Continuing/**H**igher **E**ducation in **R**esearch **M**ethods **U**sing **G**ames

CHERMUG

Project Deliverable Report

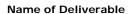|	
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Abstract (for dissemination)	Research methods and statistics are core competences across various disciplines but pose significant challenges for many students. The CHERMUG project aims to develop a digital game to support students in acquiring methodological and statistical expertise. A key issue that has to be addressed in developing a game is to identify the desired learning outcomes for students. This deliverable describes the user requirements analysis. The aim of the user requirements analysis was to establish the general attitudes to and acceptance of higher education nursing students and staff in the collaborating countries towards the use of digital games as a component of a blended learning approach to teaching methods and statistics to nurses.
Keywords List	CHERMUG, Serious Games, User requirements Analysis, Game Design, Research Methods, Statistics

Contents

Executive Summary

The user requirements analysis adopted a focus group approach. Research methods tutors and students were interviewed in separate groups concerning their views about and experience with digital games, their attitudes to games- based learning generally as well as their views of and ideas about using games in this particular content area. Three students and two research methods tutors took part in the focus groups.

All staff and students in the focus groups were generally supportive of games-based learning as a means of teaching research methods and statistics. The particular advantages that staff saw were primarily motivational: anything that might engage students was regarded as potentially useful for this difficult content area.

Game features mentioned by staff as being potentially useful included standard features such as progression to the next level; a navigation tool to allow students to know whereabouts in the game they are and a clock. More creative features included a post-it facility for highlighting difficult concepts and an "I'm stuck" facility for conversing with the tutor or a phone to phone for help. One respondent felt that games could be used as an assessment tool: the game could be used to monitor time spent playing as proxy for engagement with learning and effort in learning, although there was a danger that students might dislike the "big brother" element of this.

The students felt that games might be particularly useful for supporting quantitative research which they found difficult. They liked the idea that they could use the game to practice material covered in class. They also liked the idea of a nursing work station as a base where they could access information and where all the tools needed for solving problems are sitting in the booth. The students could see that this would help them organise and keep track of the material. Another important requirement was that the game should be easy to navigate: if a mistake was made it should be easy for the student to return to where they were. Students also mentioned useful features of games such as realistic problems, interactivity and a clock to monitor time on task. Students and staff viewed an online game as highly attractive although students were less sure that they would access it on mobile devices as the size of screen was viewed as a possible problem.

Age and gender were not regarded by staff or students as having an impact on the value of games for learning. A constraint on the current findings is that the all students in our sample were Scottish and all three were mature students. However it could be argued that if these students were supportive of games for learning then their younger colleagues, the digital natives that games are frequently targeted at, would also be accepting of games as a method for learning methods and statistics.

1. Introduction

The aim of the user requirements analysis was to establish the general attitudes to and acceptance of higher education nursing students and staff towards the use of digital games as a component of a blended learning approach to teaching research methods and statistics. The analysis would also help to identify areas of particular difficulty in understanding methods and statistics and the kind of support that staff and students would find most useful in this area. Using their knowledge of digital games, participants would also be questioned about features of a games-based approach that might be useful in learning. Given the varied ways in which games can be accessed, via console, laptop, tablet and mobiles, the best platform for the delivery of the game was also addressed. Students were asked whether they had any worries about the use of digital games for learning.

2. Main body divided in chapters

2.1 Method

Although initially a survey method was considered as useful in examining the acceptance of games for learning, previous surveys carried out by one of the partners have shown that there is generally a fairly high level of acceptance amongst students that digital games might be useful for learning (Hainey, Connolly, Stansfield and Boyle, 2011). Consequently it was thought that a focus group approach would provide a more detailed understanding of acceptance of games, views of how digital games might support learning and which game features might be useful in a game for teaching research methods and statistics. Two focus groups were carried out, one with staff and one with students. Similar questions were asked of staff and students and these are shown below.

Focus group questions

- What is your experience of using digital games?
- What do you think makes you or anybody else want to play digital games?
- How would students access digital games?
- Do you think students would prefer solo or group games?
- What are your views on the use of games to support and enhance academic studies?
- What do you think would make games a useful resource for both you and students?
- Do you have any fears or anxieties around using games in higher education?
- In terms of research methods, how could a game support student learning?

2.2 Results

Focus Group with tutors

Present: 3 lecturers: Brian Johnston who led the discussion, Ewan MacArthur and Liz Boyle;

2 nurse lecturers: M (female) and R (male)

What is your experience of using digital games?
Entertainment

M (the female lecturer) had no experience of playing entertainment games other than playing with her sons when they were younger but just because she was not involved in entertainment games

didn't mean she was not interested in the use of games for learning. She did not have much experience of playing board games either.

R (the male lecturer) used to play RPGs, not online but old fashioned dungeons and dragons with a group of his friends when he was younger and he is still interested through his son who plays a lot of games including Moshi monsters. At home R's family have a laptop and a PS and the laptop is used a lot for games. R also still plays a variety of board games. He felt that the sense of community is important in the popularity of online games, more important than the game itself.

Games for learning

M currently uses a structured exercise in a seminar which seems to engage students in critically analysing academic papers, although it is not digital. The exercise illustrates the structured research cycle. A group of students is given an A1 sheet of paper with a circle with different questions at different points in the circle; the circle illustrates the structure of the research methods cycle or the structure of an academic paper with questions under different heading such as abstract, methods, results, discussion etc. Each student is given one or more questions to address and reports their answer back to the group so that, by the end, each student has some understanding of the different questions/stages. Students have to focus as the session is time limited. The exercise is successful in getting students to interact with each other. It is not competitive but rather collaborative as students have to cooperate in presenting the answers to the questions about their section to the other students. Students then have to write a critique of the paper (strengths and weaknesses) so the exercise is not itself assessed but is useful for the assessment. M felt that a digital games-based version of this approach would be useful for learning. However M did have reservations and was not sure whether her paper critiquing activity would work online. She wasn't sure how enjoyable it would be. You would type a bit and read what other people have written. She wasn't sure what else a game would offer over and above that.

M found that with the paper critique exercise, students very often feel daunted that they can't critique an authority figure like the professor who wrote the paper! But they soon begin to realise that there are things that could have been done differently.

What do you think makes you or anybody else want to play digital games?
R stated that he needs to be interested in the topic to take part and continue taking part in playing digital games. He wouldn't go near a driving or racing game for example. Games provide the opportunity to do something different that you can't do in real life.

With respect to playing in a group R feels that you would have to be comfortable playing the game before they join a group. You don't want to die in the first two minutes! That would be embarrassing and not useful.

The motivation for M's paper evaluation activity is that it benefits the students because it is aligned with the assessment so the assessment provides the motive (or reason) for the activity (i. e. playing the game).

R noted that the language used in methods and statistics might be a barrier to learning and that a glossary might be useful to help explain terms to students.

How would students access digital games?
Both lecturers thought that the game would be most useful if it were accessible through the students' virtual learning environments, Moodle or Blackboard, where it could help to reinforce material that was covered in class and provide an opportunity for students to reflect on this material.

Do you think students would prefer solo or group games?

Both lecturers thought that the game should be usable both by single players and in groups. R thought it would be useful to play it as a solo game to gain expertise and then in groups.

What are your views on the use of games to support and enhance academic studies?

Both lecturers were of the view that games could definitely play a role in supporting and enhancing academic studies. They felt that so much is changing in teaching and learning and they felt the need to keep pace with that. This is driven to some extent by universities, not necessarily by the students. They also found that it is difficult to engage students and any tool that can do that is good. Games certainly seem to be engaging and might help to engage students. When asked about whether games would engage disaffected students they thought that it might work!

What do you think would make games a useful resource for both you and students?

- R felt that there has got to be a payback for students to play the game, so for example the game should have a scoring mechanism built in.
- However M (the female lecturer) had reservations about competition. She felt that mature students (and maybe women) would not like competition, although the younger ones might be happy with a competitive element. M felt that the more mature students would prefer collaboration.
- Another motivating element is that the students need to be able to get to the end of the game.
- The game would not itself comprise an assessment but might be used more as a self-evaluation tool for students: "If you can do this you can do your assessment".
- The students liked the dosage application they used. It was a useful resource and seemed to engage them.
- We should be using online learning to simulate the space in a classroom where students interact to learn. Students need to believe that the game is like a classroom and get the idea that there are other people in the same situation. You could capture the believability of the space with online games.
- You could be an observer (lurker) in the game, look at a run of the game to get the gist of how to do it. This would give you confidence to try yourself.
- Different kinds of presentation also might appeal to different groups, eg the nurses work station layout of proposed game might appeal to women but not to men.

What else should the game do (add ons)?

The lecturers came up with a number of facilities that the game might provide:

- A useful resource might be a **post-it** facility.
- R thought that an "**I'm stuck**" facility would be useful where student could find out what to do next by conversing with a tutor (maybe peer) - currently students do this through facebook.
- **A navigation tool** – students need to know where they are in the game.
- **Clock**: students could ignore the clock but an **alarm** would alert them to the idea that they've spent enough time playing.
- **Assessment** –The game could be used to monitor time spent playing as proxy for engagement with learning and effort in learning. BUT there is a danger that students might dislike "big brother" element of this.

- **Progression to next level** –It would be good to use the games for progression with students needing to get a high enough score at one level to proceed to next – this would be motivating.
- The original "work station" metaphor for the game included tools such as **telephone** to phone for help and links to the website.

Do you have any fears or anxieties around using games in higher education?

- The lecturers felt that it was not a good idea to use the game for monitoring attendance and effort put into the module as this might disengage students.
- Technology can be a distraction from learning rather than supporting it.
- The use of technology including games is an expectation of this and other unis rather than of students.
- M was concerned about the gender issue that females (and in UK nurses are mostly female) may be turned off by games.
- There was a worry about using the name game. This might put students off or make them feel it is not for a serious purpose. It is maybe better to call it an interactive learning zone, learning aid or learning tool.

In terms of research methods, how could a game support student learning?

- Having different areas of the game for different functions.
- R would like a wee game (sub-game game within a game) on probability
- Should we build risks into games – males might like it and females not

Focus group with students

Present: 3 CHERMUG researchers: Brian Johnston who led the discussion, Ewan MacArthur and Liz Boyle, who transcribed students' contributions.

3 student nurses: B (Male), P (Female) and D (Female)

Focus group questions

- What is your experience of using digital games?
- What do you think makes you or anybody else want to play digital games?
- How would you access digital games?
- What are your views on the use of games to support and enhance your academic studies?
- What do you think would make games a useful resource for you?
- Do you have any fears or anxieties around using games in your education?
- In terms of research methods, how could a game support your learning?

What is your experience of using digital games?

Entertainment games: The students' experiences of playing entertainment games were varied. Contrary to popular gender stereotypes the two female students played games while the male student did not. One of the female students was an enthusiastic player of entertainment games including Halo, Call of Duty and Sonic, but also flight simulations and even going back to PACMAN. She played computer games on the X box and Sega mega-drive and plays mainly with her children, family and friends. She views games as a social activity which is played across generations. She also saw game playing as seasonal and games tend to be played more in bad weather.

The second female student did not play games so much although she did play WI-fit on her own. However she knew quite a lot about entertainment games through her son who plays shooting games but also social and competitive games on the play station.

The male student was also not typical with respect to stereotype as he was not into entertainment into games much at all. He remembered space invaders in arcades but would not play games on his mobile phone, preferring to listen to music. When asked why he doesn't play he replied that he just never got into it. He is worried by the addictive properties of games and does not like the violence of many games.

Serious games: The students did not have experience of serious games but they had experience of something very similar, a CAL application (state medicate – an authentic drug training world) on a module on drug dispensing. All three students liked this with the male student particularly keen saying that he had spent 6 hours playing this game and found that the time flew past.

How would you prefer to access digital games?

When asked about how they would prefer to access digital games the students replied that online and PC would be best. These students were not enthusiastic about mobile games, viewing them as too small; they would prefer games for laptops or PCs. However these students were mature students and it is possible that their views were not typical.

What do you think would make games a useful resource for you?

The students were generally accepting of games as a learning aid and the specified a number of features that they would like to see in a game.

- **Authentic tasks:** Students felt that games could provide authentic tasks.
- **Ease of access:** The students highlighted ease of access to a game as important. The game needs to be easy to enter. They specified that they would want a game which would not take too many steps to get to. In addition the number of links should be minimised and there should be clear names.
- **Organisation:** It would be important to have an organised sequence and you could skip bits that you could do. There are lots of little bits to organise; we need to be able to place things in specific places. It would be useful to use the technology for sifting through things but we need to be careful what keyword is.
- **Making things explicit:** Students felt that they need things to be more explicitly spelled out. For example in guidance about essay writing they wanted to know "What is this question asking me to do?".
- **Summary:** At the end of the gameplay it would be good to have a summary of what they had done so far.
- **Posting notes:** When asked whether it would be useful to have a facility for players to post notes back to game the students felt that it would.
- **Time tracking:** The students also thought that it would be useful to have facility for tracking the amount of time that they had spent on the game as evidence of what they had done. This facility could also provide a measure of the amount of effort they put in (which would help their tutor).
- **Interactive:** One student emphasised that the game needs to be interactive; she gave an example of utube where they had seen a video of dancing neurons. The stents found that the Interactive games for biology are very good.
- **Practice:** Interaction was also a good facility for practice. If you have no competence in maths doing things by interaction shows where you go wrong. I'm patient and will work

through things after 5 or 6 goes I'll get the answer. It would also be useful to have a facility to go back in the game if they made a mistake so that they could get full marks; this system would help the students to get better.

- **Anonymity:** I would like the anonymity of the game – it doesn't yell back when you get it wrong.
- **Short games:** With respect to the duration of the game the students thought that shorter "bite-sized" games would be useful. It would be useful to be something you can jump into and out of for short spells of time. (These shorter games would be ideal for delivery through mobiles but the students did not like this idea because of the problems with the size of mobile screens.)
- **Chat rooms**: When asked about the possible use of chat rooms in a game the students said that they used chat rooms but were worried about lack of anonymity. When they used Blackboard, they didn't use the chat room facility of Black board but if they wanted to ask other students questions they would go out of Blackboard and onto Facebook. "Facebook is the first port of call for any questions about the course". One student didn't want to ask the teacher for fear of looking stupid, but another (F) would always be the first to ask.
- **Competition:** The students viewed competition as a useful feature of a game. They liked the idea of a personal best score. One of the females felt that she would like to compete against one other (specific) person rather than everybody as in a leaderboard.
- **Scoring/assessment:** It would be useful to include quizzes and some kind of scoring system.
- **Game features:** Students suggested that it would be useful to have a phone and some game facilities such as 50/50 and phone a friend. Could upload a video

Would you prefer solo or group games?

The students felt that it would be useful if the game were adaptable so that they could work in groups if they wanted, since they do have to work in groups. Ideally the game could be played both as a single player game but also as a group game. The students would find a single player function useful if they were playing the game at unusual times when there was no-one else around to play with, such as if they got up in the middle of the night.

In terms of research methods, how could a game support your learning?

- **Quantitative methods** The students felt that they had particular problems with quantitative research and would welcome support with that. They said that such a game would be useful if it were not complicated and quick and easy to access.
- **Nurses' work station** The students were introduced to the idea that the front end of the game would be a nurses' work station where they would have resources that they could pick up information from. They all liked this idea that all the tools they would need for solving problems would be sitting in the booth so they wouldn't need to worry about finding things.
- **Levels:** It would be useful to have levels and good to start with the easy levels. They could play longer to higher levels. Aligning quizzes – can choose level of complexity of questions
- **Organisation of material:** One of the female student felt that with the evidence based practice module there are lots of things to pull together and a game could really help to do that. She would like the game to be " like utube", i. e. engaging, but to be like a

package (i. e. accessible with everything in in the same place) instead of having to probe.

- **Content:** It would be good to have different kinds of content in the game.

Do you have any fears or anxieties around using games in your education?

- **Navigation:** Navigation was seen as a major problem for many students as they did not want to "get stuck". The students were very worried that they would find something interesting and would not be able to find their way back to it. This happened on Blackboard where the might kept distracted by something and could not find the first thing again." Navigation is definitely important."

- **Spending too much time on game:** Given his experiences with the CAL application where he got sucked in and ended up playing for six hours and his worries about the addictive potential of games, the male student felt that spending too much time playing the game might be a problem. One of the females suggested that having an onscreen clock might help in this respect; it would be useful in providing information about time so that players could monitor the amount of time they spent playing and stop playing after certain amount of time.

- **Gender and age:** The students didn't see gender or age as an issue. If the application was going to help them to learn the female students would like it. Age was not an issue either. Although younger students did seem to be more able with technology, the more mature students would use it if it helped them to learn.

Conclusion

All staff and students in the focus groups were generally supportive of games-based learning as a means of teaching research methods and statistics. The particular advantages that staff saw were primarily motivational: anything that might engage students was regarded as potentially useful. Some staff were already using game-type activities, such as a board-game type layout for progressing through the different stages in the critical evaluation of a paper.

Game features mentioned by staff as being potentially useful included standard features such as progression to the next level; a navigation tool to allow students to know whereabouts in the game they are and a clock. More creative features included a post-it facility for highlighting difficult concepts and an "I'm stuck" facility for conversing with the tutor or a phone to phone for help. One respondent felt that games could be used as an assessment tool: the game could be used to monitor time spent playing as proxy for engagement with learning and effort in learning, although there was a danger that students might dislike the "big brother" element of this.

The students felt that games might be particularly useful for supporting quantitative research. They also liked the idea of a nursing work station as a base where they could access information and where all the tools needed for solving problems are sitting in the booth. An important requirement was that the game should be easy to navigate: if a mistake was made it should be easy to return to where they were. Students also liked the idea that you could use the game to practice material covered in class without worrying about making elementary mistakes. One student emphasised that the game needs to be interactive. Students also mentioned useful game features such as a clock to monitor time on task and a chat room facility. Staff and students viewed an online game as most useful. Although an online game would be available through mobile technology, the size of screen was viewed as a possible problem.

Age and gender were not regarded by staff or students as having an impact on the value of games for learning. In fact the male student in the focus group violated the perceived view that it is males who play games since the two females played games but the male did not. This claim is consistent with research which shows that females' favourite games are puzzle games.

A constraint on the current findings is that the all students in our sample were Scottish and all three were mature students. However it could be argued that if these students were supportive of games for learning then their younger colleagues, the digital natives that games are frequently targeted at, would also be accepting of games as a method for learning methods and statistics.

References

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