Computer Games and the Three Dimensions of Reading Literacy

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Abstract

The study of computer games and their influence in culture has become an important issue in many disciplines. In this paper we will analyze how computer games change our understanding of reading literacy in a pedagogical context. Based on Aarseth’s classification of cybertexts we will develop a typology of interactive media and utilize this typology to derive a new theoretical approach to interactive media reading literacy. According to this approach the reading of books has the same pedagogical importance as the "reading", or playing, of computer games. In order to arrive at this position, we will expand the traditional concept of reading literacy by emphasizing elements of decision-making and strategic thinking, competencies that have previously not been considered connected to reading literacy.

CR Categories: K.3.m [Computers and Education]: Miscellaneous; K.4.m [Computers and Society]: Miscellaneous

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1 Introduction

According to Huizinga’s still valid approach to cultural anthropology culture emerges in the form of play and contest [Huizinga 1955]. The manifestation of a significant, technology-oriented play element, particularly in digital youth culture, might therefore be considered an important step in the cultural integration of digital technologies.

During the last twenty years, we have seen a rapid integration of computer games into digital youth culture [Wagner 2006b]. An early example of this phenomenon is the playful use of media technology in the Demoscene, a culture that arose out of the cracker movement of the 1980s [Polgár 2005]. In western civilization this development became particularly apparent with the emergence of the so-called "Generation Doom" [Kushner 2003] and the subsequent development of electronic sport [Wagner 2006c].

It is obvious that technological paradigm shifts such as the rise of the Internet, will have their influences on culture. Such developments have happened in nearly every generation. What is new, however, is the speed with which digital technologies spread throughout society.

To give one example, the Medienpädagogischer Forschungsverbund Südwest [2005], a German non-profit organization studying media usage among children and teenagers, have found that among German teens age 13-19, cell phone ownership has increased from 8% in 1998 to 92% in 2005. Within only seven years, the technology of cell phones and with it the possibility to be accessible anytime and anywhere by anybody, moved from virtually non-existent to ubiquitous.

Prensky postulates that these socio-technological "singularities" cause the development of subcultures according to age [Prensky 2006]. He calls children born and raised after the social integration of information and communication technologies "Digital Natives", those born before the integration "Digital Immigrants". Digital natives are different in many aspects: most importantly, they develop new cultural value systems, particularly in connection with new media technologies. Digital natives are play-oriented and act with twitch-speed [Prensky 2005].

Whether Prensky’s vision will become reality or not still remains to be proven. It is, however, starting to become apparent that we need to investigate the effects of the digital play culture on our cultural value system [Mäyrä 2006]. In this paper we look at one particular aspect: the development of our understanding of reading literacy in view of the emergence of computer games. We will start by revisiting Aarseth’s cybertext typology and utilize his ideas to develop an adapted typology of interactive media. This will then lead us to a new theoretical approach to interactive media reading literacy.

2 Aarseth’s Cybertext Typology

Aarseth [1997] used the terms "cybertext" and "ergodic literature" in order to emphasize the importance of "the intricacies of the medium as an integral part of the literary exchange." Reading ergodic literature requires the reader to perform a non-trivial operation in order to access the information provided by the literary medium. The concept is not without problems because it depends on specific abilities of the reader. Reading a traditional book, for instance, is not necessarily a trivial task for people with certain disabilities. Thus, this medium can be considered either ergodic or non-ergodic depending on who accesses the information. Nevertheless, Aarseth’s approach has proven important for creating a research discipline that deals with the phenomenon of computer games on a scientific level. We start our investigation of interactive media reading literacy by revisiting Aarseth’s cybertext typology.

Figure 1 shows a schematic representation of this typology. Some but not all of the texts he included in his study are represented here for illustration purposes. These are "The Money Spider", a 1988 game book by Robin Waterfield and Wilfried Davis in which the reader must solve a puzzle to find the right path through the text; "Two Kingdom Valley", a 1983 adventure game by Trevor Hall; "Caligramme", a 1916 book of poems that fork out on a page by Appollinaire; "I Ching", a Chinese book of oracular wisdom; "TinyMUD", a popular multi user dungeon; and "Moby Dick", a classic 1851 novel by Herman Melville. For details on these cybertexts as well as a detailed description of this typology, the reader is referred to Aarseth’s book [1997].

Some of these texts are based on traditional media, some on electronic media. In Figure 1 the areas corresponding to these types of media are represented by solid and dotted border lines, respectively.

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Figure 1: Aarseth’s typology.

Even though Aarseth omits trying to interpret the two factors of his analysis, he notes that the quadrants correspond to certain types of texts. Traditional narrative texts appear in the lower right quadrant, adventure games and hypertexts in the upper two quadrants and unpredictable texts in the lower left quadrant. This correspondence is shown in Figure 2.

There is another way of interpreting this typology through the author-media-reader relationship. In traditional static texts such as Moby Dick, the author is in full control of the narrative. In adventure games and hypertexts, the author is still in control of the narrative, but allows the reader to make choices and develop the story within given constraints. In unpredictable texts, finally, the author has lost control. The story is now a co-production of the reader and, in some sense, of the media itself.

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Figure 2: Schematic overview of main cybertext types.

Aarseth called this phenomenon cyborg aesthetic in order to emphasize the man-machine integration. Author, media and reader all become part of Aarseth’s cyborg author. In the following section we will use this interpretation to derive an adapted typology that will be useful for our purpose.

3 A Typology of Interactive Media

A remark on the use of the term “interactive media” is in order. One could question the existence of non-interactive media and - depend-
Using the concepts of scriptons and textons there is also another, maybe simpler, view on how we distinguish between the three media classes. Explorative media aid in the alteration or production of scriptons, active media aid in the alternation or production of textons and static media can alternate or produce neither scriptons nor textons. This also shows that explorative and active media form two independent media types as active media do not need to be explorative and vice versa.

Interactive media can thus be classified according to the two independent properties "explorability", which quantifies the medium's capability to influence scriptons, and "activity", which quantifies the medium's capability to influence textons. Media that have neither explorability nor activity are static.

4 Three Dimensions of Reading Literacy

The competence of dealing with traditional texts, also called "reading literacy" has often been considered at odds with the new media as they appear to be counterproductive for the development of reading skills. Children, who spend much of their time playing video games, are considered less inclined to read books. There exists a large body of research emphasizing various theories of reading literacy and reading literacy education in context with traditional media [Unrau and Ruddell 2004]. It is important to note that the presented approach does not replace but rather augment these theories.

Using the above typology of interactive media we are in a position to take a somewhat relaxed view on reading literacy in the context of interactive media. Since explorability and activity are properties that can be found not only in electronic media but also in traditional media, acquiring competence in dealing with active and explorative media does not divert attention away from traditional texts. On the contrary, it adds new aspects to the classic understanding of reading literacy.

Children that are playing computer games are in fact training certain competencies that are also useful in understanding and dealing with more advanced traditional texts. In order to emphasize the fact that this approach is not aimed at contesting traditional theories in reading literacy but rather adding new aspects that have previously not been considered, we call these competencies "dimensions of reading literacy".

Information-Dimension: The competence of dealing with static media. This includes our traditional view on reading literacy, i.e., the competence to properly use language, to understand the alphabet and the competence to decode words or signs and to create meaning out of a text. It also includes the competence to follow a story and to decode and understand non-verbal forms of communication. It is the competence to receive and understand any form of information, verbal or non-verbal, that is transmitted through a medium.

Decision-Dimension: The competence of dealing with explorative media. This dimension focuses on our decisions-making abilities. It includes the competence of understanding and evaluating the consequences of a decision a-priori based on the given information and given rules. It is the competence of reacting to opportunities given by the information that is transmitted through the medium.

Strategy-Dimension: The competence of dealing with active media. This relates to the ability to act within a dynamically changing environment. It includes the competence to anticipate the nature of dynamic changes. It also includes the competence to analyze the strategies of the artificial intelligence represented by medium and to synchronize own actions for optimal success within the reader-media relationship. It is the competence of producing new opportunities through strategic action within the literary exchange.

In other words, the information-dimension is the "dimension of receiving", the decision-dimension is the "dimension of reacting" and the strategy-dimension is the "dimension of acting".

Since it is possible to act or react on improperly received information, it seems apparent that the competencies of the decision and strategy-dimensions do not depend on competencies of the information-dimension. This independence is furthermore supported by comparing the presented approach to Gardner's theory of independent multiple intelligences [Gardner 1999]. According to the above definitions competencies in the decision dimension correspond to Gardner's logical-mathematical and intrapersonal intelligences, while competencies in the strategy-dimension correspond to his interpersonal and existential intelligences. Competencies in the information-dimension, finally, correspond to Gardner's linguistic, musical, bodily-kinesthetic, spatial and naturalistic intelligences.

5 Pedagogical Considerations

When children play computer games they train competencies in acting and reacting within dynamic environments and hence develop certain elements of interactive media reading competence. Computer games therefore have a pedagogical value regardless if they are considered so called serious or educational games or not.

Fromme [2003] speculated that children assume much of their media competencies before they enter school through informal learning within their computer game culture, a culture emphasizing explorative and active media. In contrast, traditional pedagogical approaches and formal learning still rely on static and explorative media. This difference is illustrated in Figure 4.

![Figure 4: Learning and media usage.](image)

The fact that children are starting to acquire competencies in reading explorative and active media before they learn how to deal with static media opens the question if we need new pedagogical approaches to foster an early development of traditional reading skills. As shown above, however, the three dimensions of reading literacy have to be considered independent. This indicates that the order in which these competencies are acquired is secondary; however, further research is needed in order to answer this question with certainty.

Another question is if and to what extent pedagogy should integrate computer games in instruction or turn to an active media based ped-
agogy altogether. On one hand it appears obvious to adjust peda-
gogy to the cultural changes of the youth through developing and
fostering new pedagogical approaches such as digital game based
learning [Prensky 2005]. On the other hand, however, active me-
dia have an intrinsic element of unpredictability as they produce
"unpredictable texts".

Computer games are in any case perfect tools in the context of in-
formal learning. Due to the element of unpredictability, however,
active media give teachers less control over the way the information
is received by the students and therefore appear to be less suitable
in the context of traditional approaches to formal learning. Intro-
ducing MMORPGs as a learning tool in the classroom, for exam-
ple, therefore also requires the implementation of new pedagogical
concepts that are capable of dealing with the unpredictability of the
information flow during instruction.

It seems unrealistic to expect a pedagogical revolution coming out
of the increased use of computer games in pedagogy. Many com-
puter games certainly have a value that can also be utilized within a
formal learning environment, but in general they should be consid-
ered just one tool out of many in a teacher’s toolbox. In fact, there
is also good reason to take a rather conservative approach. One task
for schools, especially for students at an early age, is to counteract
deficiencies that arise from the daily lives of the young learners.
Access to computer games is currently in general not one of these
deficiencies.

6 Conclusion

Starting with Aarseth’s typology of cybertexts we developed a ty-
pology of interactive media and ended up with a new theoretical
approach to interactive media reading literacy. According to this
approach the reading of books has the same pedagogical impor-
tance as the "reading", or playing, of computer games. In order
to arrive at this point of view, it has been necessary to expand the
traditional concept of reading literacy by emphasizing decision and
strategy dimensions and by including competencies that have pre-
viously not been considered elements of reading literacy.

This concept opens up a multitude of questions that require further
research to test the validity of the proposed ideas. One interesting
aspect, for example, is that this theoretical approach would predict
that children train at an early age to evaluate the consequences of
their decisions. One argument in the study of violent video games
[Goldstein 2005] has always been that children do not have the
competence to make this evaluation when dealing with violence in
video games and thus tend to reenact aggressive behavior in real
life. According to the presented theoretical framework of interac-
tive media reading literacy, however, it would be exactly the video
games that counteract the very same problem they are supposed to
create.

Another phenomenon that deserves further investigation is the rise
of competitive computer gaming, power gaming [Taylor 2006] or
eSports [Müller-Lietzkow 2006; Wagner 2006a]. As computer
games are becoming an important part in youth culture, the mas-
tery of competencies in the use of active and explorative media be-
comes a defining element for the identities of those participating
in this culture. As a result, the youth will feel the need to compare
these abilities in contest and thereby actively train competencies in
the decision and strategy dimensions of the interactive media read-
ning literacy. In some sense, we can even look at computer game
tournaments as the spelling contests of the 21st century.

At the same time, this also has the potential of creating a socio-
technological competence divide between power and non-power
users of computer game technology. Some parts of society might
then withdraw from this technology completely, adding a group of
"Digital Drop-Outs" to Prensky’s list of Digital Natives and Digital
Immigrants.

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