



HAL
open science

For ARGument's Sake! The Pros and Cons of Alternate Reality Gaming in Higher Education

Katerina Economides

► **To cite this version:**

Katerina Economides. For ARGument's Sake! The Pros and Cons of Alternate Reality Gaming in Higher Education. 11th IFIP World Conference on Computers in Education (WCCE), Jul 2017, Dublin, Ireland. pp.64-69, 10.1007/978-3-319-74310-3_8. hal-01762863

HAL Id: hal-01762863

<https://inria.hal.science/hal-01762863v1>

Submitted on 10 Apr 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

For ARGument's Sake! The pros and cons of Alternate Reality Gaming in Higher Education

Katerina Economides

Dublin City University, DCU St. Patrick's Campus, Dublin, Ireland
katerina.economides2@mail.dcu.ie

Abstract. This paper explores the potential of Alternate Reality Games, a type of Game-Based Learning experience, within higher education. The discourse opens by explaining the essence of ARGs; it then moves to present the findings from research in this domain, highlighting key benefits and challenges in using ARGs in higher education.

Keywords: Alternate Reality Games; Higher Education; Game-Based Learning

1. Introduction

The benefits of digital games for education have been investigated in depth for at least the last two decades, with a number of researchers and educators vindicating games of all kinds and elevating them as tools for learning [1, 2, 3]. Within the Game-Based Learning field, one game format in particular deserves special attention due to its immersiveness and originality: the Alternate Reality Game (ARG). This paper will discuss the potential of ARGs within higher education. The first part of the paper will provide a short description of the game type and present a few examples of educational or serious ARGs, i.e. ARGs that have not been designed predominantly for entertainment purposes [4]. The paper then moves to present the findings from research in this domain, highlighting key benefits and challenges in using ARGs in higher education.

2. Essence of Alternate Reality Gaming

To understand what an ARG is, it is important to clarify a few terms that sound very similar, but cannot be used interchangeably: Augmented Reality, Virtual Reality and Alternate Reality.

In Augmented Reality the physical reality appears to be extended, expanded or elevated via the use of technology. As Olbrish [5, pp73-74] puts it, in Augmented Reality Games (also abbreviated as ARGs) 'there is a technology overlay on reality that contributes to play'. One recent example would be the popular location-based game *Pokémon Go*, where players can interact with virtual characters situated in real life environments, with the use of their smartphone. Virtual Reality, on the other hand, is not a mere overlay of technology on the physical reality, but a complete simulation of reality facilitated by electronic equipment, such as virtual reality headsets. According to Cobbet [6] '[t]he basic difference between virtual and augmented reality is that the former completely locks you into the world, while the latter puts stuff on top of it'.

An Alternate Reality Game (ARG) does not *have* to use augmented or virtual technologies, although some ARG creators may choose to use them as part of the game. As the term ‘alternate’ suggests, an ARG creates a *different version of reality*, with the use of fiction. It can be defined as an interactive narrative ‘that plays out in real time, using real communications media to make it seem as though the story were really happening’ [7, p19]. The entry point to an ARG is traditionally called ‘rabbit hole’, as it is usually cryptic and acts as a ‘hook’ that draws players into the story. Once they enter the ‘rabbit hole’, ARG players are involved in a series of challenges that are deployed both online and in the real world [8]. In these immersive quests the participants navigate through real and fictional websites and social media profiles, decode encrypted messages, solve mind-boggling puzzles, gather clues and interact with fictional characters via email, chat or SMS, in order to progress through the story and resolve a mystery or provide a solution to a problem. For example, in one of the first successful ARGs, *The Beast*, the creators hid clues in the promotional material of the sci-fi drama *A.I. Artificial Intelligence*. After trying to make sense of the clues by searching online, the players uncovered the mysterious death of *Evan Chan*, one of the fictional characters of the game. *The Beast*’s story unveiled via a number of fictional websites, videos, audio messages, clues and puzzles that the players had to solve to progress through the game.

Apart from the numerous ARGs within the entertainment realm that are out of the scope of this paper, a number of ARGs have been created within the last decade for education and training, as well as for humanitarian reasons: to raise awareness for current social issues, to encourage empathy and to promote positive change. Among others:

- *EVOKE*¹: A ten-week ARG where the players have to come up with creative solutions to social problems, such as poverty and water crisis.
- *World Without Oil*²: A game that asks the players to imagine how the first 32 weeks of a global oil crisis would be.
- *Traces of Hope*³: a game by the British Red Cross about a Ugandan teen that was separated from his mother after their village was attacked.
- *Tower of Babel*: A game designed to motivate secondary level students to learn foreign languages [9].
- *Plunkett’s Pages*: An ARG helping students between the ages 14-15 discover the story of Ireland’s 1916 Easter Rising [10].
- *The Source*: An ARG developed to introduce to public school students (aged 13-18) sensitive topics, such as sexual health, sexual orientation and homophobia [11].

It is evident in the literature that serious efforts have been made to harvest the educational potential of ARGs at different age groups and various learning fields. Nonetheless, the pedagogical benefits of the ARG have not been fully explored yet in a higher education context. More specifically, ARGs have been implemented in higher education only within the last decade. In the following section, we will see the main ARG studies that have been deployed at tertiary level, which will trigger a

¹ <http://www.urgentevoke.com/>

² <http://writerguy.com/wwo/metahome.htm>

³ <http://blogs.redcross.org.uk/podcasts/2008/10/traces-of-hope/>

discussion on the evident strengths and weaknesses of the game when it is utilized in higher education.

3. AR Gaming in Higher Education: A discussion on pros and cons

ARGs have been implemented in third level education a small number of times, in order to achieve various learning goals, such as: To support student induction during orientation week [12] [8]; to introduce freshmen students to library resources and services [13]; to promote physical activity [14]; to develop rhetorical and digital literacies [15]; to teach new media literacies and storytelling strategies [16]; to facilitate Computer Science education [17].

3.1. The strengths

One quickly notices the variety in disciplines and learning goals in the aforementioned list of ARG studies. The diversity of ARG research in higher education suggests that ARGs are a highly versatile game format, which can be customized to fit the learning objectives of different educational disciplines. By adjusting the storyline, alongside the aesthetic and pedagogic design, it appears that ARGs can meet a variety of learning goals: from developing transferable skills such as socialization [8] to teaching complex techniques and concepts [17]. Other reasons why some educators in the reviewed studies seem to choose the ARG format, instead of other game types, appear to be of a practical nature: low development costs and accessible technology [3] [12]. ARGs utilize existing and relatively affordable technology, and so do not require the high costs of commercial game development. Moreover, due to their immersive nature, ARGs present an opportunity to apply theoretical knowledge in 'real-life' contexts, as students play as themselves instead of assuming a fictional game character [3] and can apply their skills and knowledge to resolve real-world problems [17, 18]. In fact, a number of studies suggest that there is real educational benefit in students applying pre-learned skills to design their *own* ARGs. Researchers have adopted this approach for several reasons: to inspire pre-service teachers in using ARGs in science teaching [19]; to practice multimedia design [18]; to teach new media literacies and effective storytelling practices [16]; to promote complex problem-solving [20]; to facilitate learning of computer hardware, software and applications [21]. It is evident in the literature that educational approaches where students first learn and then apply the knowledge in their ARG design can be quite effective for learning [20].

ARGs are designed as collaborative experiences, which in theory holds potential for social learning within educational contexts. The literature suggests that ARGs can indeed foster student collaboration and teamwork: There is evidence that ARGs can help to create team spirit [17], and that during ARG experiences students support and encourage each other [12], and can recognize the benefits of working as part of a team [20]. Moreover, the ARG experience may also have positive effects on the relationship between students and instructors, as it can help the former build a connection and a bond with students [16].

The majority of ARG studies in higher education offer preliminary evidence that the game format can be effective in facilitating learning. Indicatively: By the end of Hakulinen's study, the participants had learned many Computer Science concepts through the ARG puzzles [17]. Johnston et al. [14] found that the ARG had a positive

effect on the students' physical activity. Battles et. al. [13] found that the players had increased knowledge about the university library after completing the ARG. Moreover, the game format appears to be a fun way to engage students with the learning material. The participants appear to enjoy, among others, the elements of play [21], the sense of fun and the feeling that they are part of something special [12], and, lastly, the element of mystery in the narrative [13].

3.2. The weaknesses

Despite its many advantages, the ARG format does not come without challenges. In fact, a number of limitations have been identified in the literature. The researchers have encountered low participation levels due to the cryptic nature of the game format [8], gradual reduction of engagement levels [12], as well as bias against games, which would be perceived as a waste of time by a number of students [8]. It is worth noting, however, that the gradual decrease in engagement during the ARGs could be an indication that shorter interventions would better hold participants' attention, engagement levels [13].

In terms of student participation, it becomes apparent via the literature that educational ARGs may be more effective when they are incorporated in the university curriculum. ARGs are traditionally voluntary and cryptic experiences that do not advertise themselves as games. This ARG design principle is known among ARG designers as 'This Is Not A Game' or simply TINAG [22]. While this principle seems to have been successful in higher education in one of the reviewed studies [17], others express concerns on the suitability of the cryptic nature of ARGs, as it can result in low participation levels as students may simply not be able to find the route into the game [8]. The literature suggests that a game-type like the ARG, which requires high levels of motivation and dedication to progress, would work best when it forms part of the formal curriculum and assessment [23]. Moreover, ARGs implemented in a 'controlled' environment potentially make it easier for instructors to assess students' performance.

Concerns are also expressed among researchers in regards to the re-playability of the game type. The design and development of an ARG appears to be a challenging and time-consuming endeavour, and the fact that it is played in real-time makes it difficult for the creators to reproduce it [13]. In addition, despite the efforts put in ARG design, student participation cannot be taken for granted (in voluntary ARGs) and the overall success of the game cannot be guaranteed [13] [8] [17].

4. The Verdict

This paper presented the main advantages and disadvantages of Alternate Reality Gaming in higher education, as they emerge from published research studies in the field. The studies discussed offer preliminary evidence that ARGs carry various educational benefits for quality learning within higher education, but their success cannot be guaranteed. ARGs are highly customizable games that can be applied in various contexts and themes, but there are several limiting factors that educators must consider when implementing ARGs for learning. Despite the challenges, researchers still recognize the potential of pedagogical ARGs and encourage further research in the area [16] [8] [17]. Further studies by the author will help determine which techno-

pedagogic designs can limit the weaknesses and harvest the strengths of ARGs, for more effective ARG interventions in higher education.

References

1. Bowman, R.F.: A Pac-Man theory of motivation. Tactical implications for classroom instruction, *Educational Technology* 22(9), 14-17 (1982).
2. Gee, J.P.: *What video games have to teach us about learning and literacy*, Palgrave, NY (2003).
3. Lee, T.: This is not a game: Alternate reality gaming and its potential for learning. FutureLab (2006). Accessed online via: <http://archive.futurelab.org.uk/resources/publications-reports-articles/web-articles/Web-Article477>
4. Michael D.R., Chen S.L.: *Serious Games: Games That Educate, Train, and Inform*, Muska & Lipman/Premier-Trade (2005).
5. Olbrish P. K.: *Immersive Learning. Designing for authentic practice*, American Society for Training & Development (ASTD), USA (2013).
6. Cobbet R.: Virtual vs augmented: which alternate reality is for you?, *Techradar: The home of technology*, 24 Oct. (2015). Accessed online via: <http://www.techradar.com/news/gaming/virtual-vs-augmented-which-alternate-reality-is-for-you--1307470>
7. Philips, A.: *A creator's guide to Transmedia Storytelling: How to captivate and engage audiences across multiple platforms*, McGraw Hill, USA (2012).
8. Whitton N., Jones R., Wilson S., Whitton P.: Alternate reality games as learning environments for student induction, *Interactive Learning Environments*, 22(3), 243-252 (2014).
9. Connolly, T.M., Stansfield, M., Hainey, T.: An alternate reality game for language learning: ARGuing for multilingual motivation. *Computers & Education*, 57(1), 1389–1415 (2011).
10. Lynch, R., Mallon, B., Connolly, C.: Revisiting history: Using alternate reality games to tell a century old tale. *Proceedings of the European Conference on Games-Based Learning*, 1, (2014).
11. Bouris A., Mancino J., Jagoda P., Hill B. J., Gilliam M.: Reinvigorating adolescent sexuality education through alternate reality games: the case of *The Source*, *Sex Education*, 1811 (2015).
12. Piatt, K.: Using alternate reality games to support first year induction with ELGG. *Campus-Wide Information Systems*, 26(4), 313–322 (2009).
13. Battles, J., Glenn, V., Shedd, L.: Rethinking the Library Game: Creating an Alternate Reality with Social Media. *Journal of Web Librarianship*, 5(2), 114–131 (2011).
14. Johnston, J.D., Massey, A.P., Marker-Hoffman, R.L.: Using an Alternate Reality Game to Increase Physical Activity, 6(4), 828–838 (2012).
15. Nelson S.: *Crossing Battle Lines: Teaching Multimodal Literacies through Alternate Reality Games*, *Kairos*, 17(3) (2013). Accessed online via: <http://kairos.technorhetoric.net/17.3/praxis/nelson-et-al/index.html>
16. Chess, S., Booth, P.: Lessons down a rabbit hole: Alternate reality gaming in the classroom, *New Media & Society*, 16(6), 1002–1017 (2014).
17. Hakulinen, L.: *Gameful Approaches for Computer Science Education: From Gamification to Alternate Reality Games*, Doctoral thesis, Aalto University (2015).
18. de Beer K., Holmner, M.: The design of an alternate reality game as capstone course in a multimedia post-graduate degree. In: *Proceedings of the IATUL Conferences* (2013). Accessed online via: <http://docs.lib.purdue.edu/iatul/2013/papers/30/>
19. Bellocchi, A.: Practical considerations for integrating alternate reality gaming into science education. *Teaching Science: The Journal of the Australian Science Teachers Association*, 58(4), 43–46 (2012).

20. Dondlinger, M.J., Mcleod, J.K.: Solving real world problems with alternate reality gaming: Student experiences in the Global Village Playground Capstone Course Design, *Interdisciplinary Journal of Problem-Based Learning*, 9(2) (2015).
21. Warren S., Wakefield J.S.: Simulations, Games and Virtual Worlds as Mindtools. In: Spector J.M., Lockee B.B., Smaldino S.E., Herring M.C. (eds) *Learning, Problem Solving, and Mindtools. Essays in Honor of David Jonassen*, 66-87, Routledge, New York London (2013).
22. Philips, A., Martin A.: Business Models. In: Martin A., Thomson B., Chatfield T. (eds) 2006 *Alternate Reality Games White Paper*, International Game Developers Association (2006).
23. Moseley, A., Whitton, N., Culver, J., Piatt, K.: Motivation in alternate reality gaming environments and implications for learning. In: *Proceedings of the 3rd European Conference on Games Based Learning*, 279–286 (2009). Accessed online via: <https://lra.le.ac.uk/handle>