

# Science Cartooning: The Ideal Couple

## Extended Abstract

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### ABSTRACT

Traditional education continuously faces the challenge of encouraging students to care about the subject material. Edutainment (educational entertainment) has been one of the attempted solutions to this issue. There are several problems with existing edutainment; first, not all of it is created equal - topics in student and mental health are drastically underexplored compared to traditional lessons in science. Additionally, much of edutainment is still burdened with using traditional academic techniques as its core to engage the audience, with visuals and entertainment being used as an enhancement to the experience. However, entertainment is inherently based on tried and tested practices that engage the audience [Speer et al. 2009; Zak 2014]. This talk focuses on flipping this model. With edutainment, entertainment and user experience practices should be the core - with the details of the academic content being secondary to the overall experience. In this way, the subject material is not discussed in detail, and the primary goal is to excite the audience. My approach has been with science cartooning - writing comics and stories that communicate topics in health. Hired by the University of British Columbia (UBC) Digital Emergency Medicine team, I helped create an interactive graphic novel for the BC curriculum called *The Adventures of Patoo* [Mortazavi et al. 2018], which covers topics in physical and mental health for students in grades 4-7. The positive student and teacher feedback from the school pilots of *The Adventures of Patoo* is a good indication that edutainment does not have to carry much educational content. It can just be a teaser trailer.

### CCS CONCEPTS

• **Applied computing** → **Education**; *E-learning*; Computer-managed instruction;

### KEYWORDS

education, E-learning, interactive, design, storytelling

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### 1 INTRODUCTION

In a study conducted by the School of Population and Public Health and the Department of Emergency Medicine at the University of British Columbia (UBC), Hardiman and Ho used 2007-2008 survey data to determine that individuals with secondary and post-secondary education were more likely to use non-traditional health information sources before consulting conventional ones [Hardiman and Ho 2015]. Their findings suggest that educational attainment has a significant effect on the use of non-traditional sources first. It is also important to note that there is lots of evidence for storytelling and story reading helping memory retention and fostering learning [Barrett 2006; Speer et al. 2009], and studies have even demonstrated that the brain releases oxytocin - a neurochemical that plays a role in social bonding - when experiencing well-constructed narratives [Yang et al. 2013; Zak 2014]. These ideal conditions in interactive design and storytelling can help create a flow state - as Csikszentmihalyi describes in his research on optimal experience [Csikszentmihalyi 1990] - that enables the audience to draw a stronger meaning from the experience [Holt and Mitterer 2000; Zimmerman 2000]. Findings like these strengthen the notion that non-traditional sources of learning - given a professional vetting and refinement of their accuracy, story and user experience design - could have a significant impact on education. Our interactive experience *The Adventures of Patoo* was designed with many of these tenets in mind; making the basis of the graphic novel a meaningful narrative, while placing the detailed information about health in the periphery of the experience so as to not create a distraction.



Figure 1: *The Adventures of Patoo* home page [Mortazavi et al. 2018].

### 2 EXPOSITION

*The Adventures of Patoo* [Mortazavi et al. 2018] was published as part of the Learning for Life resources by UBC Digital Emergency



Figure 2: The three topics of *The Adventures of Patoo*. From left to right: sleep hygiene, mental health and nutrition.

Medicine, and has been accessible to BC teachers as of September 2016. A supplementary toolkit that includes teacher's resources and lesson plans was provided on the website as well. Based on an initial survey at the launch of the graphic novel in 2016, 77 people downloaded the toolkit [UBC 2018]. Forty teachers filled out the survey, with the toolkit being used for grade levels ranging from 4 and under to 7 and above [UBC 2018]. *The Adventures of Patoo* is an interactive graphic novel series designed for grades 4-7 in the new BC curriculum. Its success earned Digital Emergency medicine a new grant, which will let us expand on the website in the future. At its heart, the goal of our project was to tell a story about mental and physical health to young students. To do this, we needed to engage them outside of traditional means, and connect with them in a meaningful way. We dug deep into what we personally liked, and tried our best to make something that would excite our inner 10-year-old selves. I iterated through concept artwork of robots, fantasy creatures and other tropes of children's and young adult fiction, until I refined on a fictional world our team was proud of. Our solution was an interactive "choose-your-own-adventure" set in a whimsical world with both humans and robots. As of January 2018, there are three stories on *The Adventures of Patoo* website. The first story is *Sheep Trouble*, which focuses on a girl named Ellen whose day at school unfolds differently depending on the amount of sleep she gets the night before. The second story *Silent Emoji* is a rainy film noir that delves into mental health and peer support, with the lead character Darby struggling through a mental health crisis and eventually finding solace in her situation with the aid of her friend Patoo.

The third and most recent story is about nutrition, and focuses on the food groups and creating a balanced meal. It is a pirate-themed adventure starring Ellen and Patoo, in which they set out to buy groceries to make a delicious meal for a robot pirate chef in exchange for his treasure. For each graphic novel, researchers and key stakeholders for the project were consulted to ensure the clinical accuracy of the narrative content. Furthermore, school pilots were also conducted to receive feedback from the students and teachers and to evaluate the dynamics of the interactive graphic novel in the classroom setting. Overall, the pilots for *Sheep Trouble* and *Silent Emoji* were very well-received, with many students even requesting a longer story and more interactive options for the graphic novel [UBC 2018].

### 3 CONCLUSIONS

In this extended abstract, I have addressed the importance of creating edutainment with a larger focus on good storytelling and design, with educational jargon serving as a lower priority to the overall experience. In particular, graphic novels have the potential to reach wide audiences, and as demonstrated by the positive feedback from *The Adventures of Patoo* pilots, a closer collaboration between artists, designers, programmers and educators has the potential to make a significant impact on education. Student and teacher feedback from the most recent pilot of *Legend of Spaghetti* will be used to refine the creation of future interactive novels, and will be further discussed in the final talk. The talk will also contain a more detailed case study of *The Adventures of Patoo* development process, with learning outcomes on the challenges of interdisciplinary collaboration.

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