

Can Gaming Increase Antibiotic Awareness In Children?

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BACKGROUND INFORMATION

- e-Bug is a European project that educates young people ages 5 to 18 about prudent antibiotic use, hygiene and the spread, treatment and prevention of infection.
- The e-Bug teacher resources are complemented by an interactive student website hosting games, quizzes, and activities.
- There has been little formal evaluation of the student website..

AIMS

Through quantitative and qualitative methods:

1. Measure pupils awareness of appropriate antibiotic use before and after playing three antibiotic awareness-related games.
2. Analyse pupils awareness change as a result of playing the three games.
3. Gauge pupils' opinions on the usability and enjoyableness of the different games on the e-Bug website
4. Analyse qualitative and quantitative data to create an evaluation of the usability of the games section of the website
5. Suggest improvements to the games

SAMPLE AND METHODS

- We evaluated three games available on the e-Bug website (www.e-Bug.eu) that linked directly to antibiotics, the correct use of antibiotics, bacteria and viruses, and specific learning outcomes related to these subjects.
- The three games were Doctor Doctor, a role play game about the different between treating bacteria and viruses; Microbe Mania, a microbe identification quiz; and Body Busters, a Pacman like game about finishing a course of antibiotics.
- Quantitative data was collected from pre- and post- game questionnaires containing multiple choice questions relating directly to information available in the games
- Qualitative data was collection with open-ended and Likert style questions as well as focus groups and think-aloud sessions.
- Data collection carried out with permission's from the University of the West of England Research Ethics Committee.
- 153 pupils, aged 9-11, from primary schools and summer schools in the Bristol area completed questionnaires. 48 of these pupils completed 6 focus groups and 4 were observed playing games in think-aloud sessions.

CONCLUSIONS

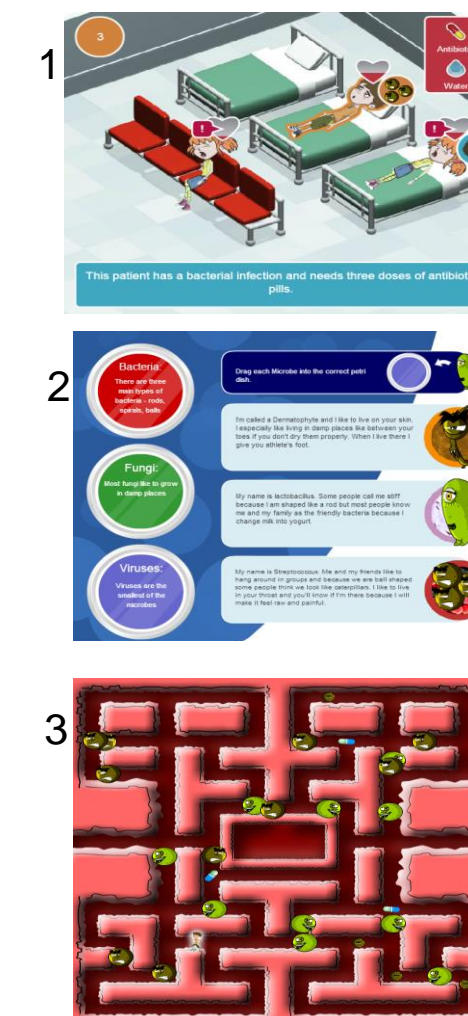
- Body Busters is the most effective game at changing awareness and requires almost no changes.
- Doctor Doctor, although effective at changing awareness, could be improved with better graphics and an expansion of the role playing element.
- Microbe Mania requires it's game mechanic updating to create a 'game' over a 'quiz'. It currently does not offer much to the website and could distract from other more effective games.
- The direct correlation between enjoyment and effectiveness of the games at changing antibiotic awareness shows that when designing educational games, the enjoyment and appeal of the game should be considered over adding unnecessary extrinsic information.
- Further investigation is suggested to identify more detailed suggestions for improvements and this study could be the basis of a larger study into the role of educational games as teaching resources.

QUANTITATIVE RESULTS

- Only 2 questions showed any significant increase in awareness of antibiotics (highlighted in table below)
- Body Busters (game 3) proved to be most effective at changing awareness as both questions related to its learning objective
- Doctor Doctor (game 1) showed some ability to change awareness as question 5 related to its learning objectives
- Microbe Mania (game 2) showed almost no ability to change awareness as there was no significant change in awareness on questions related to this game.

No.	Question	Possible Answers (correct answer denoted by asterisk)	p-value	95% CI	% Before	% After
1	Which of these microbes causes coughs and colds?	Bacteria, Fungus, Virus*, Prion	0.65	-10.41, 6.52	26.1	28.1
2	What's the best way to kill a virus?	Eating lots, Water and bed rest*, Antibiotics, Exercise	0.15	-16.67, 2.50	37.2	44.4
3	Can antibiotics help cure a cold?	Yes, No*, Sometimes	0.27	-11.06, 3.22	20	30
4	Microbes can help make...	Onions, Cheese*, Coffee, Chocolate	0.71	-14.82, 0.62	45.8	52.9
5	Which of these would antibiotics be used for?	Bacteria*, Virus, Badly scraped knees	0.011	-22.75, -3.02	27.5	40.5
6	Most coughs and colds get better without antibiotics	True*, False	0.46	-11.86, 5.39	36.6	71.9
7	Finish the sentence (circle one)Antibiotics...	Are good at killing viruses, Are bad for you, Can make you smarter, Only work if you finish the course*	0.0007	-18.68, -5.12	9.1	20.9

GAMES



QUALITATIVE RESULTS

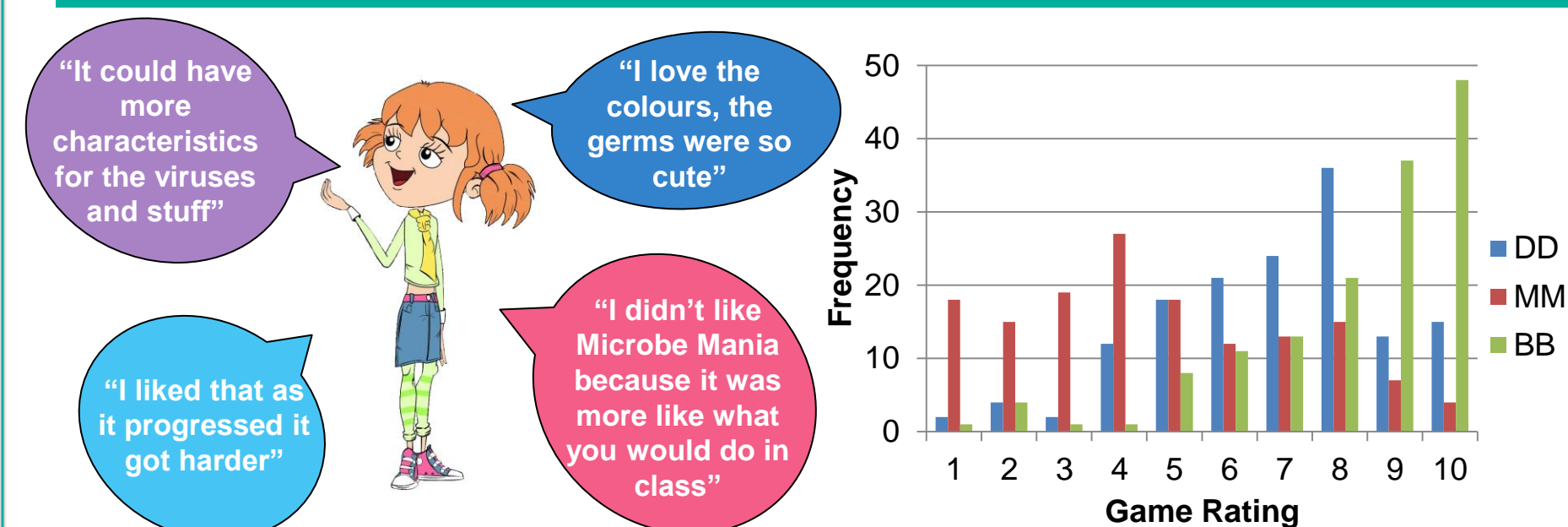


Figure: Comparison of Likert scores. 1=lowest 10=highest

- Overall, Body Busters was the most popular game with the highest rating and the most positive comments and almost no negative comments in the qualitative work.
- Doctor Doctor also scored well but received more negative comments including comments about its poor range of difficulty
- Microbe Mania scored poorly in all areas and received almost no positive comments aimed at it's gameplay.