

Learning to care for a real pet whilst interacting with a virtual one? The educational value of games like Nintendogs

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Abstract. Publishers and manufacturers of *virtual pet* games and products have also regularly claimed in their marketing literature, that their games and toys have worthwhile educational value - in other words they imply that simply by using their products can people learn to become better pet owners. At present these claims are entirely unfounded. However, if they are true then the impact of their educational value is potentially huge - games like Nintendogs, which, as of January 2008, has sold almost 18 million copies worldwide², do indeed have even the slightest educational value then the net improvement to the worldwide understanding of good pet-ownership and animal welfare could be tremendous. This paper outlines a research project aiming to test these claims.

1 INTRODUCTION

Games which exploit traditional features of computer-gameplay for educational benefit – so-called ‘serious-games’ – have generated widespread interest in recent years [1] and there are many recent examples of games being reported in the literature which have been specifically developed to promote learning of one kind or another in different subject areas and with different age groups (eg [2][3][4]). The majority of such games however have either been developed as research tools, or with their audience restricted in some way and it is still relatively rare to witness mainstream console game titles marketed as being largely educational in their design³. The idea that commercially successful games can also incidentally result in learning, or at least in putting across ideas and concepts, however is established to some degree: Squire in [5] gives a good overview of this – and, for instance, reports on the perceived urban-planning learning effects of playing games such as SimCity.

Publishers and manufacturers of *virtual pet* games and products have also regularly claimed in their marketing literature, that their games and toys have worthwhile educational value - in other words they imply that simply by using their products can people learn to become better pet owners. At present these claims are entirely unfounded. However, if they are true then the impact of their educational value is potentially huge - games like Nintendogs, which, as of January 2008, has sold almost 18 million copies worldwide⁴, do indeed have even the slightest educational value then the net improvement to the worldwide understanding of good pet-ownership and animal welfare could be tremendous. Additionally, perhaps on a lesser level, parents especially may like to test to see if their children are ready for the responsibility of owning the dog they always wanted.

There is very little previous work which analyses the educational impact of virtual pet games. Related frameworks for evaluating systems are mostly aimed at commercial software and are unable to cope with educational software appropriately [6], let alone a game

that might have education benefits. For instance, a usability metric for a commercial application may be that the user must not get lost in a ‘sea of information’. For deep learning to occur this may be exactly what is required in an educational package [7]. Many evaluation techniques, such as GOMS suggested by Card *et al.* [8], are designed to be used by HCI professionals and not educators. Evaluation methods that are used for evaluating educational software, such as heuristic evaluation [9], involve evaluation by teachers and not the learners who are ultimately the users of the software, and fail to assess whether actual learning has occurred after use. Other approaches make measurements such as time taken to accomplish a task [10] which relates to learning to use the software rather than learning from using the software.

In this paper we describe our approach to investigating whether common commercially available virtual pet games do indeed provide any beneficial education to children and young people in the care of real animals (specifically dogs) and secondly to determine whether playing such games could influence young people to find out more about caring for their pets than they might learn in the game. We were also interested to discover whether playing virtual pet games have any detrimental effect in younger people’s understanding of pet ownership. Our research has the ultimate intention to formulate recommendations to improve such games so that they provide quantifiable improvements in understanding pet ownership and animal welfare.

2 BACKGROUND

A virtual pet is an artificial companion that typically attempts to stimulate human-computer interaction by making the user feel responsible for it. Many virtual pets, visually at least, are often replicas of real animals such as cats and dogs though abstract creatures are not unknown, such as Furby. Millions of consumers worldwide have purchased these products, played with them, interacted with them, invested time in looking after them, and perhaps even become emotionally attached to them. Despite this huge financial and emotional investment by consumers, and an ongoing development and marketing investment by industry (new titles are appearing almost daily), academic interest in such products is virtually nil. This is surprising given the abundant activity in closely related fields such as social robotics [11], emotionally aware and affective computing [12], and the many diverse aspects of believable graphical agents [13][14].

A virtual pet is an artificial companion that attempts to stimulate human-computer interaction by making the user feel responsible for it. The concept gained worldwide popularity (and some notoriety) in the late 1990s when Japanese toy manufacturer Bandai released the handheld computer game, Tamagotchi. There have since have been numerous copycat products, mostly aimed at children, appearing on sale in high street stores for a few tens of UK pounds. Many such derivative games, unlike the Tamagotchi, feature simulations of real companion animals – mainly cats and dogs. Recent examples of these include Anipalz and Password Puppies. In their literature their website, the makers of Anipalz suggest that :

² For example, see view of Nintendo Press release January 2008 at <http://www.consoledigest.com/nintendo-announce-wii-and-nintendo-ds-sales-figures.html>

³ A recent exception to this is Dr Kawashima’s Brain Training game for the Nintendo DS.

⁴ For example, see view of Nintendo Press release January 2008 at <http://www.consoledigest.com/nintendo-announce-wii-and-nintendo-ds-sales-figures.html>

“For those of you looking for a real pet, start with these cute little virtual pets that will test...if you can quite cut it as a pet owner.”

Games like the Tamagotchi and Anipalz are delivered in a format that requires users to buy a complete electronic device – however there are numerous conventional game products that allow virtual pet software to run on a PC. The Petz series, which includes the games Catz and Dogz (as well as more recent and much more curious titles such as Hamsterz and Tigerz), uses animated instances of familiar pet animals as the user’s virtual pet. Players (or ‘owners’), can choose their pet at the pet shop, look after their health, teach them tricks and so on – exactly as one would with a real pet. The Petz series in this way actually feels more educational when compared with other products. Indeed, Ubisoft’s Petz Executive Producer Tony Van, when interviewed about the recent release of the Petz series on the Nintendo DS, stated that:

“one value I always suggest is the player learning how to best take care of their pet, which translates to its use in the real world. This is valuable to both kids and adults, and if it results in one less abused animal in this world, that makes my job even more rewarding”⁵

Such a claim is remarkable – that by playing a computer game which involves caring for a virtual pet, people are able to train themselves to care for, and improve the welfare of, real animals.

Nintendogs, released by the Japanese games company Nintendo in 2005 for its handheld games console the Nintendo DS, is one of the fastest selling games titles of all time and has received consistently high reviews by a video-gaming press usually dominated by adult oriented first-person-shooter and action games enthusiasts. Nintendogs features an animated puppy which owners must feed, water, walk, wash, groom, play with and train. The Nintendogs themselves are animated implementations of real breeds of dog (such as Labradors and Chihuahuas) and move in highly believable animations. Nintendogs is unique in two aspects: firstly, users can actually touch their screen based pet through the use of the DS’s touch screen, and secondly users may exploit the wireless network capability of the DS to exchange puppies with each other and allow Nintendogs to visit another device and play with each other.



Figure 1. Can playing a virtual pet game on, for instance, the Nintendo DS improve children’s understanding of looking after real dogs?

The typical characteristics of Nintendogs owners are unclear – although it is easy to assume that the game is aimed towards children (Figure 1), some of Nintendo’s marketing for the game has clearly

been adult oriented. Additionally, Nintendo have claimed⁶ that 22% of Nintendogs owners are female compared to only 5% of players of their other early success for the DS platform, Mario Kart DS (a driving game). The games industry still appears to view female gamers as a largely hitherto untapped demographic and whilst early explicit attempts to exploit this potential market were largely seen as unsuccessful, many recent games such as the Sims, Animal Crossing and Nintendogs have shown that certain styles of game-play (for instance, ones that encompass creativity and emotional attachment as well as, or even instead of, tangible goals) are indeed very appealing to female buyers. It is often assumed that the popularity of these games with female players has been accidental – however this view does seem naïve if one considers the careful, often very conservative, but ultimately successful strategies of the two games’ publishers Electronic Arts (EA) and Nintendo and the burgeoning academic debate that is informing gender and gaming (e.g. [15]).

Although Nintendo have been careful not to over-hype the educational aspects of Nintendogs, they have reported the results of a, presumably commissioned, review of the game by a relationship psychologist who made the claim that:-

“it (Nintendogs) can not only help develop our attention spans and motor skills, but also improves our ability to solve problems and think creatively teaches us how to bond and provides us with a sense of nurture and responsibility(and has) emotional effects, helping to raise self-esteem and develop strategic thinking”⁷

Nintendo also teamed up with the charity Dogs Trust in the UK in 2005 during the launch campaign of Nintendogs. In a statement at the time, Dogs Trust marketing manager Adrian Burder stated:

"it's great that there's a game that is not only fun to play, but supports the message that responsible dog ownership means more than giving your dog an occasional stroke."

Once again, the implication of this marketing is that owing a virtual pet improves players’ understanding of the implications and requirements of looking after a real one.

Compared to the scarcity of published work in the understanding of the psychological impact of owning virtual pets, there is an abundance of long-standing literature examining the benefits regarding health, social well-being and status afforded by owning real pets (e.g. [16] [17]). In our own work we have already begun to adopt a multi-disciplinary approach to the understanding of virtual pets and companionship [18][19]. In particular we have looked at anthrozoological (human/animal interaction) studies which have attempted to quantify the benefits humans receive from interacting with real pets and companion animals. We have also investigated the role of both age [20] and gender [21] in our studies of virtual pets. We are curious to know whether people interact with virtual pets to gain some, or all, of the same benefits that are achieved by ownership and interaction with real pets, or, conversely, whether people interact with them for reasons that are unconnected – which would be at complete odds with manufacturers’ claims. Therefore, we are engaged in an ongoing set of work to compare people’s perceived benefits of interaction with both real and virtual pets.

More generally, we believe that there is a set of fundamental, unanswered, questions centered on the commercial interest in virtual pets which is has hitherto been overlooked. Sales figures and the very fact that many virtual pet products are squarely aimed at children and younger people indicates to us that more attention should be paid to the effects, both positive and otherwise, that such products have on their users, owners and players. Subrahmanyam *et al.* [22], in their well known analysis of the on the impact of home

⁶ Fils-Aime, R. Nintendo keynote speech at Montreal International Game Summit, November 2006.

⁷ This review was reported in a Nintendo press release, available at: <http://www.gamesforhealth.org/news/archives/000086.html>.

⁵ Interview on Gamasutra website at http://www.gamasutra.com/php-bin/news_index.php?story=11736

computer use on the development of children and adolescents, discuss the shift from real life to simulation in the context of virtual

pets but merely conclude that systematic research is needed to assess the impact of such technology.

Criterion	Scant evidence of any knowledge	Demonstrates some knowledge but could not be trusted to look after a puppy yet	Demonstrates a reasonable knowledge but would require supervision to look after a puppy	Adequate knowledge of puppy care	Detailed knowledge of puppy care	Comprehensive knowledge of puppy care
Subject is able to prepare for the arrival of a new puppy	Most answers left blank or clearly guessing.	Most obvious questions are answered correctly, but when asked to give lists, only one or two items are given, and more difficult questions are answered incorrectly.	Answers most obvious questions correctly and leaves the others blank. When asked to give lists, typically only one or two items are given.	Has a correct answer for most questions, but when asked to give lists, typically only comes up with one or two ideas.	Has a correct answer for all questions. When asked to give lists, typically comes up with two or three ideas.	Has thought through in depth, a wide range of issues relating to preparation.
Subject is able to care for puppy in the first few days and weeks of its life in its new home	Most answers left blank or gives dangerous answers.	Gives incorrect answers but not dangerous ones.	Could nourish a puppy but not train him.	No answers are incorrect but when asked to give lists, typically only comes up with one or two ideas.	All answers are correct. When asked to give lists, typically comes up with two or three ideas.	All answers correct and demonstrates a deep understanding of puppy care and training.
Subject is able to care for the puppy outside of the home	Most answers left blank or clearly guessing.	Few correct answers but hasn't really thought through all answers.	Some correct answers but hasn't really thought through all answers.	Mostly correct answers but hasn't really thought through all answers.	Could be trusted to take puppy away from home.	Could be trusted to take puppy away from home. Demonstrates thought for the best training for the puppy.
Subject is able to care for the puppy's welfare	All answers incorrect or blank.	Few correct answers.	Most answers correct.	Correct, but brief answers.	Correct answers.	Correct and comprehensive answers.
Subject is comfortable communicating with puppy	All answers incorrect or blank.	Few correct answers.	Most answers correct.	Correct, but brief answers.	Correct answers.	Correct and comprehensive answers.

Table 1 – Rubric (or Criterion Reference Grid; CRG) used to score participants' knowledge of dog ownership.

3 METHODOLOGY

We are currently involved in a study to examine the educational benefits from caring for a virtual pet; specifically, we want to test whether caring for a virtual puppy dog increases knowledge of care for a real one. The games chosen for our investigation are the long running Dogz title currently published by French games company Ubisoft and Nintendogs by the Japanese company Nintendo. Both games run on the Nintendo DS handheld games console. So far we have run a pilot study to test our method.

We have recruited two sets of participants – 20 eighteen year olds to pilot our data collection questionnaire, and 10 participants aged again aged 18/19 to use a DS for six weeks. No subjects in the batch of 10, or their households, had previously owned either a cat or a dog. None of them had previously played the two games used in the study. Our method took a longitudinal approach to examine the educational impact of owning a virtual pet. This entailed firstly assessing each participant's knowledge about acquiring, training and looking after a dog using the questionnaire specially designed, and piloted for this study with the first batch of participants. This was followed by a period of 6 weeks during which half were loaned a copy of either Dogz or Nintendogs, as well as a Nintendo DS, to play with in their own time. The other half were given an alternative game. During this period the first participants were instructed to keep a special diary detailing their interactions with their virtual pet as well as a record of any other ways in which they sought information on pet ownership. At the end of the six week period all participants returned the loaned game and console and were again given the questionnaire based assessment of dog ownership knowledge. Each questionnaire was scored using a rubrics-based approach to assessment. This is shown in Table 1.

5 CONCLUSION

So far, all our work has focused on testing, refining and validating our proposed method for studying the educational impact of owing a virtual pet. When complete, we intend to start data collection with children aged 12-14. This introduces additional hurdles to

overcome, which need to be resolved before we can even start to answer the question of whether virtual pets can make users better pet owners.

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