

Can Games Change Behaviour?

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Abstract

“Gamification” is the application of game-design thinking to non-game concepts to make them more fun and engaging. This methodology was introduced at Paignton Zoo to test whether it is a useful tool to engage, educate and change long term visitor behaviour.

Introduction

Modern zoos play a vital role in free choice learning and promote themselves as educational establishments (Packer and Ballantyne 2010). An individual's impact on wild spaces, both now and in the future needs to be addressed to protect natural habitats for populations to thrive. However, to cultivate sensitivity in people, encouraging them to adopt environmentally responsible practices in their everyday lives, proves to be one of the biggest obstacles for governments and conservation organisations, industry and business (Scott and Gough 2004). Although our society, through the media, is exposed to images of habitat destruction and climate change along with other environmental issues, there is a limited understanding of environmental problems (Jacobson, 1999). Gamification is a relatively new concept, but is starting to gain momentum in many industries. A recent report by Paula Owen (2013) supports this concept and the use of the “fun & games 4Es theory”, which includes: Entertain, Engage, Educate and Engender behavioural change. Working with this concept Paignton Zoo wanted to evaluate the use of this tool in its free choice learning environment.

Methodology

A range of classic games with an eco-twist were developed and delivered throughout the Zoo to engage and educate the Zoo's general visitors with the aim of changing their behaviour. The use of gamification was decided as the method of delivery to ensure people have a positive experience whilst being introduced to the topic of sustainable living; creating a link between lifestyle and the impact it can have on the environment. The activities provided included: ‘Play Your Eco Cards Right’ (Fig.1), ‘Sustainability Snakes and Ladders’ (Fig. 2), an interactive sustainability touch-table and talk (including the use of puppets) (Fig.3) with cards to hand out which summarised learning and suggested follow up actions (Fig. 4).

Engagement was recorded by monitoring the number of visitors taking part in the different activities between May 2013 and September 2013. Data was collected on adult visitors (post 16) only. This was due to the inability to collect personal information such as an email address from visitors under 16.



Figure 1. Play your cards right being carried out in our discovery centre with a visitor.



Figure 2. An intern playing snakes and ladders with some of our visitors.



Figure 3. Two of our junior volunteers with play your cards right and our touch table for visitors to interact with.



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Small changes help keep the Earth balanced and conditions liveable for all life on our planet.



Help yourself and the environment

 Estimated cost to install	Estimated annual saving	Estimated time for it to pay for itself	Carbon dioxide saving per year	
Turning all appliances off standby	£0	£74	0	268kg
Reflector behind radiator	£3	£49	Under 1 year	89kg
Hot water tank jacket	£15	£40	Under 6 months	170kg
Primary pipe insulation	£10	£15	1 year	60kg
Fill gaps around skirting board	£20	£25	1 year	100kg
Floor insulation - timber floor	£770 or £100 (DIY)	£60	2 years	240kg
Loft insulation (100 - 270mm)	£50 - £350	£25	2 - 4 years	110kg

Figure 4. The credit card sized hand out included a summary of information and links to more information.

Questionnaires were given out on the day of delivery to measure knowledge, attitudes and commitment to behaviour change. A follow up study three months post visit was conducted via SurveyMonkey to measure whether visitors adopted rather than just pledged lifestyle changes. This method was selected as the most appropriate means of collecting data for this project as it is more economical in terms of time and money compared to interviews Cohen et al. (2007). To reduce emotive language and leading questions the questionnaires were adapted from a study by Paula Owen (2013) and then peer reviewed at the Zoo.

A collaboration with South West Water (SWW) was developed to encourage water saving as part of the project. As an incentive, free water saving devices donated by SWW were given to those willing to take part and fill out a questionnaire, to 'kick-start' sustainable living. These included a 'Leaky Loo' strip which can potentially save 400 litres of water per day, vouchers and details of a webpage (www.sww.savewater.co.uk/zoo) where SWW customers can request more free water saving devices.

Results

On the day:

The games were delivered over 86 days from May half term to the end of the summer holidays. A total of 7,153 (9.4%) adult visitors (post 16) were engaged with the activities at the Zoo out of a total 75,902 visiting the Zoo. Of these 7.2% (n=513) completed a questionnaire on the day about their experience.

When considering enjoyment and learning (Fig.5), the initial questionnaires show that 96.9% (n=497) enjoyed the activities they took part in and 97.5% (n=500) enjoyed the learning that took place. 88.5% (n=454) disagreed they didn't learn anything new from the games and 95.1% (n=488) agreed they learnt new actions that they could carry out at home. 96.5% (N=495) felt they could take action and 94.9% (n=487) either strongly agreed or agreed that they would be taking extra action after their visit to the Zoo (fig. 6).

Some of the verbal comments recorded when visitors were engaged in dialogue with volunteers running the activities included:

"I can't believe you can save that much from such simple things"

"I had no idea that mobile phones were linked to rainforests like that"

and

"I think it's brilliant to show people how they can make a difference"

These support the questionnaire data which indicates that learning took place.

Results Post Visit:

A follow up survey was sent via SurveyMonkey to each of the 513 visitors that completed a questionnaire on the day. With a 13.1% completion rate, responses came from ages ranging from 18-61+ years old. 69.2% (n=45) of the participants stated they had made lifestyle changes following their involvement with the Zoo activities with a further 10.8% (n=7) stating they hadn't yet but intended to. Looking at the changes these respondents claim to have made, the most common was switching things off standby and turning items off (70.1%, n=34). This on its own has potentially saved 61 tons of CO₂/year (calculated from data obtained through the Nidirect 2014 and Environmental Protection Agency 2014). Following this, recycling mobiles and being more aware of items they buy (both at 50%) were the next popular behaviour changes.

When asked the question 'If you haven't made any changes, can you please indicate why' 19.5% (n=8) responded with 'I am happy with the amount of environmental actions I take' and 'I am doing all I can possibly do', 17.1% (n=7) 'Still intend on making changes', 14.6% (n=6) stated 'I am restricted by cost' and 7.3% (n=3) answered 'I haven't learned anything that I wasn't already aware of'. Lastly, 87.7% (n=57) of the participants felt they were inspired by their visit to the Zoo.

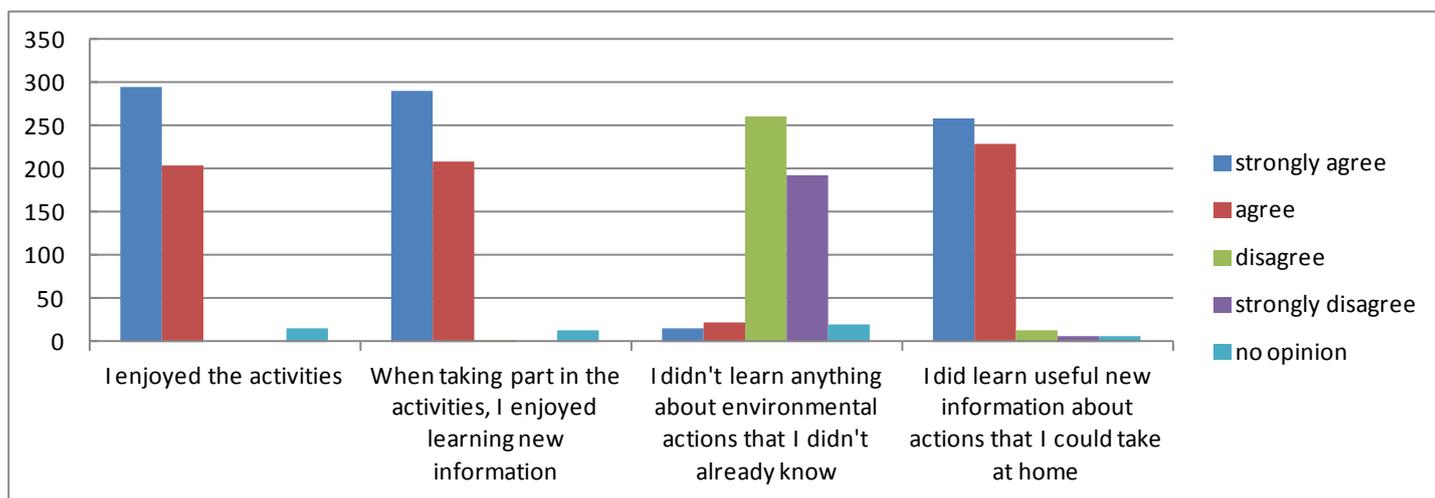


Figure 5. Visitors opinions on whether they enjoyed the games and whether they had learnt something on the day (n=513).

The use of freebies

66% of participants used the free Leaky Loo strip (n=35). 7.7% (n=3) found that they had a leaking toilet and got it fixed, saving a potential 10,342 litres of water a day. 14 vouchers were also filled out on site to send to South West Water for free devices.

Discussion

The aim of this project was to assess the use of gamification as a tool to engage, and cause behaviour change in zoo visitors. Relevant conclusions can be drawn from the data collected during this project as long as an appreciation and understanding of its limitations are taken into consideration. The nature of the data collection method (questionnaires) resulted in a limited number of responses although the use of an incentive increased participation numbers. However, the results provide an indication of attitudes and behaviour change.

The majority of visitors engaged agree that they were inspired and would change behaviours after their visit. Results post visit were incredibly promising suggesting 69.2% of participants have since implemented pro-sustainable actions at home, as a result of their involvement. This includes both energy and water savings. However, this data was collected from self-reporting questionnaires and, therefore, there is no way to tell how truthful a respondent is being. People may interpret questions differently or not read a question fully. This might be the case for question 3 on the follow up questionnaire which asked which behaviours they have since adopted. Although possible, it is unlikely that that many people have installed insulation and completed all of the indicated actions in the three month gap between their visit and the questionnaire. Nevertheless, even if it has re-raised the issue with them it could act as a reminder to carry out these actions. Though questionnaires

are a good method for large scale data collection, it is recommended that follow up interviews are also carried out with participants to increase validity of the results. This has not yet been done for this study.

The use of a freebie to boost behaviour change at the time did seem to encourage people to fill out the questionnaires. Future means of increasing the number of participants could include targeting one behaviour and completing the intervention activities where the desired behaviour is carried out (e.g. in shops to encourage the buying FSC products).

A really successful aspect of this project was the participation of the Zoo's junior volunteers and education interns in delivery. All individuals that took part in this project said that it pushed them out of their comfort zone has developed their knowledge and improved their confidence.

Comments on the initial feedback forms from the public included:

"Poppy was very interesting and great to listen to. She was very good."

Kelly (May 2013)

"The people we spoke to were very knowledgeable and enthusiastic, good to see young people leading the way!"

George (August 2013)

These comments indicate that involving young people as advocates portrayed positive messages to our visitors whilst also engaging with the topic.

Although the public engagement figures are based around adult engagement, it is important to note that children also engaged in the activities and were usually the ones that encouraged their parents to participate. By completing these activities through game play it targets all ages and is enjoyed by all age groups.

This is evident when looking at comments on the follow up questionnaire, for example:

“My children and I enjoyed the chat with the girls and it made us think more about the effect on our environment and the other species we share our planet with. The enthusiasm with which the talk was delivered was refreshing. Thanks”

Conclusion

In summary, the use of game-design thinking holds a lot of potential for creating sustainable lifestyle changes. Research indicates that it has successfully engaged Zoo visitors and initiated pro-environmental behaviour changes in a large proportion, after their visit. Using familiar games helps to reinforce messages in an enjoyable way that holds the visitors attention and is something to pursue further.

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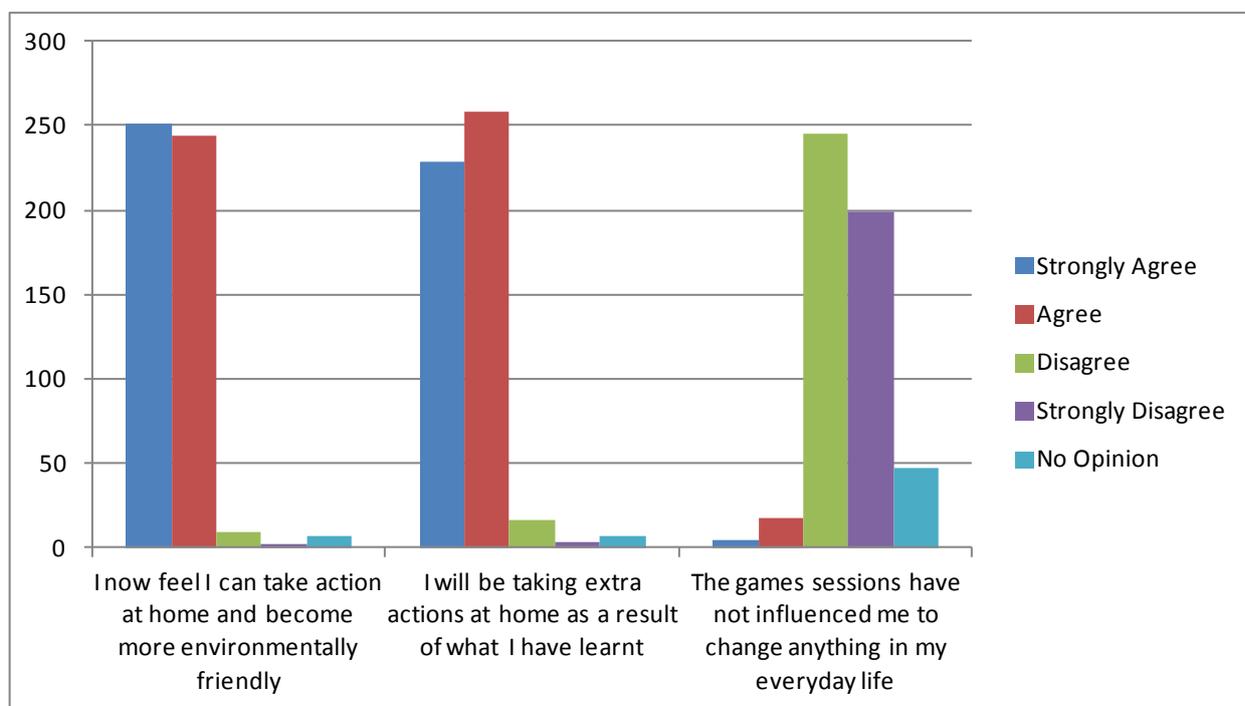


Figure 6. How many visitors feel they can now make a difference and will be making changes to their lifestyle because of the sustainable games (n=513).