

2020-06-17

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Recommended Citation

Gordon, D., O'Sullivan, D., Stavrakakis, I., Curley, A. (2020). Homo Ludens Moralis: Designing and Developing a Board Game to Teach Ethics for ICT Education. *ICT - ETHICOMP 20202: Proceedings of the 18th. International Conference on the Ethical and Social Impacts of ICT, Logroño, La Rioja, Spain, 17th – 19th June.*

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Funder: Ethics4EU

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HOMO LUDENS MORALIS: DESIGNING AND DEVELOPING A BOARD GAME TO TEACH ETHICS FOR ICT EDUCATION

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EXTENDED ABSTRACT

The ICT ethical landscape is changing at an astonishing rate, as technologies become more complex, and people choose to interact with them in new and distinct ways, the resultant interactions are more novel and less easy to categorise using traditional ethical frameworks. It is vitally important that the developers of these technologies do not live in an ethical vacuum; that they think about the uses and abuses of their creations, and take some measures to prevent others being harmed by their work.

To equip these developers to rise to this challenge and to create a positive future for the use of technology, it is important that ethics becomes a central element of the education of designers and developers of ICT systems and applications. To this end a number of third-level institutes across Europe are collaborating to develop educational content that is both based on pedagogically sound principles, and motivated by international exemplars of best practice. One specific development that is being undertaken is the creation of a series of ethics cards, which can be used as standalone educational props, or as part of a board game to help ICT students learn about ethics.

The history of using games for educational purposes is both extensive and diverse; and current literature most often associates it with the term “Gamification”, which Deterding *et al.* (2011) defines as “*the use of game design elements in non-game contexts*”, this can include things such as; using a points system, awarding badges, or completing levels, as a form of motivation and incentive (Flatla *et al.*, 2011). A meta-analysis of results by Hamari *et al.* (2014) suggests that gamification can increase motivation, attitude and enjoyment of tasks, however Seaborn and Fels (2015) caution that much of the research that purports to be Gamification-based is in fact not grounded in theory and does not use gamification frameworks in the design of the systems under study. Nonetheless they found that those studies that did adhere to a good theoretical framework did show improvement in motivation, particularly extrinsic motivation. Groh (2012) notes that gamified applications have been developed across different domains such as productivity, finance, health, education, sustainability as well as news and entertainment media. He also notes that the traditional view of gamification excludes the creation of an actual game, which he classifies as a “Serious Game”, a term which arose in 2002 with the emergence of the Serious Games Initiative (seriousgames.org). Seaborn and Fels (2015) support this distinction of gamification, which they define it as the “*incorporation of game elements into an interactive system without a fully-fledged game as the end product*”, but highlight that other researchers have a less restrictive perspective, and note that Kapp (2012) and others see serious games as being a subset of gamification rather than being antithetical to it.

Although the literature of gamification only commences in the 2000s, the notion of using elements of games for education, and specifically using concrete “playful” objects to illustrate abstract concepts has existed for centuries. In the context of childhood education, in 1693 Enlightenment philosopher, John Locke proposed the idea of *Alphabet Blocks*, saying “*There may be dice and play-things, with the letters on them to teach children the alphabet by playing*” in his thesis “*Some Thoughts Concerning Education*”. The work of both French educator Jeanne-Marie Le Prince de Beaumont in the 1750s and British cartographer John Spilsbury in the 1760s led to the development of the *Jigsaw* (also called at the time the *Dissected Map*), created as an educational tool to teach geography to children. German educator Friedrich Froebel who is renowned for creating the first kindergarten, also developed a group of “play materials” including a collection of blocks of solid geometrical shapes, and a set of foldable materials such as paper. These are now called *Froebel's Gifts*, and their creation in the mid-

19th century is recognised as a seminal moment in education, for their use in effectively stimulating all five senses of a wide range of learners. These led to later developments, such as *Meccano* in 1907, the *Erector Set* in 1913, and *Lego* in 1958 (Zuckerman, 2006).

In a similar vein, the military have long used serious games to help teach strategy for thousands of years, the most obvious example being chess, originating from at least the 15th century, but there were many predecessors to the game of chess that had a similar purpose, including the Indian game, *Chaturanga*, from the 6th century, and the Chinese game *Yì* (or *Weiqi*) from around 600 BCE (Smith, 2010). Starting in the 17th century there were versions of chess that begin to evolve towards modern strategic wargames, including in Germany: in 1616 *Das Schack-oder Koenig-Spiel*, in 1644 *Neuerfundenes grosses Koenig-Spiel*, in 1780 (featuring a board with 1,666 squares) *Koenigspiel*, and in 1812 *Kriegsspiel* (Vego, 2012). These developments eventually led to science fiction author, H.G. Wells writing “Little Wars” a book codifying the rules for miniature wargaming (Wells, 1913). This in turn led to the first commercial board wargames, including early examples such as *Tactics* in 1954, and *Gettysburg* in 1958 (Deterding, 2009).

The use of games in teaching ethics and ethics-related topics is not new, Brandt and Messeter (2004) created a range of games to help teach students about topics related to design (with a focus on ethical issues), and concluded that the games serve to as a way to structure conversations around the topic, and enhance collaboration. Halskov and Dalsgård (2006), who also created games for design concurred with the previous researchers, and also noted that the games helped with the level of innovation and production of the students. Lucero and Arrasvuori (2010) created a series of cards and scenarios to use them in, and had similar conclusions to the previous research, but also noted that this approach can be used in multiple stages of a design process, including the analysis of requirements stage, the idea development stage, and the evaluation stage.

Bochennek, *et al.* (2007) reviewed a wide range of card games and board games that focus on medical education (with many concerning medical ethics) and concluded that although games are used widely in this discipline, there has nonetheless been insufficient evaluation of the efficacy of these games, with many simply evaluated based on individuals’ opinions, rather than measuring their efficacy as teaching tools. They also reflected that some games are more boring than others, and as such this reduces the likelihood of the game being replayed, and reduces the likelihood of knowledge transfer. Lloyd and Van De Poel (2008) created a game to teach ethics where the students were given opportunity to reflect on their own perspectives and experiences, to help structure their own ethical framework. The game also involved aspects of role-play as the researchers indicated that they thought it was important that the students “felt” ethics as well as experienced them.

The aim of our work is to develop educational content for teaching ICT content. In this paper we present the development of a series of ethics cards to help ICT students learn about ethical dilemmas. The development of ethics cards has followed a *Design Science* methodology (Hevner *et al.*, 2004) in creating the board game these guidelines were expanded into a full methodology that is both iterative and cyclical by Peffers *et al.* (2007). Our project is currently in the third stage of this methodology, called the “Design & Development” stage, but the process is evolving as the cards are being designing to act as independent teaching materials that can but used in the classroom, as well as part of the board game.

A sample set of cards are presented below. The cards can be used independently in the classroom, for example, a student can be asked to pick a random *Scenario Card*, read it out to the class, and have the students do a Think-Pair-Share activity. This is where the students first reflect individually on the scenario, then in pairs, and finally share with the class. Following this a *Modifier Card* can be selected, of which there are two kinds, (1) modifications that make the scenario worse for others if the student doesn’t agree to do the task on the Scenario Card, and (2) modifications that make the scenario better for others if the student does agree to do the task. This should generate a great deal of conversation and reflection on whether doing a small “bad task” is justifiable if there is a greater good at stake.

The cards can also be used in the board game where the players have a combination of Virtue, Accountability, and Loyalty points, which are impacted by both the Scenario Cards and the Modifier Cards. It is worth noting that some modifiers result in points being added on, others subtracted, and others multiplied to the players' global scores.

Overall the goal of this project is not simply to design a game to help teach ethics, but rather to explore how effective design science methodologies are in helping in the design of such a game.

KEYWORDS: Digital Ethics; Card Games; Board Games; Design Science

REFERENCES

- Bochennek, K., Wittekindt, B., Zimmermann, S.Y. and Klingebiel, T. (2007) "More than Mere Games: A Review of Card and Board Games for Medical Education", *Medical Teacher*, 29(9-10), pp.941-948.
- Brandt, E. and Messeter, J. (2004) "Facilitating Collaboration through Design Games". In Proceedings of the *Eighth Conference on Participatory Design: Artful Integration: Interweaving Media, Materials and Practices*, 1, pp. 121-131, ACM.
- Deterding, S. (2009) "Living Room Wars" in Huntzman, N.B., Payne, M.T., *Joystick Soldiers* Routledge, pp.21-38.
- Deterding, S., Khaled, R., Nacke, L.E. and Dixon, D. (2011) "Gamification: Toward a Definition", CHI 2011 Gamification Workshop Proceedings (Vol. 12). Vancouver BC, Canada.
- Flatla, D.R., Gutwin, C., Nacke, L.E., Bateman, S. and Mandryk, R.L. (2011) "Calibration Games: Making Calibration Tasks Enjoyable by Adding Motivating Game Elements", in Proceedings of the 24th annual ACM Symposium on User Interface Software and Technology (pp. 403-412). ACM.
- Halskov, K. and Dalsgård, P. (2006) "Inspiration Card Workshops" In Proceedings of the *Sixth Conference on Designing Interactive Systems*, pp. 2-11, ACM.
- Hamari, J., Koivisto, J. and Sarsa, H. (2014) "Does Gamification Work? A Literature Review of Empirical Studies on Gamification", in *Hawaii International Conference on System Sciences*, 14(2014), pp. 3025-3034.
- Hevner, A.R., March, S.T., Park, J. and Ram, S. (2004) "Design Science in Information Systems Research", *Management Information Systems Quarterly*, 28(1), p.6.
- Kapp, K.M. (2012) *The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education*. Pfeiffer; San Francisco, CA.
- Lloyd, P. and Van De Poel, I. (2008) "Designing Games to Teach Ethics", *Science and Engineering Ethics*, 14(3), pp.433-447.
- Lucero, A. and Arrasvuori, J. (2010) "PLEX Cards: A Source of Inspiration when Designing for Playfulness", In Proceedings of the *Third International Conference on Fun and Games*, 1, pp. 28-37, ACM.
- Peffer, K., Tuunanen, T., Rothenberger, M.A. and Chatterjee, S. (2007) "A Design Science Research Methodology for Information Systems Research", *Journal of Management Information Systems*, 24(3), pp.45-77.
- Seaborn, K. and Fels, D.I. (2015) "Gamification in Theory and Action: A Survey", *International Journal of Human-Computer Studies*, 74, pp.14-31.
- Smith, R. (2010) "The Long History of Gaming in Military Training", *Simulation & Gaming*, 41(1), pp.6-19.
- Wells, H.G. (1913) *Little Wars*. London: Palmer.
- Vego, M. (2012) "German War Gaming", *Naval War College Review*, 65(4), pp.106-148.
- Zuckerman, O (2006) "Historical Overview and Classification of Traditional and Digital Learning Objects", MIT Media Lab.

Scenario Cards: Set 1

<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write a system that will capture location information without consent</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write software to control missiles</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to develop AI with human-level intelligence</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write software for an autonomous car that will always protect the driver irrespective of the circumstances</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write code that will crack the license on a commercial software package</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write a comms system that will run on channels reserved for emergency services</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to build a system that is a lot like an existing competitor's system, but it is "just for a demo"</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to secretly change an accountancy program to change the way it does calculations</i></p>

Scenario Cards: Set 2

<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to create a game aimed at children that will lead them onto a gambling website</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to create a game aimed at children that will collect credit card information</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to create a game aimed at children that will collect private information</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are about to ship a software system, and you've discovered it has a bug that will only effect 0.01% of customers, and cause small problems for them</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to write a program to deactivate the light that usually comes on when a webcam is active</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to help move a software system from the EU to a non-EU country to circumvent data regulations</i></p>
<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to create a system with a backdoor password, and a logging feature that you are assured will only be used for error checking</i></p>	<p>[10 points]</p> <p><u>Scenario Card</u></p> <p><i>You are asked to develop a system and not worry about futureproofing it, or worry about future compatibility issues</i></p>

Modifier Cards: Set 1

<p>Bad outcome, if you don't [+2]</p> <p><u>Modifier Card</u></p> <p><i>If you don't do it, someone else will do it, who is a much, much worse programmer</i></p>	<p>Better outcome, if you do [-2]</p> <p><u>Modifier Card</u></p> <p><i>If you do it, you are guaranteed that no one will ever find out it was you who wrote this code</i></p>
<p>Bad outcome, if you don't [+5]</p> <p><u>Modifier Card</u></p> <p><i>If you don't do it, someone else will do it, who will make it more unethical</i></p>	<p>Better outcome, if you do [-5]</p> <p><u>Modifier Card</u></p> <p><i>If you do it, you will be paid at least €2 million, and it will only take 2 weeks</i></p>
<p>Bad outcome, if you don't [x2]</p> <p><u>Modifier Card</u></p> <p><i>If you don't do it, your organisation will fail and 200 people will lose their jobs</i></p>	<p>Better outcome, if you do [x2]</p> <p><u>Modifier Card</u></p> <p><i>If you do it, your organisation will select a group of five sick people at random and pay for all their health costs</i></p>
<p>Bad outcome, if you don't [x5]</p> <p><u>Modifier Card</u></p> <p><i>If you don't do it, a chain of events will occur that will ruin the economy of your country for the next 15 years</i></p>	<p>Better outcome, if you do [x5]</p> <p><u>Modifier Card</u></p> <p><i>If you do it, your organisation will donate €60 million to your favourite charity</i></p>