Evaluating student perceptions of using a game-based approach to aid learning

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Why Gamification?

• Support of **small group learning** and has been clearly linked to concepts of **andragogy** in the current literature *(Nevin et al, 2014)*.

• Game rules place the “play” in **context**, can be **thematic** and are generally **goal-orientated**.

• Layers of **strategy** and “**safe**”, meaning that mistakes and the impact of these can be explored in a controlled and contextual manner.

• Games have an **intrinsic motivation** designed into them. A well-designed game works to enhance the **motivations** of the player to continue playing and in our case, **learning** *(Iosup and Epema, 2014)*.
About Braincept

• Educational card-based, team game

• Provides an interactive way to explore & expand pharmacology knowledge.

• Non-digital to encourage community learning and communication aspects of the play and to facilitate flexibility (Knowles, 1984).

4 students can play the game without needing a tutor;

Based around short scenarios where players work as a team each taking on a different role

Players link drug names with their primary mechanism(s) of action and common side effect(s) and increase their confidence in handling such knowledge.
The Study

Action research approach to collect pilot data exploring student **perception** and **learning gain** with Year 2 medical student.

The evaluation questionnaire uses a 5-point Likert scale with space for free-text comments, intended to collect perceptual data post-game (*Likert, 1932*).

Learning gain was assessed immediately pre and post-game then 3 days post-game using a short quiz.

The quiz consisted of three questions

Q1 – For a given drug what is the mechanism
Q2 – For the given mechanism name a drug
Q3 – Main side effects of given drug

**The Study**

BRAINCEPT – A Team-Based Pharmacology Role-Play Game

FEEDBACK FORM (page 1)

How many minutes did it take you to finish the game?

- $\leq 5$
- $5-10$
- $10-15$
- $15-20$
- $\geq 20$

1. I really liked playing Braincept.

    | Strongly Agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree |
    |----------------|-------|----------------------------|----------|------------------|
    |                |       |                            |          |                  |

2. Before playing Braincept, I felt confident about drug mechanisms.

    | Strongly Agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree |
    |----------------|-------|----------------------------|----------|------------------|
    |                |       |                            |          |                  |

3. I feel more confident about drug mechanisms after playing Braincept.

    | Strongly Agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree |
    |----------------|-------|----------------------------|----------|------------------|
    |                |       |                            |          |                  |

4. I would like to use Braincept...

    | For revision before exams | For revision throughout the year | In my PHIL sessions | In other small group sessions | In my own time |
    |---------------------------|----------------------------------|--------------------|--------------------------------|----------------|
    |                           |                                  |                    |                                |                |

**Did you like the Team aspect of Braincept?**

- [ ] No
- [x] Yes

**General Comments:**

Very engaging, thought provoking, forms new knowledge quickly.

P.T.O
Emergent Themes

Game Mechanics
“Slightly complicated when team leader + two treatments are chosen (after they get it wrong)”
“Really enjoyed playing as a team, made more active interesting learning + makes pharmacology more interesting and less daunting”
“Easy to use and understand- good for revision”
“Could use the game on your own”

Gamification of Learning
“Really enjoyable way to practice mechanisms and learn new ones”
“Great concept, Fun, informative and good for memorising mechanisms/effects”
“Could introduce a competitive element?”
“Really good game and concept would 100% buy it”
“More for during sessions”
“Very good way to learn pharmacology”
“Mechanisms seem to have stayed in my mind... could be self-study aide too”

Physical vs Digital
“Really useful, like that it's real life cards etc.”
“Particularly like the fact it is a REAL game with REAL people NOT an iPhone app”
“For future development this might be useful for making it into an app for private revision so you can change rules as well”

Perceptions
“Shows me how much I need to revise”
“Very stressful, very enjoyable and very educating”
“Very useful and enjoyable”
“Good idea!”
Student Perceptions

Before playing the game the majority of students reported feeling unconfident.

Following the game confidence in drug mechanisms increased markedly with only 3 still neutral.

All students enjoyed playing the game → enhanced engagement.

n=125
• Students performed reasonably well when given a drug and asked what the mechanism was but struggled when asked what drug the mechanism related to and the main side effects

• Following playing Braincept the students performed better on the same questions and 3 days later with different questions of the same type
What can we conclude?

• The feedback was extremely positive towards the idea of a game to assist in pharmacology learning.

• Free-text comments showed a need for something beyond traditional classroom-based delivery to address this subject.

• Players enjoyed the physical team dynamics of the game.

• The team playing aspect enhanced student confidence in their own ability by seeing that their peers were also of a similar knowledge level.

• Medium term (>3 days) learning gain as result of playing this game.

• The mechanism here could be applied to other subjects.
Questions?