Scupper's Island: Using game design and role play to learn about professional ethics

Ken Eustace, Clinton Mason and Mitchell Swan
School of Computing and Mathematics
Charles Sturt University

Scuppers Island is a role playing game (RPG) at http://ispg.csu.edu.au:7688/, based on a pirate code of conduct as the major part of the game play. In an educational context, game-based learning is used to teach computer ethics which can be extended to professional ethics. The purpose of the game is to let the players interact as pirates and learn about values, ethics and differences in each other's ethical beliefs. To design the game, games design theory was researched and implemented using a set of basic rules. A game must have a hero, and must involve a quest or challenge, for it to be an effective learning tool. The authors propose that use of an online environment in teaching professional ICT ethics can be very effective if used in conjunction with traditional learning techniques.
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Introduction

The learning experiences occur at two layers: as a software developer and as a gamer, as players interact with each other and objects in an EnCore learning environment (Holmevik & Haynes, 2000). The pirate code of conduct and research into games design theory are used in order to design, build and play the game by students and the teacher-researcher using bot programming. Bots are robot programmes that respond to messages and bring back answers or do data mining. They have been used as agent software in artificial intelligence (AI) and as chatter bots to mediate chat services.

In every online community, there is a code of conduct. From discussion boards, to virtual worlds, there is nearly always a mediator who over-looks all discussion. If a code has been broken, then it is up to this mediator to deal with the perpetrator. As role-play gamers, students will increase awareness and understanding via bot programmes of their own personal ethics and professional ethics as well as the ethical nature of online learning with an RPG as a common context for all modes of learning.

Additionally as software developers of parrot bots, acting as ethical agents, participants examine the issues and ethics concerning artificial intelligence and software agents. This form of active learning complements the more theoretical approach in learning about professional ethics in the ICT industry and elsewhere.

The game scenario

Scuppers Island is set in the year 1642, about the same period when the brethren of the coast formed a democratic community. They held a code based upon the Pirate code of conduct, which was the social contract or code of conduct for each voyage. The captain and officers were elected and every decision of importance was discussed, followed by a vote. The game can use up to three different pirate ships, each with different codes of conduct, in order to pose a dilemma situation to the player as well as conflicts between the ship members due to the differences in their codes.

Scuppers Island is the home for three pirate ships somewhere in the Caribbean Sea. Each ship is run under similar but different variations of the Pirate code of conduct. Players are divided into members of three ships called the Sea Dragon, Golden Tiger and Storm Queen. The ships come together often between voyages to celebrate their recent ventures at the Hogshead Tavern. Each ship has its own Macaw parrot (bot), which recounts the code of conduct signed by each of the ships company. The parrot bot is an implementation of an Eliza –like Turing bot (Turing, 1950; Weizenbaum, 1966) that is designed to pick up keywords that may represent a violation of the pirate code.

There is a dark corner in the tavern, where people signed up to ships for the next voyage. A tavern bot will serve drinks to the thirsty pirates, and a wise sage bot tells the players why they should accept the mission of signing onto a ship, using deontic logic where possible during interaction with the players. Mally's Deontic Logic (Goble, 2005) was proposed as a form of logic using modal operators to describe obligation and permission as a type of pure ethics. The two bots in the Hogshead Tavern will need to be able to communicate with the players effectively, and keep them interested, while the three parrot bots re-enforce the code of conduct of each ship.

Theoretical framework

Games-based learning using role play design shares the same theoretical background as suggested by previous research: Gee (2004); Papert (1998) and Reiber (1996). Lee et al ((2005) applied the work of Gikas & Van Eck (2004) to show that an RPG active learning experience develops the learner within the five intellectual skills of Gagné as well as all six levels of Bloom's taxonomy of the cognitive domain. By its nature, brainstorming an ethical dilemma is player-centred and requires high order problem solving and critical thinking skills to resolve. In teaching professional ethics, other uses of role play exist in teaching business and engineering ethics but not using an online RPG (Brown, 1994; Loui, 2006). The special case with the Scupper's Island RPG website is that players learn by both design and play.

The role play design begins with description of the stakeholder pirtate ships, as suggested by van Ments, (1999). Coupled to game-based learning theories is game design theory. The Jungian model of storytelling using the 'hero' approach was selected (Campbell, 2001) as it revealed the number of steps that a game must have if it is to have a positive impact on the player. Cooper (1996) described four ethical layers of respect, responsiveness, caring and moral goodness that apply to online gamers and suggests the each member should by mindful of these ethical layers during game play.

Procedures used to test hypotheses

From the literature search and the theoretical framework emerged the hypothetical ideas behind this games-based learning study by focusing on testing the educational value of the RPG:

1. Does game design and play offer an effective deep learning experience in professional ethics?
2. Does the RPG improve the learning outcomes of professional ethics when used in conjunction with face-to-face or traditional teaching practices?

To test these hypotheses, several procedures are performed over several teaching sessions. An overview of the data collection methods from a review of the literature and analysis of the game dialogue and server logs is determined. Participant surveys will gain some statistical data to back up the results. This study so far found no quantitative data from previous studies by Foner (1993) or Mowbray (2002) to show how effective online or games-based learning is opposed to traditional learning in professional ethics.

Pedagogical basis of Bot programming

Bjork (2004) described how Bot programming has several contexts for educational use through moderation of group discussion, simulation, mentoring and guiding which help to set ideas in an individual context for the learner. The project began with research into games design, codes of conduct, deontic logic and Eliza-like bots, based on the early works in artificial intelligence like Allan Turing's Turing Test (Turing, 1950) and Weizenbaum's Eliza programme (1966). Conversational bots are designed to convince the player that they are human by picking up patterns in their speech and rearranging them to make it seem like it is forming a conversation.

Parrot Bots: Enforcing the rules of engagement

A functional bot is used to enforce a code of conduct in the game environment. In online communities rules are often hard to enforce as the participants often reject these forms of online government. So by implementing a bot to detect possible violations of the code the players can be constantly reminded of the rules that are involved to belonging to that online community. In this way, the players not only learn about ethics but also differences in each other's ethical beliefs.

To do this each ship has a parrot bot that will act as a reminder of that player's code of conduct. The game centers around 3 different pirate ships with 3 different codes of conduct, each of which is designed to pose ethical dilemmas to the player as well as conflicts between the ships due to the differences in their code. A master set of rules for each ship's pirate codes was established and then certain rules are taken out for each of the pirate ships and are available as a note objects 198-200 inside the Hogshead Tavern at http://ispg.csu.edu.au:7688/62/.

BluePrint: Parrot Bot Prototype class

To program each bot to recite the code, two aspects had to be addressed: reading what the player has said and detecting whether it relates to one of their rules as a pirate and making the parrot bot appear parrot-like and realistic inside the game's environment. To do this a parent parrot class was made called BluePrint which was programmed to respond to all of the rules regardless of which code they belong to as well as appear to be parrot-like. BluePrint is not designed to be used inside the game, instead the purpose is to provide a class on which the game parrots are made. BluePrint can be tested inside "Mytch's Programming Room" (http://ispg.csu.edu.au:7688/175) in Scupper's Island.

Programming code

To program the parrots to respond to breaches in the code of conduct keywords were used to detect when the player is talking about something relevant to their code. For example:

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KEYWORDS:
1   disobey
          *Squawk* Ye Captain shall have full command at all times. He
who disobeys will be punished. Punishments may be overturned by a
majority vote
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These keywords only reflect rule 1, where if the player was to mention either disobey, order or captain inside the game the parrot would then interrupt and remind the player that "ye captain shall have full command at all times" which helps to ensure that the players remember and obey their code of conduct. For a comprehensive list of all the keywords used please have a look a note objects 198-200 inside the Hogshead Tavern.

Realism

Another key issue when programming a bot is concerned with making sure that it has its own identity inside the game. The parrot had to be made to sound authentic to the player so two techniques were used:

- Placing the word *Squawk* in every sentence from the bot reminds the player that it is a parrot talking. Parrots in real life often mimic what is said to them.
- Each bot uses several lists to create an authentic conversation: a list of pattern rules used to help create authenticity; a list of keywords that evoke use of a pre-stored response and a list of random responses to stimulate discussion.

Each bot used is designed to respond to all messages that are said in the room, but one problem to fix is when to make the parrot not say something, as a noisy parrot may become quite annoying during the game play.

Conclusion

Has the RPG game helped in the teaching of computer ethics?

Any game, or virtual world used in an education context, is effective if used in conjunction within a sound learning context. This game continues to evolve and can be used in conjunction with learning in a theme, topic or subject on professional ethics. The game is complementary to other experiences, not a replacement to them. Together, most students will get a chance to have a say, and be comfortable in putting forward their views in response.

Effective use of games-based learning in the traditional, online or blended learning situation is the aim of Scuppers Island RPG. While teaching ethics in a traditional classroom, the quality of participation from students may be higher than online as it is easier to engage in a debate; encourage valuable quick-thinking

skills and is easier to perform and absorb do presentations. However there are some positives for teaching in an online classroom using online games as students with obligations enjoy the flexibility of online classes, particularly as the majority of students in distance classes are working toward a higher degree. Students learn more about their fellow students and participation increases in online classes. In addition the RPG can arouse interest, motivate students, be re-played and the design extended at a later date.

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Ken Eustace, Lecturer in Computing
School of Computing and Mathematics, Charles Sturt University
Email: keustace@csu.edu.au

Clinton Mason
School of Computing and Mathematics, Charles Sturt University
Email: clinton.mason@ozemail.com.au

Mitchell Swan
School of Computing and Mathematics, Charles Sturt University
Email: mitch.swan@gmail.com

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