

Digital Play-Based Learning

A Philosophical-Pedagogical Perspective on Learning and Playing in Computer Games

Konstantin Mitgutsch, University of Vienna

A majority of investigations examine the potentials of computer games in enriching learning processes; however, only little research has been carried out in examining the role of irritations and disillusionments in digital games. It appears reasonable that educational game design focuses on the programming of well-structured and entertaining games that support the players in their linear learning process until the defined teaching targets are reached. But in contrast to this reduced understanding of learning and games, an anthropological theory of playing and a philosophical-pedagogical perspective on the process of learning will be investigated, opening up a new perspective on learning based on playing. In providing insights into a circular and non-linear process of relearning and learning anew, combined with the spontaneous and unstructured dimension of play in games, a different concept of learning will be proposed: Digital Play-Based Learning. This multidisciplinary paper draws on game studies and educational theory to develop a concept for a novel understanding of learning based on playing games.

Keywords: action, computer games, education, learning, literacy, media theory

In the last few years the potentials of computer games for learning and teaching have increasingly become a focus in scientific research and the computer industry. It is argued that computer games are a valuable tool

to enrich learning. The idea behind using games to encourage teaching may be as old as our habit to play games (cf. Schiller 2000/1795), but the target-oriented adoption of games in the context of learning reached a new level with the introduction of digital media. The vast majority of studies focus on the entertainment aspects of playing games combined with new technologies and certain goals of teaching and training (cf. Mitchell & Savill-Smith 2004). Only very few investigations have explored the role of errors, mistakes, and failures in learning software (cf. Kay 2005) and computer games (cf. Schank 1997). Therefore, most educational theories centre on the engaging force of digital media (cf. Jenkins 2006). In recent years this combination of playing and learning based on digital technology has been labelled “*Digital Game-Based Learning*” (Prensky 2001).

On the one hand, this new digitised way of learning based on the amusing effects of playing games opens up novel dimensions of teaching (cf. Buckingham 2005, Filipczak 1997, Gee 2003, Prensky 2001, 2003). On the other hand, it remains questionable whether playing games can significantly enhance learning: “To turn learning into fun is to denigrate the two most important things we can do as humans: To teach. To learn.” (Stoll 1999, 22) Within an anthropological theory of playing, and a philosophical-pedagogical perspective on the process of learning, I will propose a new approach to the discussion centred on issues of digital games and learning.

Most concepts of *Digital Game-Based Learning* imply a reduced understanding of learning processes and essentially restrict it to the fruitful aspects of playing, while other aspects such as the phenomenon of *re-learning* or *learning anew* are largely overlooked.

Considering the dimension of inordinate, creative, innovative and free play within the structures of games, the concept of *Digital Play-Based Learning* will be developed. This kind of learning focuses on circular processes of learning and the play dimension of games (cf. Caillois 2001/1958). Furthermore the possibilities and limits of *Digital Play-Based Learning* for teaching and learning will be considered. The objective of this paper is not to dismiss *Digital Game-Based Learning*, but to give novel insights into learning based on playing.

Digital Game-Based Learning

The term “Digital Game-Based Learning” (DGBL), in the majority of studies referring to Marc Prensky’s book of the same title (2001), embraces “any marriage of educational content and computer games” (145). Prensky points out that the process of learning is very much related to the learners’ motivation. In traditional educational institutions the enhancement of motivation for learning *something* is often reduced to a pressure to perform for *someone*: “More generally, students’ motives for learning are a mixture of intrinsic goals and extrinsic rewards, combined with psychological factors such as fear and need to please.” (Prensky 2002, 1) Although academic learning implies a high quality of meaningful content, the engagement of learners seems difficult to enhance. Computer games, however, engage the player in a highly significant way, but – until now – in less substantive content. Thus, it may be concluded that *Digital Game-Based Learning* facilitates a reasonable symbiosis of meaningful content (learning) and an engaging environment (games), transformed through digital media (cf. Prensky 2001, 146). Reasons as to why computer games engage learners were recently pointed out by Alice Mitchell and Carol Savill-Smith’s (2004) review of literature:

- computer games represent fantasies and follow a simple principle of winning or losing, with instant outcomes (Prensky 2001, Roubidoux, Chapman & Piontek 2002);
- they use aesthetic modelling and recognisable features to engage the learner’s attention (Poole 2000) by stimulating the learner’s enjoyment with visual feedback (Bisson & Luckner 1996);
- they provide a complete and interactive playing environment and an immersive experience (Prensky 2001),
- furthermore they open up different solutions and ways of solving problems (cf. Gee 2003; Mitchell & Savill-Smith 2004).

On this basis it may be concluded that computer games have the potential to engage the learner’s attention. But does playing digital games activity effectively enrich learning? What understanding of learning does this digital panacea imply? And how is *game* characterised as one that can

be learnt from? In the following sections, two notions will be critically analysed and reflected: games and learning.

What is a Game?

First of all, the understanding of games that can be found within the concept of learning based on games needs to be examined. In the early stages of development digital learning games were held in bad repute. The reason why learners in the last decades rejected games with arranged learning content was due to their unsatisfying gameplay and their simple linear structure. In these games, the structure of digital media was used to lead the user to a well-defined goal – mostly in the form of written content. These so-called *games*, that made you practise vocabulary, maths or history, were (and still are) typically structured as “tell-tests” (Prensky 2001, 71 ff.).

A much more progressive understanding of games and learning can be found in Marc Prensky’s approach (cf. Prensky 2001, 2002, 2003). Within his query on the engaging power of games, he differentiates between three dimensions of playing games: *fun*, *play* and *game*. Firstly, the dimension of *fun* refers to the relaxing and motivating aspects of playing and includes the dichotomy of “enjoyment and pleasure (good), and amusement and/or ridicule (bad)” (Prensky 2002, 5). Secondly, the aspect of *play* in games, as investigated by the anthropologists Johan Huizinga (1956) and Roger Caillois (2001/1958), implies the free activity and the uncertain outcome of playing. Furthermore Rosemary Garris defines the playing of games as “voluntary, non-productive, and separate from the real world” (Garris, Ahlers & Driskell 2002, 452). Finally, *games* restructure the play and fun dimension in “rules, goals and objectives, outcomes and feedback, conflict/competition/challenge/opposition, interaction and representation or story” (Prensky 2001, 119). Accordingly, games perform as “organized play” (119). On this basis, Prensky argues that by combining the structure of games and the unstructured dimension of playing, the engagement of the gamers in their learning process becomes enhanced: “People play games because the process of game playing is engaging” (Prensky 2002, 2). Therefore *Digital Game-Based Learning* deals with the question of how to introduce game-

play into education and learning. The next section offers insights into the underlying theory of learning of Prensky's approach.

Learning Based on Games

As mentioned previously, in learning games of the twentieth century, play was often reduced to following instructions, and learning to drill and practice. In these "tell-tests" (Prensky 2001) the learner has to follow a clear target and the pleasure of playing is reduced to a minimum. The rationale of these kinds of learning games can be found in behaviourism (Thorndike 1913), cognitive science (Gagne 1985) and in other modern psychological theories of learning and instruction. The main problem underlying these learning and training games is not only their dysfunction (Schrage 2006), but also their manipulative concealment of beliefs and strategies. This sort of teaching negates independent thought, understanding and judgement by transmitting content without allowing for the learner's critical reflection. It is more indoctrinating than instructional (cf. Snook 1972). If new media is used to enhance the manipulation of the learning process, this problematic form of teaching can be considered as digital indoctrination or "e-indoctrination". The theory of learning in "E-Indoctrination Based Games" will not be examined in this paper, but is still applied today in many e-learning environments (cf. Mitgutsch 2007). But how could a more sophisticated understanding of learning in games be developed?

Digital Game-Based Learning in the twenty-first century (cf. Prensky 2002) postulates a specific perspective on the process of human learning. While traditional theories of learning concentrate on the content of learning, and fathom learning under the condition of teaching (which goes back as far as Plato's *Menon*, cf. Mitgutsch & Sattler 2008), today's typical theories focus on cognitive processes and try to locate acts of learning in the human brain. Contrary to this, an understanding of learning based on games asks the question of *how* one *learns what*. Furthermore, Prensky recommends a learner-centred perspective, which focuses on the learner's motivation to engage with a particular content. He defines learning as follows: "Human Learning is the set of processes people employ, both consciously and unconsciously, to effect changes to their knowledge, capacities and/or beliefs" (Prensky 2003, 4).

In this understanding – which Prensky admits to being fragmentary – learning implies several related and interrelated processes and an engagement with a learning object. Furthermore, it cannot be substituted, because it has to be done by the learners themselves (in their minds) and it “involves not only ‘knowledge’ (facts, groups of facts, relationships between facts), and ‘doing’ (capacities, tasks, skills and behaviours) but also ‘beliefs’ (theories, understanding of how and why things work or happen)” (ibid.). Furthermore, Prensky stresses that the success of learning relates to the “type of material to be learned” (ibid.) and to the knowledge the learner has already achieved. In the typical group-oriented teaching situation criticised by Prensky, individual access to content by the learners can rarely be achieved, because learners’ subjective learning habits are ignored.

The theory of *Digital Game-Based Learning* argues that gaming holds the ability to be completely learner-centred and to engage the learner’s attention. On the whole, *Digital Game-Based Learning* focuses on learning based on the condition of the learner’s motivation to engage with a certain type of content. However, it remains questionable if this reduction of the human process of learning to the learner’s motivation is reasonable. To sum up, learning is understood as a set of linear processes that affect changes in the learner’s knowledge, capacities and/or beliefs (cf. Prensky 2001). What about knowledge that we are highly motivated to achieve, but that eludes us? Are knowledge, capacities and beliefs things we have a direct unobstructed access to, that we simply *employ*? Or vice versa, do not things that we learn *from* mostly happen *to us*? What about experiences that *befall* us, that employ *us*? And is learning in computer games limited to the content provided by the game designers? Questions such as these remain unanswered in the concept of *Digital Game-Based Learning*, but are essential to an extended understanding of learning. Therefore I will examine a philosophical perspective that at first glance might not seem applicable to games, but on a second and closer look is very applicable to playing.

An Educational Theory of Learning

Before entering the following discourse it seems necessary to indicate the theoretical leap that is going to be done. Instead of reconsidering learning under the perspective of narrative structures (cf. Murray 1997, Ryan 2004), under a substitution to theories of playing (cf. Aarseth 1997, 2004, Frasca 2003), or related to questions of game-design and learner-motivation (Prensky 2001, 2003), a philosophical approach to the phenomenon of learning will be undertaken. In contrast to a ludological, narratological or design-based perspective on learning, where learning is subordinate to playing games, firstly the process of learning shall be examined and, accordingly, the act of playing will be reconsidered.

Learning Anew

In present-day investigations learning is understood as a direct process in which knowledge and ability are being achieved. In this view learning is exclusively understood as a straight-lined, direct or indirect act of transferring knowledge and abilities from teachers to learners (cf. Budin, Swertz & Mitgutsch 2006). Nevertheless, some investigations focus on a so-called *negative dimension* of learning, which has been overlooked in the majority of studies (cf. Buck 1989, Burgos 2004, Meyer-Drawe 1982, Mitgutsch & Sattler 2008). In this dimension learning is conceived as a “process in which one’s experience of one’s own knowledge and ignorance, ability and inability plays a central role” (Benner & English 2004, 412). An insight into the meaning of the negativity of experience for learning can only be given by focussing on the execution of learning as a process of achieving experience. Learning in this respect indicates that expectations and prejudgements are confronted with unexpected resistance in the process of gaining experience. How can learning in this sense be defined?

The historical roots of theories of learning and negativity reach back to Aristotle’s theories of *epagoge* (often translated as induction) and can only be touched on briefly in this paper: Aristotle’s theory of learning is connected to his understanding of induction. Epagoge is the inductive and intuitive (Greek: nous) recognition of the one in the many, in the process of gaining experience. By recognising the universal principles which are implicated in the particulars, one can proceed to “understand”

the universal principles. For Aristotle, one's experience arises from a particular experience to the universal experience of causes through the process of induction (cf. Aristotle 1999). In this ancient understanding, learning is a process of ascending order of experiences.

Centuries later, Francis Bacon reclaimed the superior force of negative instances in his theory of induction overlooked by Aristotle (cf. Bacon 2000). Gaining experience is dependent on *negative instances* that help to correct incomplete pre-experiences and anticipations. Departing from Aristotle's epagoge and the theories of induction by Bacon, Hans-Georg Gadamer states in his book *Truth and Method* (1998) that the refutation of wrong generalisations through new experience is constitutional to every process of experience. He argues that the negativity of experience has a certain productive meaning to the process of gaining experience. A new experience does not only lead to a realised disillusion, it gains "better knowledge through it" (Gadamer 1998, 353).

The central aspects of Gadamer's considerations about the negativity of experience are as follows: one experiences something new about an object (1), about the limitation of his or her prior anticipation (expectation) (2), about the limitation of one's own consciousness (3), and finally one reaches a new horizon of consciousness as an experiencing subject (4). Based on Gadamer's investigation, the educationalist Günther Buck has transformed Gadamer's analysis of negativity and experience in educational discourse. In his 1989 book *Lernen und Erfahrung* ("learning and experience") he describes the relation between learning and experience as reciprocal and conditional. Learning is founded on experience and – vice versa – experience depends on learning. Günther Buck states that learners are able to boycott the process of learning by keeping a firm and dogmatic hold on their current pre-experience and knowledge. In this case, habits and familiarities turn against new experience. Günther Buck argues (with reference to Edmund Husserl) that every pre-experience is unspecific and therefore also the condition of the possibility for learning. If the learners' anticipation of *something* is disillusioned, their knowledge of this object (1), of their former anticipation (2), and of their horizon (3), transforms. Learning from the productive negativity through experience manifests as an overcoming of dogmatic anticipations, and proceeds as a change of the horizon of experience. Buck (1989, 42) calls this

fundamental kind of learning *umlernen*, a process of *learning anew* or *re-learning* by negative instances. Therein, the experience of disillusion and the confrontation with our own anticipations and experiences are key moments. In conclusion, learning is a process of confrontation with resistant experience and knowledge that transforms the learners' experience (1), their pre-experiences (2), and their knowledge (3).

By learning anew, learners relearn their former knowledge and experience their own process of learning. But does an experience of negative instances automatically lead to a learning process? We all experienced disillusionments that we did not learn from, that did not lead to a process of *relearning* or *learning anew*. Within Gadamer's and Buck's understanding, learning appears to be dependent on negative instances, but it remains questionable why in some places learning gathers momentum and in others it freezes.

In the 1980s the phenomenologist Käte Meyer-Drawe followed Günther Buck's analysis on learning. She showed that learning is essentially related to the "resistance of things" (Meyer-Drawe 1996). To stimulate learning, the teacher must force the learner to the limits of their pre-judgments, their pre-experiences, and their dogmatic beliefs (cf. Benner & English 2004, Meyer-Drawe 1982, 1996). Furthermore, the philosopher Bernhard Waldenfels (2002) states that every process of learning immediately opens up a large number of new pre-experiences, expectations and anticipations that enrich further experiences. Furthermore, the learners do not *passively receive*, nor *actively gain*, experiences: things *passionately* (Greek: pathos) *move* them.

To enrich learning, the instructor's task is to open up an un-dogmatic environment which enables passionate experiences. The disappointment one experiences while learning might feel like suffering, but it gains new experiences and gathers momentum in the learning process. But can learning – understood as relearning and learning anew – be enriched through games?

Learning Anew Based on Games?

Returning to the theories of *Digital Game-Based Learning*, this negative understanding of learning seems unsuitable. Marc Prensky admits that his definition of learning omits aspects such as experience, improvement

and permanence, because he assumes that whilst these factors are related, they are “not intrinsic to learning” (Prensky 2003, 4). In direct opposition to a passionate dimension, learning based on games aims to throw off “the shackles of pain and suffering, which have accompanied it for so long” (Prensky 2002, 4). *Digital Game-Based Learning* targets the overcoming of the pain of learning by incorporating the enjoyment of games. At this point the limited perspective on the process of learning in the discourse of *Digital Game-Based Learning* becomes evident: learning is not understood as a circular process of experiencing (relearning), but as an act of linear instruction of content (further learning). One might argue that even in the concept of *Digital Game-Based Learning* this circular and “negative” aspect is considered in the theories of “learning by failure” (Schank 1997 in: Prensky 2001, 159). But in this respect, the learners’ “mistakes” are exploited to immediately correct their actions or assumptions. In this sense, mistakes are reduced to a key figure for leading the players to the “correct” predetermined path in their games. The learners do achieve new knowledge about the correct path or the correct answers, but they barely form a reflected experience about their pre-experiences; they do not *learn anew* or *relearn* by resisting experiences. In other words: they might correct their actions, or achieve a given content, but the learners do not become aware of their own process of experience, of themselves or their own restricted anticipations. Like the rat in the t-maze (behaviourism), the players learn which path to follow through their mistakes, but they do not recognise the limits of their pre-experiences, the capacity of their process of learning.

By reconsidering this assumption, it may appear questionable whether circular learning processes could ever be reached by digital games. How can games that – as a matter of principle – are based on rules, goals, outcome, and structure (cf. Huizinga 1956), provide *relearning* or *learning anew*? In fact: one might not learn anew by *games*, but by *playing*.

Learning Based on Play: Digital Play-Based Learning

If learning is understood as a circular process of gaining experience through negative instances which confront the learners with their incomplete prejudgements and pre-experiences, a direct access by instructors or teachers appears impossible. Therefore, how can highly struc-

tured environments like computer games with well-defined goals and structures open an essentially unstructured process of learning? The answer to this question lies in a specific human activity that *games* try to structure: *playing*.

Play vs. Game?

In his expansion of Johan Huizinga's game theories (1956) the French ludologist Roger Caillois postulates an essential differentiation between *play* (*paidia*) and *game* (*ludus*) (cf. Caillois 2001/1958). Roger Caillois postulates *paidia* (play) and *ludus* (game) as the main principles that characterise games (cf. Schrammel & Mitgutsch 2008). On this basis he defines *paidia* as a free, not obligatory, act, separated from any sanctions, and circumscribed only by limits of space and time. *Paidia* remains essentially undetermined, as it performs as a spontaneous manifestation of the play instinct (cf. Caillois 2001/1958). This spontaneous act is accompanied by *ludus*, which confronts *paidia* with structures, rules, goals and limits and subsequently transforms *paidia* into its institutional form: games. The structure of *ludus* enriches the act of *paidia* with competition, excitement and social entertainment. The ludologist Gonzalo Frasca recently proposed “‘*paidea*’ as an equivalent to the English noun ‘play’, and ‘*ludus*’ for the noun ‘game’” (Frasca 1999). In conclusion, the notion of *play* refers to the unstructured, spontaneous and free act subordinated to the institutional and obligatory structure of games (cf. Adamowsky 2005).

While *Digital Game-Based Learning* focuses on the *game-dimension* of game-play, such as rules, goals and structures, the *play-dimension* remains relatively untouched. Prensky, for example, defines his idea of learning based on the structure of games, not on the unstructured act of playing. He certainly refers to the theories of Huizinga and Caillois (cf. Prensky 2001, 111 ff.), but only focuses on the game dimension and the practical implementation of learning content to games (cf. Leopold 2007). It is fairly certain that the reason for this may be found in the highly structured environments that are programmed by game design. The question that remains is: how can a computer game be designed so that it both opens up an environment for free and unstructured gameplay on the one hand and enriches the game with target-oriented learning content on the

other? How can the structuring media of a computer be used for a learning process that remains open and unstructured? How this kind of learning based on playing could be considered (and maybe realised) will be examined in the following section.

Learning Based on Play

Having discussed this different understanding of learning, it is now possible to reassess initial thoughts on learning based on *play*. To contradict assumptions that learning *anew* and *relearning* based on the unstructured act of playing cannot be realised through computer games, a statement by James Paul Gee shall be mentioned. In Gee's introduction to his book *What Video Games Have to Teach Us About Learning and Literacy* (2003) he illustrates his impressions after playing his first digital game:

This game – and this turned out to be true of video games more generally – requires the player to learn and think in ways in which I am not adept. [...] Oddly enough, then, confronting what was, for me, a new form of learning and thinking was both frustrating and life enhancing. (Gee 2003, 5)

What Gee articulates in this quotation is prototypical for circular *learning anew* based on the play dimension of computer games and video games. What Gee experienced by playing a game, was a change of his prior horizon of experiencing and learning. He learnt more than just a new content, he *relearnt* his own way of learning, learnt about personal limits and potentials, about his desire to play and the power of frustration. And, what seems to be most important, he learnt about himself as a learning and experiencing subject, embedded in a cultural environment. Furthermore, it should be mentioned that this act of *Digital Play-Based Learning* was not based on a typical learning game, but on the game "The New Adventures of the Time Machine" (2000).

This example might give an initial idea as to what learning based on playing looks like. In a related but different understanding, Carlo Fabricatore stresses that "new paradigms in educational game design are needed" (Fabricatore 2000) that reconsider a wider examination of the connection between learning processes and computer games. He points out

that learning based on games includes not just the transport of content, but a whole virtual learning environment:

In this sense, it is in first place important to understand that a virtual gaming environment is per se a learning environment, since it offers conditions free of any functional pressure and negative consequences, and constantly faces the player to situation [sic] that engender changes, thus involving her in an experience that demands learning and developing skills and abilities during each instance and repetition of the basic interactive cycle which the game-playing is based on. (Fabricatore 2000)

Fabricatore's understanding of playing and learning opens up a new perspective on learning based on computer games. Although his concept of "edugaming" (Fabricatore 2000) focuses more on the dimension of *game* rather than *play*, and restricts learning to an act of achieving knowledge via content (similar to Prensky), he recognises the potential of virtual environments for learning. But *playing* environments contain more potential for learning than simply enjoyment and learning content. Gonzalo Frasca reminds us of how game-environments that focus on the *play* (or *paidea*) dimension of games can be understood:

Paidea [play-based] videogames have no pre-designated goal. So, there is no 'winning plot', as in adventure videogames. The player has more freedom to determine her goals. As we have seen, as soon as the paidea player determines a goal with winning and losing rules, the activity may become a ludus [game]. (Frasca 1999)

Learning based on a playing environment, which enables *learning anew* and *relearning*, does not directly determine the player's learning path via goals and rules. It opens up a wide range of opportunities, and gives the learner the freedom to choose, and the possibility to reflect upon experienced negative instances. Compared with James Paul Gee's thirty-six learning principles in video games, *Digital Play-Based Learning* involves active and critical learning (Principle 1), the reflection of meta-levels of semiotic domains (principle 5), the gain of self-knowledge (Principle 9), the aspect of rethinking (Principle 15) via multiple routes

(Principle 16), and the reflection of cultural models of principles and of learning itself (Principles 30 & 31) (cf. Gee 2003). Furthermore, this idea opens up a new understanding of digital literacy (cf. Buckingham 2007) and digital competence. To develop the competence or literacy to *relearn* and *learn anew* by playing digital games requires a specific virtual and social environment and creative thinking by the players. Neither the teacher nor the game sets the objectives; the game-play, the experiences, and the disposition of the learner opens up the new potential of *Digital Game-Based Learning*. In a last step the idea of *Digital Play-Based Learning* will be assessed.

Conclusion

Digital Play-Based Learning is a phenomenon that refers not to a linear but to a circular process of learning and the unstructured act of play in games. It can be characterised as an act of *learning anew* from *negative instances* experienced in an open virtual learning environment. It aims to teach the learners about their prior horizon of experience and to relativise their prejudgments and their premature beliefs. Therefore, learning based on play does not only engage the learner by entertainment and challenge, but by confrontation and passion. This understanding of learning in games is not a substitution for *Digital Game-Based Learning*, but it focuses on a different aspect of learning and playing.

Learning based on *play* includes more than the transfer of content to an engaging entertaining environment. The virtual environment itself, with its own culture, its specific social aspects, its horizon of experiences with its implicit knowledge and beliefs, and with its drive to confront the learner's prior experiences, appears to be the vital key to enriching learning. It opens up a multitude of potentials that allow the players to experience unknown situations and experiment with situations that they would not have access to in their normal lives. Learning based on the unstructured, spontaneous and free act of play (Caillois 2001/1958) uses the learners' experience of negative instances that confront them with resisting knowledge and new perspectives within their game-play. Instead of leading the learners to the correct path of achieving knowledge and true content (DGBL), the learners are forced to be players that experiment without functional pressures of negative consequences or social

sanctions. To support this uncontrollable way of learning within media literacy or digital competence, the players should be capable of reflecting upon and rethinking meta-levels of semiotic domains, models of game and learning cultures, and predetermined goals that restrict their learning habits. Furthermore, the learners should be enabled to understand the impact of media on our culture, beliefs and fields of knowledge (cf. Swertz 2008). In this sense, the learners are challenged to develop a new media literacy (Buckingham 2007, Jenkins 2006) that allows them to play within the limits of games and to rethink, reflect upon and relearn their actions in games. How this new media literacy can be arranged and how games can be designed that open a wider learning environment appears to be a major task for the future of learning based on video games. *Digital Play-Based Learning* places an emphasis on aspects of play, learning anew, and relearning, which so far have not been considered by educators or game designers.

Konstantin Mitgutsch is affiliated with the research unit of General Science of Education and Media Pedagogy at the Department of Educational Science, University of Vienna (Austria).

E-mail: konstantin.mitgutsch@univie.ac.at

References

- AARSETH, ESPEN J. (1997). *Cybertext: Perspectives on Ergodic Literature*. Baltimore & London: Johns Hopkins UP.
- AARSETH, ESPEN J. (2004). "Quest Games as Post-Narrative Discourse." *Narrative across Media: The Languages of Storytelling*. Ed. Marie-Laure Ryan. Lincoln & London: U of Nebraska P. 361–376.
- ADAMOWSKY, NATASCHA (2005). "Spielen und Erkennen: Spiele als Archive." [To Play and Recognise: Games as Archives]. *Anthropologie und Pädagogik des Spiels*. Eds. Johannes Bilstein, Matthias Winzen & Christoph Wulf. Weinheim and Basel: Beltz. 37–53.
- ARISTOTLE (1999). *Metaphysics*. Oxford. Vol. I. [pr. 1924].
- BACON, FRANCIS (2000). *The New Organon*. [1620]. Eds. Lisa Jardine & Michael Silverthorne. Cambridge: Cambridge UP.
- BENNER, DIETRICH & ANDREA ENGLISH (2004). "Critique and Negativity: Toward the Pluralisation of Critique in Educational Practice, Theory and Research." *Journal of Philosophy of Education* 38: 410–428.
- BISSON, CHRISTIAN & JOHN LUCKNER (1996). "Fun in Learning: The Pedagogical Role of Fun in Adventure Education." *Journal of Experimental Education* 19.2: 108–112.
- BUCK, GÜNTHER (1989). *Lernen und Erfahrung – Epagogik: Zum Begriff der Didaktischen Induktion*. [Learning and Experience – Epagogik]. 3rd ed. Darmstadt: Wissenschaftliche Buchgesellschaft.
- BUCKINGHAM, DAVID (2005). *The Media Literacy of Children and Young People: A Review of the Research Literature*. London: Ofcom.
Also available at <<http://www.ofcom.org.uk>>.

BUCKINGHAM, DAVID (2007). *Beyond Technology: Children's Learning in the Age of Digital Media*. Cambridge : Polity.

BUDIN, GÜNTHER, CHRISTIAN SWERTZ & KONSTANTIN MITGUTSCH (2006). "Knowledge Organization for a Global Learning Society." *Proceedings of the Ninth International ISKO Conference: Advances in Knowledge Organization*, 9. Würzburg: Ergon.

BURGOS, ROSA N. B. (2004). "Negativity: A Disturbing Constitutive Matter in Education." *Journal of Philosophy of Education* 38: 429–440.

CAILLOIS, ROGER (2001). *Man, Play, Game*. [1958]. Chicago: U of Illinois P.

FABRICATORE, CARLO (2000). "Learning and Videogames: An Unexploited Synergy." Paper presented at AECT 2000.
<<http://www.learndev.org/dl/FabricatoreAECT2000.pdf>> [2008-15-03]

FILIPCZAK, B. (1997). "Training Gets Doomed." *Training* 34.8: 24–31.

FRASCA, GONZALO (1999). "Ludology Meets Narratology: Similitude and Differences Between (Video)Games and Narrative." [Finnish as: Ludologia kohtaa narratologian]. Parnasso 3. <<http://www.ludology.org/articles/ludology.htm>> [2008-15-03]

FRASCA, GONZALO (2003). "Simulation Versus Narrative: Introduction to Ludology." *The Video Game Theory Reader*. Eds. M. J. P. Wolf & B. Perron. London: Routledge.

GADAMER, HANS-GEORG (1998). *Truth and Method*. 2nd ed. [1975]. New York: Continuum.

GAGNE, ROBERT M. (1985). *The Conditions of Learning*. 4th ed. New York: Holt, Rinehart & Winston.

GARRIS, ROSEMARY, ROBERT AHLERS & JAMES E. DRISKELL (2002). "Games, Motivation, and Learning: A Research and Practice Model." *Simulation & Gaming* 33.4: 441–467.

GEE, JAMES PAUL (2003). *What Video Games Have to Teach Us About Learning and Literacy*. New York: Palgrave/ Macmillan.

HUIZINGA, JOHAN (1956). *Homo Ludens: Vom Ursprung der Kultur im Spiel*. [Man and Play]. Reinbek bei Hamburg: Rowohlt Taschenbuch.

JENKINS, HENRY (2006). *Convergence Culture: Where Old and New Media Collide*. New York: New York UP.

KAY, ROBIN H. (2005). "The Role of Errors in Learning Computer Software." *Computers & Education* 49: 441–459.

LEOPOLD, DANIELA (2007). *(Computer-) Spielend Lernen? Eine Auseinandersetzung mit dem Konzept des Game Based Learning*. Diploma thesis. University of Vienna.

MEYER-DRAWE, KÄTE (1982). "Lernen als Umlernen. Zur Negativität des Lernprozesses." [Learning as Relearning]. *Lernen und seine Horizonte: Phänomenologische Konzeptionen Menschlichen Lernens: Didaktische Konsequenzen*. Eds. K. Meyer-Drawe & W. Lippitz. Frankfurt am Main: Königstein. 19–45.

MEYER-DRAWE, KÄTE (1996). "Vom Anderen Lernen: Phänomenologische Betrachtungen in der Pädagogik." *Deutsche Gegenwartspädagogik*. Vol. 2. Eds. M. Borelli & J. Ruhloff. Hohengehren: Schneider. 85–89.

MITCHELL, ALICE & CAROLL SAVILL-SMITH (2004). *The Use of Computer and Video Games for Learning*. <<http://www.lsda.org.uk/files/PDF/1529.pdf>> [2008-15-03]

MITGUTSCH, KONSTANTIN (2007). "Indoktrination als Phantom. Über die Intentionalität des Medieneinsatzes im Lehr-Lernprozess." [Phantoms of Indoctrination]. *Indoktrination und Erziehung: Einblicke in die Rückseite der Pädagogik*. Ed. H. Schluß. Wiesbaden: VS-Verlag. 93–111.

MITGUTSCH, KONSTANTIN & ELISABETH SATTLER (2008). "Learning by Passion: Tracing a Passionate Dimension within the Negativity of Learning in Philosophy of Education." *Critique & Humanism*. [forthcoming].

MURRAY, JANET H. (1997). *Hamlet on the Holodeck*. New York: Free Press.

The New Adventures of the Time Machine (2000). PC version. DreamCatcher Interactive, Cryo Interactive.

POOLE, STEVE R. (2000). *Trigger Happy, Video Games and the Entertainment Revolution*. New York: Arcade Books.

PRENSKY, MARC (2001). *Digital Game-Based Learning*. New York: McGraw-Hill.

PRENSKY, MARC (2002). "The Motivation of Game Play: The Real Twenty-First Century Learning Revolution." *On the Horizon* 10.1. <<http://www.marcprensky.com/writing/>> [2008-15-03]

PRENSKY, MARC (2003). “*eNough!*: ‘e-Learning’ is a misnomer – it’s mostly just ‘e-Teaching.’ For any teaching to reliably and consistently produce the results we want, we still have a lot to learn about learning.” *On The Horizon* 11.1.
<<http://www.marcprensky.com/writing/>> [2008-15-03]

ROUBIDOUX, MARILYN, CHRIS CHAPMAN & MARY PIONTEK (2002). “Development and Evaluation of an Interactive Web-Based Breast Imaging Game for Medical Students.” *Academic Radiology* 9.10: 1169–1178.

RYAN, MARIE-LAURE, Ed. (2004). *Narrative Across Media: The Languages of Storytelling*. Lincoln: U of Nebraska P.

SCHANK, ROGER C. (1997). *Virtual Learning: A Revolutionary Approach to Building a Highly Skilled Workforce*. New York: McGraw-Hill.

SCHILLER, FRIEDRICH (2000). *Über die Ästhetische Erziehung des Menschen*. [1795]. Ditzingen: Reclam.

SCHRAGE, M. (2006). “The Dysfunction of ‘Fun’: How Today’s Educational Computing Corrupts the Character of Learning.” *Educational Technology* 46.4: 60–62.

SCHRAMMEL, S. & K. MITGUTSCH (2008). “Spielerische Gewalt: Skizze einer Ludi-schen Kultur des Spiels *Counter-Strike*.” *Faszination Computerspielen: Theorie - Kultur - Erleben*. Eds. Konstantin Mitgutsch & Herbert Rosenstingl. Wien: Braumüller.

SNOOK, IVAN AUGUST (1972). *Indoctrination and Education*. London: Routledge & Kegan Paul.

STOLL, CLIFFORD (1999). *High Tech Heretic: Reflections of a Computer Contrarian*. New York: First Anchor Books.

SWERTZ, CHRISTIAN (2008). “Courtship Patterns in the Information Age: Theoretical Reflections on the Impact of Computer Technology on Human Grouping.” *eCulture*. Eds. J. Hasebrook & G. Muhr. [forthcoming].

THORNDIKE, EDWARD L. (1913). *Educational Psychology: The Psychology of Learning*. New York: Teachers College Press.

WALDENFELS, BERNHARD (2002). *Bruchlinien der Erfahrung: Phänomenologie, Psychoanalyse, Phänomentechnik*. [Fractures of Experience]. Frankfurt am Main: Suhrkamp.