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Procedia - Social and Behavioral Sciences 228 (2016) 396 – 401

Procedia
Social and Behavioral Sciences

2nd International Conference on Higher Education Advances, HEAd´16, 21-23 June 2016, València, Spain

Making *Curveball*: Working with students to produce a game that can 'liven up' research methods and ethics teaching in the social sciences

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Abstract

In this paper we explore our experiences of a staff-student collaborative project that sought to design games and learning resources that could be used to "liven-up" research methods and ethics teaching in the social sciences. The paper highlights the benefits of staff-student collaboration in the design and production of game resources, and in particular, the potential for harnessing students' experiences of teaching and learning through feeding it into curriculum development. The paper also considers the value of the "game-show format" and non-traditional teaching and learning formats for increasing student engagement and performance. Finally, the paper demonstrates the benefits of gamification, through the positive student feedback and evaluation received by the developed games, and explores the wider applicability of games in research methods and ethics teaching across social sciences disciplines.

Peer-review under responsibility of the organizing committee of HEAd´16

Keywords: gamification, reasearch methods, ethics, student collaboration.

1. Introduction

Curveball is a research methods card game designed and produced through a collaborative project involving two academics, eighteen sociology/social science students and one design student at Leeds Beckett University. The game is based on the principles of problem-based learning and tests students' methodological, analytical and

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Peer-review under responsibility of the organizing committee of HEAd´16
doi:10.1016/j.sbspro.2016.07.060

ethical knowledge and their understanding of how to design an undergraduate research project by encouraging problem solving and reflexivity in the research process. In this paper we firstly explore the theory and rationale underpinning the project before moving on to discuss issues around game design, development and learning outcomes. Finally, we interpret feedback from early student evaluations of the game.

2. Project Rationale & Guiding Principles: Students as Producers

The impetus for this project was provided by the Higher Education Academy, UK, who allocated a small pot of funding for academics at Leeds Beckett University to work with sociology students on exploring how games might be developed and used within the sociology curriculum. The project rationale and design was underpinned by the concept of 'students as producers' and the pedagogical principles that this approach espouses. While a full exposition of the 'students as producers' discourse is beyond the scope of this paper (see Neary and Winn, 2009; Neary, 2010 for discussion) several key insights from this model have informed the design and development of the project reported here. Firstly, the 'students as producers' discourse asks us to rethink or reconsider how we teach in Higher Education. In particular it challenges the 'dysfunctional' 'transmission model' of teaching whereby, through the traditional lecture and seminar model, students are cast as passive recipients of academic knowledge transmitted by a lecturer. In its place, 'students as producers' seeks to recast students as active producers of socially useful academic knowledge and in the process acquire key critical, evaluative, problem-solving and research-based skills.

Central to this reconstruction of students as active producers is the commitment to problem-based learning (PBL) whereby students work collaboratively to solve problems and reflect on their experiences; this overlaps with, but is also distinct from, enquiry-based learning (EBL) where learning is driven by the process of enquiry and research-based learning (RBL) where students have the opportunity to be involved in academic research projects in collaboration with academics and are thereby enabled to better connect the theory and practice of research (University of Lincoln, 2012; Kiili, 2007). These approaches to learning facilitate the development of critical academic and evaluative skills that are necessary to support problem-based and enquiry-based learning and raise the level of traditional student project work (Neary and Winn, 2009).

In developing this project it was our contention that research methods and ethics teaching in the social sciences is particularly ill-suited to the 'transmission model' of teaching and learning. Our experience of teaching in such areas tells us that students can often find such teaching (in the transmission context) 'dry' or 'boring' and struggle to connect theory and practice. Thus in our minds, this makes research methods teaching a prime area for the application of some of the principles of the students as producers discourse, and indeed, ripe for potential gamification.

In recent years games and simulations have increasingly been used as teaching tools but traditional games, in particular, have a long history of being used by humans. Board games, for instance, have been argued to be simplified coded models of problems that can occur in real life (Ghory, 2004). Games have been suggested to provide an active learning environment as well as a fun one. A body of literature has grown that considers the pedagogic value of using games-based learning. 'Serious games' or educational games are increasingly being developed and used in education settings. However, as Moseley and Whitton (2014) point out, although games are currently enjoying something of a golden period with new game forms appearing every year, *game mechanics* are crucial and need to be at the core of game development.

In addition, it appears that many educators are attempting to design digital games and these are fraught with problems such as: demanding considerable technical skill and taking time for development to an acceptable standard for students. The trend towards the development of digital games has led, in their view, to the design of many games that are not fit-for-purpose, not least because the ability to create the games has been taken away from the teacher and the students. Games can, nevertheless, make anything fun (Ebner and Holzinger, 2007) and educators should retain a motivation and enthusiasm for their use in appropriate contexts (Moseley and Whitton, 2014).

Bringing the "fun factor" into teaching is itself a potent contributor to the efficacy of games as a teaching tool as students might not necessarily realize that they are involved in a learning activity. Nevertheless, clearly any game-based learning strategy needs to be associated with specific learning objectives or outcomes. To turn a game

used in the class room into game-based learning requires the 'building in' of opportunities for reflection (Cruz and Patterson, 2005; Lichtenwalter and Baker, 2010), which has been hailed by some as the most critical component in game-based learning (Kiili, 2007). Games may thus be presented as merely another option within a diversified teaching and learning strategy but their characteristics, such as clear, achievable goals and rules which challenge students, make them a good tool to be used in teaching, particularly when they draw on PBL (problem based learning) which can then be turned into PBG (problem based gaming) (see Kiili, 2007).

It has been noted that games can encourage higher levels of student interest and promote positive attitudes towards the subject (Ebner and Holzinger, 2007). They also have cognitive benefits in that, like textbooks, they effectively serve to reinforce or strengthen students' new understandings (Magney, 1990). Games, particularly traditional games (board and card games), are interactive (collaborative and/or competitive) and can be played in safe environments which provide the opportunity to make and learn from, mistakes (Whitton and Moseley, 2012). The interaction and feedback resulting from this process is therefore a key part of the games-based learning environment. Curiosity, permission to fail and engagement with others can provide students with contextual challenges in which they have opportunities to gain a sense of control and power to make judgments and decisions (Knapp, 2012). Collaborative and problem solving skills are thus often emphasized in the skills development that is part of the learning outcomes within games-based learning activities.

As noted above, early discussions amongst the authors identified research methods and ethics teaching as an area that might be particularly ripe for 'gamification'. Whilst there are some efforts of using games in research methods teaching, many rely on quizzes in digital formats (see for instance the CHERMUG games, www.chermug.eu) and have been designed by educators. However, our interest in the 'students as producers' pedagogic model led us to focus on *students'* experiences of teaching and learning on research methods and ethics modules and on providing the facilitating framework for them to design and develop an appropriate game for future cohorts of research students. Central to our approach was a very careful consideration of how we designed the project in order to facilitate the development of games *for* students *by* students.

3. Workshops - Sociology 'does' the Apprentice

Upon arrival at the initial workshop event (which was voluntary staged outside of the normal teaching environment), students were allocated to one of two groups of nine and each group was supported by an academic facilitator experienced in teaching research methods. Students were given a brief team-building task before being presented with a relatively loose brief, which was primarily focused on our initial desire to produce a research methods game built around problem-based learning. Thus the brief to the students in the first workshop was to create a game-based learning approach to methodological and ethical dilemmas in planning and carrying out UG research/dissertations drawing on their knowledge and experience. As such, students were drawing on their 'authentic' experiences, a key principle highlighted in the gamification literature (Kiili, 2007).

In the afternoon the two groups worked on thinking about how these problems could be incorporated into a game that could be used as a pedagogical tool in the future in methods modules. Providing an incentive to achieve the aims of the day was the promise that, in true "Apprentice style", a winning and a losing team would be declared after presenting their games concept and that the "winners" would get a "treat" and the "losers" would get to go to a "greasy spoon café". What we really did was to take all the students to an event space/café where we celebrated our collective achievements.

The first workshop produced the winning game *Curveball*. A second workshop day two months later continued the project with the aim of producing a set of three learning objectives and developing the educational content of the game more.

is a research methods game for groups of students group which tests methodological, analytical, and ethical knowledge and understanding of a research project by encouraging problem solving and reflexivity. The aim is for a group to design a research project which considers method, data collection, sampling, and analysis. Throughout this process the group will be 'thrown' a number of Curveballs which the group needs to address in relation to the research design. Upon completion, the group will present their research project to the class including a brief explanation of the problems/issues which emerged as a result of the Curveballs, and the lessons that have been learnt in the process.

Learning Objectives

1) Collective design of a research project within given fields

2) Develop an understanding of the ethical and methodological problems that arise in doing empirical research and find solutions

3) Develop a reflexive approach towards social research

Fig. 1. *Curveball* game description and learning objectives

4. Game Instructions

Curveball is played as follows: To begin students (ideally arranged in 3 or 4 groups of 4) are asked to pick a card from one of 8 (in this case social science) topic areas (for example crime, the media, gender, etc.). On the reverse of the card the group finds a dissertation research question. The groups are then given 10 minutes to design an empirical research project that would address that question paying particular attention to 4 key areas: method of data collection, access and sampling, data analysis, ethics. Groups receive 'help' cards that set out their options in these categories.

There are 8 data collection options, 4 sampling options and 6 analysis options for the groups to choose from when designing their project. When the 10 minute buzzer sounds the groups then briefly present and justify their research design to the game facilitator (and the rest of the class) and are given feedback and a score out of 20 for the appropriateness of their research design. At this point each group is thrown a curveball by the game facilitator that directly relates to one of the 4 key areas covered in their research design. The curveball consists of a 'real-life' problem that may occur during the undergraduate research process. Groups are given 7 minutes to consider how they will respond and adjust their research design in light of the curveball. Groups are then given bonus points (out of 10) to add to their cumulative score based on how well they adapted their research design to their curveball. If appropriate, further curveballs can be thrown or the game moves onto the second round (the initial topic card offers 3 dissertation research questions which get progressively more difficult).

The winner is the group with the most points at the end of 3 rounds (or fewer if preferred). The design and mechanics of *Curveball* presented a variety of problems for the students in the second workshop. Firstly, they needed to come up with topic areas and dissertation questions. Topic areas were generated on the basis that they were perceived by the facilitators and students to be popular areas for student research projects in the social sciences. Students wanted the dissertation research questions to reflect students' interests. Thus dissertation research questions were based on real student projects we have previously supervised, conducted or worked on.

The next challenge was selecting the methodological, sampling and analysis options which could be chosen by game players and which would need to link to the curveballs 'thrown' by the tutor/game facilitator. Here choices reflected the data collection, sampling, and analysis methods that undergraduate social science students typically

utilize and those which are usually covered in methods texts. Finally, curveballs had to be created that directly related to the options that players could select in relation to data collection, sampling and analysis methods.

Ethical issues were built into the curveballs, particularly where methods or sampling technique might generate specific ethical issues. This was perhaps the most challenging aspect of the game design as students have relatively little experience of doing research and the pitfalls involved. Indeed a key learning outcome of the game is to help students become more aware of the challenges involved in doing research. Here then we called more heavily on facilitators' experience of doing and supervising research as well as textbook examples and the students' own research experiences. Two curveballs were created for each data collection method, sampling technique, and form of data analysis.

According to the student game-designers who also tested and piloted *Curveball*, the key elements of the game are that it stimulates group discussion around how to design a research project based on a given question and encourages consideration of how data collection, sampling and analysis are linked. Feedback from the tutor/game facilitator also provides important learning support. Curveballs add an element of fun and randomness, but also encourage critical reflection and an increased awareness of the challenges involved in doing research. Scoring increases competition and motivation.

5. Evaluation and Reflections

There are multiple ways by which we could evaluate this project. Here our focus is on the evaluation of *Curveball* rather than the project that produced it (for testimonies from students involved in this project see http://blogs.heacademy.ac.uk/social-sciences/2013/07/19/sociology-does-the-apprenticeand-develops-two-games-for-methods-teaching/). Evaluation has, and continues to be, an on-going process. In the first instance the student game designers tested *Curveball* on each other.

Following this students and tutors piloted *Curveball* on a group of second year undergraduate research methods students at Leeds Beckett University, placing a student game-designer in each group playing the game in order to monitor the general playability of the game, how well the players understood the game and the instructions. Detailed notes were taken by the student game designers and fed back into game design, content and development before *Curveball* was then more formally trialed and evaluated in an external academic institution. The more formal evaluation of *Curveball* has produced very encouraging data and feedback so far. On all of the questions asked a good majority of the students ranked the games as either 'very' or 'quite' useful.

Table 1. *Curveball* evaluation January 2014 – Liverpool John Moores University 2nd year UG students (N=30).

In percentages %	Very (%)	Quite %)	Little (%)	Not (%)
LO1 - How useful did you find the game for your understanding of the research process?	30	50	17	3
LO2 – How useful was *Curveball* for thinking through the design of a research project within your field?	40	37	20	3
LO3 – How helpful is *Curveball* in developing an understanding of the ethical and methodological problems that arise?	30	43	24	3
LO4 – How useful is *Curveball* in developing a reflexive approach towards social research?	20	63	14	3

Other strong findings from this evaluation (not shown in table 1) showed that 60% of the students found the group component of the game 'very useful', while more generally, 92% agreed that the game was a useful learning tool for research methods students. When asked to rate the game (out of 10) *Curveball* scored a median rating of 8. Although we did not seek to formally quantify how much fun the student's had whilst playing *Curveball* in this evaluation, some students did spontaneously offer written comments on our quantitative evaluation sheets. These comments included "*very useful it* [Curveball] *makes you think!", "Really enjoyed! Great way of learning*!" and

"*Learnt the most! Involved and interesting!"* Students also offered suggestions for developing *Curveball* further. Popular here was the idea of developing scorecards to quantify the quality of each group's research design and their responses to the Curveballs thrown.

Whilst the sample size for the evaluation data is currently rather small, the purpose here was to consider the merits of involving students in reflecting upon and contributing towards creating teaching tools that they think are suitable for their peers. The pleasure of being involved in this project was ultimately mutual as the students really appreciated drawing on their knowledge and experiences in order to develop, with the help of a design student, a resource which has a legacy.

In addition, for us as facilitators this was an enriching experience, allowing us to work with our students in an unusual format. This was so successful in fact, that since then we have run an extra-curricular project involving students in non-traditional game design which feeds into teaching on a yearly basis and the newest gamification project looks at helping students with their transition into university life, which for the staff team is a game to address attrition for first year students. Thus, the creativity and productivity that the initial *Curveball* collaboration produced is, in fact, enduring.

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