Can an extended immersive pharmacy simulation game influence students’ perceptions of their professional competencies?

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Background

- Pharmacy students approaching graduation require the knowledge, skills, attitudes and competencies commensurate to those commencing pre-registration internships

- Gamification:
  - transferring some of the positive attributes of a game to something that is not a game\(^1\)
  - pedagogical approach to game-based learning is an increasing area of research interest and publication\(^2\)

1 Kim B. Understanding Gamification. *Library Technology Reports.* 2015;51(2)
Serious Games

- **Serious gaming** is a long-accepted strategy for workplace training, recruitment and communication\(^3\)
- It can be defined as “the use of game principles for the purposes of learning, skill acquisition, and training”\(^4\)
- Advantageous to students through motivation, stimulation, generation of enthusiasm and interactive participation\(^5\)

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3 McConnon A. The name of the game is work. Bloomberg Businessweek. 2007
5 Kapp KM. *The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education*. Wiley; 2012
Features of a Game

- Rules
- Goals and objectives
- Outcome and feedback
- Conflict and competition
- Challenge and opposition
- Interaction
- The representation or story\textsuperscript{6,7}
- More than just simulation

\textsuperscript{7} Schwabe G, Göth C. Mobile learning with a mobile game: design and motivational effects. Journal of computer assisted learning. 2005;21(3):204-216
Aim and Objectives

- To evaluate an adapted extended immersive pharmacy simulation game
- Achieved through exploration of whether this serious game could influence pharmacy students’ perceptions of their professional competencies
PharmG

- 3-week fully immersive pharmacy simulation game
- Adapted from GIMMICS in the Netherlands
- Final semester BPharm
- Capstone activity
PharmG

- Simulated city Pillborough
- August-September 2016
- 27 students
- 5 pharmacy teams
- 3 weeks of game play
- 1 game day = 1 week
PharmG Gameplay

- Daily prescriptions with written or verbal counselling (in person and mp3 recorded)
- Primary health consultations with simulated patients (actors)
- Clinical cases, case plans and clinical phone calls
- Daily staff meetings
- Extended assignments: adverse drug reaction (ADR) reporting, drug use evaluation (DUE), health research presentation
Research Design and Methodology

- An online questionnaire was created based on the draft updated *National Competency Standards Framework for Pharmacists in Australia*
- Self-assessment of competencies rated on 5-point Likert Scale
- Surveys conducted before the 3-week game and repeated afterward
- Linked by individual to enable measurement of change
Research Design and Methodology

5 weeks pre-game

Final BPharm Semester

PharmG Simulation
Weeks 6, 7 and 8

3 weeks post-game

Survey 1

Survey 2
Competency Standards Framework

- 26 competency standards across 5 domains:
  1. Professionalism and Ethics
  2. Communication and Collaboration
  3. Medicines Management and Patient Care
  4. Leadership and Management
  5. Education and Research
Competency Standards Framework

1. Professionalism and Ethics
   1. Uphold professionalism in practice
   2. Observe and promote ethical standards
   3. Practise within applicable legal framework
   4. Maintain and extend professional competence
   5. Undertake expert professional practice
   6. Contribute to continuous improvement in quality and safety
2. Communication and Collaboration

1. Build partnerships for the delivery of patient-centred care
2. Collaborate with professional colleagues
3. Communicate effectively
4. Apply interpersonal communication skills to address problems
Competency Standards Framework

3. Medicines Management and Patient Care

1. Develop a patient-centred approach to medication management
2. Implement the medication management strategy or plan
3. Monitor and evaluate medication management
4. Compound medicines
5. Support Quality Use of Medicines
6. Promote health and well-being
Competency Standards Framework

4. Leadership and Management
   1. Show leadership of self
   2. Manage professional contribution
   3. Show leadership in practice
   4. Participate in organisational planning and review
   5. Plan and manage physical and financial resources
   6. Plan, manage and build human resource capability
   7. Participate in organisational management
Competency Standards Framework

5. Education and Research
   1. Deliver education and training
   2. Research, synthesise and integrate evidence into practice
   3. Participate in research
Results

• 26 students (96.3%) completed the pre- and post-game questionnaires
Results by Individual Student

No. of competencies changed per student

No. of competencies improved per student

No. of competencies worsened per student
Results by Competency

% of students that improved

- ** P ≤ 0.01
- *** P ≤ 0.001
- ns
- * P ≤ 0.05
- ** P ≤ 0.01
- *** P ≤ 0.001

0% 10% 20% 30% 40% 50% 60% 70% 80%

1.1: Uphold professionalism in practice
1.2: Observe within applicable legal standards
1.3: Maintain and apply professional competence
1.4: Maintain and apply professional competence
1.5: Undertake professional development in quality & safety
1.6: Contribute to continuous improvement in quality & safety
2.1: Build partnerships for delivery of patient-centred care
2.2: Communicate effectively with professional colleagues
2.3: Communicate effectively with professional colleagues
2.4: Apply communication skills to address problems
3.1: Develop patient-centred approach to medication management
3.2: Implement medication management strategy or plan
3.3: Monitor and evaluate medication management strategy or plan
3.4: Support Quality Use of Medicines
3.5: Support Quality Use of Medicines
3.6: Promote health and well-being
3.7: Promote health and well-being
4.1: Show leadership of self
4.2: Manage personal and professional development
4.3: Show leadership in practice
4.4: Participate in organisational planning and review
4.5: Plan and manage physical and financial resources
4.6: Plan, manage and build human resource capability
4.7: Participate in organisational management
5.1: Deliver education and training
5.2: Research, synthesise & integrate evidence into practice
5.3: Participate in research

Griffith University
Results by Domain

Ave. no. of Students that Improved per Standard

No. of Students

<table>
<thead>
<tr>
<th>Domain 1: Professionalism and Ethics</th>
<th>Domain 2: Communication and Collaboration</th>
<th>Domain 3: Medicines Management and Patient Care</th>
<th>Domain 4: Leadership and Management</th>
<th>Domain 5: Education and Research</th>
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<td>13.83</td>
<td>13.5</td>
<td>14.67</td>
<td>14</td>
<td>16.67</td>
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Conclusion/Discussion

- Participation by final semester pharmacy students in an extended immersive pharmacy simulation game significantly improved their self-assessment of professional pharmacy competencies.
- Further research is currently underway to evaluate the impact of this serious game on student performance and pre-registration outcomes.
- Results may not be generalisable to other cohorts or other schools.
- Despite the small sample size, almost all results were significant.
Questions?
Thank You