

Addressing the Student Dropout Rate in Engineering through Induction of Students with Interactive Gaming

Kevin Curran and Kieran Forbes

School of Computing and Intelligent Systems, Faculty of Engineering, University of Ulster

Abstract

Student dropout rates have been a source of contention for universities worldwide. Though many universities recognise this and have acted to improve their induction process for new students, dropout rates continue to be higher than acceptable. This case study presents an interactive student induction game, designed to provide new students with information that will help them to settle more effectively into university.

Background

Student retention within universities is becoming more important as the Government is targeting 50% of 18 to 30 year olds in the UK to engage in higher education before 2010. The need to integrate new students from different economical and social backgrounds has made student induction and integration to academic life more important than ever (DfES, 2003). The UK student dropout rate for 2002/03 was 15.4% for mature students and 7.8% for young students (HESA, 2004). The University of Ulster dropout rate for the year 2002/03 was 12.8% overall, combining both groups of young and mature students. It is against this background of student retention rates that this project has been undertaken.

The aim was to design an enjoyable digital game for new students in the format of interactive games popular in the 1980s and 90s, providing the student with information on the Faculty of Engineering, beneficial to them for the duration of the course. Currently within the Faculty all new students must attend an induction seminar where they are presented with information on the course structure, the university and faculty as well as details of staff at the school. These follow guidelines similar to the STAR project (Cook et al., 2005). The approach is quite formal and the students are encouraged to attend additional inductions, such as library and laboratory. Attendance is voluntary, although students have to provide the college with proof of attendance via a signed 'stamp collection' which is entered into a prize draw. In comparison, the digital game is a new method of engaging the student and integrating them into university life. It also provides an induction tool for the faculty that may improve the confidence of new students.

Marc Prensky is an internationally recognised expert on learning by the use of educational game software. He maintains that the Nintendo generation (game-playing children born after the 1970s) now attend colleges throughout the world and, as a result, there are new challenges in the way educational subjects are taught (Prensky, 2001). He listed ten personality traits comparing current game generation children to previous non-game generation children. Traits included "Twitch Speed vs. Conventional Speed, Parallel Processing vs. Linear Processing, Graphics First vs. Text First, Random Access vs. Step-by-step, Connected vs. Standalone, Active vs. Passive, Play vs. Work, Payoff vs. Patience, Fantasy vs. Reality and Technology-as-friend vs. Technology-as-foe" (Prensky, 2005). The summation of these traits concludes that game generation children can e-mail, chat, listen to music, do course assignments and surf the internet at the same time. Take these children into a lecture theatre and present them with a single long topic and it's no wonder they get bored. In effect they are being taken from a fast moving, thrilling game/MTV world into a slower paced environment.

Methodology

The induction game was built using Adventure Game Studio (<http://www.adventuregamestudio.co.uk/>). The basic input/output structure for the game consists of point and click movements with icons on the screen bringing up messages when clicked on by the user. The main icons in the game are the walk, eye and face icons so the user can walk in the desired direction selected, look for clues and talk to a member of staff. A hand icon allows the character to attempt to lift an object. The game uses images from the university campus. The main character in the game, Roger, (Figure 1) is the only one able to move throughout the game areas. The game starts in the car park, and the first

visible icon is the walk icon. By right clicking on the mouse button Roger can bring up the eye icon and if he clicks on the building in front he will receive directions to the sports hall.



Figure 1. Start of game screenshot

Roger then travels to the sports hall where he will see the Head of School (HoS) and start a conversation with him. HoS will then send Roger to MF 124 to meet another member of staff (see Figure 2).

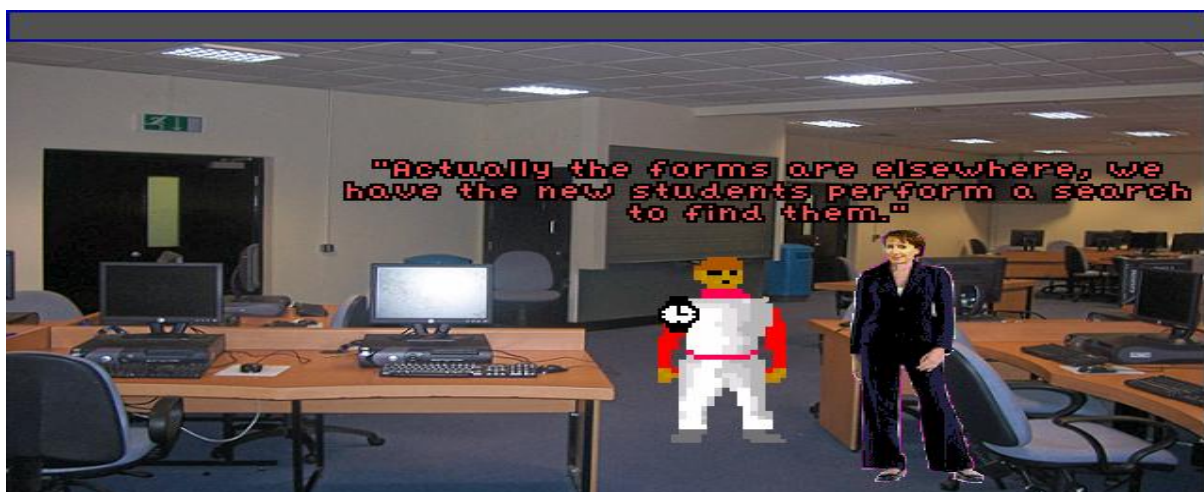


Figure 2. Meeting a lecturer in a classroom

Here the lecturer will send Roger on a tour of the building (where most of the computer labs are), ending in a teaching classroom with another lecturer. For example, in one room there is a clue for Roger which helps him find out the next step in his task. Finally, Roger will meet the HoS outside the library. The interactive games end after Roger is sent into the library to talk to a librarian to complete his required induction form.

Evidence of Success

To evaluate the effectiveness of playing a game prior to setting foot on the campus, volunteers were classified into two groups (eight people in total). The first group were not shown the game at all and the second group played the game. None of the participants had been to the campus previously. Each group were taken to the university car park and sent to the sports hall to get their next instruction. Both groups were studied to ascertain if the group that played the game gained any benefit by having seen visual representations of the campus prior to their actual visit.

Group 1 (Non game playing group)

The first noticeable aspect of this group was that each person had no idea of where to go or how to get there. The first thing that they did was to go towards the main building to ask for directions to the sports centre. At this stage they were told which way to go and, once there, they were to proceed to room 124 in the MF building. The non game playing group often displayed more nerves and apprehension as well as hesitation in their movements. Once in the MF building they looked for direction signs in the entrance hall and were often slow to connect their destination with the directions available. Their next task was to go to MF 138 and there was a noticeable delay before they realised MF 138 was simply nearby. The next room to seek was MF 214 and here two of the participants returned to the main direction signs in the hall and worked out they had to go up the stairs. After this they all found MF 214 and MF 217 quite easily as they were located next to each other.

Group 2 (Game playing group)

The first observation made of these participants was their confidence as to where they were going and how they would get there. This group were given the same instructions as group 1 and made straight for the sports hall without any hesitation at all. From the sports hall they all separately made their way to MF 124 and had no trouble getting there, even managing to give directions to their observer as they walked to their destination. After going straight to MF 124 they were told to go to MF 138. Here three of them on individual time trials went straight to MF 138 with no problems at all. Their next task was to go to MF 214 and again they mostly had no hesitation as to how to get there. From MF 214 they recognised MF 217 from the game.

Each participant was also asked to identify the members of the faculty staff featured in the game from the faculty photograph board and all did so with ease. Figure 3 shows how both groups completed the tasks and demonstrates that the game playing group were able to get to their destination far faster and displayed more confidence in their navigation of the building. It must also be noted that the retention figures for the faculty were 11.2%, which was an improvement of 1% on the previous year but we cannot claim here that the prototype was responsible.

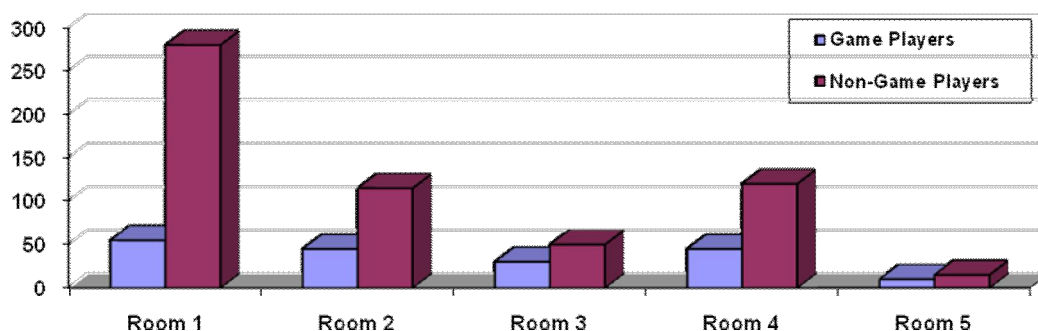


Figure 3. Time comparison of game players versus non game players

Reflections

The key question is whether the interactive navigational game helped or not? Over 18 students were introduced to the prototype and it was shown that students who played the game were more confident in their actions and knew where they had to go as well as how to get there. It is hoped that these new students will be more inclined to interact with the appropriate personnel and avail themselves of their services sooner and also be more proactive regarding events affecting them within their student life. At present, we are porting the prototype to the Nintendo DS platform and we intend to evaluate the new student intake using Nintendo DS Lites sourced through the Higher Education Academy TechDIS scheme.

References

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| Contact Details | |
|------------------------|--|
| Author(s): | Kevin Curran and Kieran Forbes School of Computing and Intelligent Systems Faculty of Engineering University of Ulster, Northern Ireland, UK Email: kj.curran@ulster.ac.uk |
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