specific situation means”13 thus already linking the audio to a multi-media background.

To get a useful comparison and thus to be able to say something about a correlation of playing of MMORPGs and multi-media literacy it is necessary to compare the players also to people who belong to the same group as they do with the only difference of the playing or without playing the respective kind of games, MMOs.

10 Collaborative Virtual Environments
12 Jørgensen. (2008)
13 Jørgensen. (2008)
2.6 Hypothesis

Hypothesis 1: People who play **MMORPGs** have a better multi-media literacy than people who do not.

Hypothesis 2: People who play **computer games** have a better multi-media literacy than people who do not.

Hypothesis 3: People who use **social media** (social networking sites, chat, messenger, forums and blogs) have a better multi-media literacy than people who do not.

Hypothesis 4: People who use the **Internet** frequently have a better multi-media literacy than people who hardly use it.

Hypothesis 5: People who use the **computer** frequently have a better multi-media literacy than people who hardly use it.
Figure 2 shows the different groups of participants divided according to the hypotheses.

These groups of users create a range of different problems for the analysis of the results. While the distinction between computer users and people who do not use computer is rather simple as well as the distinction between users of the Internet and non-users it becomes difficult to draw a line between users of social media (social networking sites, chat, messenger, forums and blogs) and players of computer games. As shown in figure 3 the groups of players and users of social networking can mix with each other as well as the sub-group of players of MMORPGs can be users of social networking. It is also possible that people do play computer games but do not use the Internet.

These rather difficult relationships between the different groups of test-takers can lead to some problems when investigating the relationship of the different media usage to the multimedia literacy. It can be expected that the groups will be overlapping and interrelating. This is taken into account in the analysis.
3. Pre-evaluations and test design

3.1 Introduction

The centre of the research is a test called Media Skill Test\textsuperscript{14}. This test has been online under the address http://omdb.kilu.de/study/ and http://mediaskilltest.6x.to/ from the 9\textsuperscript{th} to the 30\textsuperscript{th} of April. The test is designed to test the ability of the participants to process communication through different mediums at the same time, to be attentive and to react fast to the received information. This part of the paper is explaining how and why the test is measuring what it is supposed to measure.

3.2 Operationalization

The test is supposed to measure the multi-media literacy of the test takers as a meta-literacy on operational level as discussed above. The measurement of literacy as an ability of understanding media texts could be done in a variety of ways. A classical approach would be to expose the test takers to media and test afterwards how much they have understood and can reproduce. However, this kind of test setup is not usable in the case of this study. The aim is to measure multi-media communication literacy. Communication is an ongoing process with an exchange of information between different parties. To reflect this view of communication as a process there have to be measurements and ways of asking feedback from the participants while the test is still going on and while they are still receiving information. Otherwise the test would be some kind of media text reading comprehension not measuring communication literacy.

As the aim is to determine the multi-media communication literacy of the participants it would be the best solution to put them into a real communication situation and evaluate their performance. This would mean that their responses to the incoming information should be used to reshape the communication situation. It would require some kind of reactive test that adapts to the reply it gets from the participant. This could only be created using either multiple choice replies or actual human beings in the test to communicate with the participants. Both possibilities are problematic. The multiple-choice solution would limit the communication extremely and change it so much that it would be hard to argue that it is still multi-media communication literacy that is measured. It would be difficult to evaluate the performances of the participants as they would just press on one of the answer choices thus imposing further difficulties.

The setup with real human beings simulating a multi-media communication situation brings different problems. There would be two kinds of test setups possible here: a kind of focus group discussion of many test takers with each other over multi-media channels or a communication of one test taker with research assistants trained to simulate the same test situation for every test taker. The focus group approach faces the problem that every group would be different and the findings for the different groups and different participants in it would not be comparable. This approach is thus not usable. The setup with research assistants simulating the same test for everybody would be better. However, apart from the enormous resources required to carry out such a test the basic problem would remain the same. The test

\textsuperscript{14} Later referred to as MSK.
would not be exactly the same for everybody. It would be impossible to evaluate and compare peoples’ performances.

As it is not possible without creating even bigger problems to measure communication where the test takers can respond freely the test design is limited to testing the understanding of multi-media communication with the test taker responding to the communication and the destined targets in it while being in the communication situation.

This approach measures primarily the ability to understand multi-media communication. Its strength is that it requests feedback about the understanding on the run while there is still communication going on. This reflects a real communication situation in the respect that there is still information coming while one is responding to it. It puts the test takers in the stress to respond and receive at the same time to and from different media.

The limitation of the approach is that the response is limited to the press of a button upon receiving a certain signal. This means that the test is not measuring the ability to express oneself well in multi-media communication and that it overemphasizes the receiving part of multi-media literacy. However, it is still usable to evaluate and measure multi-media communication literacy.

The test operationalizes the measuring of multi-media communication literacy.
4. Methodology

4.1 Test Layout

The media skill test was designed and constructed for this study. It is made available on a website in the Internet.

To challenge the ability of the contestant to deal with different media at the same time the test consists of three different parts, a chat part, a video part and an audio part. The chat part takes the left third of the screen while the video fills the upper right side. In the lower right side are the start button as well as pictures of the three buttons assigned to the media to react to them.

Here is a picture to explain the test layout (figure 3). The very same picture is used in the explanation of the test to the participants.

![Figure 3: Text layout explanation.](image)

4.2 Test Mechanics

The test page utilized some simple mechanics to measure the test takers’ performances. It registered the hits on the keys 1, 2 and 3. 1 was assigned to the chat-, 2 to the video- and 3 to the audio part. In each medium 14 targets appeared during the course of the test to be reacted to by pressing the button.

The target for the chat was the first mentioning of any male name. Whenever a male name was mentioned for the first time the test takers were supposed to press button 1. If the button was pressed for a male name that had already been mentioned before it was counted as a false alarm.

The target for the video part was the appearance of a new kind of animal that had not been shown before. Here button 2 had to be pressed.
For the audio part the test takers had to hit button 3 when Diana started talking after a question.

The first two media thus required one not only to react fast but to keep in mind, which names and animals had already been shown to avoid false alarms. Another structural difference between the media is that in the chat the test takers can still see the old messages while the audio and video parts are only running forward and cannot be listened to again during the test. However, this difference is intrinsic to the different media and part of them and the challenge of dealing with them at the same time. It was further of no use for the test takers to read the “old” posts in the chat again.

The test program has the times at which the targets appear saved in three different time lines. If the program registers a click, it checks the time of the click according to the time line of the medium. If the click has been not more than four seconds after a target appeared the program registered a hit. After a hit the four second window is closed and there are no more clicks registered during this period. If a click has been at a time where there has not been a target before the program registers a “false alarm” and blocks the possibility to get another false alarm in the respective four-second time window of the first one.

Every time window after a target that has not been reacted to becomes a “miss” and every other four second windows that has not been reacted to become a “correct rejection”. To make the time windows fitting to the actual time of the targets in the media there had to be some windows with different length than four seconds. All these windows are not after a target but directly before. They can be three to seven seconds long. Every medium of the test has 14 targets. That means that the number of hits for every medium is 14. The number of time windows that are not to be pushed is different according to the time of the targets in the medium and to how many irregular time windows have to be created to make the targets fit. The number of empty windows varies such slightly between the media. The time window length had to be set to four seconds to make it possible to have at least one empty window between two targets time windows.

The time windows for the reaction had also to be kept short to make sure that the appearance of something is measured as a target and not its consistent existence in the medium. This creates the problem that people who for example see a new animal kind and press the respective button too late do get both a “miss” and a “false alarm” and are thus even worse than people who did not see the animal kind at all. However, this is a risk that exists even in reaction tests that are done with synthetic and animated graphic media that can be controlled very well as the test taker can press too late for a certain target. The difference lies in that in the video used in this test a new animal kind is still on the screen when the time for pressing it has already passed. It is important here to stress that the target to be reacted to is the immediate appearance of the animal kind and not its continued screen time.

To test the usability of the test mechanics three fictive test takers where used and there results compared: a monkey who just hits all the keys on the keyboard all the time, a person that does not hit any and a person who hits the three keys randomly. All these three fictive test takers are supposed to get the same result in the test. The monkey would get every single hit right but would also trigger false alarms all the time. The guy who does not press at all would get the exact opposite result, misses and correct rejections. The randomly hitting person would get a mixture of the four possible results with more false alarms than hits and more correct rejection than misses. This is because of the negative time windows outnumbering the positive ones. This created a problem as it makes a positive window more important than a
negative one. It also means that the monkey will hit countless times in negative time windows while also triggering every positive window immediately. The negative time windows can only be triggered once as well as the positive ones. This means that the program becomes unreceptive for the rest of the time window once it has received a hit or false alarm. Any presses that lie in this time are lost for the evaluation. However, this system is necessary. If it would be possible to trigger a negative time window many times the monkey would get an infinite number of misses but only one hit per time positive window as one target can only reward one hit. The monkey would not get many hits for repeatedly pressing the button during the target time window. In the opposite the monkey would also get false alarms in the time of the positive window for every click after the first one. It would thus give the monkey a way worse score than the random pressing or the passive person. The loss of key hits is thus necessary to have all these three equally unskilled behaviors rated the same. The loss of the registering of these key hits is not problematic as such very fast after each other hit keys will most probably anyways be mechanical or movement- rather than understanding- and reacting-mistakes. With this system all the three fictive example test takers would get the exact same score.

Another comparison used to test the mechanics where to test takers who had the same multi-media skill but a different way of taking the test. The first person is thriving for security trying to avoid mistakes. He presses only when he is sure that there was a target. The second person takes the risk and wants to get every target at the price of creating “false alarms”. He presses as soon as he thinks that there might be a target. These two should get roughly the same score at the end of the test as the test is supposed to measure their multi-media skill and not their test-taking attitude. It is difficult to ensure that these two would get the same score, especially as the security person would whenever being too slow not only get a miss instead of a hit also get a false alarm. However, the reaction time of four seconds is sufficient to react to the target even after making sure that it was one if one has been paying attention to the medium. If on the other hand a test taker presses too late because he or she has not seen the appearance of the target but just understands that something now is there without knowing, when it appeared, because he or she did not manage to observe the medium then a negative score is good as it is describing his abilities correctly. The risky test taker on the other hand will probably get many more mistakes than the secure one. This is not problematic in itself and will be taken into account when evaluating the data. The higher hit rate will thus make up for the mass of extra mistakes. Both test takers should thus roughly get the same results in the test.

4.3 Test Content

The content of the test media is partly downloaded from the Internet and self-written. The chat part is self-written while the video- and audio-part are from the Internet and just cut to fit the purpose. The console exists to help the test takers to orientate and start the test.

4.3.1 The Chat

The chat window shows a talk between four friends in a chat. The window starts empty and the new posts as well as chat messages are popping up at the top of the window. The chat text can be found in the appendix (Appendix 3). The four participants’ are colored red, blue, green and yellow to make it easy to see, if someone new is joining the chat and if somebody is posting. This color symbolic is used in many chats in the Internet. The new posts appear at
the top of the chat window pushing the existing posts down. This way of appearance of new posts is different to the way it is done in most chats where new posts appear at the bottom of the window. However, as the window starts empty it is easy to see for a participant how the chat works. It is further helpful because it does not make it overly easy for people used to chat and to quickly scan new messages. The ability to understand quickly how a medium works is also a part of media literacy and can thus be seen as a part of the test.

In the chat, four friends, three men and a woman are talking about a party and then planning a trip together. The topic has been chosen to be easily understandable for everybody. There are no signs that the chat topic is easier to understand for any group of people, especially not for people with computer knowledge or for people who play computer games. The language in the chat resembles chat language in the respect that it is using short sentences, shortenings and is not always using capital letters where they should be, e.g. at the beginning of a name. This is not only meant to make the chat more realistic as written communication is thriving for shortcuts for the price of grammatical correctness and unambiguousness. Written communication can therefore require the ability to deal with those problems and understand it despite of unclear formulations, forms and simply typing mistakes. It also makes it more difficult to find the names by simply scanning the text for capital letters which would be oversimplifying the chat part. The text has been shown to people from different nationality and with different mother tongues to make sure that there are no grammatical constructions originating from my German mother tongue that makes it easier to understand for Germans than other non-native English speakers.

4.3.2 The Video

The video window shows a part of a movie about the nature and wildlife in the Andes in South America. The different kinds of animals in the video are clearly distinguishable as they are very different reaching from penguins over whales to bears. Because of this choice of simple to distinguish and exotic animals it is also unlikely that there are any groups that would have an advantage in the video part.

4.3.3 The Audio

The audio part is a calm interview with Lady Diana, Princess of Whales. In the interview there are only two people speaking, the interviewer and Lady Di.

The interviewer is male. The two voices are clearly distinguishable. That makes it a useful strategy to wait for the male voice of the interviewer to start paying attention to the audio part again and then click as soon as Diana starts speaking when dropping the attention to the audio part until the male voice reappears. The audio part might thus show a higher average rating than the other mediums. However, this behavior is still requiring attention to the medium and a fast understanding of the paste and character of the audio content.

The interviewee and the interviewer are speaking British English. This might make it easier for British people to follow it. It might also be easier for them because they know more about Lady Di. On the other hand there was feedback from test takers who reported that they got distracted by the interview because they found it interesting and thus listened to it and were less concentrated on the actual test. This might hint to a disadvantage for people who are familiar with the story of Lady Di as they can be assumed to be more interested in the
It is also important to notice that the feedback of being distracted by the interview came mostly from women. There could thus be a slide disadvantage for women connected to this choice of interview topic. These problematic will be taken into account when evaluating the data.

### 4.3.4 The Console

The lower right part of the screen in the test is the console. There is the button that lets the test begin.

There are further three pictures of keys, 1, 2, and 3 that are placed near the respective medium to remind the test takers of the key bindings. These key pictures show a click animation when the test takers push the respective key. This is giving the participants feedback over that the test is registering their clicks. This could distract the users from the test or it could calm them down by ensuring that their actions were registered and the test was working.

Finally the console show the time left in the test and the time elapsed. This might also create distraction or security for the test takers. There are however no signs that this feedback provided to the test takers could be of advantage or disadvantage to certain groups.

### 4.4 Test Evaluation

A number of different methods are used to evaluate the result of the test for every participant.

The first and simplest evaluation simply counts the number of hits for every test taker. As there are 14 targets in every medium the number of hits possible is 42. The number of hits achieved out of the 42 possible hits is then the first score for every user. This way of evaluating the results could be problematic for the reason that it ignores the amount of false alarms a participant produced. This could be problematic because a higher number of hits could be caused not because the respective participant is better in multi-media communication but because he or she is simply pressing more often. This possible problem will be taken into consideration when using this kind of performance evaluation.

The next possibility to evaluate the result for every participant is somewhat more complicated. This score is called the d-prime and it calculates a rating for every participant according his or her hit rating and rating of false alarms. The score for d-prime varies between -3,7 and 3,7. It is expressed in standard deviations from the rating a non-responsive person would achieve according to a normal diversion of the results. This means that a negative d-prime rating would be really bad in this test while any rating above 2 would already be very good and a rating over 3 exceptionally great.

Another evaluation of the test is using statistic calculations based on the d-prime score to give a rating for the responding behavior of the respective test taker. This beta-rating shows if a person has a bias for responding pressing a lot and thus creating many hits as well as many false alarms of if the person uses a more security oriented approach pressing only if there clearly was a target thus producing fewer hits and false alarms.

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4.5 Questionnaire

Information about the test participants was collected with the help of an online questionnaire. The questionnaire can be seen in the appendix part (Appendix 2).

The participants were asked about their age, gender, profession, education, the number of their kids and if English is their mother tongue. They further had to answer questions about their media usage. The data gathered here contains the media used by the participant and the weekly hours spend using it. The use of the computer is divided into Forum, Blogging, Messenger (MSN, ICQ, etc.), Games, Chatting and Social networking sites (Facebook, Myspace, etc.). Computer games are further divided into different genres and it is asked for the actual MMORPG, Shooter or strategy game played. Finally the test takers are asked to estimate their computer knowledge and their multimedia communication abilities.

4.6 Advertisement

The test was advertised to different audiences that were selected according to the desired group of people to take the test and to lead to an unbiased group of participants.

4.6.1 Target Groups

The first aim was to get enough players of MMORPGs to take the test as the aim is to find out about their media literacy of these. It was further important to get people to take the test who are using digital media and Internet, who are young and computer-interested and who are maybe playing other kinds of games to have different groups for comparisons among the players. It was then also important to get participants that are not using digital media and computers very much to be able do another set of comparisons with the data and to have a full set of data with all levels of technology use and playing.

Following this set of target groups the test was advertised in different ways. The test was explained and advertised in the official WOW forums in German and English. These forums are very active and created many views and replies in which players might report their opinion of the test, their score or technological problems. The access to the official game forums is mostly bound to the ownership of a game account. This is why it was possible to get access to these forums on the European forums of WOW but not to the American forums or the official forums of other MMORPGs. The advertisement of the test was further posted in various MMORPG community forums e.g. WOW, WAR and EVE. Especially the post in the general forum of MMO-Champion.com was very successful in terms of views and responses to the post. MMO-Champion is a community for engaged WOW-players providing news about the latest changes of and news from the game like comments of the producers in the official forums or first-kills by the most successful guilds.

The test was reported about in the show “gejm”\(^{16}\) in Uppsala student radio in an interview that aired on the 8th of April. The show tests new computer- and video games and reports about them life on radio.

\(^{16}\)Homepage of the show gejm: http://www.studentradion.com/index.php?option=com_content&task=view&id=130&Itemid=1
The test was made public and liked to in forums for family parents like e.g. vifööäldrar.se, kaksplus.fi and martat.fi in Sweden and Finland.

The test was further advertised by the use of social media. It was advertised in facebook.com and in studi.vz, a German social networking site. A Finnish class and a floor ball group in Uppsala were invited to take the test.

### 4.6.2 Possible Problems

Possible problems in the advertisement of the test could arise because it could attract a special sub-group of the target groups thus changing the results of the test.

A possible risk here could lie in the heavy use of forums related to the game WOW. However, there is no reason to assume that WOW is different in its encouragement or requirement of multi-media literacy from other MMORPGs.

Another problem might lie in the use of MMO-Champion as this highly specialized community site might mostly be used by heavy and skilled players who are especially knowledgeable of computers and digital media. Here it can be said that the questionnaire records the playing time of games and forum activity. It should thus be possible to find such an especially skilled group of participants if it should exist in the analysis of the data.

The danger that the posts in the forums attracted especially competitive and thus fast-reacting players who then told their competitive friends about it creating a sub-selection of even more competitive test-takers is offset by the fact that people who where personally asked to take the test, all those who where reached through invitations in social networks and real-life meetings in courses and sport groups, and who are not a special kind of players were asked to state in the questionnaire that they were asked personally. This makes it possible to compare the group of personally asked test takers to the rest of the test takers to see if they could be some kind of sub-selection.

There is no problem expected in the fact that people from Europe, especially English-, German-, Finnish- and Swedish-speaking were invited to the test. The question if the test language, English, is the mother tongue is covered in the questionnaire.

### 4.7 Test Phase and Fixed Problems

As the test was online and open for everybody to take it had to face certain problems that had to be fixed to make it possible to use the data of as many participants as possible.

The test was run through many test phases carried out by different people with different systems and browsers to make sure that it worked as well as possible for as many people as possible. However, there were some problems left.

The biggest problem was the different presentation of the test in different browsers. Internet Explorer for example would not break the lines of the chat at the end of the chat window unlike any other browser. This made it necessary to force line breaks manually making the chat text looking a bit strange. Another problem that was discovered while testing and fixed was the missing usability of the number pad on a big keyboard.
In the final version of the test problems could still be caused by test takers using an old browser or flash player version. To counter these problems there were links in the test instructions linking to the sources to download the latest version of Firefox and flash player. The results are showing that there still where people who did not get the test to work as there are test results that did not register the single hit of a key which hints to technical problems. These technical problems occurred according to the questionnaires and the feedback from the forums among players as well as non-players while the percentage of non-players with technological problems seems to be slightly higher. There might be a bias in the way that only people with low computer knowledge would not get the test to work. This is taken into account when analyzing the data.

4.8 Cleaning the Data

Before analyzing the data, it had to be cleaned from some not usable tests.

Tests were regarded as not usable for different reasons. They were simply useless when the questionnaire was left blank or when there was no hit in the test pointing to technological problems. These tests had to be deleted as they would have corrupted the data.

Tests were further regarded as not usable when the information given in the questionnaire had to be regarded as untruthful using common sense. For example a case was deemed not usable in which the test take claimed to be 108 years old and to spent 748 hours a week using social networking sites while using the Internet only 13 hours.

Tests in which certain parts of the questionnaire where not filled in hat to be dismissed as well. If for example not all the media got an hour of weekly use assigned to them the test could not be used.

People who had more than 14 false alarms were taken out of the data. This was done because the data showed some participants with an enormous amount of false alarms. As reason for these extreme values only a failure in the technique, a misunderstanding of the test rules or an attempt to cheat and get more hits by repeatedly hitting the buttons without having seen a target could regarded as possible thus making the respective tests useless.

Finally test results turned out to be unusable in which there where obvious logical mistakes. Such a mistake would be if the number of years spent in school was higher than the age of a person.

Because of the cleansing the number of test that could be used shrunk from nearly 500 to 173 tests. In the process all the tests that were regarded as unreliable were taken out. This shows that the left 173 tests are highly reliable. The strict cleaning of the data is also done to make the results more reliable.
5. Results of the Study

5.1 Overview over the Participants

After cleaning the data, there are 173 tests usable for the analysis. These 173 participants can be described as the following:

- 140 are male, 31 female and 2 did not state their gender.
- The youngest participant is 14 years old, the oldest 58. The average age is 21,5.
- The participants have absolved a mean of 12,5 years of school education.
- One is a company owner, 28 are employees, 8 are independent, 119 students and 14 were unemployed. 3 did not answer this question.
- The average weekly use of computer lies at 34,8 hours. 122 participants use computer more than 20 hours a week.
- 99 participants use the Internet more than 20 hours a week while the average weekly use is about 30 hours a week.
- Social media (social networking sites, messengers, chats, forums and blogs together) show an average use of 25 hours a week. The use of social networking sites is only 3 hours a week in average. Nearly everybody uses social media. Only 7 participants do not use them, while 78 do not use social networking sites.
- The participants spent on average 20 hours a week with computer games. 99 participants play more than 10 hours a week and 70 play more than 20 hours. Still 25 people spent more than 40 hours a week playing. Only 25 of the participants do not play any computer games.
- 103 of the participants play WOW with an average play time of about 20 hours a week. 83 of them play more than 10 hours, 53 more than 20 hours and 18 more than 40 hours a week.
- The average mean number of hits is 22,7, the average d-prime is 1,68 and the average beta rating is 1/3.

The participants of the test are mostly young male computer players. However, there are also people from other groups and with different media usage profiles like for example middle-aged females and people who do use the computer a lot but do not play at all among the test takers.

5.2 Hypothesis Correct?

The aim of the paper is to investigate the relations of different media usage, especially of the use of MMORPGs, to multi-media multi-channel communication literacy. The theoretical
discussion has led to 5 hypotheses about this relation. Before controlling, if the hypotheses are correct, it is necessary to investigate their relationship to each other.

5.2.1 The Subgroups According to the Hypothesis

As mentioned above and shown in figure 3 there is a difficult relationship between the subgroups the participants can be divided into according to the hypotheses. There is a range of problems connected to them.

The first problem is that all participants are using the computer and the Internet. This has been expected as the test has been online. It could still have been possible to divide the groups of Internet users and computer users according to the weekly hours in which they use the respective medium. However, an analysis of the data has shown that Internet and computer use are highly correlating. This means that it will not be possible to make a meaningful difference between computer- and Internet users for the purpose of this analysis. The two groups have to be treated as one at least for any correlation analysis. This makes hypothesis 5 and hypothesis 4 fall together.

The next problem is the high correlation of the people who play games and those who play MMORPGs. The reason for this can be seen in the bias of the advertisement for Internet communities associated with WOW. Nearly all the people in this test who states that they play computer games do play WOW and thus an MMORPG. This makes it impossible to make a difference between the groups for the purpose of correlation and regression analysis. It is still possible to compare the groups in an exploratory way.

The use of social media has shown some correlation to the use of the Internet and of computer games. However, the connection between the subgroups is not very strong. It is thus possible to use the group of social media users.

This leaves the three groups of Internet users, players of MMORPGs and users of social media for correlation- and regression analysis.

5.2.2 Correlation- and Regression Analysis

The next step in the analysis of the data is a correlation analysis between the different media usages and the different scores.

A correlation analysis shows if the two variables are related to each other. This is the case if an increase in one value leads to an increase or decrease in the other one.

A regression analysis assigns the function that is best fitting to the relationship of two variables to each other. The function that is fitting best is the one that has the lowest deviation. It is possible to assign all kinds of functions to a regression plot. However, the used regression plots are limited to the use of linear functions as there is no reason to use another kind of function. The regression analysis produces apart from the table with the assigned function two statistical values, the deviation and a value called $r^2$. The deviation value states how much the data on average is diverting from the assigned function- The $r^2$ value states how much of a correlation can be explained by the connection between these two variables.
An $r^2$ value of 1 would mean that it is the perfect explanation whereas a value closer to 0 points towards a less strong connection.

In this step there are thus 9 different relationships to investigate. The use of Internet, MMORPGs and social media has to be related to the hits, d-prime and the beta-value.

### 5.2.3 Results of the Correlation- and Regression Analysis

All these 9 analysis have failed to show any correlation between the variables.

This means that there is no obvious connection between the amount of the use of the respective media and the multi-media communication literacy as tested in this paper. However, it does not necessary mean that there is no connection between them.

There could be a number of reasons for this result:

The different user groups divided according to the hypotheses are overlapping and difficult to separate. The ideal situation for an analysis of different user groups would be if there would be clear differences between the groups and if a member of one group could not be member of another one. The situation here is the contrary. The groups of players and users of social media are not only sub-groups of Internet users and nearly covering the whole group of them, they are also overlapping in themselves. This means that nearly every single person who took the test is at least in two groups.

Another difficulty that could influence the result is that people who are using the Internet and especially those who play MMORPGs are doing that a lot. That means that the graphs produced with the weekly hours of playing are showing high number of players over a weekly play time from 5-50 hours. A playing time of 5 hours a week means that the respective person is already playing nearly an hour a day. A play time of 35 hours translates to 5 hours of playing per day. It could be possible that the learning of multi-media communication simply takes place in the lower weekly playing hours and that it does not make much of difference any more if somebody plays MMORPGs 10 or 50 hours ever week. The same could be valid for the use of Internet and social media. It could thus be rewarding to take a look at only the lower hours of weekly media usage and search for correlations there.

### 5.2.4 The Low Hours

Learning through media usage could be most visible when looking at low hours of usage and skill differences as the difference between different excessive users of the medium might not be that clear or not bound to usage time any more. Lower weekly hours of media use can be interpreted differently. However, a media usage of 5 hours means already that the respective person spends one hour on each working day using the medium. A person with an eight-hour job would have to spend a whole day after work each week to reach 5 hours of weekly usage. The interesting points to look at here are the relationship of the ratings to the use of Internet, social media, computer games and MMORPGs.
Starting out from the hypotheses the first medium of interest is the Internet. A regression plot of Internet use up to five hour a week and the respective rating in total hits gives an overview (figure 4):

![Low Hours of Internet Usage](image)

**Figure 4: Regression analysis plot of Internet use up to five hours a week and the respective total hits**

The graph illustrates a range of things. At first it shows that there is a positive influence of Internet use on the rating and it gives the equation that resembles the relation between Internet hours and rating the closes. According to this equation one hour of weekly internet use increases ones score by nearly 0,3 hits. That equation is \( y \). The \( r^2 \) value indicates how much of the data can be explained by the relationship between the two variables. The value of about 0,042 indicates that this relationship can account for explaining nearly 5% of the data.

The graph shows a connection between Internet usage and the number of hits. As the number of hours spent surfing the web every week increase, so does the number of hits. This relationship does continue into higher numbers of weekly Internet use but the curve of increasing hit numbers with longer internet use becomes nearly flat. This is in accordance with the thought that the media users learn most when starting with a medium and not so much when intensifying an already excessive use.
The next medium to look at is computer games. Here it could be that case as well that the learning takes place in the low hours of weekly usage. A regression plot of playing computer games up to five hour a week and the respective rating in total hits gives an overview (figure 5):

![Low Hour of Playing Computer Games](image)

**Figure 5: Regression analysis plot of playing computer games up to five hours a week and the respective total hits**

Here as well there is a clear connection indicated between playing computer games and the number of hits in the test. The equation states that one hour of weekly playing increases the number of your hits by 1.5. This is a rather steep increase. The $r^2$ value shows that the relation between games and the hits can account for about 9% of the data. Again this connection does not hold during the higher weekly hours of playing. This points again at a rather steep learning curve in the beginning of a media usage that becomes flat reaching the higher weekly usage hours.
The next graph (figure 6) shows the relation between the weekly play time of World of Warcraft from 1-5 hours a week and the d-prime score. The graph has a bit different layout to emphasize the difference from the other ones in respect of the different score value and the fact that the participants who do not play WOW are not shown in this graph in contrast to the upper ones where the zero-value is included.

![Figure 6: Regression analysis plot of playing WOW between one and five hours a week and the respective d-prime value](image)

The graph shows a strong connection between the weekly playing hours of WOW and the d-prime score. The $r^2$ lies at 0.35 showing that 35% of the data can be explained by the connection of WOW and d-prime. The average increase of the d-prime value by 0.3 for every weekly playing hour that is shown in the graph indicates a rapid learning here.

However, there are strong limitations to this result. First it is important to note that only 12 participants are in this range of playing hours limiting the generalizability of the result. Second, it has to be kept in mind that this result does not show as clearly if the people not playing WOW are included in the graph with a playing time of zero hours. The last can be explained easily as there are so many more than 12 people not playing WOW but other games or also nothing at all in this study that they would overshadow the regression if they were included in the graph. The relatively low number of only 12 participants in this range of playing hours out of the more than one hundred that play WOW is connected to the fact that people who play WOW tend to play it a lot. The weekly playing hours of WOW players stretch out till 100 hours and a big part of the players is playing more than 20 hours a week. The first 5 hours can thus be seen as relatively low usage and the 12 participants in this range are not especially under- or overrepresenting the time span.

From the graph it can be derived that there is a clear connection between WOW and thus MMORPGs and the score and thus the multi-media skill for the low weekly usage hours.

17 For an explanation of the d-prime value see 4.4 Test Evaluation.
The graphs for WOW and computer games are related in the way that WOW is a computer game and thus the participants who are part of the WOW graph are part of the games graph as well if they do not play other games as well which would push them over the total 5 hours of computer playing in a week.

The variable for social media usage is simply the addition of the weekly hours spent with social networking sites, messenger, chat, forum and blog. The examination of the data shows that the participants are using these media parallel. There are many people who spent nearly as much time in the separate social media as they spent in the Internet with the sum of their social media hours exceeding the online time. The parallel use of different media, especially different digital media, is in line with contemporary research on media consumption behavior and was expected. This needs to be kept in mind when dealing with the social media variable.

However, for social media usage there is no correlation whatsoever visible when examining the low hours of usage. The next graph (figure 7) shows this:

![Low Hours of Social Media Usage](image)

**Figure 7: Regression analysis plot of using social media up to five hours a week and the respective total hits**

The very low $r^2$ value of 0.0013 shows that there is no connection between the use of social media and the number of hits. The slow increase of only 0.18 hits per hour spent renders social media rather meaningless for the number of hits in the test.

### 5.3 Exploring the Data

The exploration of the data is to be seen as a second step of analysis. It allows a freer processing of the data and a search for interesting facts and points aside major correlations. The results of data exploration need to be seen as somewhat less reliable or at least requiring a stronger justification compared to correlation analysis. However, only by data exploration it is possible to find hints and connections in the data and to shed some light on the details and interesting cases in the data.
5.3.1 Comparison of Subgroups

The first step in the exploration of the data is the comparison of the different subgroups of the participants in the test. This is done by separating the participants according to their use of different media in general. It is still possible to take the number of weekly hours a medium gets used into account but this can only be done by separating users in different groups according to their usage time and comparing the mean values for those groups. For this study there are different subgroups possible. It is for example possible to compare people who are only playing MMORPGs and nothing else to people who play all other kinds of games but no MMORPGs or to compare people who use the Internet less than 10 hours a week to those who use it more than 25 hours a week.

It is again possible to compare the different groups according to different factors. Naturally the average score would be an interesting variable for a comparison. The three different ways of evaluating the performance of the participants explained above, the hits, d-prime and the beta-value, can be used here again.
The values for these different evaluations as means for the respective groups of participants can be seen in the table below (table 1):

<table>
<thead>
<tr>
<th>1st table</th>
<th>MMORPG Games</th>
<th>Social Media</th>
<th>Social Networking</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits</td>
<td>23,59</td>
<td>23,61</td>
<td>22,66</td>
<td>22,80</td>
</tr>
<tr>
<td>d-prime</td>
<td>1,73</td>
<td>1,73</td>
<td>1,67</td>
<td>1,67</td>
</tr>
<tr>
<td>Beta/ratio</td>
<td>1,04/3,02</td>
<td>1/3</td>
<td>1,04/3,04</td>
<td>1,06/3,09</td>
</tr>
<tr>
<td>number</td>
<td>124</td>
<td>148</td>
<td>166</td>
<td>95</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>2nd table</th>
<th>only MMORPG (no social media)</th>
<th>Only Games (no social media)</th>
<th>Only Social Media (no games)</th>
<th>Only Social Networking</th>
<th>Only Internet</th>
<th>MMORPGs and Social Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits</td>
<td>30,00</td>
<td>31,75</td>
<td>17,48</td>
<td>11,00</td>
<td>17,00</td>
<td>23,52</td>
</tr>
<tr>
<td>d-prime</td>
<td>2,30</td>
<td>2,41</td>
<td>1,34</td>
<td>0,78</td>
<td>1,09</td>
<td>1,72</td>
</tr>
<tr>
<td>Beta/ratio</td>
<td>1,38/3,97</td>
<td>1,17/3,30</td>
<td>1,05/3,21</td>
<td>0,60/2,17</td>
<td>0,59/2,17</td>
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<td>number</td>
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<td>21</td>
<td>2</td>
<td>3</td>
<td>122</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd table</th>
<th>Games and Social Media, no MMORPGs</th>
<th>Games, no MMORPGs, no social Media</th>
<th>Games, but no MMORPGs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits</td>
<td>22,68</td>
<td>32,33</td>
<td>23,84</td>
</tr>
<tr>
<td>d-prime</td>
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<td>2,44</td>
<td>1,80</td>
</tr>
<tr>
<td>Beta/ratio</td>
<td>1,08/3,07</td>
<td>1,10/3,08</td>
<td>1,01/3,07</td>
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<tr>
<td>number</td>
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<td>3</td>
<td>25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4th table</th>
<th>Few Internet (&lt;=5h/week)</th>
<th>Much Internet (&gt;5h/week)</th>
<th>0-18</th>
<th>19-24</th>
<th>25-58</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hits</td>
<td>18,33</td>
<td>23,19</td>
<td>22,45</td>
<td>24,18</td>
<td>20,26</td>
<td>28,62</td>
</tr>
<tr>
<td>d-prime</td>
<td>1,31</td>
<td>1,71</td>
<td>1,63</td>
<td>1,80</td>
<td>1,50</td>
<td>2,24</td>
</tr>
<tr>
<td>Beta/ratio</td>
<td>0,91/2,56</td>
<td>1,05/3,08</td>
<td>1,03/3,01</td>
<td>1,06/3,07</td>
<td>1,02/3,02</td>
<td>1,38/4,14</td>
</tr>
<tr>
<td>number</td>
<td>15</td>
<td>158</td>
<td>62</td>
<td>76</td>
<td>35</td>
<td>8</td>
</tr>
</tbody>
</table>

Table 1: Mean evaluation values according to different sub-groups of participants

Table 1 shows the average number of hits, the average d-prime and the average beta values for different subgroups of the test participants as well as the size of the respective subgroup in the number row. The groups are mainly divided according to their media use, but also according to their age. The first table shows the groups according to the use of a certain kind of media. The people in the column titled “MMORPGs” are thus people who play MMORPGs. For this sub-group it does not matter what other kinds of media the people in it might be using. This is different in the 2nd and 3rd table. In the MMORPG group in the second table for example are people who play MMORPGs but do not use social media. The table shows also that there is only one person in that group.
See the next figure (figure 8) for an overview over the number of people in each sub-group and the average hit rating of the group:

**Figure 8: Groups of test-takers according to the hypothesis with the numbers of the group members and their average hits.**

This figure shows how tight the different groups are interconnected and how they are overlapping. The picture points towards a connection between playing games and getting a high score.

The first subgroups to make for the comparison are selected according to their media usage. Thus all the people who are using social media are one group while all the people who play computer games and use social media are the second group and people playing MMORPGs and using social media are the third group. These three groups were compared according to the numbers of their average hits. As discussed above the score that only uses the hits to measure the performance of a participant comes with the issue of ignoring the amount of false alarms. However, a correlation analysis shows no relation between the number of false alarms and the number of hits or any other value. For the relation between false alarms and hits see figure 9.
Figure 9: Regression analysis plot of the false alarms and the respective total hits
The very low $r^2$ value of 0.002 indicates the hardly existent connection between the false alarms and the hits. It can thus be regarded as not influencing the hit value. The number of hits is thus a usable score.

The figure shows a number of things. The most important is the clear difference in the score between people who play computer games and people who do not. For an overview over the most important participant groups and their results see the graph below (figure 10):

![Average Hits in Different User Groups](image)

Figure 10: Groups of test-takers according to their media and their average hits.

The total number of participants who do not play any kind of computer games is 24. Their average hit score is 17. The total number of participants who are playing computer games is 148 and their average score is about 23.5.

It does not seem to play any role if people are using social media. The average score of the participants who use social media but do not play and those who only use Internet is the
same. However, there are only three participants in this study who surf the web but do not play or use social media. This group is too small for a reliable comparison with the users of social media. This leaves only the group of users of social media for a comparison with the sub-group of players.

There is a small difference between participants who do both play and use social media and those who only play. The last ones have a slightly higher average score. However, the difference here is very small. It could be accounted for by the two people who stated that they did not use social media but played games, one playing MMORPGs and the other one different games, who scored with 30 and 32 extraordinarily high. This could be interpreted as a sign that social media is even hindering multi-media communication literacy. However, because of the small number of people causing this still very small rating difference such a conclusion would be very unreliable.

There is a visible difference in the score of participants playing MMORPGs and those who are playing other games. The difference is less than one hit. The size of the sub-groups is big enough to have significance here with 123 participants playing MMORPGs and 25 playing different computer games. Though the difference is small, it is there and it is reliable.

Table 1 also shows a clear difference in the rating of people who use the Internet more than 5 hours a week compared to those who use it less. However, the number of participants with this low Internet use is so low, only eight people are in this group, that the result is not very reliable. This said it shows that Internet use influences the score at least for people who do not use it a lot.

The figures clearly show that participants who play computer games have a better score at the test. It further shows that participants who play MMORPGs have a higher score than participants who play other kinds of games.

An increase over a certain amount of the weekly hours spent playing is not mirrored by an increase in media literacy.

Playing makes you better, not playing a lot!

5.3.2 Interesting Cases

Looking over the data there are some interesting cases or groups that catch the eye. The statistical value of these cases is not high. Keeping this strict limitation to the generalizability of the findings deriving from these single cases in mind they can provide interesting insights in the data.

The first rather expected relation to mention here is the one between the hits and the age of the participants. There are clear differences in the score of the three different age groups from Table 1. Participants up to 18 years of age had an average score of 22,55 hits. The age group from 19 to 24 scored 24,18 on average and people from 25 years onwards could hit the targets 20,26 times. To get an overview over the age and the corresponding hits of the participants see figure 11.
Figure 11: Regression analysis plot of the age and the respective total hits

This result is not especially surprising and it is not clear whether it has to do with the different media consumption of the different age groups or if it is actually the age that influences the result. Both could be the case and would be equally expected. However, there is one group, the participants who are 22 years old, who scored especially high. They average score lies at 28.62 and thus more than 4 hits higher of the age group they are part of. There are only eight people in the group of 22 years old. The group is thus too small to yield reliable results. However, group is not small enough to just dismiss this result. A possible explanation for it could be that in many countries people graduate from university at that age. They could be at the top of their media literacy climax at the end of their education and before they start working. Another explanation could be more biologistic. People could just be the most capable at the age of 22.

Another interesting subgroup are the two people who only use social networking sites and no other social media. Their average score is 11 and thus the lowest of all groups by far. The group is too small to take any reliable conclusions. This said it does not seem that social networking sites are doing multi-media literacy any good.
6. Discussion of the Result and Conclusion

6.1 Research Question Answered?

The research question was if players of MMORPGs are better in using multi-channel communication. The question was concretized in five hypotheses:

**Hypothesis 1:**
People who play **MMORPGs** have a better multi-media literacy than people who do not.

**Hypothesis 2:**
People who play **computer games** have a better multi-media literacy than people who do not.

**Hypothesis 3:**
People who use **social media** (social networking sites, chat, messenger, forums and blogs) have a better multi-media literacy than people who do not.

**Hypothesis 4:**
People who use the **Internet** frequently have a better multi-media literacy than people who hardly use it.

**Hypothesis 5:**
People who use the **computer** frequently have a better multi-media literacy than people who hardly use it.

Of these five hypotheses not all could be answered. The main reason for this is that the different user groups were overlapping. This was especially the case for computer and Internet users. Because of the nature of the test, it was available online, nearly every participant was using the Internet. The same problem of overlapping groups presented itself when making a difference between Internet users and participants who use social media or played games as well as nearly all Internet users where at least also part of the other subgroups.

This said it was possible to test at least the first four hypotheses in some way.
6.1.1 Hypothesis 4: Internet

The data found in this study gives evidence that people who use the Internet frequently have better multi-media literacy than those who use it rarely. The supporting data for this is not very strong as the group of people using the Internet rarely, not more than 5 hours a week, is fairly small.

People who use the Internet frequently have a better multi-media literacy than people who hardly use it.

6.1.2 Hypothesis 3: Social Media

The data found in the study showed that there is no relationship between multi-media literacy. There is no learning curve visible in among the participants with low weekly usage. The average score of users of social media is as low as of the people who are only using Internet and the users of only social networking had the worst results in the test as a group. However, the comparison with the only-Internet users, there are three of them, is as unreliable as the data about the two people using only social networking.

This leaves the group of social media users with a far lower score than the group of people who play computer games. If social media usage has a relationship to the multi-media literacy it could not be shown with this study.

People who use social media (social networking sites, chat, messenger, forums and blogs) do not have a better multi-media literacy than people who do not.

6.1.3 Hypothesis 2: Computer Games

The data found in the study gives evidence that people who are playing computer games have a better multi-media literacy than those who do not play. There is a clear difference between the score of players and non-players and the data has shown a noticeable increase of the score connected to increasing playing hours for participants playing not more than 5 hour a week.

People who play computer games have a better multi-media literacy than people who do not.

6.1.4 Hypothesis 1: MMORPGs

The data found in the study gives evidence that there is slightly higher media literacy among players of MMORPGs compared to players of other computer games. The difference is fairly small. The data also shows a clear connection between playing WOW, an MMORPG, and the multi-media literacy for not more than 5 playing hours in a week.
People who play MMORPGs have a better multi-media literacy than people who do not.

6.2 Validity and Reliability

There are certain threats to the validity and limitations to the reliability of the result.

The result is valid for the operational and receptive part of multi-media multi-channel communication literacy. The test design was a limit here. This said there is reason to assume that the receiving literacy skills are mirrored by expressive ones as the test required also to answer while still receiving information and as it showed the meta-literacy that is needed to pay attention to different communication channels at the same time.

The reliability is limited by the low numbers of participants in certain groups and for certain results. In general the study is of an explanatory character somewhat reducing the reliability of the findings. However, especially the increased literacy of participants playing computer games and in the next step MMORPGs is clear and there is no concrete reason to doubt either the higher literacy level nor the shown learning in the low weekly playing hours.

6.3 Further Studies

The study pointed out many possible directions for further studies. The most interesting would be to be able to establish a causal relationship between playing computer games and MMORPGs and multi-media communication literacy. It would thus be highly interesting to study the development of literacy among people who start playing computer and MMORPGs. This could show if they acquire literacy skills through the games.

It would further be interesting to do a similar study as this one with more control over the participants. It would be very useful to have participants with various media backgrounds of media usage and it would be helpful to have less overlapping of the different sub-groups.
References


Appendix:

Appendix 1- Welcome page:

Hello and welcome to my Media Multitasking Skill Test!

I am glad that you want to take this test and support my research.

In the first step of the test I need you to fill in a short questionnaire about you and your media usage. Please answer the questions truthfully. The second step is the actual test.

**The test takes about 7 minutes.** It is going to test your ability to deal with communication stress using different media.

The test consists of 3 parts, a chat part on the left side of the screen, a video part in the upper right corner of the screen and an audio part. The three parts are independent from each other and have different topics. Your task is to search for signals in the 3 mediums and when you found one to press the assigned button as fast as possible.

Here a picture to explain the layout of the test:

In the chat, a simple chat between four friends, you need to search for male names. Every time you read a **new male name** you need to press **button 1** on your keyboard. The names can be in the text as well as the names of the actual participants in the chat. Each single name should get only one click!

The **video part** is a nature film showing wildlife in south America. In the video part you need to search for animals. Every time you see a **new species of animal that has not been shown before** you need to press the **button 2** as fast as possible. If you for example see a horse for the first time you need to push 2. If you see a horse later in the movie again
you must not push the button again.

The audio part is an interview of Lady Diana. In the audio part you need to listen for Diana starting to speak again after being asked a question by the interviewer. Every time you hear that Diana starts speaking again you need to press button 3. Make sure that you have your sound activated to be able to take the test!

It is not possible to pause the test. So please make sure before starting it that you can concentrate on it without interruption. Please make sure that you are fully concentrated to have the best result possible and be as valuable for me as possible. Please do not use your browser functions to go backwards or reload the page once in the test.

The test will approximately be online until the end of April. If you happen to get into the high score you can leave your nickname on the high score list.

The test is viewed best with an actual version of Firefox and it requires a rather new version of the adobe flash player. You can get the actual (english) version of Firefox here:
Firefox

You can get the latest version of the Flash player here:
Adobe Flash Player

If you have any questions, suggestions or problems please do not hesitate to write me: praxp(at)web.de

Thank you again for your help and have fun with the test!

CU

Patrick Prax

Appendix 2- Questionaire:

Questionaire:

1. How old are you?

2. What is your gender?

3. How many children do you have?

4. Is English your mother tongue?

- male
- female
- 0
- 1
- 2
- 3
- more
- Yes
- No
5. How many years of school education have you undergone? 

6. Which is the highest educational level you have successfully finished?

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Yes</th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Junior High School</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>University Degree</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Postgraduate Degree</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Practical Education</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

7. What is your job best described as?

<table>
<thead>
<tr>
<th>Job Description</th>
<th>Yes</th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Employee</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Company Owner</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Housekeeper</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>C</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

8. Which kind of media do you use? Please write down the approximate weekly hours of use for each kind of medium.

<table>
<thead>
<tr>
<th>Media Type</th>
<th>TV</th>
<th>Radio</th>
<th>Computer</th>
<th>Internet</th>
<th>Newspaper</th>
<th>Books</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. How do you use the computer? Please write down the approximate weekly hours of use for each kind of application.

<table>
<thead>
<tr>
<th>Application</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forum</td>
<td></td>
</tr>
<tr>
<td>Blogging</td>
<td></td>
</tr>
<tr>
<td>Messenger (MSN, ICQ,...)</td>
<td></td>
</tr>
<tr>
<td>Chatting</td>
<td></td>
</tr>
<tr>
<td>Social networking sites</td>
<td></td>
</tr>
<tr>
<td>(Facebook, Myspace,...)</td>
<td></td>
</tr>
</tbody>
</table>

10. Do you play computer games? Yes ☐ No ☐

   If you answered yes on the previous question, what games do you play?
   ☐ MMORPG’s (WOW, Age of Conan, WAR online, Everquest, Lineage, EVE online, ...)
   ☐ First person shooter (Counter Strike, Quake, Unreal, ...)
   ☐ Strategy games (Starcraft, Warcraft, C&C, DotA, ...)
   ☐ Riddles
   ☐ Card games
   ☐ Simulations
   ☐ Adventures
   Something else: _______________________

11. How much do you play these games? Please write down the
approximate weekly hours of use for each game.

<table>
<thead>
<tr>
<th>Game</th>
<th>WOW</th>
<th>Age of Conan</th>
<th>WAR online</th>
<th>Everquest</th>
<th>Linage</th>
<th>EVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>another</td>
<td></td>
<td>CS</td>
<td>another</td>
<td>Starcraft</td>
<td>Warcraft</td>
<td></td>
</tr>
<tr>
<td>MMORPG</td>
<td></td>
<td>shooter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you play another MMORPG/shooter/strategy game, what is it called?

12. How do you estimate your computer knowledge?

- Great
- Average
- Poor

13. How do you estimate your multimedia communication abilities?

- Great
- Average
- Poor

14. Have you taken this test before? Yes [ ] No [ ]

15. Have you been asked by me personally to take part in this test? Yes [ ] No [ ]

Appendix 3- Chat Text:

The new messages were posted at the top end of the chat. This means that you have to read this full chat text from the bottom up.

Pete82 quit

Excalibur quit

Pete82: Yeah, cu.

Excalibur: I did not. But aron was all over her the whole evening. I think she just came to me to escape from him. However, I got to go. Cu later

Pete82: Now mate, just among us, did you hit on that girl yesterday or not?

Angelwing quit

Angelwing: Damn, now I have to run down to the mall and buy a new bikini! So see you later!
John quit
John: Good. So see you guys later.
Excalibur: I will be ready, sir!
John: Good. So I will call ray and then we will get ready and pick you guys up. But please be ready. I really hate it to sit in the hot car like in a sauna and wait for some guy to search the sun lotion
Excalibur: so there is exactly one place left for me. Perfect :-)
Pete82: So I would bring cristian and jessica if there is place. They were talking about the lake since weeks.
Angelwing: I will bring my little brother William. He is just here for the weekend and I cannot leave him at home.
John: Hm. I think the can take seven people. So it will be me and marcus
Excalibur: To the lake sounds fun. Is there still place in the car?
John: I thought about leaving before noon. Like half past eleven? Ray wants to come as well and we can take his car.
Pete82: Good plan. When do you want to go?
John: Hi angela. Hey guys. Good to meet you here. I was thinking about going to the lake today. The weather is just to great to miss it.
Angelwing: Hi john.
John: Mornin
Angelwing: Hi michael. Did you recover already from yesterday?
Excalibur: Hello guys.
Excalibur joined the channel
Pete82: I see. I will not even try to hide my disappointment :P
Excalibur: Good morning pete :D the party was nice and so is jamie. but I have to disappoint you. We were just talking and not so much flirting. Even though I would have liked to. No but seriously, she is a nice girl and she has some interesting things to say.
Pete82: and more important: did alberts girl flirt with you? The one with the long brown hair.
Angelwing: That is just what I said. How did u like the party then?
Excalibur: Nah, my head feels as if it is liquid inside. I suspect all that sugar in those cocktails.
Angelwing: And andrew was having some discussion about the second world war like he uses to have. He talked to the husband of Karen, what was his name?
Angelwing: Jannica, this girl from the California, was doing some stand up parts. She was hilarious. She said that she had been performing some times in small pubs and such. She was doing the greatestHillary Clinton imitations. Awsome!
Angelwing: alright alright. Mathiew was talking to that girl linda like the whole evening. Then at about two o clock they disappeared for half an hour and nobody knew where they had been. He stated later that they went to getcigarettes but of course nobody believed that. However, they shared a cabon the way home
Pete82: now tell me the juicy details already!
Angelwing: and the evening was really wild. I blame the mojitos. With all the sugar you just dont realize how muchalcohol you are actually drinking.
Angelwing: i think they are cute together. And so in love :D
Pete82: Albert has been quite lucky to get such a girl. I think she was with Neal before..
Pete82: no, you know that i am just kidding. I think as well that she is nice.
Pete82: yeah right!
Angelwing: Pete! that a women talks to some guy does not mean that she must be flirting!
Pete82: the one that flirted with michael?
Angelwing: i think you have seen her before at Freddies party last week. She was wearinga red dress and she has brown long hair.
Pete82: have i seen her before? What does she look like?
Angelwing: well, we were drinking mojitos and listening to cuban music, that was the topic of the party. And his girlfriend jamie gave a speech. She is really nice.
Pete82: give me some more details
Angelwing: it was fun. Albert is such a weirdo. He had invited like forty something people to his tiny flat.
Angelwing: hi pete!
Pete82: i just heared you where on thatbirthday party of albert yesterday. How was it?
Pete82: hi angel, how r u doin?
Pete82 joined the channel
Angelwing joined the channel