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Game Media Literacy as an Approach to Complexity in Education

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ABSTRACT: *In this paper, we focus on Eric Zimmerman's Manifesto for a Ludic Century, an essay on the importance of games as a paradigm for understanding the complexity of the 21st century, in which systems thinking, play and design are presented as crucial skills to be considered as indispensable as others when reinventing an education system, which aims to approach the complexity of the world we inhabit and promote. We also present some useful points of view of well-known game designers and academic scholars involved with Game Science who introduce Game Media Literacy as an approach to complexity in education. Finally, we present the setting up of the first-year Game Design Lab activity, involving Students coming from the Senior High Schools of Sassari area in Sardinia as well as students from the Course of Studies in Public Communication and Information Professions of the University of Sassari.*

KEYWORDS: *Game media literacy, Trialogical learning, Complexity, Critical thinking, Hybrid environment, Teaching practice.*

Introduction

Let us start with the generally accepted modern definition of *game* in the Game Community (Salen, Zimmerman, 2003).

A game is a closed and regulated system in which we freely choose to participate, subjecting ourselves to rules for solving artificial challenges, which result in a quantifiable outcome. The engaging in the game activity, the act of playing a game, does not entail losses or benefits.

Christian Swertz (2019) describes Game Media Literacy (GML) as the set of educational processes specific to games, which become tools to discuss learning in games, learning about games, learning by game

design, and learning from games. GML, born as a theory in 2004, embodies in a very direct sense the characteristics introduced by Eric Zimmerman in his *Manifesto for a Ludic Century* (Zimmerman, 2014) to describe media and culture as systems which are increasingly modular, customizable, and participatory. The way we work and communicate, research and learn, socialize and romance are all intimately intertwined with complex digital information networks which, owing to their flexibility and organicity, promote a playful dynamic twist to the pursuit of an education model suitable for young students to approach complexity in a spatiotemporal perspective. GML is about creating and understanding meanings, forcing us to gain the ability to see how the parts of any system of human relations fit together to create a complex whole, making use of active playful participation and innovative transdisciplinary ways of thinking geared to analyse, redesign, and transform existing systems into more organized ones. Games are a natural habitat for approaching complexity. Being playful is the engine of innovation and creativity, as we play, we think about thinking and we learn to act in new ways, overcoming the passive relationship to the systems we inhabit.

1. Game Media Literacy and Complexity in Education

The book *What Video Games Have to Teach Us about Learning and Literacy* published by James Paul Gee (2004) is considered the starting point of Game Media Literacy. Studying GML at school is often justified in terms of making the curriculum relevant to students' lives. This is not a popular way to pique their interests but to equip them with the skills and understanding to make sense of and contribute to contemporary forms of communication and representation (Buckingham, 2003). GML is also inherently polemic, arguing that the cultural materials young people engage with outside of school, such as games, deserve investigation. Underpinning these pedagogic and political aims is a theory of communication which understands meaning to be constructed through different ways, such as visual image and sound, and not just written text.

Therefore, studying games has in recent years been described in terms of acquiring a form of literacy, designed to enable students to be fluent in a different media language. This completes recent developments in literacy research, which identify in the spread of modern technologies the reason for which verbal language is no longer the primary symbolic system (Kress, Leeuwen, 2001). Contemporary texts, from newspapers to internet web pages, increasingly combine verbal language with visual images, sound, and graphics. Being literate today means understanding and applying the grammars of different styles and media, not only of written texts. The concept of 'multiliteracies' (Cope, Kalantzis, 2000) has engendered a range of subcategories, such as TV literacy, cinema-literacy, visual literacy, computer literacy and of course game media

literacy (Tyner, 1998). Literacy is about creating and understanding meaning, which allows people to write (create) and read (understand) texts. The understanding of GML is therefore connected to a certain understanding of what we refer to as text. The classical definitions are in a certain way narrow because they refer only to printed texts and to texts that are regarded as high culture. Media Literacy offers a less restricted meaning of text, which includes multimedia and multimodality, addressing objectives for teaching and learning about media and developing consequences for pedagogies. Game Media Literacy offers a broader meaning of text. Crucial to GML is not just the meaning of games, but rather, the ideologies and ethos of gamers' cultures. By means of Gee's *Theory of Discourse*, which provides a tool for investigating discourse and social practice that highlights the interrelationships between language, language learning, social identity, and social context (Knobel, 1999), GML first goal is to become familiar with dialogues about games and gamers' cultures. Let us not forget that on the one hand we have a generation of teachers with very little game literacy if none, and on the other a generation of students raised with internet and a multitude of gaming literacies, many of which are not affiliated with school academic world (Beck, Wade, 2004; Gee, 2003). If we are willing to acknowledge that today's students have literacies that their teachers lack, we should be considering letting the kids develop the curriculum! Can anyone imagine 14-year-old 'L33T speaking'¹ kids teaching media literacy courses, where teachers, students, parents, and elected officials are required to finish a game like DOOM? This hypothetical and imaginary scenario hopefully makes obvious that the question is not whether one group can simply make sense of texts, but according to whose systems of interpretation. One of the core issues for GML is whose literacies privilege, what questions consider legitimate and which ones not.

What is the value of studying games in school? The cognitive skills which games develop are much more complex than those usually required for school-based learning, with players acquiring a 'metalanguage' for games in a way which rarely happens for school subjects (Gee, 2007). It cannot be assumed that young people are inherently competent users of game media. Although games teach the competencies required to use and interpret them, this does not mean there are no gaps in young people's knowledge and no room for making this more systematic and sophisticated (Meek, 1988; Buckingham, 1993). Gee (2007) makes a strong argument for the critical literacies that informal player communities sustain. But the extent to which players develop these forms of literacies relates largely to their social

¹ L33T is an Internet Language which substitutes for English alphabet. L33T, the word itself, means *élite*, which is used for good gamer, and it is also known as 1337, l33t, 31337. <https://sites.google.com/site/inhainternetlanguage/different-internet-languages/l33t>

circumstances; many young people have little access to the social contexts that enable and, most importantly, motivate critical consideration of games. Buckingham and Sefton–Green (1994) argue that the creative and critical use which young people are assumed to make of digital technologies, and games, is often overestimated. For many players, informal learning only goes so far. First, there are issues of access and power; certain social groups, for example, may play a less prominent role in fan communities and have more restricted access to games. Consequently, they will have less opportunities and social purpose in considering games and game practices reflectively. Second, although game players may learn to read games and consequently write or produce their own approach to play, there remains an impasse between contributing to game culture through play and contributing by making games. Few players have the social motivation, institutional connections, and practical tool to understand games by producing their own.

This makes a strong argument for developing forms of education and social situations that enable people's interactions with games to be more productive than they might otherwise be. While acknowledging students' existing abilities, it is also possible to say that they can be provided with the material, cognitive and social resources to move beyond them. More subtly, following the tendency of researchers to define complexity in terms of their objects of inquiry, with GML we invert the assertion that learning is complex and work from the conception that complex systems are learning systems (Davis *et al.*, 2008). This definition enables us to embrace both the hard and the soft approaches to complexity research. From the demandingly empirical branch of inquiry that follows mathematics and that is most associated with physics, GML allows to draw principles that are useful for challenging prevailing perceptions about what learning is and how it is related to teaching (Davis, Sumara, 2010). From the more holistic soft branch that is more the domain of health professionals, biologists, philosophers, psychologists, and educators, GML offers the perfect ground to examine some possibilities for action when dealing with phenomena that seem to learn and change on their own. The project of education is among the most complex of human enterprises, arising in the nexus of individual interest, social need, disciplinary diversity, cultural self-perpetuation, and humanity's efforts to situate itself in the more-than-human world. Oriented by this realization, the insights offered by hard complexity research do more than inform education, they transform education.

It should be clear by now, that our main interest is in teaching about games, not through games. To date, much of the game and education literature has concerned itself with using games to teach curriculum content, such as history or ICT. The notion of game literacy is then applied to the functional competences required to manipulate game hardware and software and is often said to be a competence that teachers require, rather than students, who are assumed to already have it. Many teachers

are indeed likely to have limited experience of board or digital games, and there is an issue about what kind of professional development might enable them to use them in class. Yet it cannot be assumed that all students play games or have experience of a wide range of titles. Furthermore, playing games and developing a metalanguage about them involves different kinds of competences. Although playing games might be crucial to considering them in design terms, developing critical understanding of games is different from using them functionally as a delivery mechanism. In other words, GML is not about gamification, applying games to teach and learn content, like in serious games or edutainment products, these aspects are not included in its definition. GML is not about imposition, playing a game is a free, optional activity that completely loses its nature if it is imposed. A workshop built on a game, if forced, does not work. Psychology, Management and Pedagogy have recognized motivation as a determining factor for years now. GML is not the overall solution. A game can work, and it can work particularly well to convey valuable content and solid skills, but it is a language, a medium to master, not the solution to all shortcomings. GML is specific to gamers and their culture, it includes multimedia and multimodal communication, also popular culture, and the suggestion to learn from games how to handle complex systems and systems thinking.

2. Complex Systems and Systems Thinking

Complex systems are described as large systems of heterogeneous parts, interconnected hierarchically without centralized control. Every individual part interacts with other local parts (neighbors), which in turn generates a global behavior. In other words, it is from local interactions with simple rules that complex patterns can emerge. Some examples are the brain, an ant colony, human society, the global weather, the Internet (Lansing, 2003). Essentially, all these examples have nodes of some form – the brain has neurons, an ant colony has individual ants, human society has individual humans (whose bodies in turn are complex systems) – and these nodes interact mostly locally, adhering to some simple rules, which is a sign of a complex system. Complex systems are a subset of nonlinear dynamical systems, it is a very interdisciplinary topic, covering topics from biology to anthropology, from computer science to chemistry. For biologists, it is the idea that natural selection is not the sole source of order in the biological world (Lansing, 2003). What makes a complex system interesting is how mysterious its behavior can appear, and how incredibly hard is to predict how it will behave. It is the seeming simplicity of these systems that baffles scientists when instead they generate different intricate patterns.

The big revelation is that games are complex systems too, being forms of learning environments where learners are collaboratively developing, transforming, and creating shared objects of activity in a systematic

manner. Therefore, playing them help foster Systems Thinking which, according to Peter Senge (Senge, 2006) of the Center for Organizational Learning at MIT, is a discipline for seeing wholes. A framework for seeing interrelationships rather than things, for seeing patterns of change, rather than static snapshots. Systems thinking probes the underlying nature of how things work. To survive in a time of increasing complexity, becoming a systems thinker would be key. Today world problems require the kind of thinking that GML provokes. e.g.: How does the price of gas in California affect the politics of the Middle East, and how these two variables affect the Amazon ecosystem? These types of problems force us to understand how the parts of a system fit together to create a complex whole with emergent effects. They require playful, innovative, transdisciplinary thinking in which systems can be analyzed, redesigned, and transformed into something new. For these reasons, games make a natural fit.

3. Board and video games as a training ground for life skills.

Board and video games are examples of complex systems which are protected environments, where players feel comfortable and free from fear to make mistakes when engaging in new situations, since the consequences of their actions are limited to the game field only. When information is put at play, game-like experiences provide the increasingly systemic, modular, customizable, and participatory environment required. Games embody all these characteristics in a very direct sense, becoming machines of inputs and outputs, hybrid environments that are inhabited, manipulated, and explored.

Different games help to develop different skills. Cooperative games favor teambuilding and consolidate the habit of giving and receiving feedback. The well-known game of chess develops pure logic attitude and analytical thinking. Management games involving economic simulation forge priority management and performance analysis. Strategic games, involving complex analysis and decisions making, promote problem solving and critical sense. Over time, game practice develops both assessment and productive skills, faster and more successfully than theoretical manuals. It trains to picture both the parts of a system and its global frame of actions.

4. There is a need to be playful

To be able to deal with complexity, it is not enough to be a systems-literate person, who understands systems in an analytic sense. We also must learn to be playful in them. A playful system is a human system, a social system rife with contradictions and with possibilities. Being playful is the engine of innovation and creativity: as we play, we think about

thinking and we learn to act in new ways. As a cultural form, games have a particularly direct connection with play. John Seeley Brown (1989), former chief scientist at Xerox Palo Alto Research Center, considers crucial to understand that play is not only a juvenile activity. Play is how mammals learn. Babies and children play as a way of developing their understanding of the world – therefore, it is essential that adults can play as well. We transitioned into a time of transitions, and the only way we can adjust to the present-day speed of change is to become as adept at play as babies dropped into a world about which they know nothing. Play constitutes a pushback against the boundaries of a system established by rules. Man-made systems – the tax system, the school system, society as a whole – can be oppressive sometimes. In a world increasingly dominated by such systems, play could become a crucial, even subversive skill.

5. We should think like game designers

In the Ludic Century, we cannot have a passive relationship to the systems we inhabit. We must learn to be game designers, to recognize how and why systems are constructed, and to try to make them better. It took several decades for automobiles to shift from being a hobbyist technology, requiring expert knowledge, to being a locked-in consumer product. The constant change of digital technology means that our hardware and software systems may never stabilize in this way. To fully engage with our world of systems, we must all think like game designers. Game design involves systems logic, social psychology, and culture hacking. To play a game deeply is to think more and more like a game designer – to tinker, retro-engineer, and modify a game to find new ways to play it. But... what exactly thinking like a game designer is about? It is beginning to recognize how the elements of a system interact, to frame possibilities for our participation within a system, to fit those possibilities into real contexts and communities and finally, to achieve these possibilities in a shared exchange with others. Thinking like a game designer promotes effective learning through constructive groups interactions, minimize conflict and controversy; it encourages giving and receiving feedback as well as asking for elaboration or help, to exhibit a general equity of participation and minimal social loafing and have an equitable division of labor (Webb, Palincsar, 1996). If you imagine this level of exchange around our national or global discussions about education, healthcare, environmental impact, privacy, security, civic participation and more, then the notion that we must all learn this way of thinking rises to an imperative.

The 20th Century was the age of linear information, the 21st Century is the age of games. Because we live in a world of complex systems, we need systemic tools to describe it. Linear media (books, movies, lectures), no matter how attractive, allow users only to learn passively (learning–

to-know), without exposing them to direct practice (learning-to-do) (Aldrich, 2009). Games instead, offer users possibility to learn actively, as they act as metaphors reflecting specific systems (Mendler de Suarez *et al.*, 2012). Consequently, carefully designed games provide players with a first-hand experience of the systems they represent.

6. Game Design Lab Activity (Sassari, Sardinia)

Based on Discourse theory, the idea of respect for different discourses, and the rejection of putting bans on certain discourses, suggest picking up gamers Discourse in non-gamers Discourses and vice versa. An example is a dialogue in class about games students play, with teachers as presumable representatives of a non-gamers Discourse. A dialogue like that can increase respect for the respectively other discourse. It also allows to reflect cultural practices like social class or cultural values and to develop critical thinking (Squire, 2005).

Good chances to learn something useful in games, where useful is not restricted to relevant in a competitive capitalistic economy to earn money but might also mean relevant for personal development and development of societies, justifies games as relevant for informal learning. All scholars who research Game Media Literacy argue that there are good chances to learn something useful in games and from games. The arguments range from theory of play through game analysis to empirical research. The Game Media Literacy discourse convincingly argues the relevance of games for approaching complexity and systems thinking, which are becoming relevant skills for understanding today's society.

Therefore, we are setting up a one-year Game Design Lab project involving Highschool Students and University Students. Investigating questions are:

- How do we approach understanding of complex system and systems thinking?
- How can we fully engage with systems of relations?
- How can we promote in our students, in a natural way, the ability to recognize how and why systems are constructed, and to try to make them better?

A pilot of Highschool students attending the last three-year Senior High Schools in Sassari area, Sardinia, mixed with university students coming from the Course of Studies in Public Communication and Information Professions of the University of Sassari, are going to be engaged in thinking as game designers, exposed to systems of reasoning which show how the systems thinking perspective can be applied to provide fresh insight into complex phenomena as interpersonal behavior, social relations, attitudes, social cognition, and personal beliefs. Our goal is to measure their grasp of complexity underlying our way of communicating, learning, and behaving in the real and digital world.

Outcomes from this study include monitoring learning about games, the awareness that takes place while playing games, education that takes place while designing games, and for teachers involved in the project, monitoring learning from games of new educational approaches. To simplify this challenge, we decided to use board games instead of video games for several reasons. First, we wanted to be as independent as possible from technical elements, avoiding the excessive programming specialization typical of videogames. Board games make complexity evident, being systems entirely readable by players. Also, we wanted the mechanics and interactions between players independent of specific hardware and software, providing anyway an environment where players can enjoy their agency, which is one of the core elements of a game. Preserving options and structure to make meaningful decisions and shaping one's own experience, with the satisfaction of implementing a personal will inside the 'magic circle'² of the game. Through this will, players wield, influence, and implement what can be accomplished inside the game itself.

In conclusion... Enjoy play to live and live to play!

The ideas emerging from Game Science are particularly useful paradigms for thinking about the future (Hunicke, 2004). There was a time, during the third industrial revolution, when the dominant cultural metaphor was the machine. That was the prism through which people understood their world and themselves. The ideas about games, play, design, and systems are becoming a dominant prism, through which future generations are looking at their world. The Ludic Century, its tools and technologies afford us a unique opportunity to design it together (Zimmerman, 2014). To do so, we must learn to communicate effectively with each other about future realities. We must embrace the struggle of collaborating on their designs. When we play, we challenge each other while allowing for mistakes, and doing so we create together, we explore the systems around us, experience victory and defeat, learning how to succeed through our failures.

Game Media Literacy is a very useful ground to teaching critical thinking, consideration of cultural contexts, and creative actions. While teaching grammar as a metalanguage in lessons that focus on printed text is common knowledge for teachers, this is not yet the case for the grammar of games, we need to work on this aspect. To analyze games it is important to have a common metalanguage, because players do not develop critical thinking by just playing games. Teaching about games is necessary to reach these objectives.

² In the context of games, the magic circle is the area within which the rules of the game apply, a special space, ideally but not necessarily delineated by the rules within which play occurs. It need not be a physical space but can instead be virtual or a frame of mind.

This is our way how we build bridges, increase empathy, and shape our future. Together!

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