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“Tell a Tail”

The design of an AR comic book
for an animal welfare transmedia

MASTER'S DEGREE PROJECT

Sarah Louise Santos Oliveira

INTERNATIONAL MASTER OF INTERACTIVE MEDIA DESIGN

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“We learn about the world through stories”

Helen Papagianni

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Abstract

Tell a Tail: Caminho Incerto is an Augmented Reality comic book, part of a larger transmedia project, about animal welfare in Madeira island. The goal of this project is to educate, raise awareness and spread the love for animals. The comic book was designed for children, more precisely targeting children between 10 and 12 years of age.

Caminho Incerto is a “choose your own adventure type” comic book, where readers face various choices in a branching narrative that will lead to one of the four different endings. In addition to the comic book, an Augmented Reality application unlocks content upon scanning special markers disseminated in the comic book where users can watch augmented 3D scenes depicting scenes from the comic book, from the character’s point of view.

Our project shows that augmenting traditional media (such as a comic printed book) with cutting edge technologies (like AR) can be efficient in delivering engaging content and have a positive impact to younger audiences, in particular, digital natives by creating immersive experiences.

Keywords: Branching narrative; Interactive Storytelling; Augmented Reality; AR; Transmedia Storytelling; Educational narrative

Resumo

Tell a Tail: Caminho Incerto é uma banda desenhada com Realidade Aumentada, parte de um projeto transmedia sobre o bem estar animal na ilha da Madeira. O objetivo deste projeto é educar, consciencializar e espalhar o amor pelos animais. A banda desenhada foi criada para crianças, mais precisamente crianças entre os 10 e 12 anos de idade.

Caminho Incerto é uma banda desenhada com uma narrativa ramificada, onde os leitores deparam se perante decisões que os levam a uma das quatro possíveis fins. Para além da banda desenhada, tem uma aplicação de Realidade Aumentada que desbloqueia conteúdos depois de fazer a captura de um marcador especial da banda desenhada. Depois de fazer a captura de um destes marcadores, os leitores podem ver cenas em 3D que retratam cenas que se passam na banda desenhada do ponto da personagem.

O nosso projeto mostra que a fusão entre tecnologias recentes (como a Realidade Aumentada) e mídias mais tradicionais (como uma banda desenhada impressa) é uma maneira positiva de criar a partir desses mídias, tornando-os mais envolvente para um público mais jovem, em particular nativos digitais, criando experiências imersivas.

Palavras-Chave: Narrativa ramificada; Narrativa Interactiva; Realidade Aumentada; Narrativa transmedia; Narrativa para educação

Table of Contents

Chapter I: Introduction	1
1. State of the World	1
2. Storytelling	3
3. Objectives	5
Chapter II: Background	6
1. Interactive Narratives	6
1.1 Types of Interactive Narratives	6
2. Types of Interactive Stories and Comic Books	8
2.1 Choose Your Own Adventure Books	8
2.2 Augmented Reality	11
2.3 Research Opportunities	17
Chapter III: Context Research	19
1. Questionnaires	19
1.1 General Public	19
1.2 NGO's and Kennels	20
2. Field Research	21
2.1 SPAD	21
2.2 Municipal Kennel of Funchal	22
3. Discussion and Conclusions	23
Chapter IV: <i>Tell a Tail: Caminho Incerto</i> Project	27
1. <i>Tell a Tail: Branding</i>	27
1.1 <i>Unleashed Studio</i>	27
2. <i>Tell a Tail: Transmedia World</i>	28
3. <i>Tell a Tail: Caminho Incerto: Comic Book</i>	33
3.1 Guidelines that shaped <i>Tell a Tail: Caminho Incerto</i>	33
3.2 Story, Characters and Narrative Structure	33
3.3 Characters Profile	37
3.4 <i>Caminho Incerto</i> – branching narrative structure	39
4. <i>Tell a Tail: Caminho Incerto: Graphic Design</i>	45
5. <i>Tell a Tail: Caminho Incerto: Augmented Reality Mobile Application</i>	49
5.1 Guidelines that shaped <i>Caminho Incerto AR</i>	50
5.2 Story	50
5.3 AR Points	52
5.4 Interface and Implementation	61

Chapter V: Evaluation of <i>Tell a Tail: Caminho Incerto</i>	67
1. Pilot Study	67
1.1 Observations results	67
2. User Study	69
2.1 Methodology	69
2.2 Results	71
Chapter VI: Future Work and Conclusion	82
References	84
Appendix 1: Field Visits	86
Appendix 2: Comic Book Storyboard	91
Appendix 3: AR application Script & Storyboard	115
Appendix 4: Questionnaires	125
Appendix 5: Comic Book	145

List of Figures

- Figure 1:** Facebook posts and news articles about animal issues in Portugal.
- Figure 2:** Posters of Animal Welfare campaigns in Madeira
- Figure 3:** “A Typology of Interactive Narratives” by Benjamin Houget
- Figure 4:** Choose Your Own Adventure Books by Edward Packard
- Figure 5:** Meanwhile by Jason Shiga
- Figure 6:** Adventure Time: Choose Your Own Adventure Time
- Figure 7:** Unwritten #17
- Figure 8:** Milgram & Kishino Reality-Virtuality Continuum
- Figure 9:** Little Red the Inventor by Wonderscope
- Figure 10:** MagicBook and some examples of its applications
- Figure 11:** Masters of The Sun AR Application
- Figure 12:** Modern Polaxis
- Figure 13:** “*Animal Welfare is something that worries me a lot*”. Chart from the general public questionnaire
- Figure 14:** “*In your opinion, what are the main reasons for abandonment?*” Chart from the general public questionnaire
- Figure 15:** “*Do you think schools can play an important part in the education about how to take care of animals?*” Chart from the NGO/Kennel questionnaire
- Figure 16:** Photos of the Visit to SPAD
- Figure 17:** Photos of the Visit to the Municipal Kennel of Funchal
- Figure 18:** Map of the regions NGOs, kennels, and collection centres

Figure 19: Mind map of all the findings of Animal Welfare Issues in Madeira

Figure 20: Diagram of topics approached in the *Tell a Tail* Transmedia

Figure 25: Screenshot of *Unleashed* website

Figure 26: Screenshot of *Unleashed* blog

Figure 27: Story Arch for *Tell a Tail: Caminho Incerto*

Figure 28: Family's profile card

Figure 29: *Cool Kids* profile card

Figure 30: Initial sketches of the story's characters

Figure 31: *Tell a Tail: Caminho Incerto* story path in Twine

Figure 32: Flowchart of *Tell a Tail: Caminho Incerto* with AR points

Figure 33: Overview of story points that compose Path A - Adopt

Figure 34: Overview of story points that compose Path B - Buy

Figure 35: Storyboard of a spread of the comic book

Figure 36: The chosen colour pallet for the comic book

Figure 37: First comic book page layout prototype

Figure 38: Second comic book page layout prototype

Figure 39: Illustrative example of a comic page with coloured paths to follow

Figure 40: AR icon and final comic page with an AR icon

Figure 41: Initial ideas for the AR application

Figure 42: Initial AR interface prototype

Figure 43: AR final interface using AR CORE and illustrating the merge between 2D and 3D

Figure 44: AR1 Interface in ARCore and the comic book trigger page

Figure 45: AR2 Interface in ARCore and the comic book trigger page

Figure 46: AR3 Interface in ARCore and the comic book trigger page

Figure 47: AR4 Interface in ARCore and the comic book trigger page

Figure 48: AR5 Interface in ARCore and the comic book trigger page

Figure 49: AR6 Interface in ARCore and the comic book trigger page

Figure 50: AR7 Interface in ARCore and the comic book trigger page

Figure 51: AR8 Interface in ARCore and the comic book trigger page

Figure 52: AR9 Interface in ARCore and the comic book trigger page

Figure 53: AR10 Interface in ARCore and the comic book trigger page

Figure 54: AR11 Interface in ARCore and the comic book trigger page

Figure 55: AR12 Interface in ARCore and the comic book trigger page

Figure 56: Example of an animation sprite sheet where Penny is happy and talking

Figure 57: Sprite animator in Unity

Figure 58: Unity screenshot: Spline

Figure 59: Unity screenshot: String ID and Flowchart

Figure 60: AR Instructions and visual cues in ARCore

Figure 61: User's Journey of *Tell a Tail: Caminho Incerto*

Figure 62: Scanning a trigger page, detecting it and opening the AR world

Figure 63: *Macaronight* pilot study photos

Figure 64: Smiley-o-meter for the questionnaires

Figure 65: User tests age demographic

Figure 66: “The duration of the comic book is” (left) and “I liked that the comic book had various branches to follow” (right) Response chart

Figure 67: “I liked that there were various branches to follow” Response chart

Figure 68: “Do you feel that by using AR you created a bigger bond emotionally with Penny?” Responses Chart

Figure 69: “With the application you got to know Penny better” (left) and “AR augmented the pleasure of reading the comic book” (right) Responses Chart

Figure 70: “Do you think AR helps to learn?” Responses Chart

Figure 71: “The duration of the comic is” (left) and “I liked that the comic book had various branches to follow” (right) Response Chart

Figure 72: “I liked that I was responsible for taking the decisions that affected the story” Response Chart

Figure 73: “What type of decisions did you want?” Response Chart

Figure 74: “Is it better to adopt or buy a dog?” Response chart on the before questionnaire

Figure 75: “Is it better to adopt or buy a dog?” Response chart on the after-questionnaire Group AR (left) and Group NOAR (right)

Figure 76: “With what frequency do you think it's important to take an animal to the vet?” Response chart on the before questionnaire

Figure 77: “With what frequency do you think it's important to take an animal to the vet?” Response chart of Group AR (left) and Group NOAR (right) on the after questionnaire

Appendix Figures

Figure 78: SPAD: Cleaning The Cages

Figure 79: SPAD: Sponsored Dogs Cage

Figure 80 Comic Book Storyboard – Beginning

Figure 81: Comic Book Storyboard – Beginning 2

Figure 82: Comic Book Storyboard – Path A (1)

Figure 83: Comic Book Storyboard – Path A (2)

Figure 84: Comic Book Storyboard – Path A (3)

Figure 85: Comic Book Storyboard – Path A (4)

Figure 86: Comic Book Storyboard – Path A (5)

Figure 87: Comic Book Storyboard – Path A (6)

Figure 88: Comic Book Storyboard – Path A (7)

Figure 89: Comic Book Storyboard – Path A (8)

Figure 90: Comic Book Storyboard – Path A (9)

Figure 91: Comic Book Storyboard – Path A (10)

Figure 92: Comic Book Storyboard – Path A (11)

Figure 93: Comic Book Storyboard – Path A (12)

Figure 94: Comic Book Storyboard – Path A (13)

Figure 95: Comic Book Storyboard – Path B (1)

Figure 96: Comic Book Storyboard – Path B (2)

Figure 97: Comic Book Storyboard – Path B (3)

Figure 98: Comic Book Storyboard – Path B (4)

Figure 99: Comic Book Storyboard – Path B (5)

Figure 100: Comic Book Storyboard – Path B (6)

Figure 101: Comic Book Storyboard – Path B (7)

Figure 102: AR Storyboard - Sequence of Events of AR1

Figure 103: AR Storyboard - Sequence of Events of AR2

Figure 104: AR Storyboard - Sequence of Events of AR3 & AR9

Figure 105: AR Storyboard - Sequence of Events of AR4

Figure 106: AR Storyboard - Sequence of Events of AR5

Figure 107: AR Storyboard - Sequence of Event of AR6

Figure 108: AR Storyboard - Sequence of Events of AR7

Figure 109: AR Storyboard - Sequence of Events of AR8

Figure 110: AR Storyboard - Sequence of Events of AR10

Figure 111: AR Storyboard - Sequence of Events of AR11

Figure 112: AR Storyboard - Sequence of Events of AR12

List of Tables

Table 1: Each line represents an AR SDK's/Applications and each column the desired feature

Acronyms

AR – Augmented Reality

VR – Virtual Reality

SDK – Software Development Kit

NGO'S – Non-Governmental Organizations

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Chapter I: Introduction

1. State of the World

Animal Welfare is a worldwide trend topic, being a major concern for today's society. Awareness around this topic has been growing, and as a result, people are becoming more conscious of their environment and surroundings. The term animal welfare was created in relation to the health state and quality of their space [9]. More recently, however, there has been a discussion that animal welfare should be entirely about the animal's feelings as they could be in perfect health conditions and have a good shelter but still be feeling anxious. Consequently, new definitions arose. According to the American Veterinary Medical Association, animal welfare cares for the wellbeing of animals and how these are coping with the conditions they live. A good state of welfare is when the animal is healthy, well-nourished, safe, able to express innate behaviour, and not suffering from unpleasant states such as pain, fear, and distress [1].

This project, however, will be focusing more precisely on the welfare of domestic animals. Before narrowing the issue locally, we conducted a broader research on the topic. The last statistics from the World Health Organization (WHO) in 2011 estimated that there were more than 200 million stray dogs worldwide [24]. In Europe alone there are significant differences between countries. In England, on the government's website, there is a section for animal welfare where they provide guidelines on how to properly practice the welfare for a specific animal [25]. This may seem like a small act but goes to show that it is not a topic that is overlooked or dismissed. In the case of Holland, they have been named the first country in the world not to have any stray dogs in their streets [26]. Through nationwide sterilization programs, updated vaccines to control the spread of diseases, implementation of laws against neglect and animal abuse and raising the taxes on store-bought dogs to promote the adoption of animals. All this contributed to controlling the problem and reducing, or in this case, eliminating stray dogs.

In Portugal and Madeira Island, however, the issue is still quite problematic, as the number of animals collected in only 2018 was around 36 thousand animals. [11] "The

number of abandoned animals in Portugal continues to be very expressive, a reality that leaves the Order of Veterinary Doctors apprehensive face to the capacity of Official Collection Centers to collect and treat these animals" [12]. Nearly every day there are posts on Facebook groups or on the local paper about issues that occur around the country, for example abandonments, malnutrition, lost animals, rescued animals and stray dogs as seen in Figure 1.



Figure 1: Facebook posts and news articles about animal issues in Portugal.

In Madeira Island, the context where this research develops, adoption campaigns and free sterilization for animals (see Figure 2), as well as implementation of new laws and governmental are trying to address the issue. We can see considerable efforts that have been made to change things, but it is still not enough.



Figure 2: Posters of Animal Welfare campaigns in Madeira

The general population and the lack of knowledge regarding Animal Welfare topics, is part of the problem. For example, there is a miseducation on how animals should be properly treated, what rights they have, and how they are unique individuals with feelings “As their findings emerge, we gain a more enlightened perspective of the diverse expression of animal emotions” [3]. The Veterinary Physicians Association in Portugal also believes that the solution is not in creating more spaces to shelter animals but in the education of the population through awareness campaigns. The association's president reinforces how education should be focused mostly on children and educate them in what it really is like to own a pet and all that revolves around that. In his words: "There is a need of converging efforts policies and awareness campaign. That will eventually provide some effects in the years to come" [11]. As a result of this miseducation, new subjects have been created in Portuguese schools that tackle issues of the present world, one being animals, and how they deserve to have rights and how they interlace with humans. [27]

2. Storytelling

Stories are a natural and vital element of people’s daily lives, it is a way to make sense of the world around us. Stories can imprint messages in our subconscious and eventually in our belief system [28]. "Researchers have found that the brain activity that occurs when we read fiction is very similar to experiencing that situation in real life" [29] Children are usually exposed to stories as these serve as a way to translate the real world into a narrative, simple enough for them to understand and process. Reading stories can enrich the child's life and expand their view of the world. [17]

Various narrative formats have been explored and created to expand the ways we tell stories in more exciting and novel manners. One example is transmedia storytelling. “Transmedia storytelling is a story format where a story unfolds across multiple media platforms, with each text making a distinctive and valuable contribution to the whole” [30]. It contains a world filled with stories that can enrich educational concepts with game-based learning or experiential learning. “Using mixed reality-based education we can blend formal and informal learning spaces to create an environment of engaging continuous learning” [19]. It has the advantage of being accessible to a broad range of audiences because it has more entry points into the narrative. Each new medium can portray unique content by highlighting details and facts that were not present in the previous renditions, giving the audience a deeper connection to the narrative world encouraging further exploration and a participatory environment, making them invest time in learning about all the different aspects [19].

Nevertheless, a significant and intrinsic limitation of transmedia is that it requires a more advanced media-literacy because of the complex narrative structure. When considering children as the consumers, creators should take into account their information-processing capabilities, memory capacity and their attention span [6].

Furthermore, transmedia when used as a tool in introducing social change, is called “Transmedia For Change”, a term coined by Robert Pratten [19]. Pratten, believes that the story is the main component of the experience, and needs to be told to the right people at the right time [19]. Complementing on Robert Pratten vision, Nedra Weinreich says the creation of such type of transmedia should provide Immersive Engagement. According to her, Immersive Engagement can be achieved by combining different elements such as: Behavior Change, Good Storytelling, Ubiquitous Media, Participatory Experience and Real World [14]. Each one of these elements has a specific function in the experience. In order to function and provoke change, the narrative must be engaging, not only the topic it tackles but the content of the story itself. A good practice is crafting real characters, believable conflict and good story arch to make it believable. In the story the problem should be exposed, and after a way to resolve that problem should be displayed "put your audience in situations where they need to make decisions related to the actions you want your audience to take, and show the consequences of those decisions" [14]. Therefore, all the different mediums should work together, taking advantage of their strengths and paying attention to their weaknesses.

3. Objectives

The goal of the project, which this thesis is part of, is to create a transmedia world where our target audience can be immersed and engaged with the transmedia, while gaining awareness about good Animal Welfare practices and all the issues inside this topic. The transmedia world created is called *Tell a Tail* and is composed of two parts, the Augmented Reality (AR) comic book, *Tell a Tail: Caminho Incerto* and *360° Tell a Tail*, a 360° documentary with Virtual Reality (VR). The comic book is targeted to children from 10 to 12 years old while the documentary is targeted to teens from 15 to 17 years old. The two story-artefacts are referenced in one another's story world, encouraging the audience to continue exploring the common theme that is Animal Welfare. Within the same world and theme, the projects explore different topics and views. The transmedia focuses on "creating social impact by using storytelling to raise awareness and influence action" [31]. We strive to portray the reality and complexity of life, depicting life in a raw sense or form, with all the problems that come with it and use technology as a way to supplement this.

This thesis will specifically focus on the design and effects of *Tell a Tail: Caminho Incerto*, the AR comic book.

Chapter II: Background

1. Interactive Narratives

Interactive narratives existed well before digital technologies came about. They were in the form of: oral storytelling, participatory rituals, theatre and later to choose your own adventure books. More recently, interactive narratives have been defined as the art of telling stories with the use of technological, social or collaborative interactive features. Interactive stories imply that there is some form of interaction between the story and the reader; these interactions mostly being simple acts of scrolling, clicking or/and turning the page. They are non-linear narratives that do not stick to a straight outcome, taking in several variables on different aspects of the story. This type of narrative was created to mimic the real world, where everything is intertwined and connected, showing the intricate mechanics of the world and the actual weight of each decision. These stories are more demanding for the reader and for this reason they should be more rewarding than the typical linear story, as it has the reader's imprint, their choice and their path [4].

1.1 Types of Interactive Narratives

Interactive narratives are complex artifacts, as it has a flexible story structure. Characters and plot lines branch out and change throughout the narrative as they must include a way for the reader to influence, intersect and mould the story in some way. Benjamin Houget created "A Typology of Interactive Narratives" consisting of six different types of Interactive narrative structures, as seen in Figure 3 [4].

#2 Narrative structures

A typology of interactive narratives

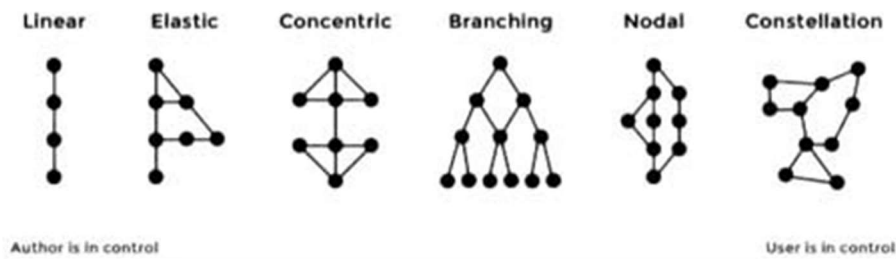


Figure 3: “A Typology of Interactive Narratives” by Benjamin Houget

The interactions between the story and the reader are often presented in the form of choices for the audience to make. These choices should be coherent and necessary: “Without choices, the story never moves forward, and the narrative becomes irrelevant” [4]. Nevertheless, the coherence of the narrative should be kept at all costs. According to Hoguet, the more complex the narrative is, the more the user is in control, as they choose their way throughout the storyline and change the outcome of the story [4]. “A key issue in interactive storytelling is how to generate stories which are, at the same time, interesting and coherent” [2].

The points of interaction can be plot-based or character-based. Plot-based means that there will be significant changes of the over plot and character-based means that the reader can intervene at any point of the story because ultimately, they are the character. However, a character-based approach makes the ongoing plot unpredictable and confusing as to where a plot-based approach, even though the choices are limited, has a better chance to guarantee coherence and dramatic power.

As a result, the story follows loosely a branching narrative, not being confined to its pre-determined structure and a plot-based interaction because even though it is a more limited intervention for the reader, we have better control over the plots and guarantee a satisfactory narrative.

2. Types of Interactive Stories and Comic Books

2.1 Choose Your Own Adventure Books

Choose your own adventure books have been around since the '70s and are a popular genre inside interactive narratives. Edward Packard was the first to publish this format where he created a whole series called “Choose Your Own Adventure” (see Figure 4). These types of books added another layer of interactivity to the act of reading, as they invite the reader to take an active role in them. By using a branching narrative format, they make it possible to have a series of choices that lead to unique paths and multiple endings, giving the sensation of freedom to the reader and making every decision relevant. These books were initially targeting children from 7 to 14 years old [22].

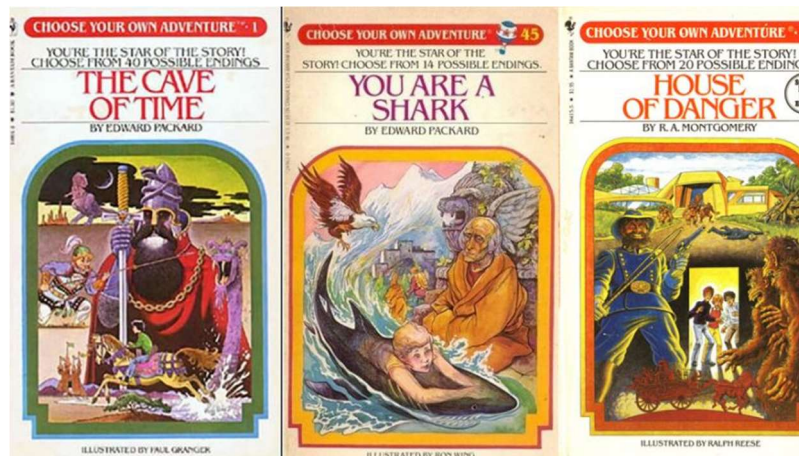
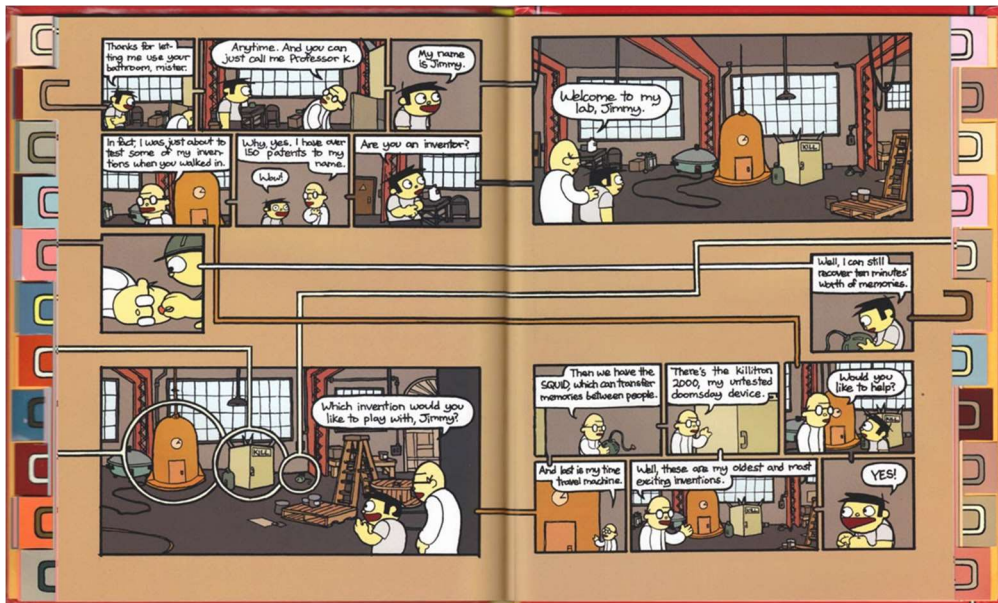


Figure 4: Choose Your Own Adventure Books by Edward Packard

Visual narratives exploited the potential of the “Choose your own adventure” type of structure in, for example, video games, graphic novels and comic books. In this section there are some interesting examples of comic books created inside this genre that inspired and helped create *Tell a Tail: Caminho Incerto*.

Firstly we have *Meanwhile* by Jason Shiga [32] (see Figure 5). It focuses on a little boy named Jimmy and his journey. The choices in the comic book are all about life choices for Jimmy, starting with simple and what seems uncomplicated choices that then roll into a great big tangled web of intersections that then lead to new adventures and many possible endings.

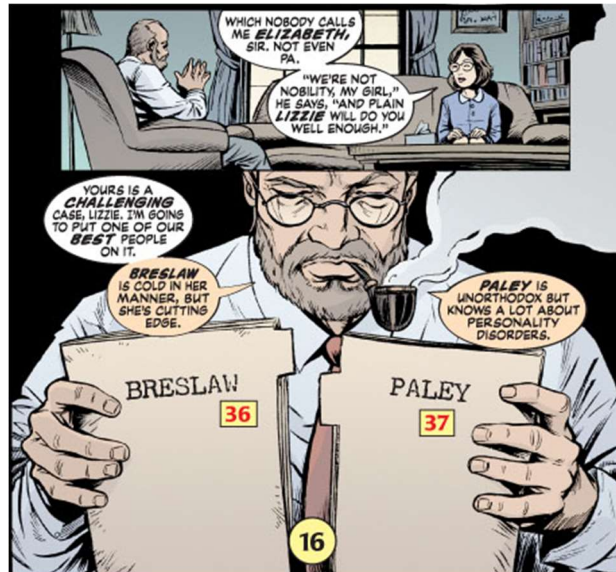
The author created visual cues on the page for the reader to follow their path, leading to tabs on the end of the pages aiding the reader on what page they should go to.



¹Figure 5: *Meanwhile* by Jason Shiga

Another example is *Adventure Time: Choose Your Own Adventure Time* [33] (see Figure 6). This comic offers a simple plot-based interaction narrative where the reader gets to be the two main characters and choose what adventure they should follow. The authors added a visual aid on the page with the choices and paths, colour coordinating them, facilitating the navigation through the different panels. This way, the reader does not get lost when reading.

¹ <https://www.wired.com/2010/04/take-your-pick-with-meanwhile-by-jason-shiga/>



³Figure 7: Unwritten #17

This example demonstrated that making choices for only one character may seem limited at first as it requires profound and careful attention to detail but can create a more significant connection to that specific character. This makes the reader more careful when pondering their choices as they will have a closer connection with that character.

2.2 Augmented Reality

Höllerer and Feiner define AR systems as those that combine “real and computer-generated information in a real environment, interactively and in real-time, and which align virtual objects with physical ones. Zhou, Duh, and Billinghurst define AR as a technology “which allows computer-generated virtual imagery to exactly overlay physical objects in real-time” [18].

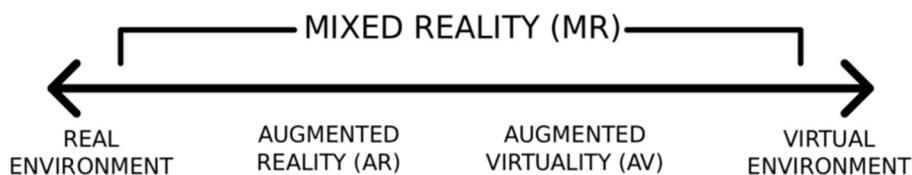


Figure 8: Milgram & Kishino Reality-Virtuality Continuum

³ <https://www.dccomics.com/blog/2018/10/30/a-pick-a-story-adventure-in-the-unwritten-17>

In Milgrams and Kishino's reality-virtuality continuum diagram (see Figure 8), AR is the closest to the real environment extreme. In the real environment, we have substantial interactions made of space, time and material conditions of the physical world. On the further end, there is Augmented Virtuality (AV). Augmented Virtuality is when a virtual environment is controlled by the physical world, it is the closest to a virtual environment. Virtual environments are artificial simulations, recreating real environment imagery and enhancing them as Virtual Reality (VR) [5].

AR and VR are very closely tied since the concept of AR grew as an extension and variation of VR. Both are interactive, immersive and include information sensitivity. The difference is that in AR, there are computer-generated images superimposed in the real world, whereas in VR, the user is fully immersed into a virtual world.

AR content can be triggered in many ways, from simple marker-based targets like QR codes to markerless. Marker-based are the most common throughout AR apps and are used when the author wants to focus on the target. Marker-based AR requires an image/marker to be detected by the device's camera in order to show the rendered image/product. Markerless AR, on the other hand, does not need any image to render the content. It detects flat surfaces in the environment and renders the objects to that area. It is mainly used when the objective is to focus on the environment and the location, using sensors to place the AR objects correctly.

Furthermore, as AR pioneer Ronald Azuma succinctly explained "AR allows the user to see the real world with virtual objects superimposed or composited with the real world. Therefore, AR supplements reality, rather than completely replacing it." [18] Ronald Azuma and other researchers defined three main characteristics should for the implementation of AR [2] :

- 1- Combination of real-world and virtual elements;
- 2- Interactive in real-time;
- 3- Registered in 3D

Storytellers were inspired to evolve and create content adapting to new technologies, as they are on the rise and an essential part of human life. With this, new exciting communication mediums emerged. AR presents a vast possibility of what can be created within it, as it can bring a story to life by literally bringing the story into the real world. It allows digital content to overlay the real environment seamlessly, where the format of

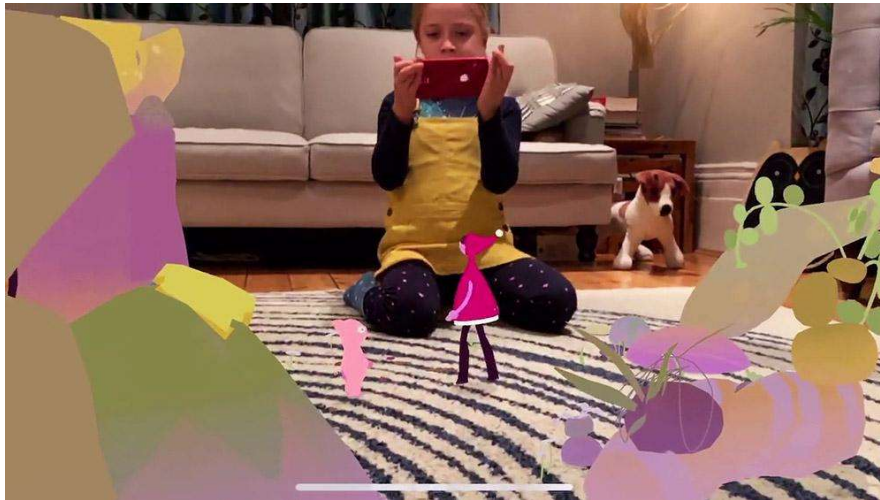
the content can be varied, from audio, text, 2D and 3D objects, video to even olfactory and tactile information. New advancements in technology permit AR to be compatible with small devices such as smartphones. With smartphones being more and more mainstream, AR is becoming more accessible to the masses, thus gaining popularity, therefore “this is a critical time to be exploring the capacity for storytelling in AR” [18].

2.2.1 Augmented Reality for Children

Children from today's day and age are digital native users, as they spend a lot of their time online on digital media. A study conducted in the UK found that children spend twice as long looking to a screen as to playing in real life. “By the time they reach the age of seven, children will have been looking at screens for the equivalent of 456 days” [23]. AR can be a way to interlace the real world with the virtual world, as it enables children to explore and understand spatial relationships and interactions of elements within a 3D space [10]. They can seamlessly interact and move between the real and virtual world, enhancing creativity and imagination. “AR holds unique potential to impact this situation by providing children to engage their imagination as they explore and interact with the world around them.” [8]. Augmented books open a new door to creating stories in new interfaces. It provides a means for enhancing regular books with interactive visualisations, animations, 3D graphics and audio. The purpose of adding such features is in creating engaging user experiences, enriching the reading experience and facilitating the learning process. “AR technology has great potential to offer students 3D presentations and interactive experiences that are likely to appeal to digital native learners.” [7].

Various studies have been made targeting children, to understand if in fact AR could be a way to enhance and facilitate the learning experience [10,13,16]. In one of these studies, a classroom was divided in two groups. In one group, children learnt about a topic from a simple textbook and in the other group, they learnt about that same topic, but with the help of an AR application. In the end, it was concluded that those that had the AR application had better results in the final test than those that only had the textbook. This shows that engaging content is more easily memorable than merely reading and memorising [13].

One of the great inspirations for *Caminho Incerto's* AR application was *Little Red the Inventor* by Wonderscope (see Figure 9) from its engaging 3D imagery to the compelling storytelling [34]. The story loosely follows the classic tale “Little Red Riding Hood”, where the reader follows a girl through the woods intending to bring her grandmother food, but along the way finds a big bad wolf. Wonderscope reused a classic tale and made it more current and modern. They utilised clean and simple graphics and converted a text-based experience of reading into a 3D animation version, using the real world as their background. The approach used for this application was a gamified version of a story, making users having to complete tasks like talk to the application for the next sequences to unlock, as users go around the story world to continue listening and viewing the 3D animation. Users can seamlessly roam around the virtual space making them feel like they are inside the story themselves.



⁴Figure 9: Little Red the Inventor by Wonderscope

Consequently, *Caminho Incerto's* AR application, aims at creating a story inserted in a magical world, a world that can be viewed inside the homes of the readers in conjunction with the comic book, richening the experience by providing extra content. Furthermore, by following the characters around, *Caminho Incerto* introduces another layer of interaction, one where the reader must follow around a character and view the story from their point of view.

⁴ <https://vimeo.com/302244305>

2.2.2 Augmented Reality Comic Books

MagicBook (see Figure 10) was one of the first projects with a mixed reality interface, combining a physical book with AR and VR. Even though the book is not a comic book, it showed the way to combine traditional media with new media. The book was made to be experimental and not focusing on a particular thematic. *MagicBook* is a standard printed book with pictures and text that can be read regularly or with the use of the AR to view the models in 3D. Its interface can be used by several users, viewing the model simultaneously (with their own devices). If users want to dive into the VR world, they must flip a switch that appears in the AR and navigate; to go out of that world, they have to flip the switch again. If one user is in AR mode and another in VR, the AR shows a small virtual avatar of that person [5].



⁵Figure 10: MagicBook and some examples of its applications

Masters of The Sun - The Zombie Chronicles (see Figure 11) is a comic book that includes AR and VR. The comic book is about a hip-hop group, based in L.A., where a zombie outbreak happens led by an ancient alien god. The group must fight the zombies in order to combat evil. The comic serves as an allegory to the 1980 crack outbreak, which the authors believe having been orchestrated by the government to reduce the black community. The comic book depicts the story and can fully exist without the technology, but the experience that the technology brings, makes the experience unique and more immersive. With the AR, the readers can see special effects, 3D models and listen to sound effects [35].

⁵ <https://www.youtube.com/watch?v=tNMljw0F-aw>

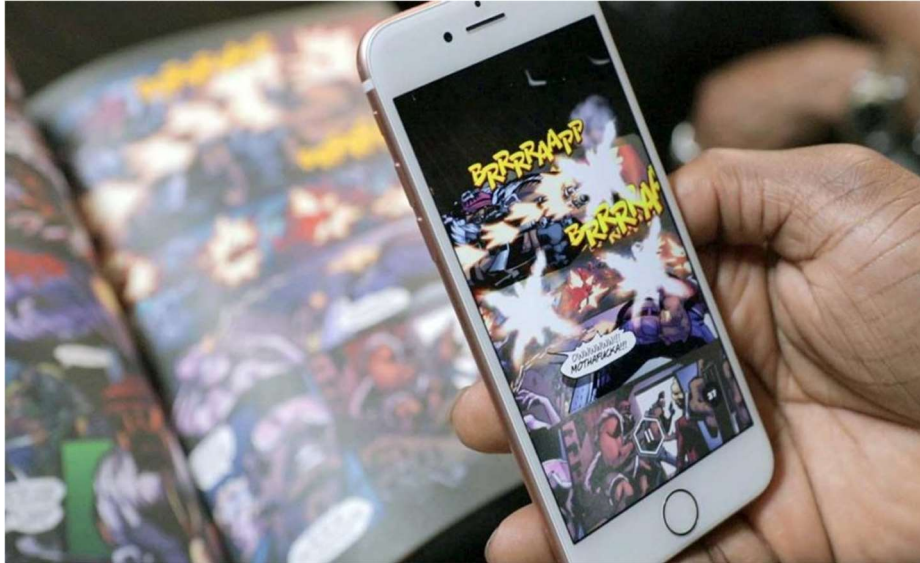
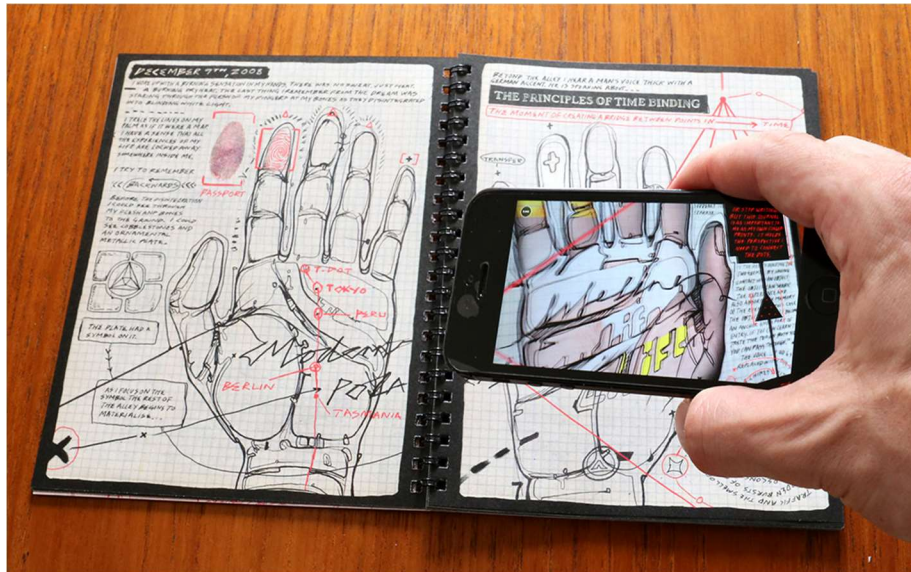


Figure 11: Masters of The Sun AR Application

This example was particularly inspiring as we saw the potential in creating a AR comic book where the reader uses AR as a complement rather than a repetition on what the comic book already says.

Modern Polaxis (see Figure 11) is also an AR comic book, this time about a paranoid time traveller known as Modern Polaxis. He writes in his journal about his daily life and puts all his secrets, paranoid delusions and conspiracy theories in there. The secrets Modern Polaxis hides in his journal can only be viewed through the AR, uncovering parts of the story that otherwise would not be seen otherwise. So the AR, comes as a way to uncover further parts and details of the story [36].

⁶ <https://www.youtube.com/watch?v=mqbwgqoF64Q>



⁷Figure 12: Modern Polaxis

Caminho Incerto's AR application was created with this in mind, by creating extra content that otherwise could not be accessed, giving a level of excitement and mysteriousness on what the AR will unlock, making it more appealing for the readers to use the application.

2.3 Research Opportunities

Comic books were for a long time associated to readers with low literacy and limited intellectual accomplishments. This was due to its graphical format, easiness to follow and understand [20]. However, the medium has matured into depicting more serious, deep and meaningful topics, becoming a more erudite genre. Comics have the advantage of creating a narrative where readers acquire information and ideas in a faster way. Especially, when compared to reading text, it is an easier to convey complex concepts through imagery [20]. Will Eisner wrote: "When this language is employed as a conveyance of ideas and information, it separates itself from mindless visual entertainment. This makes comics a storytelling medium." [20].

Combining AR and storytelling is a rising research and application area, as it is a way to combine a new media with traditional media, creating better and more engaging

⁷ <https://www.youtube.com/watch?v=5jhDF0CJT0A>

experiences. "AR is no longer just about the technology, it is about living in the real world, and creating magical and meaningful experiences that are human-centred." [18]. Through this research, we identified that the combination of, "choose your own adventure comic books" with AR lacks some exploration. Comics and AR are both interactive and immersive media, that can create meaningful bonds between the audience and the characters and immerse the reader in the story world, enhancing the overall message and power of the story.

Chapter III: Context Research

To better understand Animal Welfare in the context of Madeira, we conducted questionnaires, interviews and field research. The goal of the research was to gain some insights into what Madeirans thought about the thematic and find out what issues arise. Regarding the NGO's and kennels, the research was about discovering what aspects of animal welfare are important to them and what solutions they propose and practice. The applied questionnaires can be fully consulted in Appendix 3.

1. Questionnaires

We created two online questionnaires: one for the general public and another for Non-Profit Organizations (NGO's) and local kennels. The questionnaires were directed to the general Madeiran population and distributed online through Facebook.

1.1 General Public

Overall, 219 people answered this questionnaire. The questions were more about personal and based on people's daily lives and their opinion. Generally, the answers did not vary much as most participants had the same opinions, ideals and views about the topic approached, as seen in Figure 13.

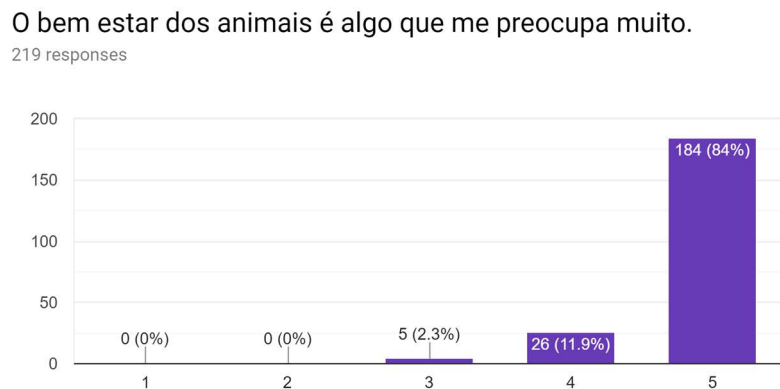


Figure 13: “Animal Welfare is something that worries me a lot”. Chart from the general public questionnaire

In Figure 14, it can be visualized that the only instance there was a more disperse type of response was an opinion question on the main reasons for abandonment. This particular question was important for this thesis project as it showed us how diverse the issue of

abandonment is and how the factors for it can range from person to person. The top results were: the animal was a present and then they did not want the animal anymore, lack of money for the veterinary bills and the animal makes too much noise.

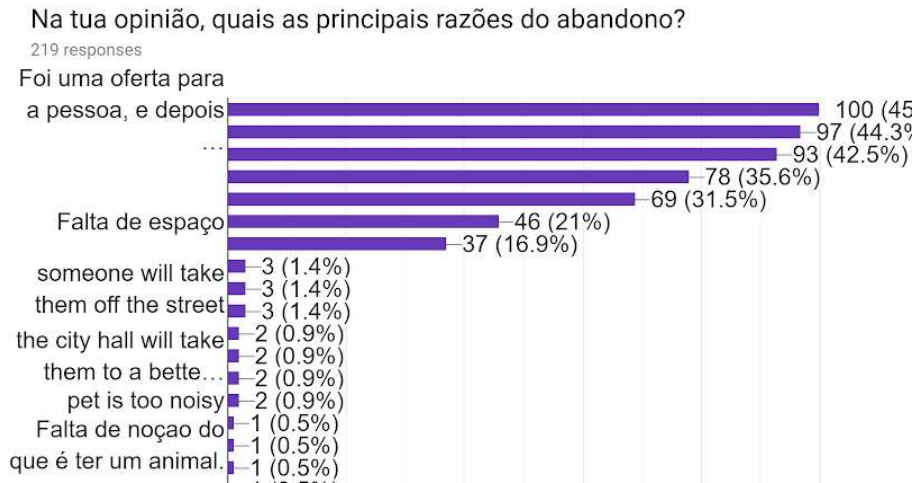


Figure 14: “In your opinion, what are the main reasons for abandonment?” Chart from the general public questionnaire

1.2 NGO's and Kennels

We gathered in total 4 answers from the 3 NGO's and 1 Kennel manager. The focus of this questionnaire was to understand how they see fit on how to spread more awareness about animal welfare and resolve possible problems within this topic.

The most important outcome was fundamenting the critical role of schools in educating about this thematic. All the participants agreed on this question (see Figure 15) seeing it a viable course of action.

Acha que as Escolas podem desempenhar um papel importante na educação sobre o cuidado com os animais?

4 responses

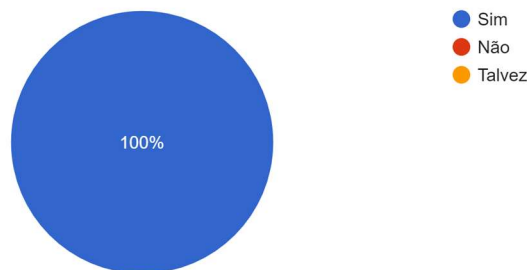


Figure 15: “Do you think schools can play an important part in the education about how to take care of animals?” Chart from the NGO/Kennel questionnaire

2. Field Research

To extend our understanding on the subject, we stepped onto the field and performed a series of contextual enquiries, interviews and observations. We visited SPAD, a private institution and Municipal Kennel of Funchal, a governmental institution.

2.1 SPAD

SPAD is a non-profitable private institution sustained by donors. Their main objective is to fight for animal rights and animal welfare, based on the Universal Rights of Animals and all acting laws. They also solicit and act with competent entities of adoption associations to prevent and condemn cruelty to animals. SPAD premises were visited for one day. The account of the visit reconstructed from notes, photograms and interviews that can be seen more in-depth in Appendix 1.

The establishment was divided into a cat section and a dog section. The differences between both were evident: from a big cage with a lot of space for cats to small cages with limited space for 2-4 dogs. The dog section was in poor conditions; they barely had space to move or even lie down, the cages were mostly covered with dog necessities and surrounded by flies. The state of these dogs was not the best, as many were afraid of human interaction while others wanted it badly (see Figure 16).

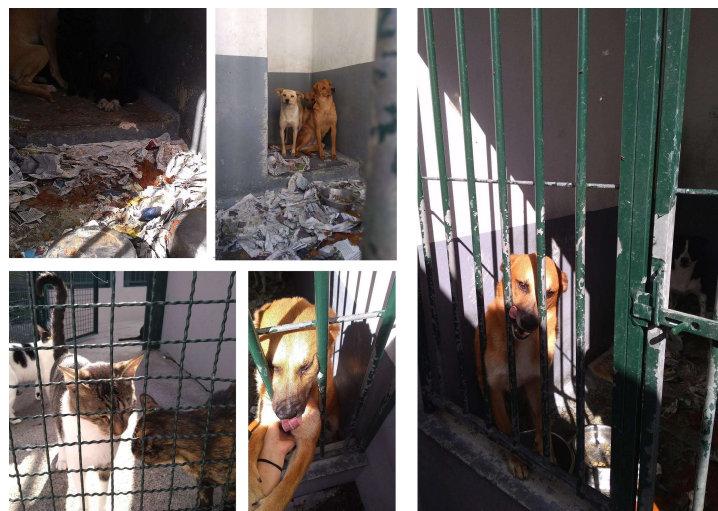


Figure 16: Photos of the Visit to SPAD

2.2 Municipal Kennel of Funchal

The Municipal Kennel of Funchal, now known as the Official Collection Center: Vasco Gil is managed by the AMAIS Association (Madeira Animals Association) since 2016. However, it still does not have all the legal requirements to be officially recognised as an official kennel. It accommodates over 270 canines and 60 felines. More details in Appendix 1.

The kennel is a large facility that is noticeably over packed with animals, mostly dogs. Most dogs predominantly stay inside their cages by themselves; then there are packs of dogs that stay in a bigger section, and finally, there are the dogs that roam around freely in the bigger section of the entrance. These divisions are made in the dog's interest, meaning that dogs that are not friendly are kept alone, dogs that only get along well with some dogs get paired and dogs that get along well with all, stays in the general section (see Figure 17).



Figure 17: Photos of the Visit to the Municipal Kennel of Funchal

3. Discussion and Conclusions

Based on the questionnaire survey we conducted, we could determine that the biggest problem inside Animal Welfare in Madeira is abandonment. We reinforced our findings from the questionnaires about the reasons of abandonment and learnt some more, those being: animal behaviour problems, owners' economic difficulties, emigration, health issues/age, gender, seeing animals as disposable objects, too many expenses for the animal, availability/time, vacation and lack of space to put the animal.

From the field studies, we discovered that the kennel, stereotypically displayed as a sad rundown place, was quite the opposite. Most of the dogs were happy and cared for. The kennel also pointed out the importance of the dogs having free space to run around.

SPAD, the private institution, on the other hand, was not as comforting to visit as the Municipal kennel. Starting with the fact that all dogs were held in small cages where they were crammed inside. The maintenance of this institution was poor and sloppy. The dogs, in general, were more hostile, aggressive and scared.

Nevertheless, there were some positive aspects to highlight, such as the way they cared for the cats and the sponsored animals. SPAD has a program for companies to sponsor an animal in exchange for publicity. This way, instead of trying to solve the issue with adoption campaigns, SPAD found a way to cater to animals that are not adopted.

In summary, the main Animal Welfare related problems identified here in the Madeira context are:

- Uneducated people mistreat animals. Generally, people are still not aware of the new changes in animal laws and consider as objects;
- There is a lack of responsibility of owners that do not sterilize, vaccinate or give basic care to their animals. Non-owners as well generally do not contribute to the care and wellbeing of stray animals;
- Abandonment is the most noticeable pressing issue. This is evident when going to any institution that serves as a temporary shelter.
- The overpopulation of the institutions (animal shelters), filled with the abandoned animals, mostly dogs.

Through this research, some existing good practices and solutions were identified. The good practices and solutions identified are listed below:

- The concept of community animal emerged as a positive way that a community characterised and take care of a stray animal living in the neighbourhood. The animal is acknowledged as an abandoned animal but is being taken care of by the community near them. This way, the animal is not necessarily a stray, without an owner, but has a whole community of owners;
- Several veterinarians' doctors and associations perform free sterilization and castration on stray animals from time to time, trying to combat the overpopulation of abandoned animals;
- Associations and kennels promote campaigns on responsible adoption, and they offer sterilization or castration and the first vaccines for free;
- Associations and veterinarians are going to schools to educate and bring awareness to Animal Welfare issues and introduce some good practices.

Figure 18 depicts a map of all the NGO's and kennels in Madeira. Although there are many NGOs, there is still only one official collection centre for animals. All the other institutions do not have the proper requirements to be official even though they run as collection centres.

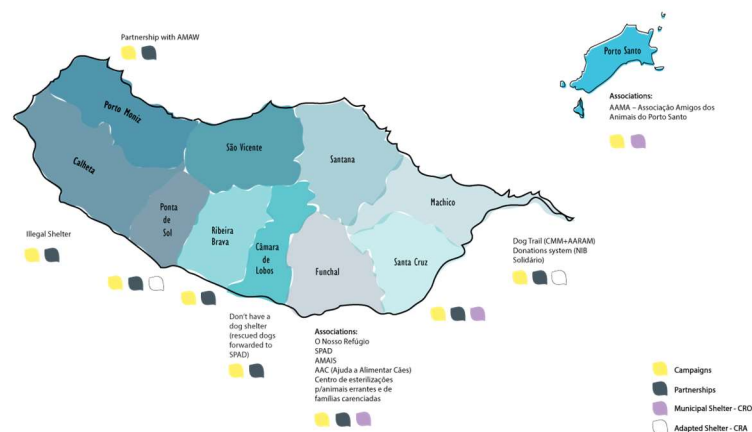


Figure 18: Map of the regions NGOs, kennels, and collection centres

Once the data was analysed, a mind map was created, connecting all the findings (see Figure 19). This way, it was possible to look at the issues individually and branch out on them, determining which and how they connected, creating a big web.

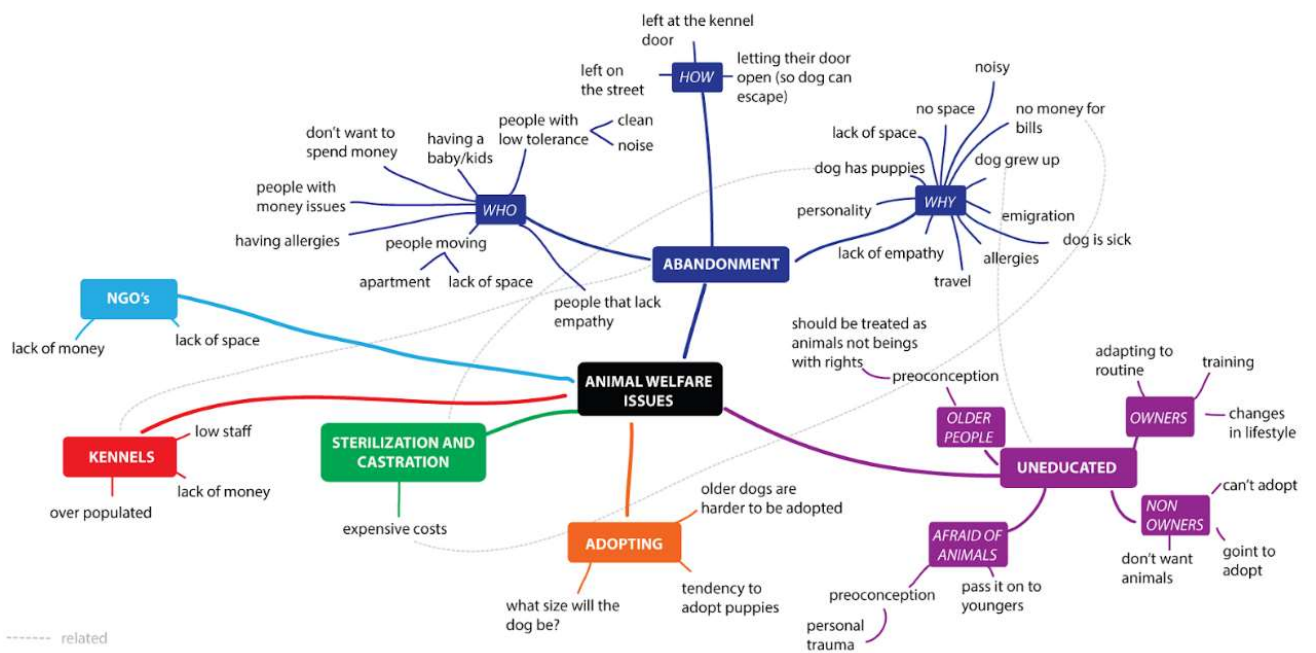


Figure 19: Mind map of all the findings of Animal Welfare Issues in Madeira

After acknowledging the vast dimension of the issue and identifying the various thematics, it was clear that the amount of problems found were too big to be tackled into a single project. Hence, the creation of a transmedia world, where different types of media could create awareness and education for different problems for different target audiences. Our research shows that the most significant problems found in Animal Welfare were due to Domestic Animal Abandonment and Population Uneducation, giving material and common goals to both transmedia ends of the project. However, the two different artifacts (the VR Documentary and AR comic Book), will in their essence go beyond those common issues and tackle other issues in more detail, as can be seen in Figure 20. Together *Tell a Tail* connects the findings and displays them in each medium's full potential, molding the stories accordingly.

Tell a Tail Transmedia World

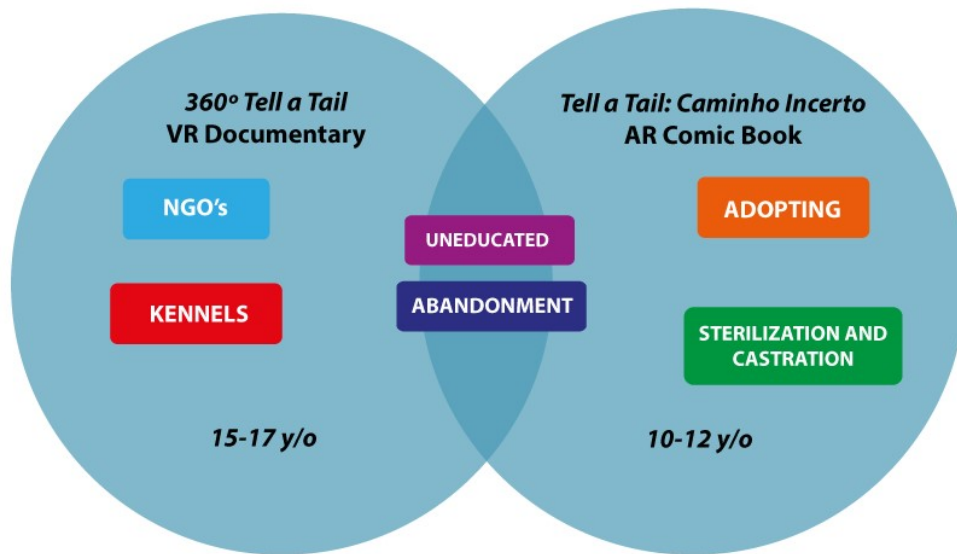


Figure 20: Diagram of the *Tell a Tail* Transmedia world

Chapter IV: *Tell a Tail: Caminho Incerto* Project

1. *Tell a Tail*: Branding



Figure 21: *Tell a Tail* Logo

After a brainstorm session, *Tell a Tail* was chosen as our transmedia's name. By swapping *Tale* to *Tail*, it plays with the words as they are homonyms, and shows that the transmedia is a collection of various tales, hinting to the topic about animals. Visually we wanted to convey a shape that transmitted movement, so we created an organic shape referring to an animal's paw shape. Then the typography was created by hand in order to give a more simple, fun and organic feel to it, emphasising *Tail*.

1.1 *Unleashed Studio*



Figure 22: *Unleashed Studio's* Logo

Before *Tell a Tail*, we created an entity for our project studio. After brainstorming, the name chosen was *Unleashed*. The name was essential to define the mission of the studio and be clear about what the topic was, communicating the freedom and rights of animals.

Visually the logo has bold colours to transmit boldness towards the topic, and by adding the dog with a leash on its mouth represents the name of the studio visually.

2. *Tell a Tail*: Transmedia World

Tell a Tail is a transmedia story world that consists of an immersive 360° VR documentary called *360° Tell a Tail* and *Tell a Tail: Caminho Incerto* an AR branching narrative comic book. *Tell a Tail* extends beyond multiple media, providing multiple entryways and additional information in each medium. It provides a single unified story or experience, by tackling the Animal Welfare topic, avoiding redundancy between media by having two different ways of transmitting a story: a fictional and a non-fictional one (see Figure 23).



Figure 23: *Tell a Tail* Transmedia

In *360° Tell a Tail*, the user explores a local kennel and discovers what their daily routine looks like, exposing challenges and misconceptions of kennels. In *Tell a Tail: Caminho Incerto*, the reader follows the adventures of a girl with her dog and chooses their path throughout the story; by doing so, they alter the ending of the story. Then the AR serves to reveal what the dog perceives and feels on some occasions.



Figure 24: *Tell a Tail* Transmedia projects

To unify the whole transmedia experience, more media was created: a website, an Instagram and a YouTube channel. On the website users are able to check out information about the whole transmedia world and what variants exist inside it. It was also a way to record what was being done and some field findings, all found inside the blog. The website is available to check at *unleashed.m-iti.org* (see Figure 25). The Instagram, *@unleashed.projectstudio*, provides extra content and behind the scene moments while the YouTube channel, *Unleashed Studio*, was made to record our findings and to also make the project more accessible to further audiences.

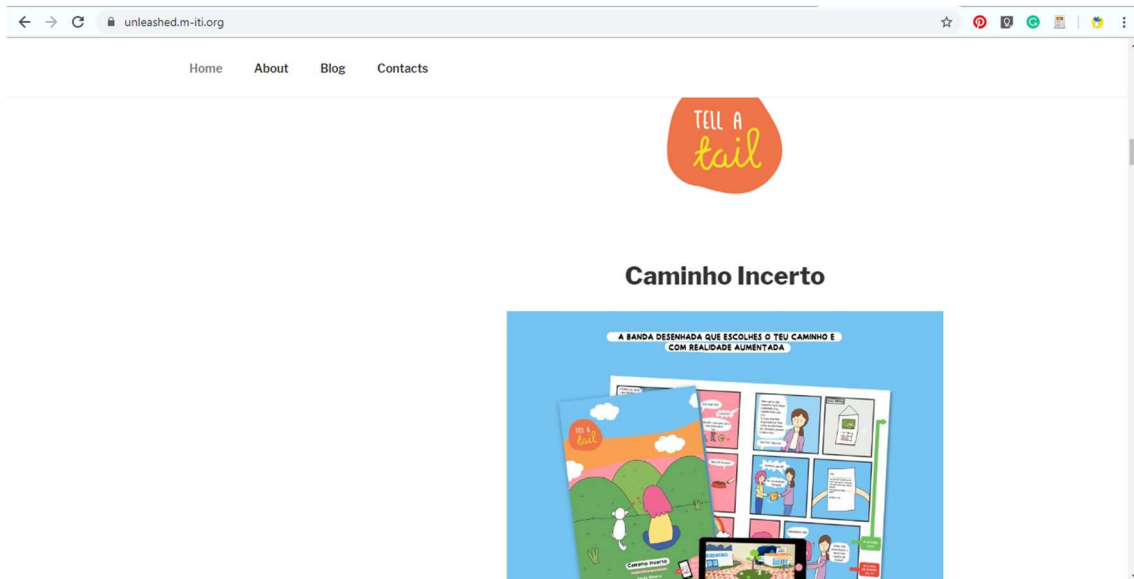


Figure 25: Screenshot of *Unleashed* website

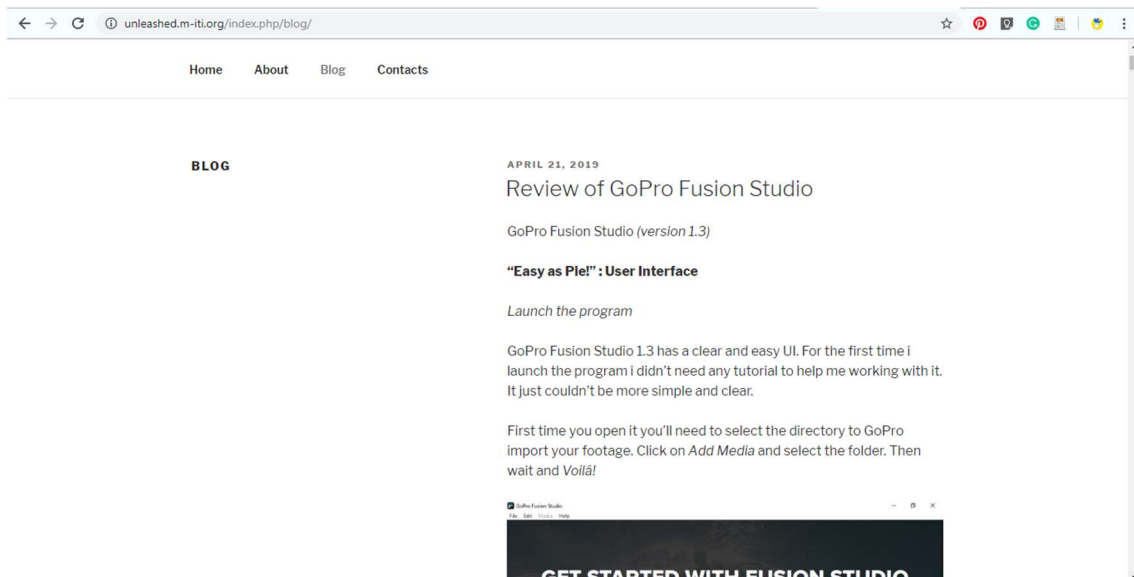


Figure 26: Screenshot of *Unleashed* blog

Educating audiences from an early age makes it easier to introduce habits, in this case, on proper animal treatment. As such, the transmedia is targeted towards these younger audiences: *360° Tell a Tail* for ages 15 to 17 years old and *Tell a Tail: Caminho Incerto* for 10 to 12 years old. For the project this thesis is focused on, this age group was chosen seeing how based on Piaget's Stages of Cognitive Development, children's cognitive ability from the ages of 7 to 12 years old focuses on their concrete operational stage. At this age, they still have concrete and lateral thinking. However, they start thinking with more logic involved. Children at this stage also become more aware of how other people might view situations. A critical characteristic in this stage is the ability to focus on many

parts of the problem, making them understand different perspectives [5,7]. This made this target group the most adequate for the story format chosen, they can put themselves in the place of these characters and empathize with what happens, giving them a more emotional and personal connection with the story. They also can logically think about the choices and consequences throughout the whole story and assimilate it all into one experience.

Tell a Tail project was guided by Jenkins [26] seven principles of a transmedia world creation. Below they are enumerated, defined and how they shaped *Tell a Tail*:

a) Spreadability vs Durability

Definition: The creator should be able to grab the audience with a good story arch and have various layers in the story. This makes the audience more engaged and more willing in spreading the material giving it more visibility.

Tell a Tail creates a branching narrative with many layers where the more the audience explores, the more they know. Then by captivating them with the stories, they will uncover more, incentivizing them to search for more and talk about it.

b) Continuity vs Multiplicity

Definition: Previously it was thought that continuity was the way to approach characters and narratives, but with transmedia, it is vital to have multiplicity where people create different perspectives and get to know multiple sides of the story;

Within the *Tell a Tail*, there are multiple perspectives and different views throughout the characters. In the comic, it is about one dog while in the documentary, it is about many more.

c) Immersion vs Extractability

Definition: Immersion is the ability of the audience to enter the fictional world and suspending disbelief, forgetting their surroundings. Extractability provides the audience with something they can take and introduce in their daily lives;

In the *360° Tell a Tail*, the user is completely immersed and integrated with the world they are viewing. In *Tell a Tail: Caminho Incerto*, they have the merging of both worlds. Then what they learn they can carry and use in their daily lives.

d) World-Building:

Definition: The story is just an entryway to the whole world the transmedia portrays. How the audience interacts with the world and goes and find new and different aspects is the crucial aspect, creating the world as they want;

The user can start with *360° Tell a Tail* and discover a character of the comic inside the VR. Then they can read the comic, growing their knowledge of the world.

e) Seriality

Definition: Transmedia stories not only unfolds in multiple segments of the same medium but across various mediums;

Tell a Tail provides multiple entryways to the transmedia, throughout various media making sure to complement and add to the information they previously learnt.

f) Subjectivity

Definition: Transmedia extensions bring diversity to the story, like viewing the narrative from other character's perspective;

While navigating *Tell a Tail*, the audience gets exposed to various characters, from the lady that works in the kennel to Cris in the comic book, learning new things with each one.

g) Performance

Definition: Audiences, when engaged with the transmedia world, want to create extensions of the stories as they envision. Sometimes these stories are added officially to the transmedia world others they are not.

Tell a Tail incentives users to explore the real world and learn more about the thematic portrayed in the transmedia. As the audience goes and explores the world, they can then create real life stories with what they find.

Tell a Tail strives to disseminate links across the two stories so that the audience is made more aware and hopefully entailed to engage with the other stories available. We designed links as seamless parts of the story, such as one of the main characters of the comic book, Penny appears in the documentary in one of the scenes making a bridge between the comic and the documentary. Vice versa, at the end of the comic book, it is mentioned and incentivized to try the VR experience. This is all encapsulated on the website where it explains and demonstrates the different sides of the transmedia.

3. *Tell a Tail: Caminho Incerto: Comic Book*

3.1 Guidelines that shaped *Tell a Tail: Caminho Incerto*

Will Eisner in "Graphic Storytelling and Visual Narrative" [20] explains that a story forms when told in an arranged and purposeful order. Because comics are a medium that is meant to be read quickly, character development must happen fast but still in a believable way, so by using images that most people are familiar with this process can be accomplished. "The function of a gun is clear. But how it is held is storytelling". The artistic style is an essential factor to the overall message of the story; it connects the reader with the artist and transmits a specific mood. When the story intends to teach something to the reader, the story should highlight the learning process, as humans acquire skills through imitation. Humans learn a lot from watching gestures, images, posture and other non-verbal languages in order to feel and understand what the character is going through.

Regarding the branching narrative choices, we followed Paul Nelson's guide [15]. Choices are a crucial aspect of a branching narrative; these choices should be carefully planned as they influence how the story is perceived; choices should be broad and captivating but also manageable for the author. They need to affect the story, or there is no purpose for them at all and choices should incentivise new beginnings and advantages for the characters. Authors should always strive to keep choices coherent within the story's plot because if something random happens, the reader will get frustrated.

3.2 Story, Characters and Narrative Structure

The first drafts were based around a core idea of a girl in her pre-teen years. She lived with her parents, and her dream was owning a dog. Each family's story would have a different start, middle and end, where the reader would choose which family to follow.

After considering the readability of the comic, it was reduced to one family, so that the reader would not be confused. Still, the overall plot remained quite weak, as a small group of people tested it for initial feedback. The story did not grasp the reader's attention and was overall confusing. Then it was defined that the story after the introduction the theme branched out to different parts, leading to four different endings: abandon, keep, give or lose the dog. To fully grasp the complexity of the whole topic, we thought it was necessary to have these multiple endings, where each one covers a topic that was found in the field research.

To further enrich the narrative, an online Pixar course on Storytelling provided by Khan Academy was done along with the Three Act Structure along with The Story Spine by Keen Adams (see Figure 27).

At first, we defined our own "What if" question to get a motive and theme for the story:
"What if there was a girl that wanted a dog, but after getting it, it is not what she wanted but what she needed."

THREE-ACT STRUCTURE Story Arc

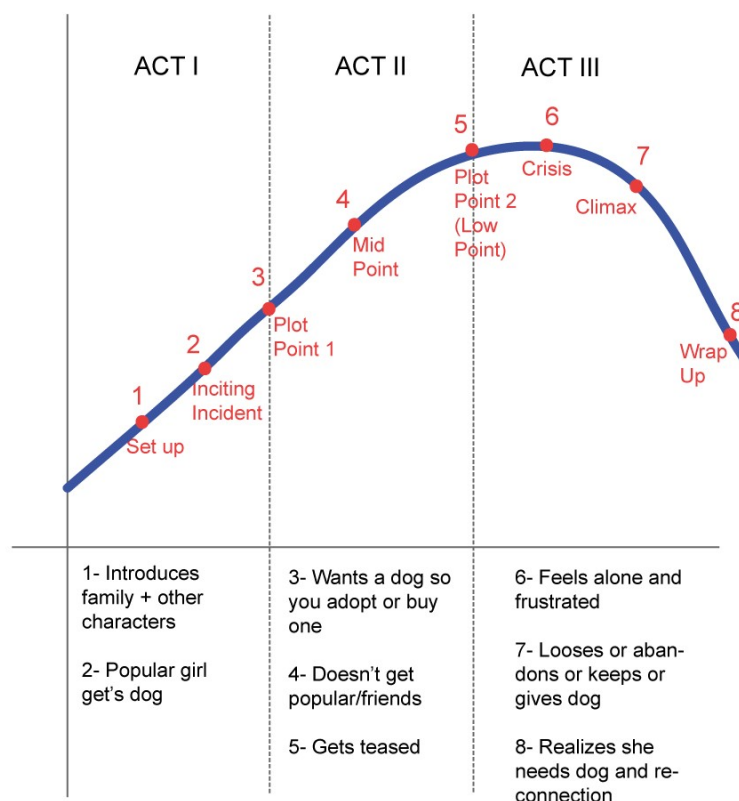


Figure 27: Story Arch for *Caminho Incerto*

Then following the classic “Three Act Structure”, originating from Aristotle where it divides the story into three acts along with “The Story Spine” by Keen Adams dividing the story into 5 parts, *Tell a Tail: Caminho Incerto* was created. Below we can see a merge of the two-story structures and how it was applied to *Tell a Tail: Caminho Incerto*:

- **Act I** introduces the main characters, informs where and when the story takes place, informs the reader what type of text the narrative is, shows the antagonist and introduces the conflict that will lead the story forward. This is where the beginning that established the routine is introduced;

Tell a Tail: Caminho Incerto (see Figure 25):

1- Shows the school, home and the park. These being the main scenes and settings the comic will take place. Then introduces the main character: Cris, her parents and the cool kids from school which are Carla, Joana and Pedro;

2- Carla gets a dog;

3- Cris and family adopts or buys a dog;

- **Act II** is when the main character faces complication; it starts the metamorphosis of that character, which introduces the point of no return, the break of the routine, injecting a difficult decision. That character will learn something new with this complication and realize their need, making clear their goal for the endpoint;

Tell a Tail: Caminho Incerto (see Figure 25):

4- Cris does not get any more popular because of that decision;

5- Cris gets teased just like before;

- **Act III** contains the story climax that sets the resolution of the story in motion. The main character faces their ultimate test and shows change after that. The character will fight for what is important to them, moved by their goal, leading the reader to the story end, showing the theme of the narrative with a satisfying resolution.

Tell a Tail: Caminho Incerto (see Figure 25):

6- Cris feels alone, frustrated and nothing is going according to plan;

7- Cris either loses, gives, abandons or keeps the dog depending on which decision and path that leads to;

8- Cris realizes what she has done or what happened and realizes she needs the dog much more than she wanted it.

3.2.1 Story Summary

Cris is longing to have a connection with someone and have friends, but this turns out to be a complicated task for her. Until one day she has the idea of getting a dog after one of the cool kids got one and hopes that the dog will be the solution for everything. It all seemed to be working out at first; she gets invited to hang out with the cool kids. But to her dismay, it all starts getting away very quickly, and the friends she thought she had made were not real. Family life was not going well, and the toll of the responsibilities of having a pet was gaining up. This leads to the success of bad decisions and worse consequences. All this time, the connection she had been longing for, a true friendship and trust and loyalty as the one Penny provided, was the only one she took for granted.

The moral of the story and the takeaway messages are:

- abandoning animals is wrong;
- pets are part of the family too;
- how to properly take care of an animal;
- animals are being with feelings;
- choices have consequences.

3.3 Characters Profile

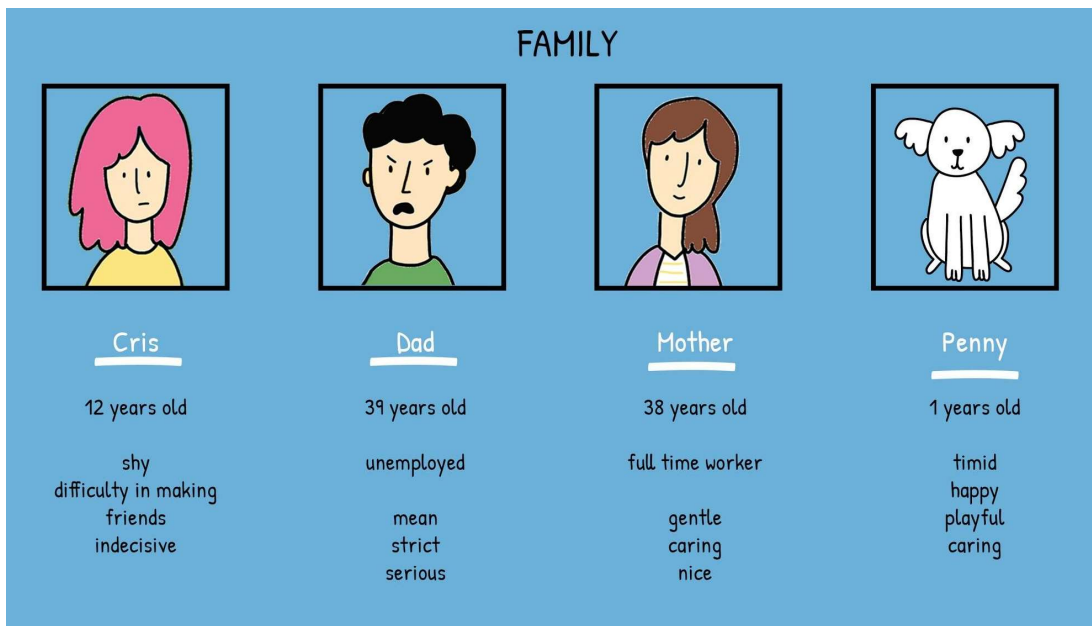


Figure 28: Family’s profile card

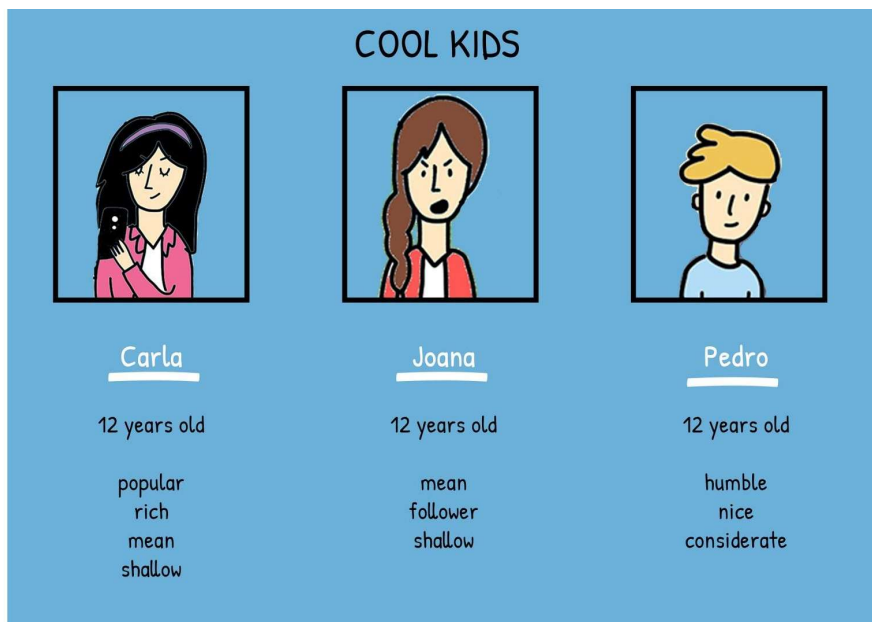


Figure 29: Cool Kids profile card

To further our understanding of how to design the characters, we decided to use the Actantial model of Greimas “The actantial model is a device that can theoretically be used to analyse any real or thematized action” [37] :

Subject: Cris and Penny

Object: Penny

Opponent: The father, Joana and Carla

Helper: The mother and Pedro

Sender: Cris

Receiver: Cris

Cris is a character that has some issues and wants very desperately to feel like she is part of something. Being a young girl, she is easily influenced by her peers and wants to be like them. The other main character is Penny, the dog and the whole reason and motivation of the story. She is added to the story on what seems a whim but ends up being an essential character of the whole narrative. Pedro and the mother will mainly be the helpers of the story. They will be the characters that will represent goodness, truth and courage. Then there are the antagonists, that are Carla, Joana and the father. They are the characters that will incentivize the malice and wrong actions from Cris.

Visual Style

When creating the story, we focused on how they would look visually. We based our graphical decisions by our target audience and our type of narrative. Seeing as the story portrays a more serious message, we wanted to keep the visuals simple to balance it out.



Figure 30: Initial sketches of the story's characters

Initially, all the characters had a roundness to their features with no sharp edges, giving no special feature or differentiation between them, as seen in Figure 29. So, the antagonists were then modified to have sharp edges to their visuals, making them more acute, sharp and effectively meaner (see Figure 28 and Figure 29).

3.4 Tell a Tail: Caminho Incerto – branching narrative structure

In this narrative, we kept the number of decisions quite limited because of (1) the target audience, (2) being an uncommon type of narrative that can be confusing and (3) having a more dramatic impact by limiting the choices. The first step was drafting the story with the main plot points, beginning and ending. To help keep track of each branch, Twine was used to facilitate the navigation throughout the narrative (see Figure 31).

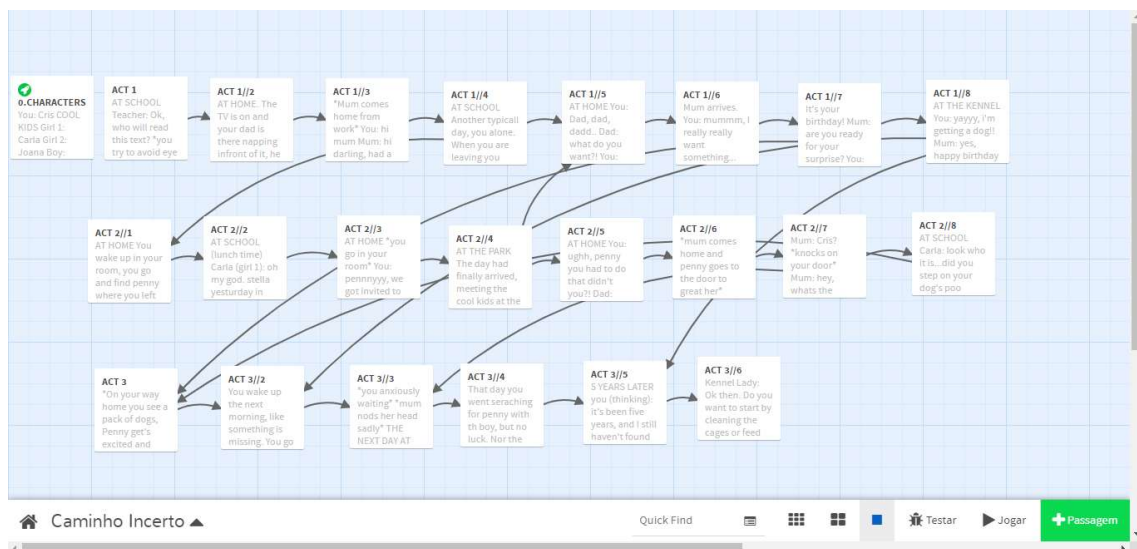


Figure 31: Tell a Tail: Caminho Incerto story path in Twine

<https://twiny.org/2/#!/stories/189cae69-f5c6-49e8-b574-f5d499d25c76>

Initially, there were two different endings, but after some revision, we thought to expand the endings giving more options to the reader, this way incorporating more of the field and questionnaires findings extending on the educational aspects and thematics approached. After several iterations, the result was one story that branches into four endings. It was defined that there would be two significant paths in the story, and these

would alter the story in its entirety. So “Path A” and “Path B” would tackle different topics and would have slightly altered plots as they never intertwine as seen in Figure 32

To better understand the story flow, we created a flowchart, also seen in Figure 32. The beginning of the story is common for all branches. After this, the story bifurcates into two main branches “Path A” and “Path B”. After bifurcating into two each path has two smaller paths inside leading to two different endings, summing to a total of 4 endings. “Path A” is the path where the dog is adopted at the kennel and “Path B” is the path where the dog is bought from a pet shop.

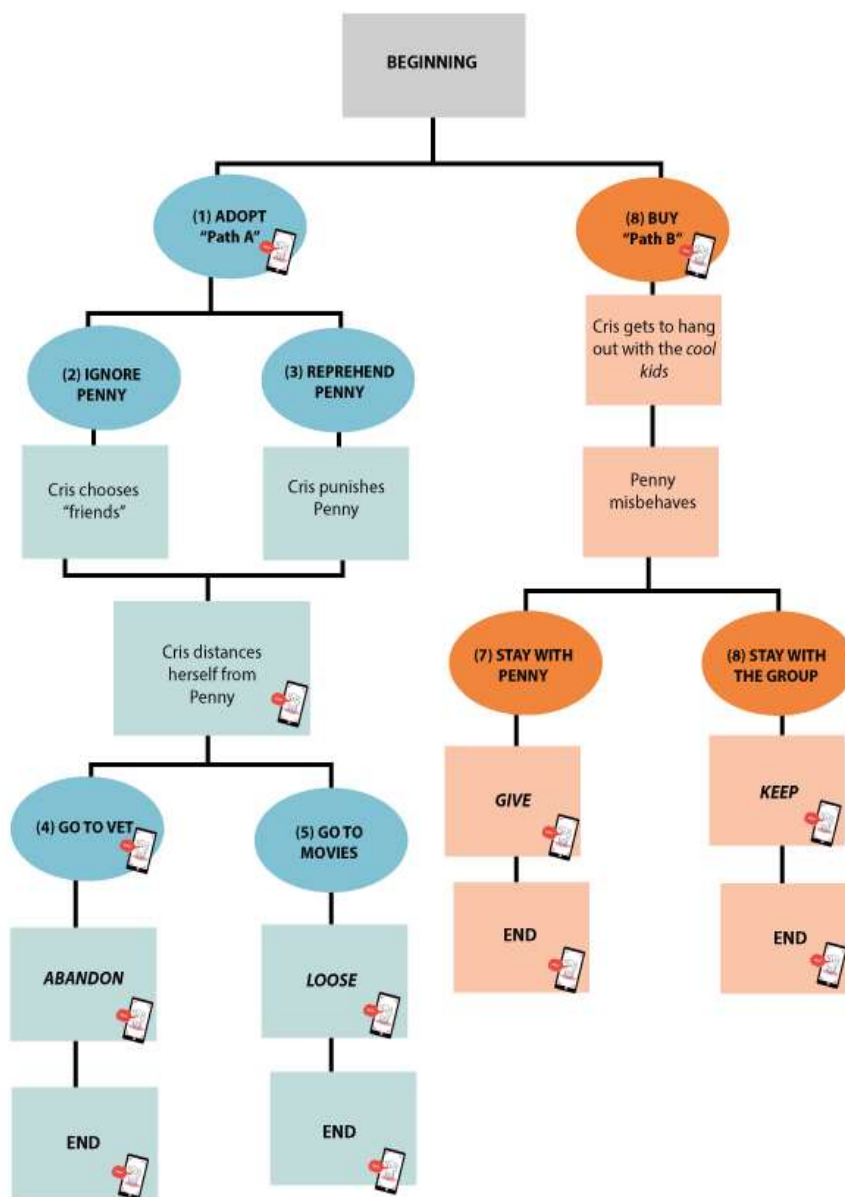


Figure 32: Flowchart of *Tell a Tail: Caminho Incerto* with AR points

3.4.1 Path A- Adopt

"Path A" is about educating the reader that a kennel is a viable option for adopting a happy, healthy animal. It also touches on the topic of being aware of knowing what to feed an animal. This path shows that educating an animal takes time and patience, and it does not happen overnight. In the discourse of the story, there is also personal problems that arise for the main character. That character then quickly dismisses her dog, portraying how easy it is to ignore and forget that a dog has needs; however, independently of what a person is going through, these must be met. See Figure 33 for an overview of the main story points about this path.

(1) **"Adopt"**: This option takes the reader to the kennel, and by doing this, we wanted to show that this is an option that should not be overlooked when thinking about adopting a family pet. Dogs from the kennel are not some anti-social and mean dogs.

(2) **"Ignore Penny"**: This option shows that dogs need attention and need to be taken care of. If they are left on their own, it may result in them doing things the owner does not agree and may lead to unfortunate incidents.

(3) **"Reprehend Penny"**: This option shows that there are ways to educate a dog and being temperamental and hot-headed will not solve anything, if anything it inactivates the dog to become fussier and lead to worse outcomes.

(4) **"Go to vet"**: By choosing this option, it later presents the adoption system as it is in real life and not as the general public perceives it to be. The act of abandonment, even if at the door of a kennel, is a cruel action. Dogs might have some chances of being re-adopted, but it is hard and is not always the case, especially for older dogs.

(5) **"Go to the movies"**: Here it shows that it is essential not to give in to peer pressure. It also shows how much a dog is loyal and affectionate to their owner because once they get attached nothing, the owner will do will disappoint them.

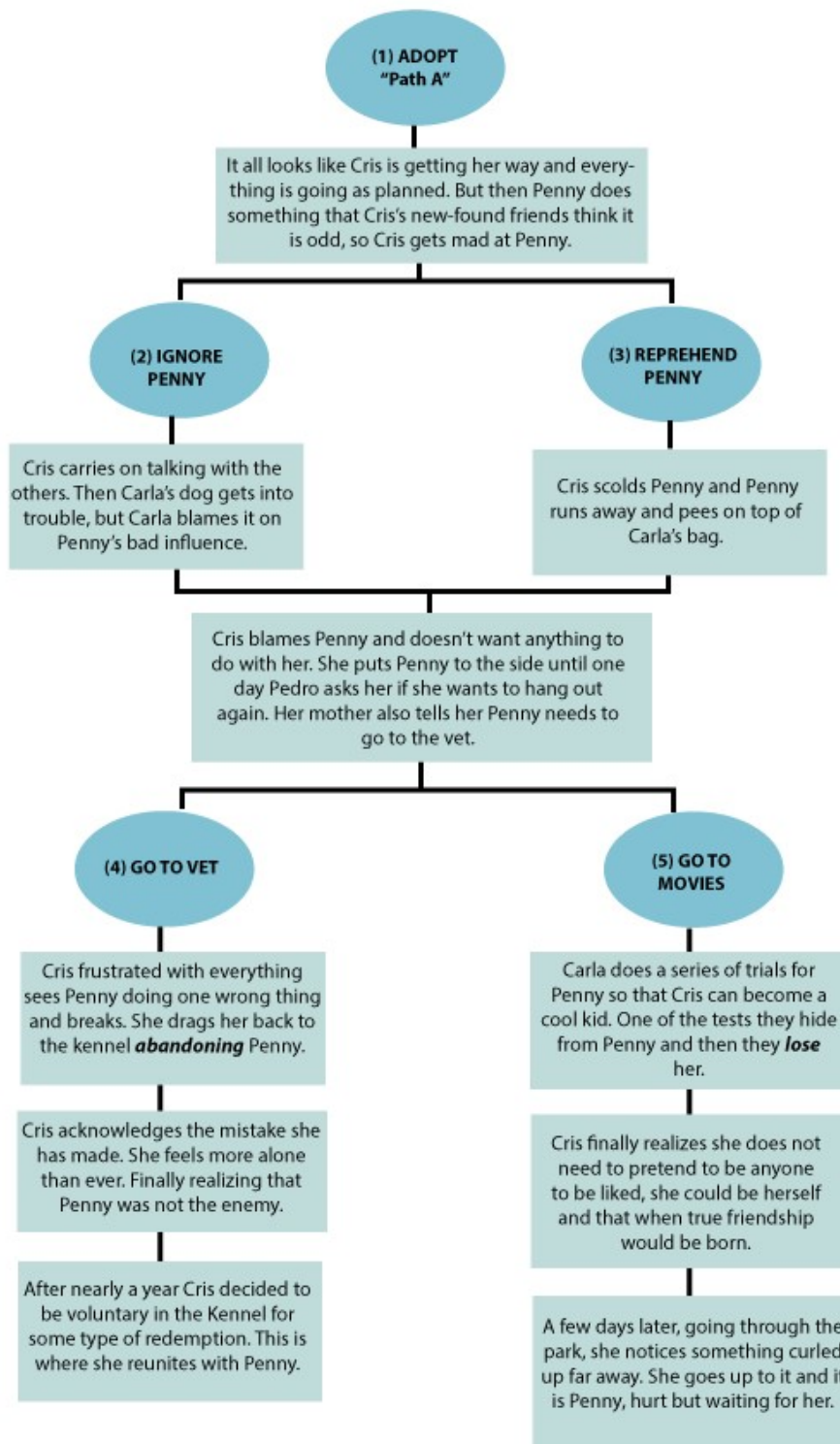


Figure 33: Overview of story points that compose Path A - Adopt

3.4.2 Path B- Buy

"Path B" big message is "adopt don't shop". Here it is shown the reality of pet shops and where they get their dogs: Puppy Mills. The main goal was to make the reader aware that breeding dogs for profit are what pet shops are all about and that they do not care about Animals Welfare. There is also a misconception that breed dogs are more valuable because they are more "special" than others, and the story shows that dogs, independently of the breed, are equal. Breed dogs do not come pre disciplined and are not smarter than others. Another topic approached in this path is sterilization and the importance of it. See Figure 34 an overview of the main story points further information about this path.

(6) **“Buy”**: Going to the pet store leads the reader to a pet store where the dogs are sad, influencing the reader into thinking about their visits to pet shops and making them see the reality that is not good, dogs are unhappy and locked up there.

(7) **“Stay with Penny”**: This choice reminds the reader of the importance of sterilisation and points out the consequences of not sterilising the dog. Even if the dog is meant to spend its days inside a house, it is still a health benefit.

(8) **“Stay with the group”**: This is the only branch that does not have an unfortunate consequence at the end. Cris realizes in time that her frustration was not because of Penny; it was because of what she expected that would happen and did not. This branch shows that even though things might be bad, it is not right to take it out on those who do not have the fault. It is not easy, and things do not go as planned but, taking time and understanding this will make it all worth it.

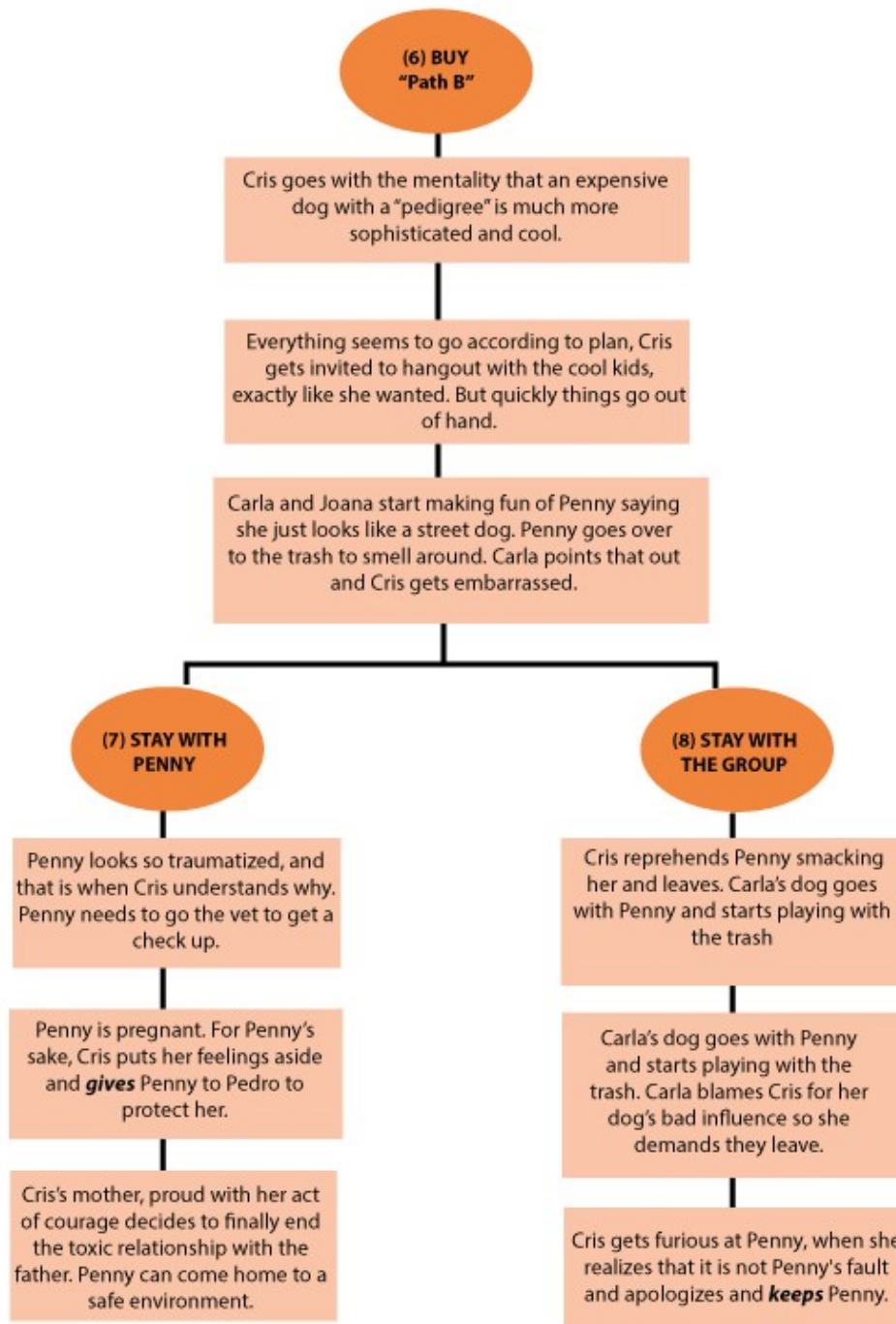


Figure 34: Overview of story points that compose Path B - Buy

4. Tell a Tail: Caminho Incerto - Graphic Design

In order to transfer the story script to a visual medium, storyboards were created for the entire story, as seen in Figure 35 and more in-depth in Appendix 2. In this process, there was care of portraying the most with the images and reducing the amount of text.

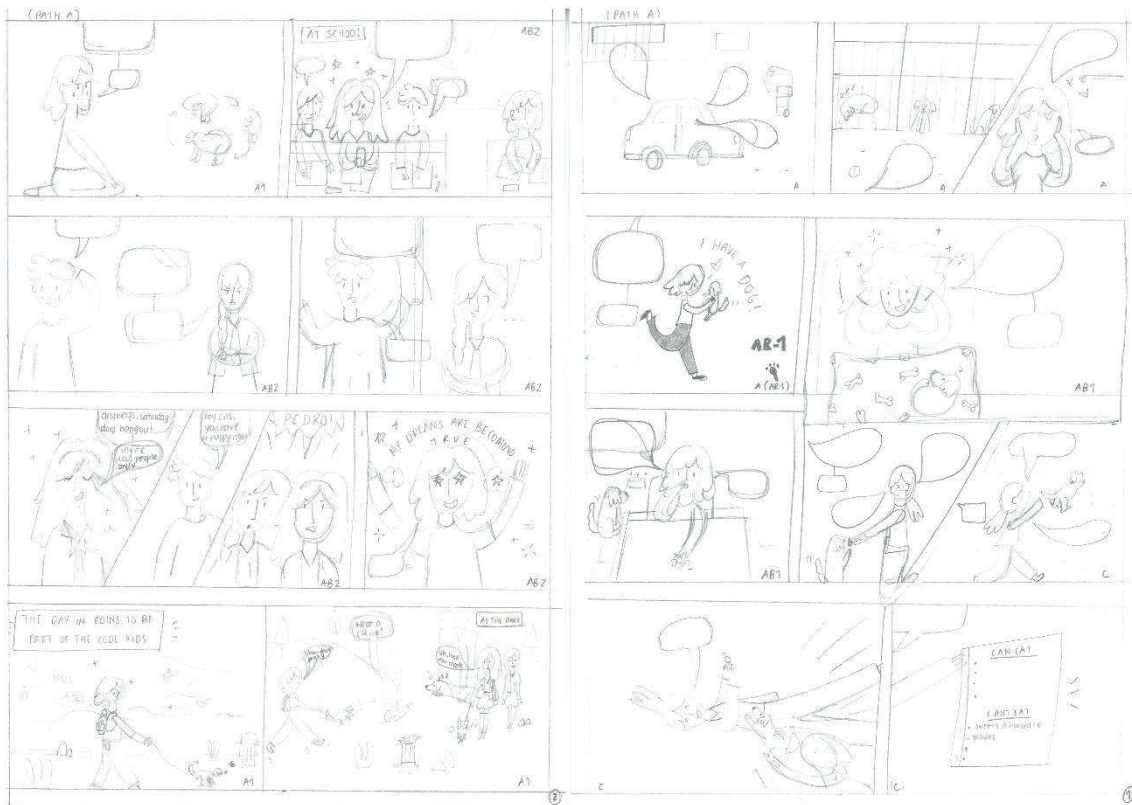


Figure 35: Storyboard of a spread of the comic book

After the storyboards were ready, it was time to transfer them into a digital format. First, there was a choice of the colour pallet, taking into consideration the target audience and what they would see as more appealing, opting for a bright and colourful pallet as seen in Figure 36.

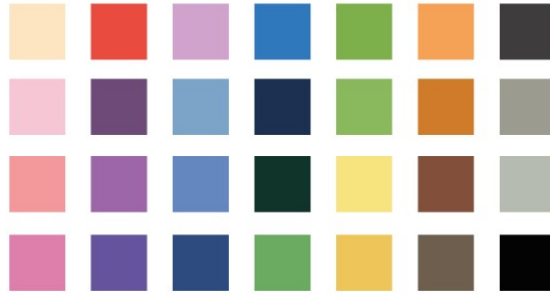


Figure 36: The chosen colour pallet for the comic book

The program used to create the comic book was Adobe Photoshop CS6 and Adobe Illustrator CS6 with a Wacom tablet to draw digitally. Each panel was drawn by hand and coloured individually, adding details in the end as finishing touches.

The comic was intended to be a printed physical copy. The size, however, was not defined initially, as the style of the comic and the choices would determine what size would be legible. Then, the readability of the mobile phone for the AR application was also a factor in deciding the best size.

Initially, the choices were presented as coloured ribbons, that could easily catch the reader's attention. The idea was to create a shape that what was easily identifiable and would seamlessly take the reader from one panel to the next (see Figure 35 and Figure 36).

A series of prototypes were created in order to see where the choices would be and how they were going to be displayed for a better legibility and reading flow as seen in Figure 37 and Figure 38.

In the end, straight angled lines, were chosen. These are presented at the edge of the pages, thus not interfering with the panels. This way, the reader will not get lost and will get a more unobstructed view of where to head, without having too much visual clutter.

To further magnify the different paths, we coloured the border of each panel as the same colour as the path (see Figure 39). This way, even when immersed in the story, there is visual feedback of where to go, without losing track of their chosen path.

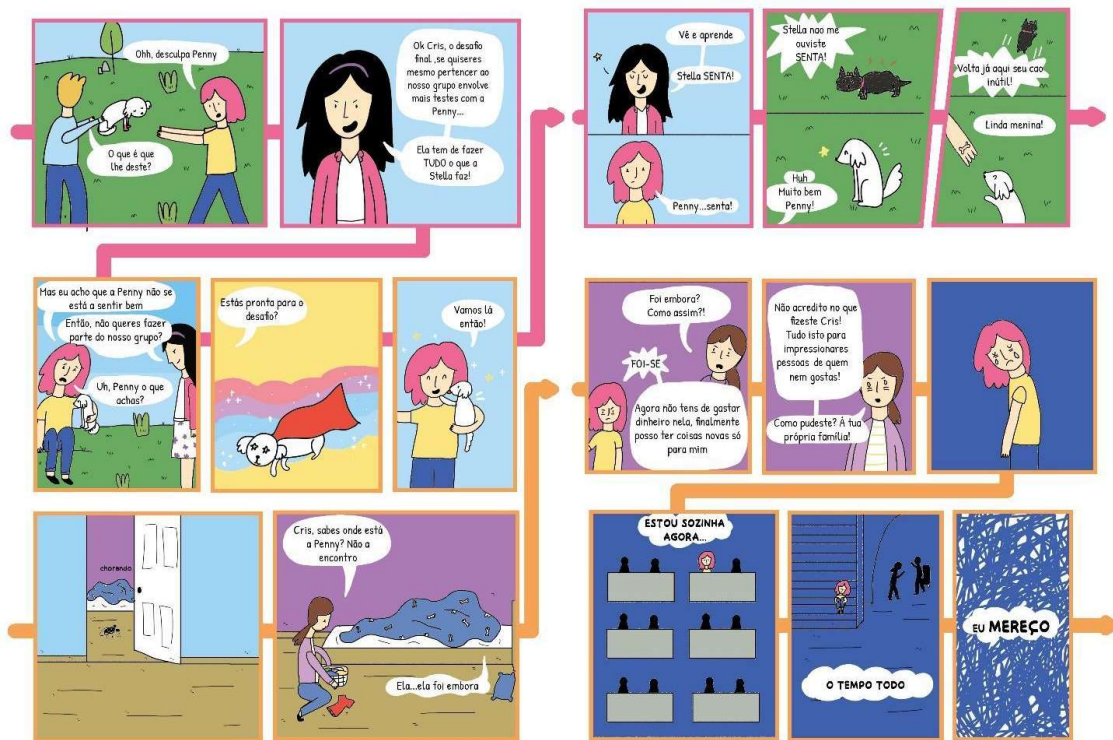


Figure 39: Illustrative example of a comic page with coloured paths to follow

For the pages that had an AR interaction, we created an icon and a red border on the page, made especially for the reader to know when there was a target point as seen in Figure 40. To see the whole comic book check Appendix 4.

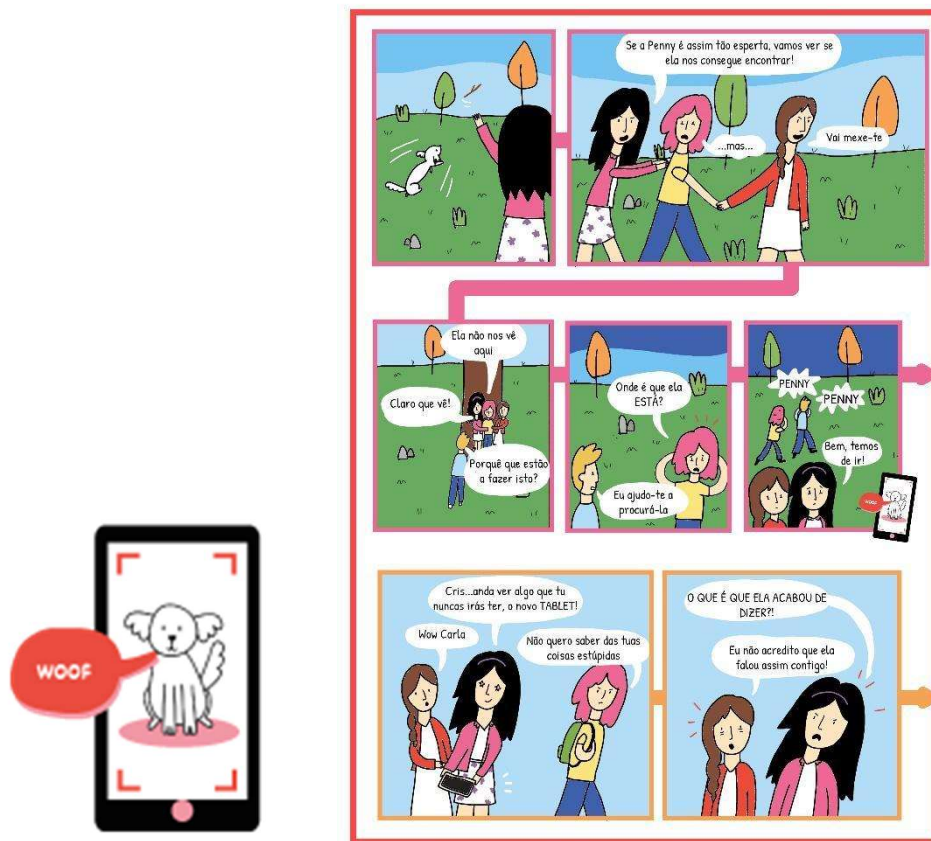


Figure 40: AR icon and final comic page with an AR icon

5. Tell a Tail: Caminho Incerto - Augmented Reality Mobile Application

For this project, we wanted to take advantage of this moldable technology by making the users feel like the computer-generated images are inside their world, thus creating a deeper connection with the story and the characters, enhancing the overall message and power of the narrative.

The application consists of a pop-up scenario comprise of a mix between a 3D background/scenario and a 2D model of the character. It is used to explore further into the story and give insight to the users about the dog's perspective. The application also allows the reader to create a more significant connection with Penny as they interact with her, hence, developing a further attachment to that character. In the AR scenes, Penny will tell things in her way, the way she views things and happenings.

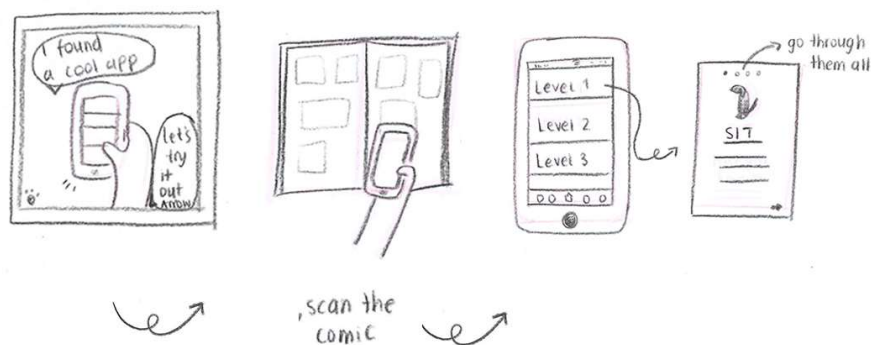
5.1 Guidelines that shaped *Tell a Tail: Caminho Incerto* AR

As a guideline for the development of the AR section of our project we analysed Helen Papagiannis book called “Augmented Human”. Papagiannis states that AR is in an experimental stage, where there are very few standards, so it is open to new experiences. Creativity is still very much allowed to drive to this medium. Creating a believable experience and making the user feel integrated with the environment is essential when creating an AR application. This is defined as “presence”, typically applied to VR but important in AR too. Presence is giving the feeling of immersion inside the experience. Theresa Ditton’s definition of presence is: “the medium can appear to be invisible or transparent and function as would create a large open window, with the medium user and the medium content (objects and entities) sharing the same physical environment.” [14].

5.2 Story

Several ideas were discussed as to what the AR application would transmit to the users (see Figure 41). Ranging from teaching users how to train their dog to play with the dog of the story. Another idea was creating a dog lens, where the user could understand what the dog was saying in the comic book through the application. Story-wise, the last application idea was what seemed more appealing and better for the narrative. The application serves as a way to uncover what the dog is thinking and talking to the reader, giving them unique insights into that character's perspective.

When creating the script for the AR points, it was essential for the dialogue to be simple, clear and childish. A type of dialogue that younger audiences could easily identify with. Visually we wanted to show the same scenery that appears in the comic, bringing them to life, making it a more believable immersive experience.



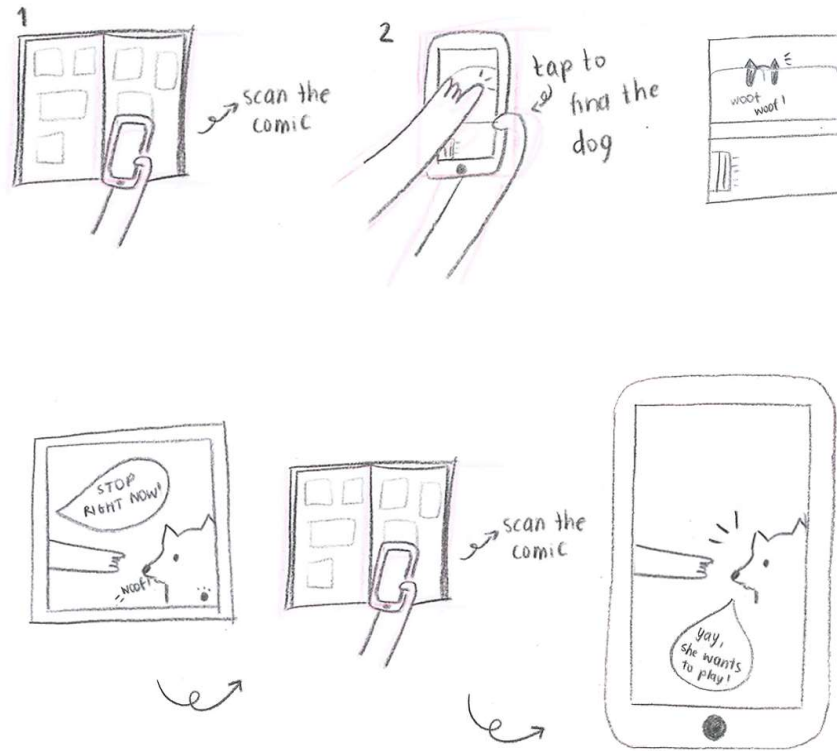


Figure 41: Initial ideas for the AR application

As the AR application is a vital part in making a stronger connection between the dog and the reader, the interface was intended to be simple, believable and placed in the reader's world. Even though the trigger is in the comic book, we did not want the reader to be confined to the comic book.

Our initial prototypes for the AR application consisted of 2D imagery that would play like an animation after being triggered by the comic book as seen in Figure 42. The issue here was that being all 2D images, there was no point in the user moving around the space as they would not be able to explore the AR world.

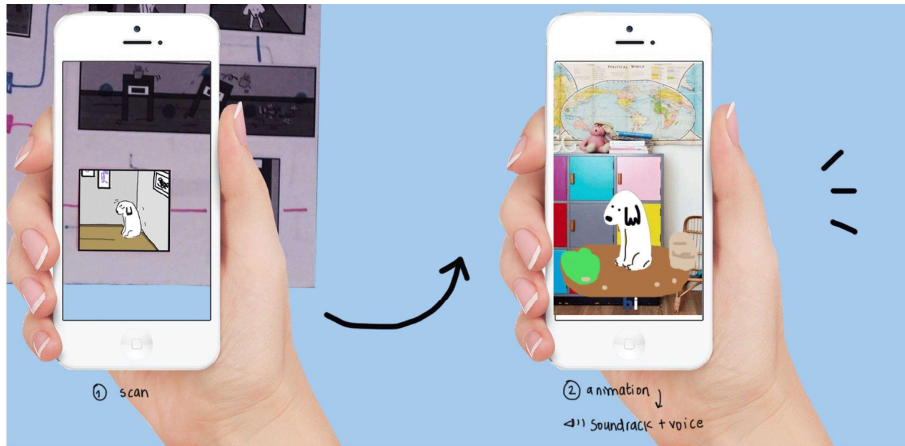


Figure 42: Initial AR interface prototype

So instead, a setting that could easily be placed anywhere on the environment was created as the final interface merges 2D and 3D images into the AR world. This gives the users the ability to move around freely and explore the AR world in their world (see Figure 43). To see all the storyboards and script check Appendix 2.



Figure 43: AR final interface using AR CORE and illustrating the merge between 2D and 3D

5.3 AR Points

There are twelve AR points throughout the whole story. Each one containing a different education moment or a way of extending the narrative, complementing the comic book with extra content.

AR1 “Kennel”- Penny introduces herself and thanks the reader for adopting her. Then explains the adoption system briefly. The goal is to highlight the importance of adopting and show that kennels are almost always overpopulated, meaning that the dogs do not receive the amount of care that they need (see Figure 44).

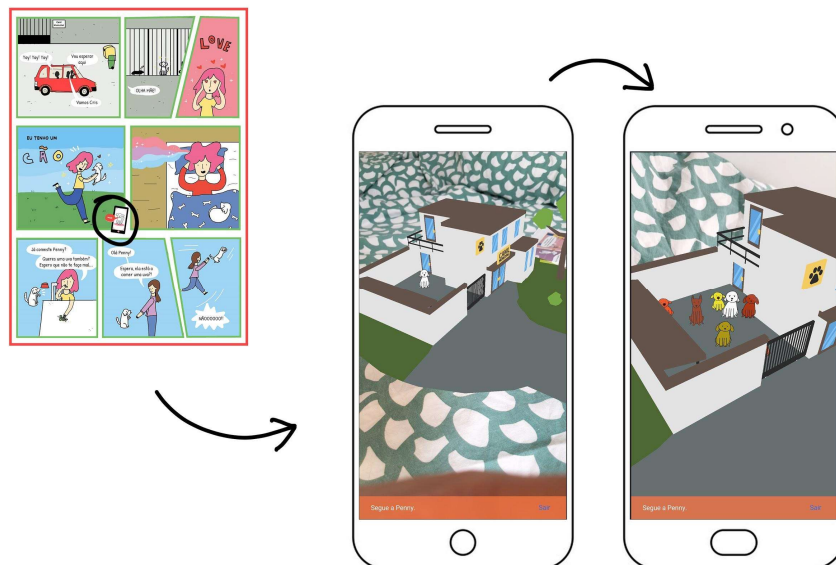


Figure 44: AR1 Interface in ARCore and the comic book trigger page

AR2 “Cris’s Room”- Penny did something, she should not have, and Cris gets mad. However, because Cris did not immediately scold Penny, she did not understand. This AR interaction explains how to educate pets. They have to react to the behaviour of the dog on the spot, or they will never understand what it is about and will continue to do the wrong thing (see Figure 45).

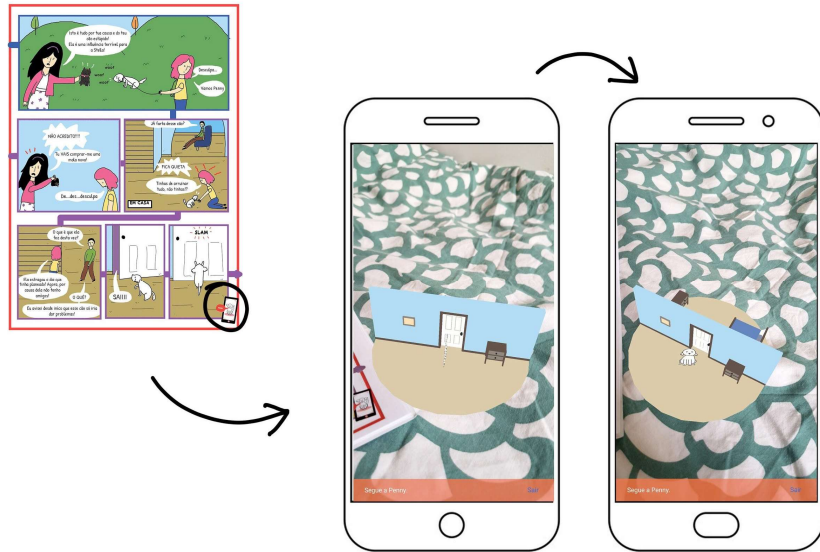


Figure 45: AR2 Interface in ARCore and the comic book trigger page

AR3 “Veterinary”- Penny is nervous because she does not know where she is going. When they get to the vet, Penny gets a vaccine, and end up hating the experience but when she sees a reward, she becomes happy and cannot wait to go back. This intends to show the importance of going to the vet even if the pet does not like it. It also demonstrates the importance of positive reinforcement by making pets associate things that are bad and replace them with a positive memory (see Figure 46).

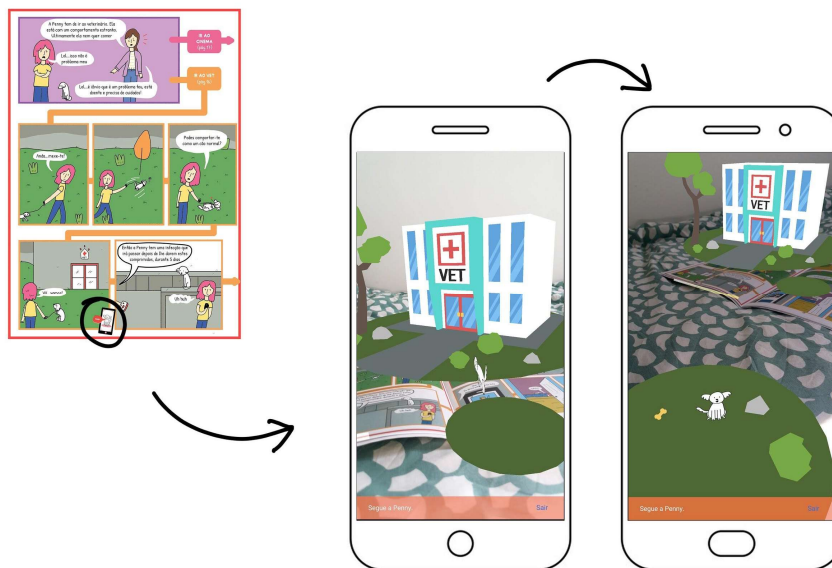


Figure 46: AR3 Interface in ARCore and the comic book trigger page

AR4 “Lost”- Penny catches the stick, but when she notices no one is there, she starts panicking and feels alone. Then Penny falls into a big black hole and thinks she has gone blind. This AR point is a way to show what happens to the character, because the reader does not know what happened to Penny (see Figure 47).

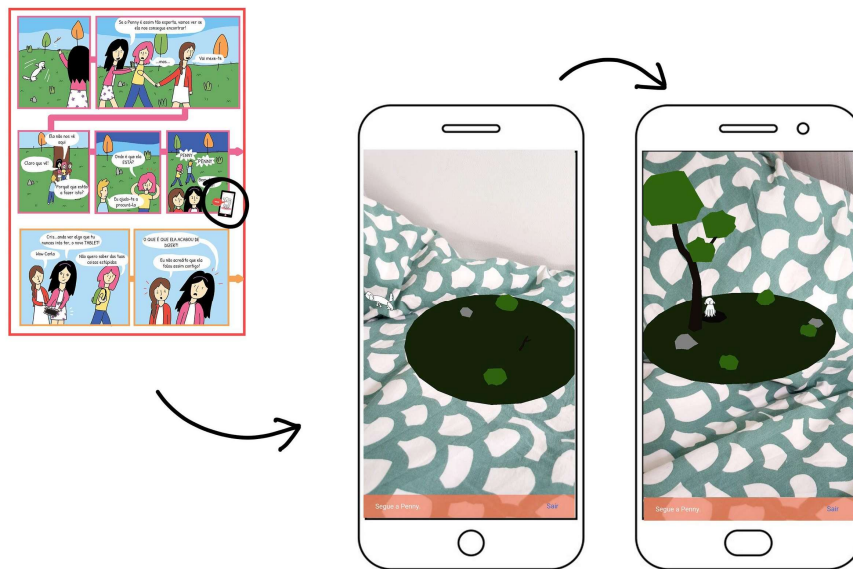


Figure 47: AR4 Interface in ARCore and the comic book trigger page

AR5 “Reconnection”- Penny is excited Cris is back, questioning why she was away for so long. Penny thought she had been a bad dog, and because of that, Cris abandoned her. Here we wanted to show that dogs are loyal till the very end, even if a long time passes, they never forget who their owners and loved ones are (see Figure 48).

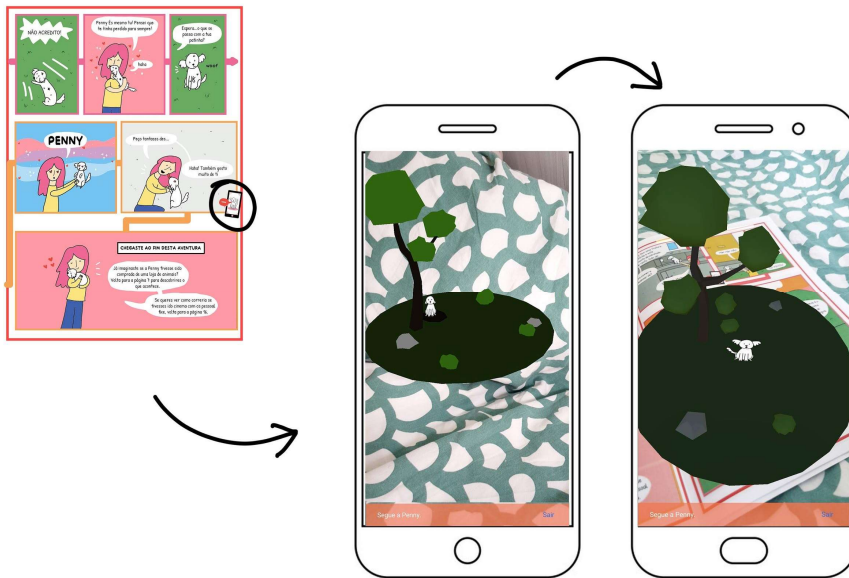


Figure 48: AR5 Interface in ARCore and the comic book trigger page

AR6 “Abandon”- Penny is at the kennel, and she thinks she is visiting her friends. When she realizes that Cris goes away and leaves her there, she panics and questions why. This shows what type of emotions a pet can feel when being left behind and how sad they feel (see Figure 49).

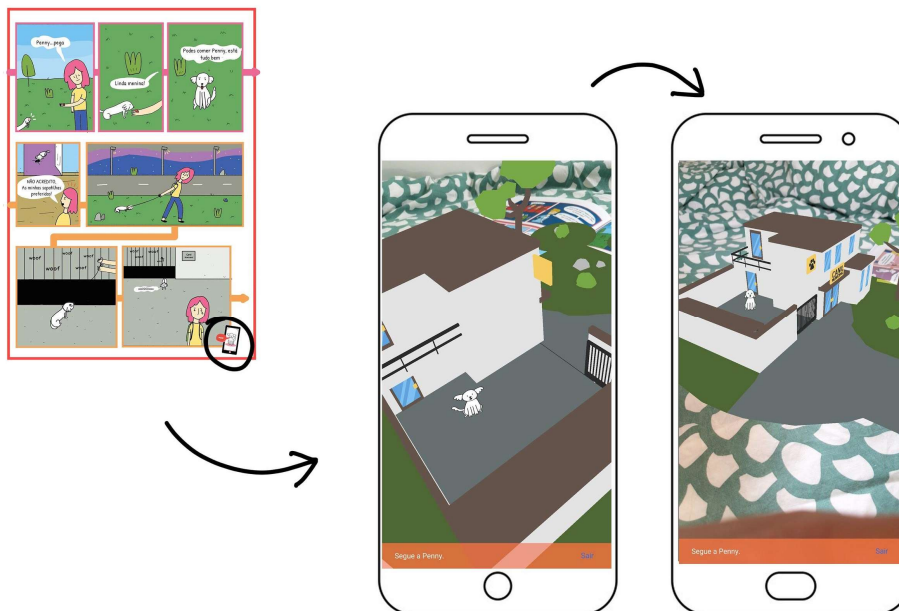


Figure 49: AR6 Interface in ARCore and the comic book trigger page

AR7 “Found”- Penny appears hurt, but excited to be found. This AR follows up from when Penny fell into the hole when trying to catch the stick. She then climbed out and waited for Cris in that spot, hoping she would come back (see Figure 50).

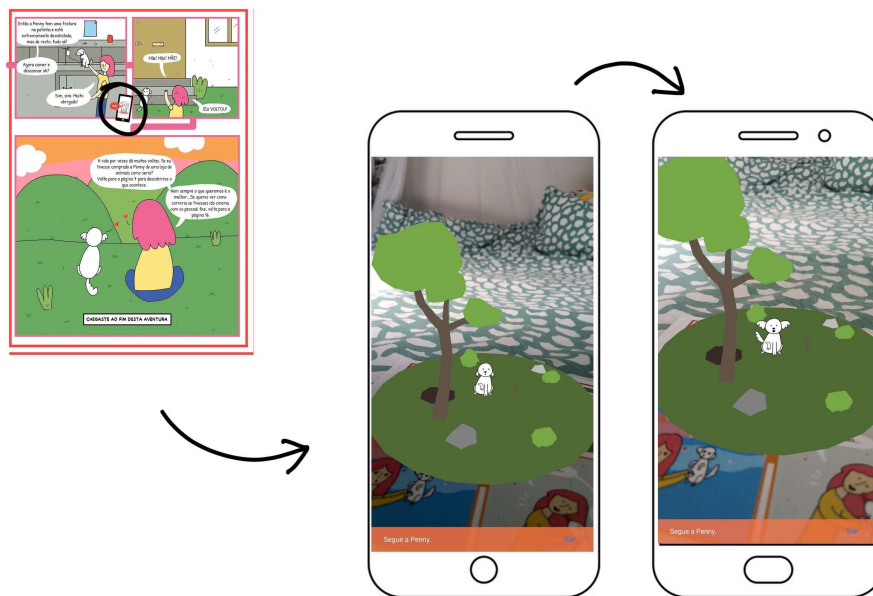


Figure 50: AR7 Interface in ARCore and the comic book trigger page

AR8 “Puppy Mill”- Penny introduces herself and thanks for picking her. She then talks about her experience so far that people and then she shows where she came from, the puppy mill. Penny then explains how she was taken from her mother and sent to the pet shop. She is very excited to finally have a space of her own, with a person that will care for her. This AR point is intended to show how poorly dogs are treated in puppy mills and why people should not buy dogs but rather adopt them (see Figure 51).

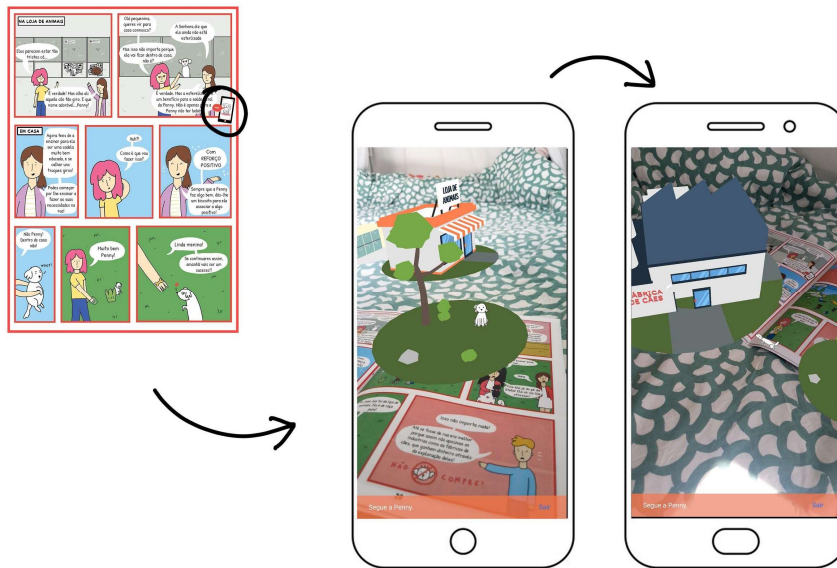


Figure 51: AR8 Interface in ARCore and the comic book trigger page

AR9 “Veterinary”- Penny is nervous because she does not know where she is going. When they get to the vet, Penny gets a vaccine, and end up hating the experience but when she sees a reward, she becomes happy and cannot wait to go back. This intends to show the importance of going to the vet even if the pet does not like it. It also demonstrates the importance of positive reinforcement by making pets associate things that are bad and replace them with a positive memory (see Figure 52).

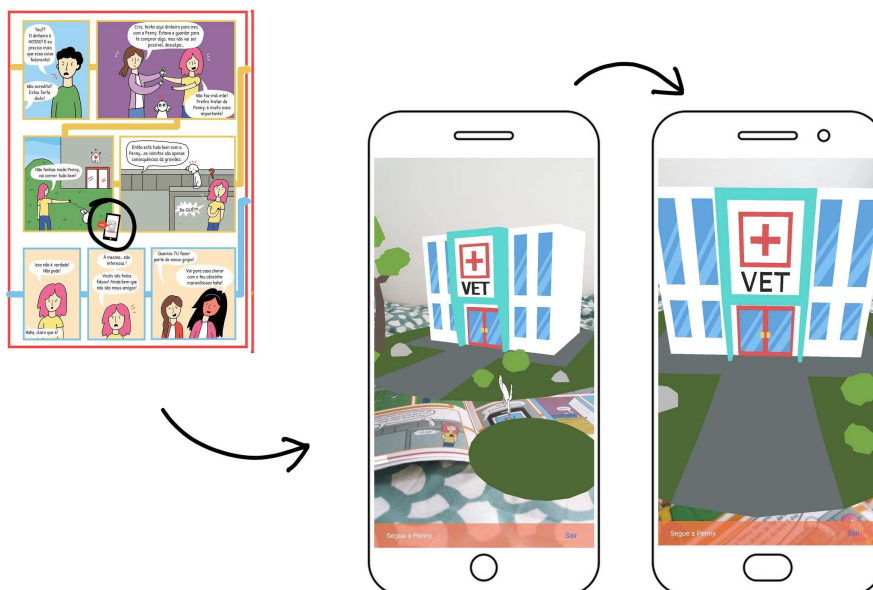


Figure 52: AR9 Interface in ARCore and the comic book trigger page

AR10 “Pedro’s House”- Penny and Cris arrive at Pedro’s house, and Penny is super excited. When the door closes on Penny, she starts crying because Cris leaves without her and she does not understand why. The message to take away from this AR point is that dogs feel alone when their owners leave and that is normal as they do not understand the reasons or if the owner will come back (see Figure 53).

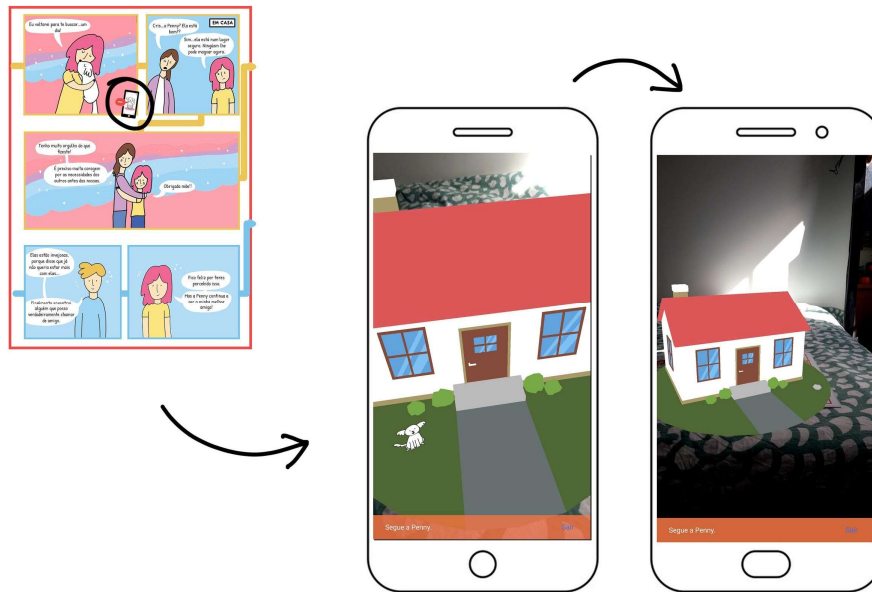


Figure 53: AR10 Interface in ARCore and the comic book trigger page

AR11 “Back Home”- Penny sees the chair Cris’s father is always sitting on and immediately panics thinking something terrible will happen. Then when she smells his scent, she tells Cris to get behind her because she will protect her. Here we show that dogs can have a memory attached to scents, but even if they are scared, their instinct is to protect their owner (see Figure 54).

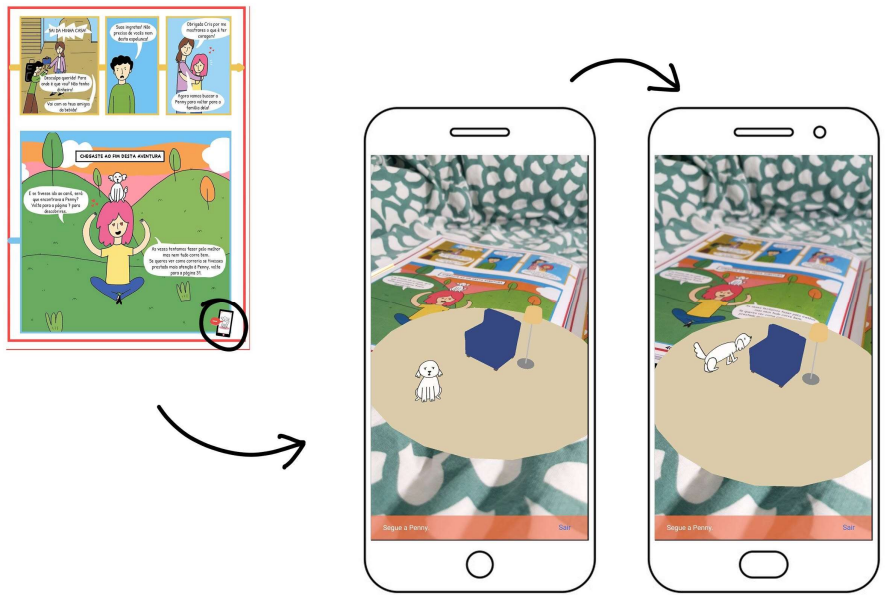


Figure 54: AR11 Interface in ARCore and the comic book trigger page

AR12 “Family”- Penny is very grateful and happy for being part of the family, and even though not everything goes perfectly, she is happy that the family stayed together. This shows that pets are always very grateful for being part of a family (see Figure 55).

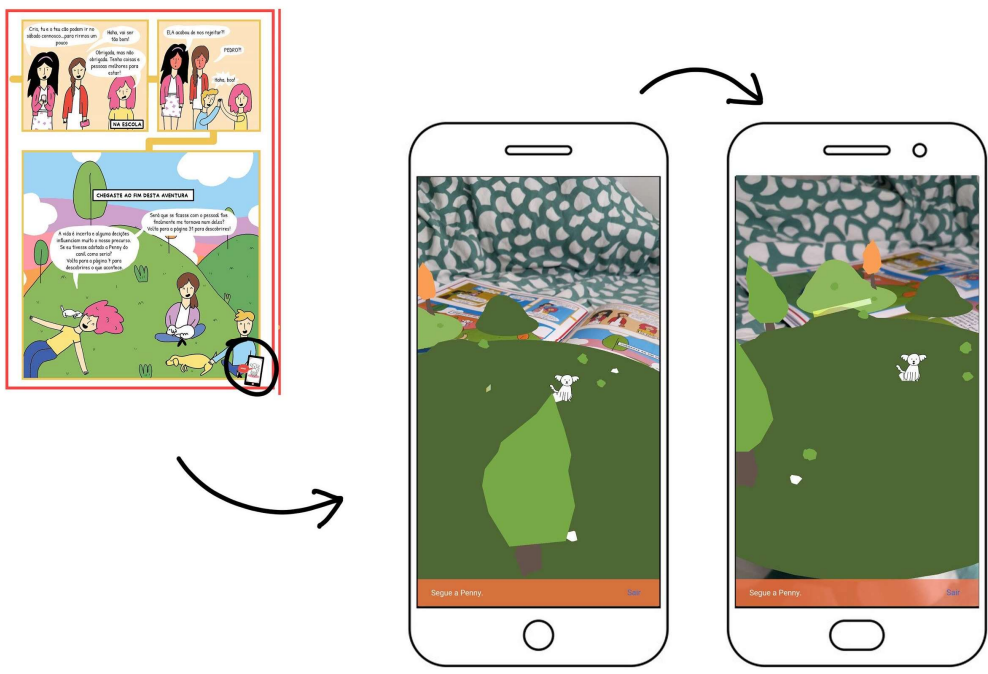


Figure 55: AR12 Interface in ARCore and the comic book trigger page

5.4 Interface and Implementation

To choose the right tool to implement the mobile application with AR capability it was essential to do a benchmarking research, Table 1 summarizes our research of tools against the requirements that we had. For the implementation of this project it was necessary to have: 1) a basic package, free of charge, that would allow to create and upload the application to a mobile device. 2) Allowing environment placing of the AR world. 3) The placement of 2D and 3D images should be simultaneous, as they interact with each other and can be in the same space. 4) It should allow creative freedom and not restrict what type of movements and experience we want to facilitate for the users.

	Free	Environment based	Easy	2D + 3D	Creative Freedom
Vuforia ●	×	×	×	×	×
Wikitude ●		×		×	
Maxst ●		×		×	×
Easy AR ●	×	×		×	
Kudan ●		×		×	
AR Core ●	×	×		×	×
HP Reveal ●	×		×	×	
Blippar ●	×		×	×	×
Metaverse ●	×		×	×	

Table 1: Each line represents an AR SDK's/Applications and each column the desired feature

The Software Development Kits (SDK) marked with the red dots in Table 1, in general, provides more creative freedom but in hindsight, are not as easy to use as the applications, marked with blue dots in Table 1. However, as the intended application has a more complicated environment where the animation of 2D characters interact with 3D models, we opted for an SDK. Although Vuforia was a simpler tool to handle, after some initial tests, we discovered that the environment tracking was somewhat complicated and unreliable. Therefore, the chosen AR development tool was AR Core as it offered the best environment-based positioning.

ARCore is Google's SDK to create AR experiences, and is available for development environments like Android and Unity . This SDK provides Application Program Interface (API) for AR features like motion tracking, environmental understanding and light estimation. ARCore uses the mobile phone's camera to detect interesting points, what they call features, and tracks how those points move along the way. It detects the position and orientation of the phone as it moves. It can also detect flat surfaces and estimate the light area around it and create accordingly to this information to create what feels like real computer-generated images in the real-world. ARCore being quite recent, it is not available for all mobile devices, just Android 7.0 (Nougat) or higher.

The whole AR application was developed in Unity 2019.3.0a11, ARCore v1.10.0 along with the Fungus Unity package to handle the narrative flow. All the 3D assets were created in Maya, and the 2D assets were created in Adobe Illustrator CS6 and Adobe Photoshop CS6. The 3D models were made to be the same as the scenery inside the comic book, giving the feeling that the comic has come to life. The 2D models were made into animation sprites (see Figure 56).

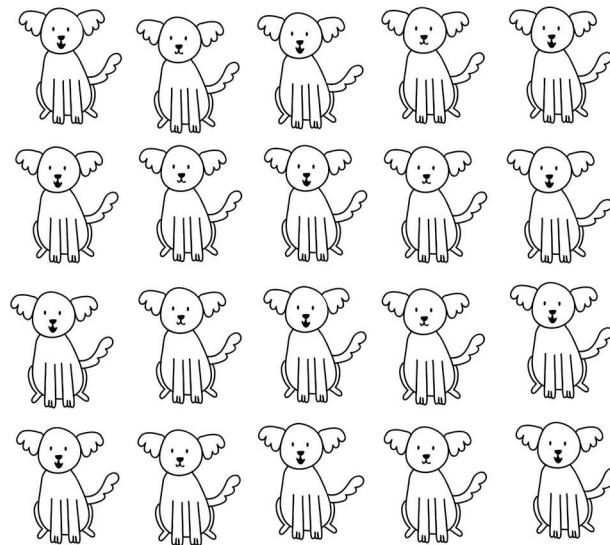


Figure 56: Example of an animation sprite sheet where Penny is happy and talking

The sprites were then transformed into an animation using the “animator” option in Unity (see Figure 57). This way, the speed of the animations could be controlled and made in loop so that the animation never stopped.

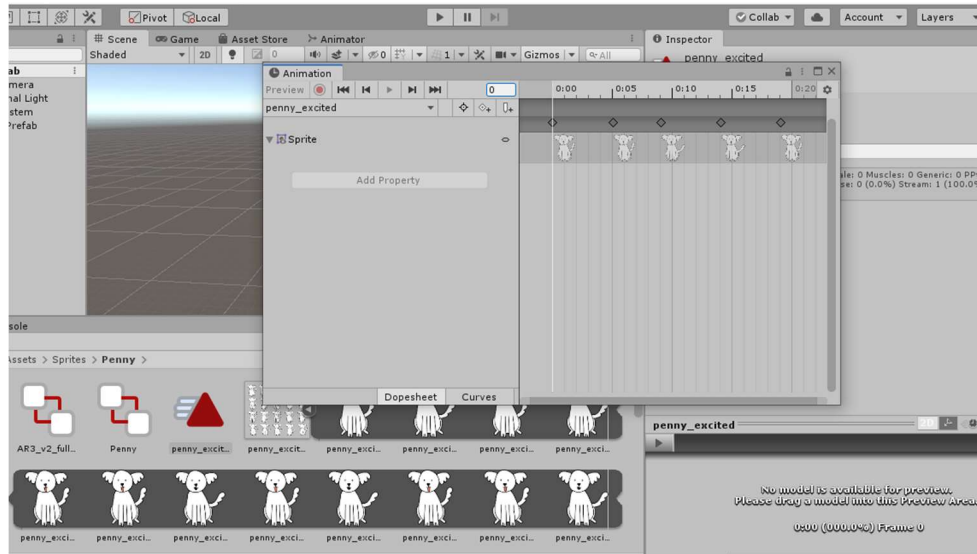


Figure 57: Sprite animator in Unity

In Unity, the world was created with the use of “Prefabs” as defined by Unity. These “Prefabs” are all the assets introduced inside the program to create the AR world. To move around the 2D character, “Splines” were used that allowed to move the character along the path defined as seen in Figure 58. Then to animate the world, a “Flowchart” script was developed to facilitate the process of the sequence of events that would happen in the AR world as seen in Figure 59. Then by adding “Fade in/out” and “Move to” it created the animations, and then adding the sounds and pauses to create the ambient. Then each command would have a String ID (see Figure 59) attached so that the script would know what asset should be called and utilized at that moment.

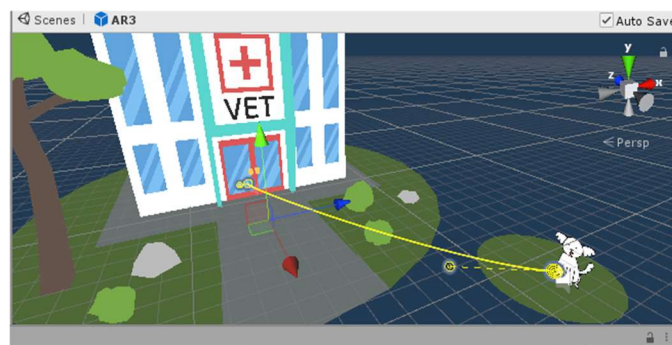
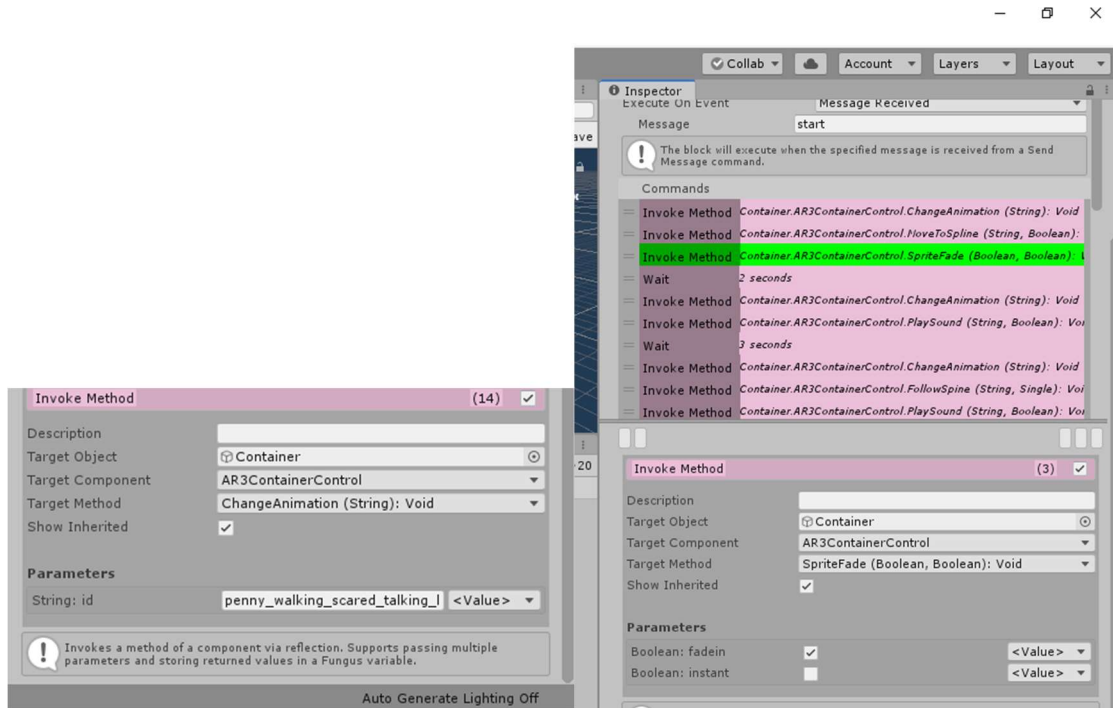


Figure 58: Unity screenshot: Spline

⁸ All the 3D models and textures were provided and created by Rui Trindade



⁹Figure 59: Unity screenshot: String ID and Flowchart

To help users navigate the AR application, visual cues were made in AR Core. The goal was to have simple and easy to follow instructions mainly because of our target audience and not frustrate them with too much information. The instructions start with the 1) “Scan the page” after there is a visual cue indicating that a page had been found ; 2) “Tap the new surface to place Penny” where it appears a mesh in the places that the AR can be placed and 3) “Need any help” in case the users are lost and do not understand the instructions. 4)“Exit” button each time a user finishes an AR point so that they can scan a new page (see Figure 60).

⁹ The coding for ARCore and the build was made by Paulo Bala and the base code of the scripts for Unity. The scripts were then edited and altered to adapt to each AR point.



Figure 60: AR Instructions and visual cues in ARCore

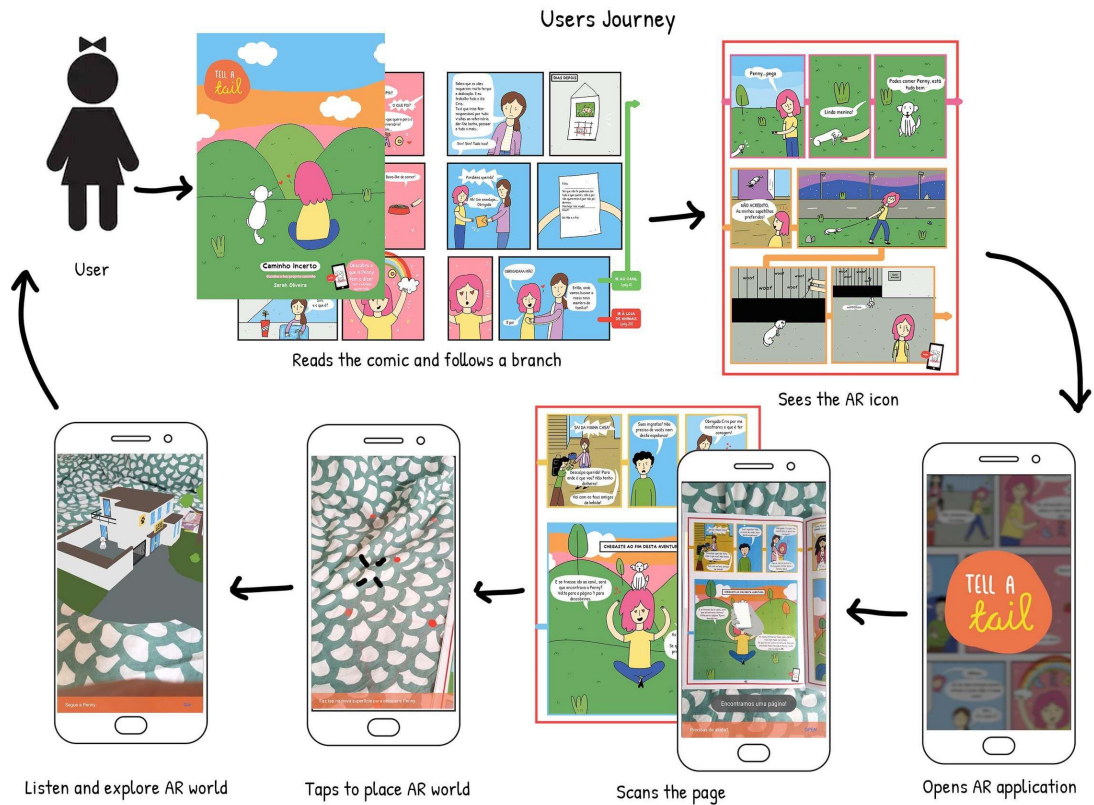


Figure 61: User's Journey of *Tell a Tail: Caminho Incerto*

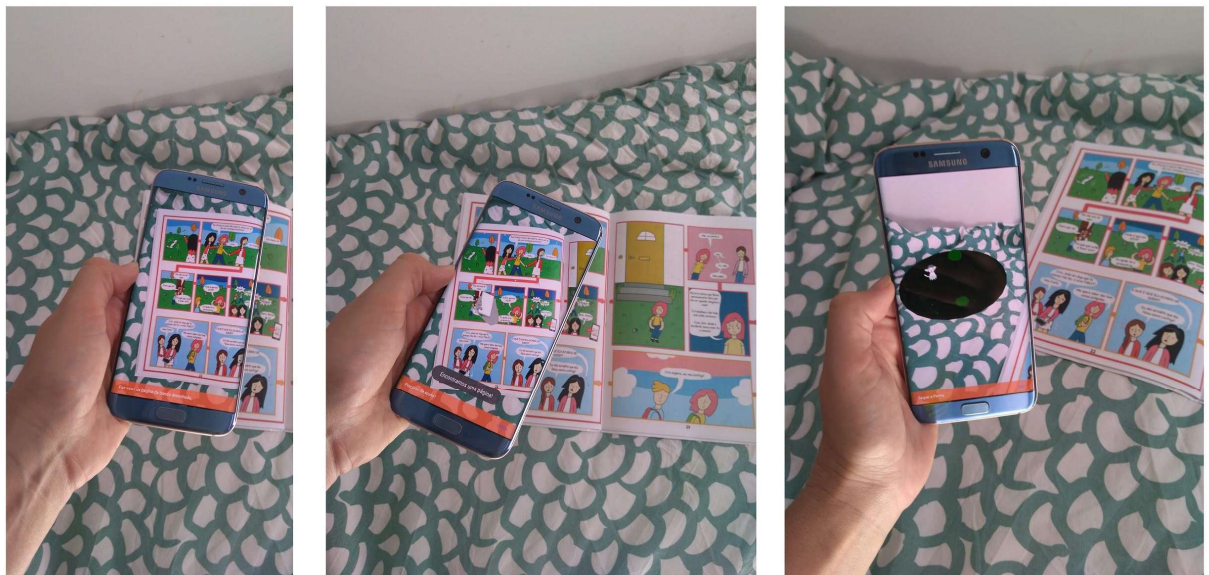


Figure 62: Scanning a trigger page, detecting it and opening the AR world

Chapter V: Evaluation of *Tell a Tail: Caminho Incerto*

1. Pilot Study

Our project was invited to be showcased at an event called: “Macaronight”, where many schools and various people come visit projects that were developed by the investigators. This was the perfect set up to run a pilot study based on observations, in order to get the first reactions of children interacting with the prototype. Figure 63 displays some pictures of the setup of the showcase.



Figure 63: “Macaronight” pilot study photos

<https://www.arditi.pt/index.php/component/acymailing/listid-3/mailid-141-newsletter>

1.1 Observations results

Around 40 visitors of "Macaronight" interacted with our prototype, 20 of these were children with ages ranging from 5 to 17 years old. From our observations, we noticed that all were captivated by the bright colours showing interest in knowing what the comic was about, asking if they could read it. When visitors realized that comic book was complemented with technology, they showcased more enthusiasm and interest by actively asking what the mobile application would do. There was a clear interest by most children

to see what was new and innovative, wanting to try the AR application more than reading the comic book. They would quickly jump to the comic book pages that have the AR icon and scan the page. When the images popped up, they expressed surprise and fascination by these; they would smile, gasp and say "wow" and "aw", calling people around them to come to take a look.

We noticed that in the first interaction with the AR world, some participants were reluctant to move around the smartphone thinking that they had to keep pointing at the marker for it to play correctly, they asked what they had to do and would keep the phone in the same spot for the entire experience. Only a 4 or 5 managed to move around confidently and freely. After the first interaction, however, all users became more confident to move around and explore the AR world.

However, the pilot study revealed some issues with the application. In some instances, the pages did not track correctly, the application froze and quit unexpectedly. Furthermore, due to the setup, the interaction with the project was swift; therefore, users did not experience the full story, and we could not verify if they understood the overall message of the experience.

This pilot study was the first time that the project was showcased to people outside the academic community. We could identify how the visuals used in the comic book were captivating enough for users and prompt their engagement with the story while the mobile application gave it a wow factor, incentivizing users to stay and interact. Furthermore, while this type of events is not the ideal set up for the users to get a full grasp of what is our experience, as they would need to sit down and read, re-read and interact with the comic and application as a whole, it was a great way to showcase, make connections and plan ahead for a complete user study in a school setup, that will be explained in the next section.

2. User Study

A user test was conducted to discover if the combination of a comic book with an AR application was successful in raising awareness towards good Animal Welfare practices while providing a positive impact in an immersive and engaging experience for children. Based on our pilot study, we could determine that the set up to test our project should be in a context where users could both sit down and walk around freely.

2.1 Methodology

A mixed-method evaluation was used, combining observation and questionnaires and then a session of A/B testing was conducted. A/B testing shows two variants of the same project to different target users this way, comparing which condition is most effective [28]. Each group got to interact with two variants of the “*Caminho Incerto*”, as we defined as condition A and condition B. The group assigned with condition A (later referred to Group AR) would be testing the comic book with the AR application. We provided a comic book for each user and a smartphone with the application and earphones. The group assigned with condition B (later referred to Group NOAR) would only be testing the comic book, so we only provided them with a comic book. This helps to determine the importance of the AR and if it does in fact provide an immersive and engaging experience and see the differ to the ones that will only read the comic book.

The observation method was used to discover how the users interacted with the project, how the project influenced their behavior, and determine their immersiveness. For the observation method, guidelines were created on what the investigators should pay special attention. For the comic book, those included: 1) Did users get confused with the branching options; 2) Did they wander around in the comic book or did they have any difficulty following the branches; 3) Did they flip the comic book back and forth; 4) Did they understand they could re-read the comic book. Then for the AR application the observation guidelines were: 1) Did the user manage to scan the trigger image correctly; 2) Did they manage to place the AR world in their first try; 3) Did they understand they could explore the AR world; 4) Did they follow Penny; 5) Does the user seem immersed in the AR world; 6) Did they come back to the AR application even when not needed. Check Appendix 3 for further details.

The questionnaires were a way to learn more about the knowledge of the users, prior and after interacting with “*Caminho Incerto*”. The questionnaire before the interaction included questions about their general knowledge about Animal Welfare; if they liked to read; if they ever read a choose your own adventure type book; if they were interested in AR and if the combination of books with AR was interesting and demographic questions.

The questionnaire after the interaction included the same questions about general knowledge about Animal Welfare and questions about the comic book and it’s length, if they liked being responsible for choosing how the story evolved and if they identified with the story. Then for Group AR, there was an extra section in the questionnaires about the technology, asking if the AR application made the story more interesting, if they felt more attached to Penny the character from the AR and if they felt it was easier to learn with the technology.

The fact that we had a before and after questionnaire was a way to compare both groups, to determine if there were any differences before and after the interaction with the project.

In both questionnaires we used a “Smiley-o-meter” [8] because of our target audience, making it easier for them to comprehend the choices, giving visual cues as seen in Figure 64 grading them from 1- “Completely Agree” to 5- “Disagree” accordingly. Check Appendix 3 for further details.



Figure 64: Smiley-o-meter for the questionnaires

We were able to test our prototype with 5th graders from a local middle school. In total, there were 17 users, from the ages of 10 to 12 years old (see Figure 65) that were then divided into two groups. Group AR had 6 users, and Group NOAR had 11 users.

Before testing, we explained that the project consisted of a comic book that they could choose their path, leading them to four possible endings. To Group AR we informed about the AR points that could be accessed with a smartphone.

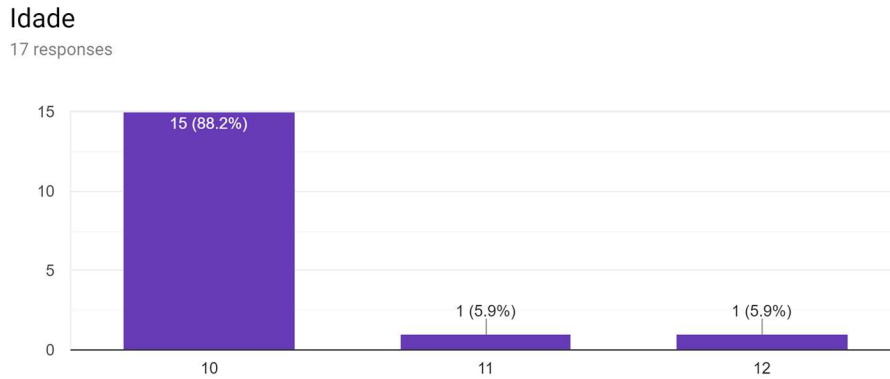


Figure 65: User tests age demographic

Participants were asked to fill out one questionnaire before the experience, then were able to interact with the project for around 30 minutes. The task for Group AR was to read the comic book and follow one or more branches using the AR application when needed. While Group NOAR was only to read the comic book by following the branches they wanted.

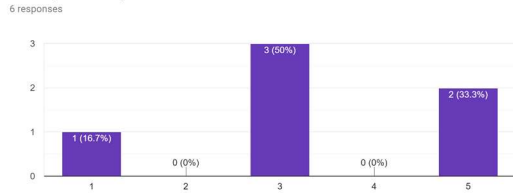
After the experience, participants were asked to fill out another questionnaire to complement the first one, this way we could compare what or if anything changed in their overall knowledge and evaluate the experience.

2.2 Results

2.2.1 Results from Condition A (Group AR) - Questionnaires

Overall when asked about the length of the comic book, most users selected two (50%), and all users liked the fact that there were branches to follow (see Figure 66). Moreover, all users felt more conscious and responsible when making decisions/choices and did not make them randomly.

Acho que a duração da banda desenhada está:



Gostei que a banda desenhada tivesse vários caminhos por onde seguir

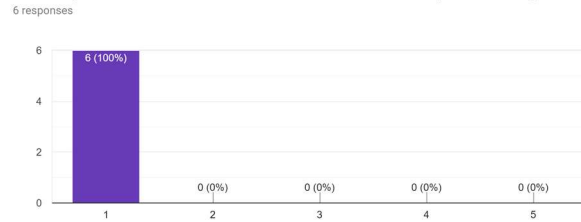


Figure 66: “The duration of the comic book is” (left) and “I liked that the comic book had various branches to follow” (right) Response chart

The number of users that read all the branches were 3 (50%) and while the other 3 users (50%) read only two. When asked if they thought the comic book should have more options, some users (33.3%) selected 1- “Completely agree”, 2 (33.3%) selected three and the other 2 users (33.3%) selected one. The majority of users (66.7%), enjoyed that their decisions affected the outcome of the story (see Figure 67). Furthermore, half of the users thought it would be more interesting if the decisions were about educating Penny and the other half thought that decisions about Cris’s life would be more engaging. When asked if they related to the story 3 users (50%) selected “Completely agree” justifying that it was the experience was nice and because they wanted a dog like Penny, 2 users (33.3%) selected 1- “Disagree” and 1 user (16.7%) selected three.

Gostei que fosse eu o/a responsável por tomar decisões que afetavam a história

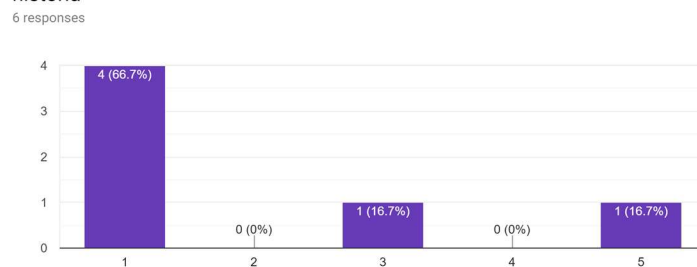


Figure 67: “I liked that there were various branches to follow” Response chart

Regarding the technology, the majority of users (83,3%) when asked if the AR made the story more interesting; if they thought the technology contributed on changing their sensibility about the topic; if they felt they got to know Penny better (see Figure 69) and

create a more significant bond with her through the application (see Figure 68), selected 1-“Completely agree” .

Sentiste que ao usar Realidade Aumentada criaste uma maior ligação emocional com a Penny?

6 responses

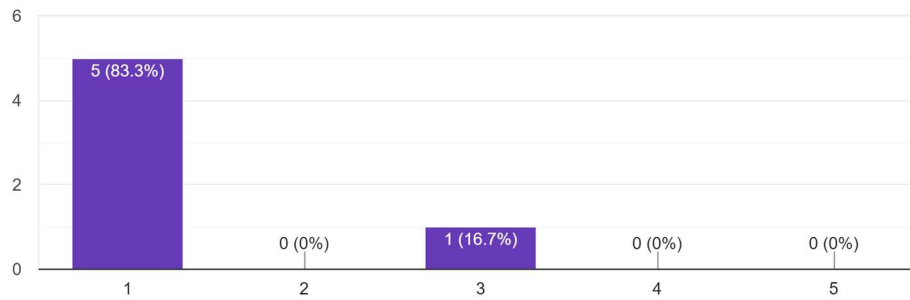
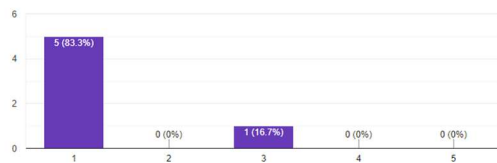


Figure 68: “Do you feel that by using AR you created a bigger bond emotionally with Penny?” Responses Chart

Com a aplicação ficaste a conhecer melhor a Penny?
6 responses



A Realidade Aumentada aumentou o meu prazer ao ler esta banda desenhada?
6 responses

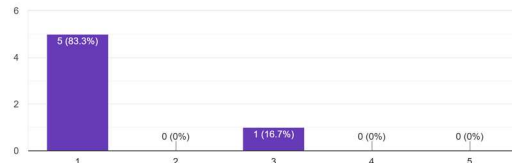


Figure 69: “With the application you got to know Penny better” (left) and “AR augmented the pleasure of reading the comic book” (right) Responses Chart

When asked what they thought about the merging of the AR with the comic book they wrote: “interesting, fun and good”. Then all the users responded 1- “Completely agree” when asked if AR helped learning (see chart in Figure 70).

Achas que é mais fácil aprender com Realidade Aumentada?

6 responses

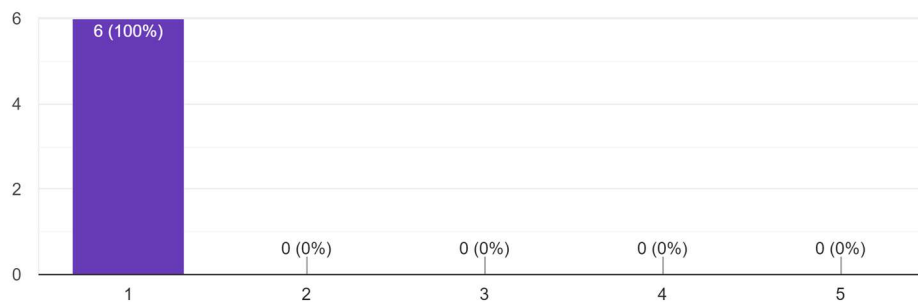


Figure 70: “Do you think AR helps to learn?” Responses Chart

2.2.2 Results from the Condition A (Group AR) - Observations

This section contains a summary of the observations collected during the user test sessions and according to the guidelines described in section 2.1. and in Appendix 3. The display of the classroom tables allowed users to work in groups, creating a lot of interaction between the users. However, 2 of the 6 users opted to stay at their desk for the experience to be able to read and see the AR in their own time. These 2 users were so immersed in the story that they did not even look up or around them, even when the other users walked around and talked out loud. Most of the users used the phone to open up the application before opening the comic book. When they saw that nothing happened, they proceed to open the comic book and read the instructions. 4 of the 6 users flipped through the pages trying to find the AR icon as they were very eager to discover what the application would do, but when these tried to scan the AR icon, nothing would happen as they only scanned the AR icon rather than the whole page. They also had some difficulty in putting the AR world in the physical world, not understanding where they had to point the camera for it to appear. AR Core needs a well illuminated and texture area to be placed, and the classroom had neither. However, after understanding the mechanics of it, they got creative and searched around for points in the room where the AR could be placed more easily.

After a while user stood up as the trigger image was hard for them to scan while sitting, because of their height, and also because after triggering the image they would walk around trying to find the best place to place the AR world. Another aspect we observed

was that when the AR finished, some users were in doubt if it had finished or not. They would not notice the “Saír” (Exit) button, or they would not understand that it was to exit that specific AR point, so they would wander around the classroom continuing going after Penny. The fact that the application did not always trigger the AR world on all images it was supposed to, also made the users frustrated; they would not understand that they had to scan the entire page correctly. One doubt that arose when re-opening the application was if that meant they had to see every AR point again or only view the one they were looking at in the moment before closing the application. There was also an issue with the mesh that appeared on the screen as to indicate a good place for users to place down the AR world. The mesh appeared in random colours, so users thought that the colours meant something, like the white mesh being good and the red mesh being bad and that not being the case.

2.2.3 Results from Condition B (Group NOAR) - Questionnaires

This group, similarly to the other, rated the duration of the comic book not too short nor too long (three) based on 5 users (45.5%), 4 users (36.4%) selected four and only 2 users (18.2%) selected five - “too long” (see Figure 71). Most of the users (81.8%) selected “Completely agree” that they liked that the story had various branches to follow and the other 2 users (18.2%) selected three “Nor agree nor disagree” in the scale (see Figure 71). Nearly all users appreciate that these decisions affected the outcome of the story, as seen in Figure 72. Moreover, 7 users (63.3%) selected “Completely agree” that they felt more conscious and responsible when taking the decisions.

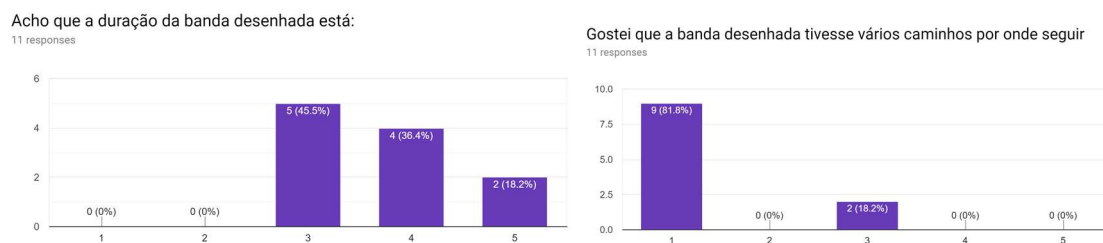


Figure 71: “The duration of the comic is” (left) and “I liked that the comic book had various branches to follow” (right) Response chart

Gostei que fosse eu o/a responsável por tomar decisões que afetavam a história

11 responses

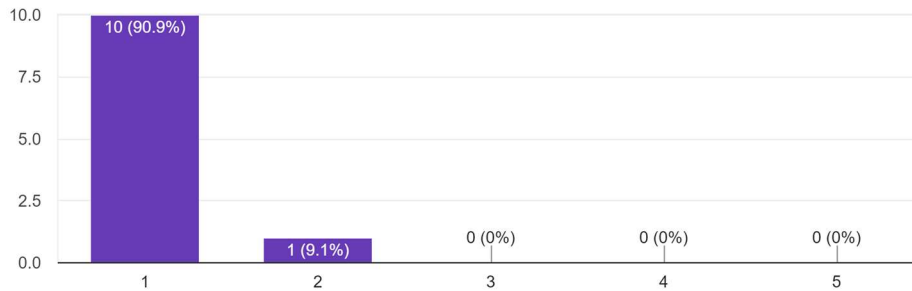


Figure 72: “I liked that I was responsible for taking the decisions that affected the story” Response Chart

The number of users that read all the branches was 6 (54.5%) and 2 users (18.2%) reading two (18.2%) and only 1 user (9.1%) reading one, mostly because they were curious about the different paths and endings. Most users selected one -"Completely agree" on having more options throughout the comic book with 4 users (36.4%) and the other 3 users (27.3%) not agreeing or disagreeing, selecting three. A greater number of users wanted to have more choices available about the education of Penny based on 8 users (72.7%) as seen in Figure 73, with only 2 users (18.2%) selecting having more decisions about Cris's life.

Que tipo de escolhas querias

11 responses

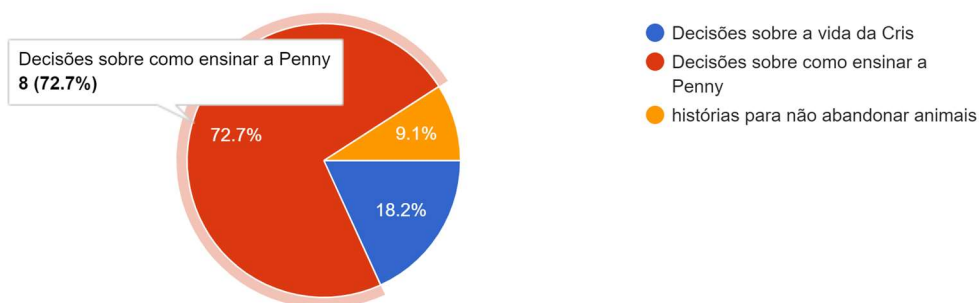


Figure 73: “What type of decisions did you want?” Response Chart

The majority selected one - “Completely agree” when asked if they identified with the story. 3 users (33.3%) selected that they did not agree nor disagree selecting three and the other 2 users (22.2%) selected two, justifying that they loved animals and wanted to have a dog.

2.2.4 Condition B (Group NOAR) - Observations

Opposite to Group AR, this group was very quiet and focused on reading the comic book and following the paths. Each user was sitting on their desk. They quickly got started reading and following the paths they wanted. All the users looked fully immersed and engaged with the story as they would not look up or stop reading. Only 1 user at one point got confused as to where a specific path would lead while the rest got on smoothly on their own. When they got to the final pages, they would flip back and forth considering what new branch they wanted to follow.

2.2.5 Comparing the results between Group AR and Group NOAR

The general knowledge of both groups, broadly speaking, did not change from the before questionnaire to the after questionnaire. Mostly because what users already knew was what was reinforced with the messages of the story. On the before questionnaire 14 users (82.4%) responded that it was better to adopt a pet justifying that they need love, help and care and only 3 users (17.6%) responded buying is best (see Figure 74). Those 3 users justified that option because they believed that if it is bought no one can take it away and another side, thinking that that is where small puppies come from. After in Group AR, the majority of 5 users (83.3%) still answered that adopting was best, with 1 user (16.7%) still choosing buying is best (see Figure 75). In Group NOAR, the majority of 10 users (90.9%) chose that adopting was best with only 1 user (9.1%) remaining on buying is best (see Figure 75), meaning that overall 1 person changed their answer from buying to adopting.

É melhor adotar ou comprar um cão?

17 responses

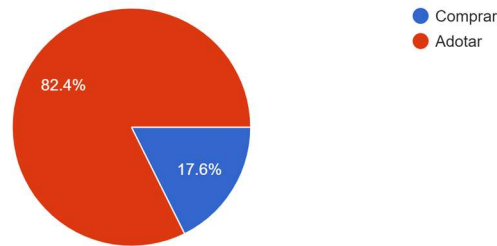
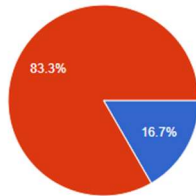


Figure 74: “Is it better to adopt or buy a dog?” Response chart on the before questionnaire

6 responses



11 responses

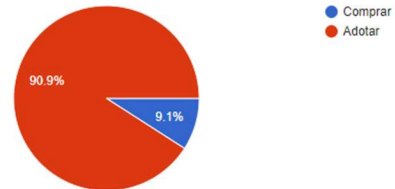


Figure 75: “Is it better to adopt or buy a dog?” Response chart on the after-questionnaire Group AR (left) and Group NOAR (right)

When questioned on the frequency they thought an animal should be taken to the vet, on the before questionnaire 10 users (58.8%) selected “Very frequent” (five) and 4 (23.5%) selected four and the other 3 users selected two (5.9%) and 1 user selected two (11.8%) as seen in the figure below (Figure 76). Afterwards Group AR answered mostly “Not very frequent” (one) with 50% and the others (16.7%) scattered along the scale. In Group NOAR, they mostly answered “Very frequent” (five) with 7 users (63.6%), other 3 users (27.3%) selected four and the remaining user (9.1%) selected three (Figure 76).

Com que frequência achas importante levar um animal ao veterinário

17 responses

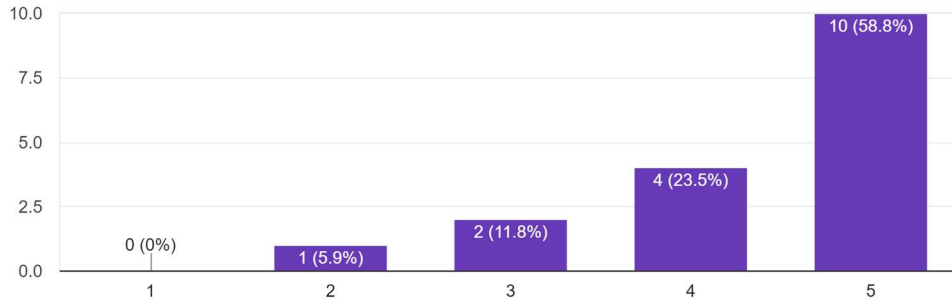
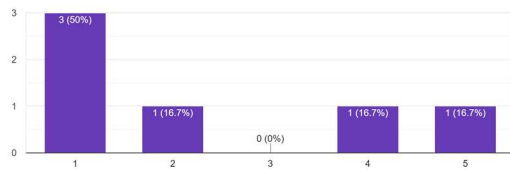


Figure 76: “With what frequency do you think it's important to take an animal to the vet?” Response chart on the before questionnaire

Com que frequência achas importante levar um animal ao veterinário

6 responses



Com que frequência achas importante levar um animal ao veterinário

11 responses

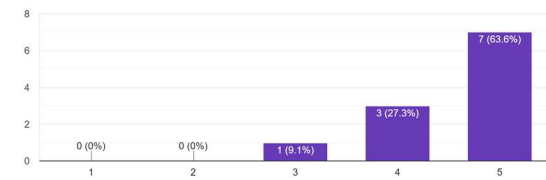


Figure 77: “With what frequency do you think it's important to take an animal to the vet?” Response chart of Group AR (left) and Group NOAR (right) on the after questionnaire

2.3 Discussion

From the qualitative evaluations, it was possible to detect some differences between both groups and how what they tested affected their experience. When asked about the duration of the comic book, as it was important to analyse if with the application the duration got a bit tedious, or if just reading all branches summed up to a very long process, it was possible to detect that both groups answered the same as seen above, indicating that the length is good. However, after the majority, the rest of the users from Group NOAR selected that it was rather short. Nevertheless, only 50% of the users of Group NOAR read all 4 paths, so it can influence that question. More users of Group NOAR also answered that they wanted more decisions, making us believe that Group AR did not

mind as they had another task to do, use the application. Overall both groups felt responsible when taking the decisions, so the application did not have any weight when users pondered about what to do. This can derive from the fact that the application was a novelty for the users, so they were not focusing on the message contained in the application but on the technology itself.

Further differences were found between both groups during the observations. Overall the excitement level of Group AR was much higher than Group NOAR, mainly because it involves technology and Group AR was already excited about having to use a mobile device. Where in Group NOAR, the excitement was upon learning that there were various branches to follow leading to different possible endings. One thing we noticed was that in Group AR some users were not paying attention to the story, they would flip through the entire comic book just looking for the AR icon and would not bother reading. While in Group NOAR, they were keen on getting to know the story and following all the possible outcomes. Indicating that while AR technology can provide that sense of excitement it can at the same time become distracting and detach the users from the actual message contained inside the story, making them only focus on what the technology can do.

From Group AR, a significant positive aspect was an immediate connection between Penny and the user. After one interaction, with the AR environment, they grabbed the physical comic book and said things like "What is going to happen to Penny" and "Oh no, poor Penny". When using the AR application, they would call out her name and chase her around very amused. They would say out loud that they found Penny and try to touch her by putting their hand in front of the phone's camera wanting to pet her. This is why the user studies were conducted in a place where users could move around and express themselves freely. This is something that we did not observe in Group NOAR; they were not so vocal as Group AR, keeping their emotions to themselves. Thus, making us reflect, on how children connected the AR to their real world. For these sorts of interactions, a more informal and open environment might be better, one that is more indicated for children to vocalize their experience and explore the 3D environment. For example, it might not be an experience suited for libraries or places that require concentration.

The technology also provided a way for users to interact with each other even though they had earphones and a smartphone each. They looked at each other's screens and wanted to follow along with what was happening to their nearby colleague. Both groups were so engaged that they didn't even notice the passage of time as some users in both groups asked if they could engage with it for a little bit longer. In Group AR we noticed there was a more significant impact as they kept engaging with the AR and checking what possibilities it contained, explore the world, discover what they could do with it and listen to what Penny had to say.

Usability issues were found in the AR application, consistent with what was already observed in the Pilot study. The visual cues used in the application, were still not enough or not clear enough for the users, leading to some frustration. The fact that the placement of the AR world was not the best, could also have been a factor of previous frustration for the users, as initially, detecting a surface that was rich enough to put the AR world was hard to find. The fact that ARCore is a recent technology can also be the source of this.

As for possible solutions, it would be beneficial to have more visual cues and more explicit instructions on what to do. A possible solution could be leaving the AR world on the screen until users pressed the “Saír” button, giving them more time to further explore the AR world. The issue with the mesh could be resolved with a simple change of colour to one colour only. As for the trigger images, we could see that even though it had a red border around the page, users initially scanned the AR icon only, even when the instructions provided them with the correct information. So, to resolve this issue, there could be a small text next to each AR icon or on the trigger page informing to scan the whole page or creating an individual icon for each trigger image.

Chapter VI: Future Work and Conclusion

1.Future Work

From the results of the questionnaires, it emerged that it would be beneficial if the story included more educational aspects, particularly specific advice on how to properly educate a dog. There could also be the addition of more choices that would not affect the overall narrative but could provide essential and valuable educational tips for the users. It would also be interesting to have another edition of the book with a follow up story, making *Caminho Incerto* into a series of comic books about animal welfare, this way dividing the content more easily and deepening on the selected topic. Eventually where each series could portray a specific aspect regarding Animal Welfare.

For the application, it would be interesting to conduct a test to verify the usability of the technology itself. As AR is a new technology it would be beneficial to see how children interact with it and what would make it easier for them to navigate. It would also be interesting to have the application as a more gamified approach, thus seeing if the overall message would be better retained or if their awareness were bigger than from a storytelling approach.

2.Conclusion

Tell a Tail tackles one of societies current concerns, Animal Welfare. Because this is such a broad and complex topic that can be cut down into so many pieces and viewed from so many different perspectives, it seemed suitable for a transmedia world. This way, the story can evolve as the issues evolve, creating new ways of tackling the problems by providing more content with more medias, expanding the transmedia world.

Tell a Tail: Caminho Incerto shows that merging a branching narrative comic book with an AR application can create a positive impact in delivering important messages to young audiences. The comic book facilitates making users visually and contextually aware of how choices can affect a series of events. The AR application adds another layer of awareness, making users more immersed in the story, letting them connect with the characters while seamlessly navigating through the story world. Nevertheless, it is

important to note that educating audiences is a complex process, and it is not with one interaction that users will become more educated. This project merely provides an entryway to the topic, creating awareness about Animal Welfare in general and hopefully incentivizing users to search for more information.

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Appendix

Appendix 1: Field Visits

1. Municipal Kennel of Funchal

The Municipal Kennel of Funchal, now known as the Official Collection Center Vasco Gil, managed by the AMAIS Association (Madeira Animals Association), since 2016. It still does not have all the legal requirements to be officially recognised as an official kennel. It accommodates over 270 canines and 60 felines. The kennel was visited by both researchers of the transmedia project over a period of a week, in which we stayed two full days of that week. With this visit we wanted to see first-hand how things were in the field and determine if the questionnaire findings were true. In the next paragraph the visit to kennel is described in detail, reconstructed from notes, pictures, memory and a brief interview with Dr. Sara Machado.

The day we visited the kennel some work was ongoing, they had a space destined for cattery, and that was still covered in mud. From the moment we arrived there was a very loud and warm welcome from the dogs that were roaming freely at the front door. The workers routines start very early and each one has a different section to take care of by themselves. All the cages are open to be cleaned, and while these cages are open, the dogs roam freely in the courtyard, performing their daily exercise, which is very important so that they do not get muscle atrophy. They let the dogs walk and run freely whilst doing their job cleaning the cages. They free dogs that are known to get along together, to avoid dog fights happening in the courtyard. Despite this attention, from time to time dogs to get into a fight and all the workers come together to try and separate them. Because the kennel has far too many dogs for their cages, the friendlier dogs remain free in the front of the kennel, all together and loose. These dogs that always remain free and cageless, at night when no one is there, sometimes get into fights, and this results in bad injuries or even deaths.

In the kennel, there are puppies that were abandoned, and these have to stay separate from all the other dogs because they are the easiest target of the fights. When the puppies are abandoned without their mother, it is harder for them to survive. The kennel

must arrange for another dog which recently was a mother and hope that this dog will take these puppies as her own and feed them for them to survive. There is also a separate section dedicated to the cats, where one person takes care of them all, feed them and clean all their necessities. The cats are usually brought in when injured and cannot survive on its own.

When we interviewed Dr. Sara Machado who is the person responsible for the kennel, we asked her about her opinion on animal abandonment on the island. She disclosed that it is an alarming issue since some people see animals as disposable. Even though the kennel is always at full capacity they never say no to another animal. The kennel receives 20 to 30 dogs collected per month, in the best-case scenario. She even reported cases where people left dogs overnight tied up to the kennels gate or simply dump them near the area so that they get picked up by the kennel. We asked if there was a specific season for abandonment, she confirmed our findings from the questionnaire, that summer is the worse period on abandonment, but not because people go on vacation, as we thought, but rather because that is litter season, so the number of dogs and cats collected increases. This means that during the other months a smaller number of dogs and cats might be disposed of, but as they are on the street and are not sterilized, they get pregnant and have litters.

Dr. Sara Machado also informed us that older dogs tend to be discarded in the adoption process, as they deem to be not as exciting as a puppy, so in order to solve that issue the kennel made a partnership with a German Association. This association sends local older dogs to Germany to be adopted since they would not have that opportunity in Madeira. This way they have the chance to have a new happy life welcomed by a culture that does not look down on older animals. This shows how different cultures operate in shaping mentalities, where in one country dogs independently of age are likely to be adopted and in another like in Madeira older dogs are devalued as old things that will not learn new habits or may be too traumatized to be adopted, which by the way all proved to be false.

From our online survey, the term “wandering animals” and how they were a big issue in Madeira and how they are everywhere was quite recurrent. We asked Dr. Sara Machado about it and she stated that these “wandering animals” were not actually the biggest

issue, because stray animals in Madeira are almost all tagged and sterile, usually benefitting from the care of the people who live near them. For her the biggest issue nowadays is lack of mainstream education related to animals, their welfare and rights. Madeiran society quickly need to be re-educated by demystifying all the previous false assumptions and beliefs about animals and become aware of the consequences their actions can have on these beings.

2.SPAD

SPAD is a non-profitable private institution where most of their money comes from donors.

Their main objective is to fight for animal rights and animal welfare, basing of the Universal Rights of Animals and all acting laws. When they have the space and means, they bring in abandoned animals, giving them assistance when they are sick, and they try to promote ways to sensibelize people how to care and love their animal. They also solicit and act with competent entities of adoption associations to prevent and condemn cruelty to animals.

Both researchers visited SPAD premises for one day. The account of the visit reconstructed from notes, photograms and interviews that is reported below. When we visited SPAD, we went to the main headquarters, where there is the reception and also a toy store for pets, where everything appears clean and modern. For newcomers, finding where the animals for adoptions are kept is not easy, there is no indication of such, but we could hear them. In the farther side of the place we found the door to the kennel, and very close to these, the temporary animals that are just there for a short stay, while their owners are out. When we went inside, we first saw the cats, more precisely one cat that was alone, and some dog heads popping out of their cage barking for our attention. There was this big cage with a lot of cats inside, all hanging out together with a big space for them to run around freely and plenty of beds and food for them all. The dogs cages however, were almost all packed. With a minimum of 2 up to 4 or even 5 dogs per cage. There were the dogs that crave for attention and would not let go of our hand and then there were dogs that would hide in the back of their cages, afraid and shivering. Many times, their food was all spread out and the water bowl had nothing

inside but urine. While we were there, there was a lady cleaning all the cages. She would open the cage, put the dogs in a big carrier as seen in Figure 1, clean the newspaper, spray the cage with water, put back some new newspaper and put the dogs back into the cage.



Figure 78: SPAD: Cleaning the Cages

We also spotted 3 dogs that were sponsored (see Figure 2); we knew this because the outside of their kennel was advertised as such. A sponsored dog gets brand name food, a cage to themselves and from what we could see a much cleaner cage.



Figure 79: SPAD: Sponsored Dogs Cage

Appendix 2: Comic Book Storyboard

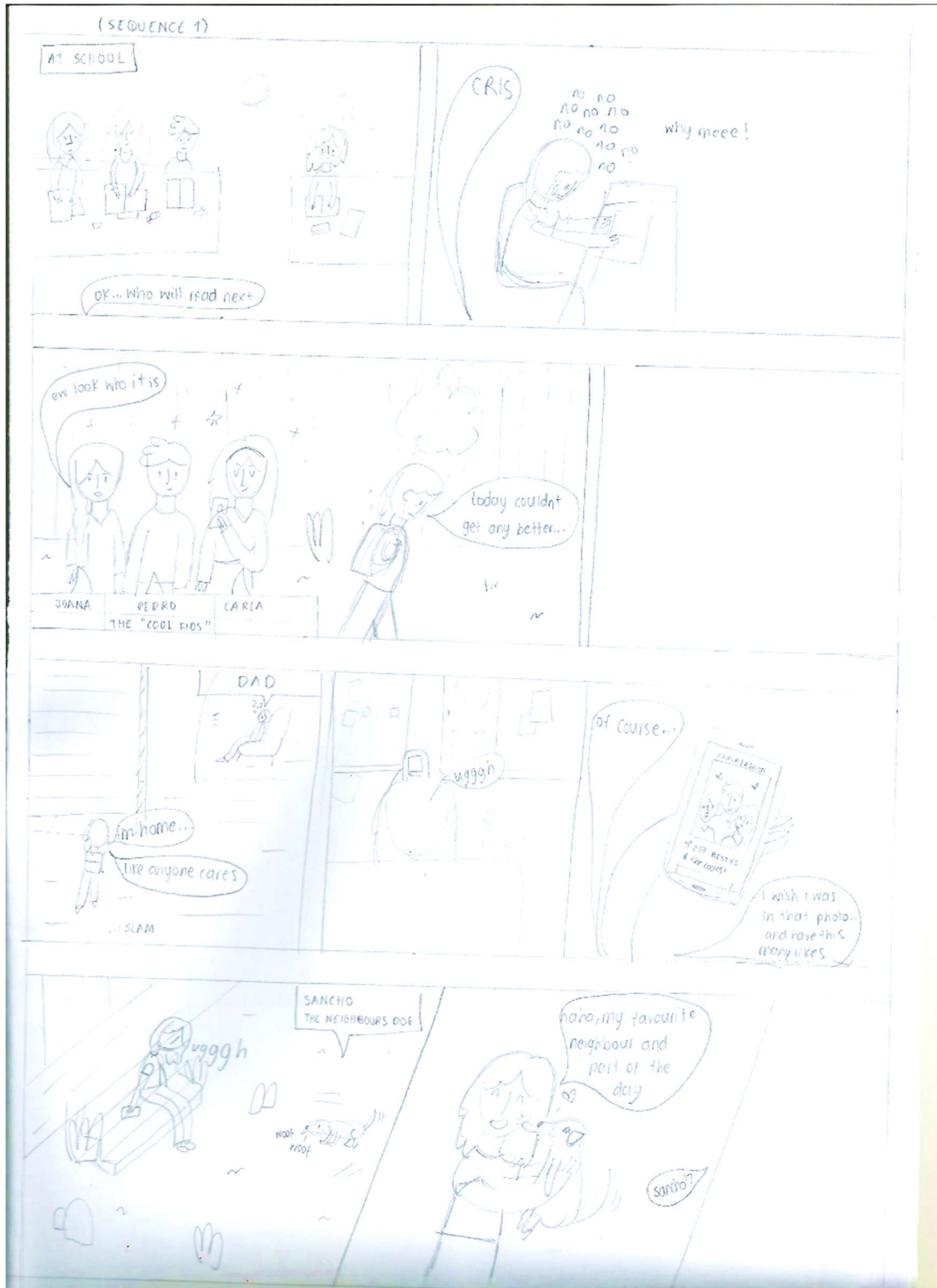


Figure 80 Comic Book Storyboard – Beginning

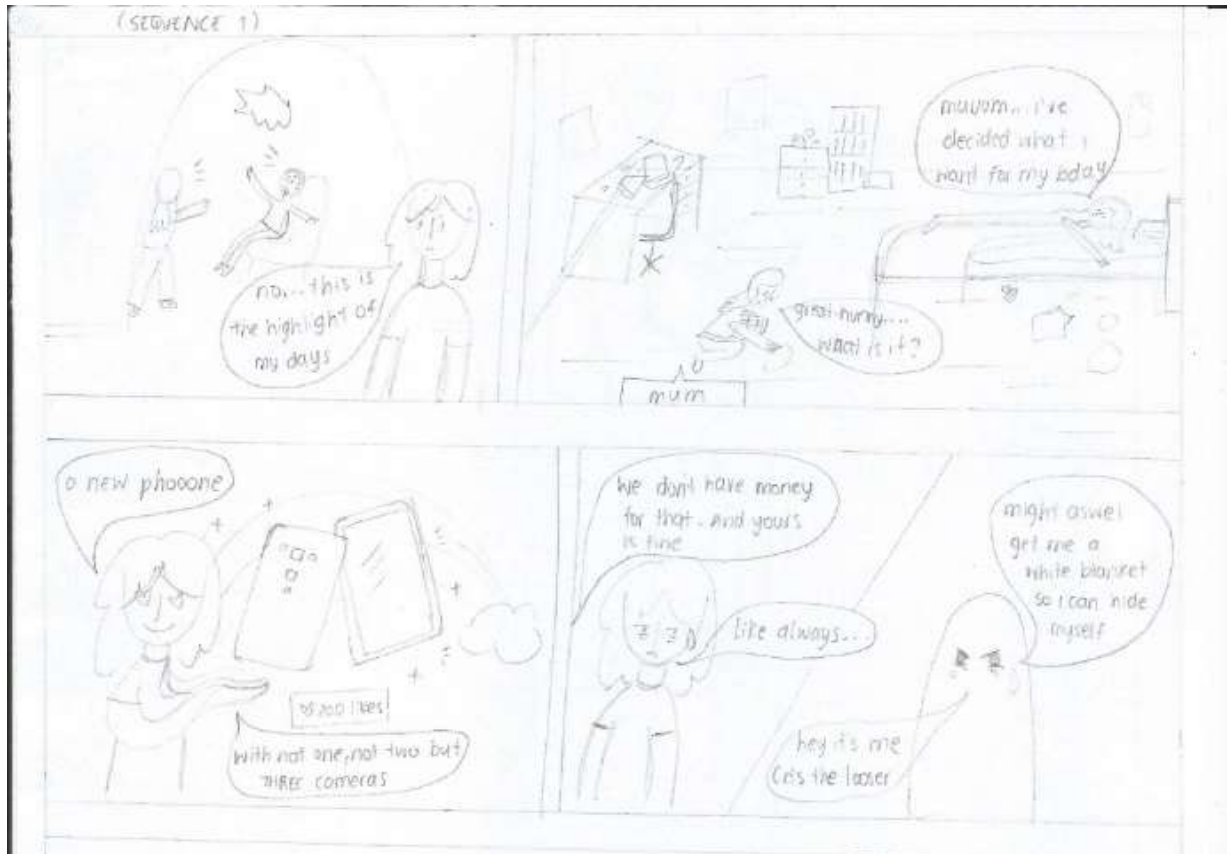


Figure 81: Comic Book Storyboard – Beginning 2

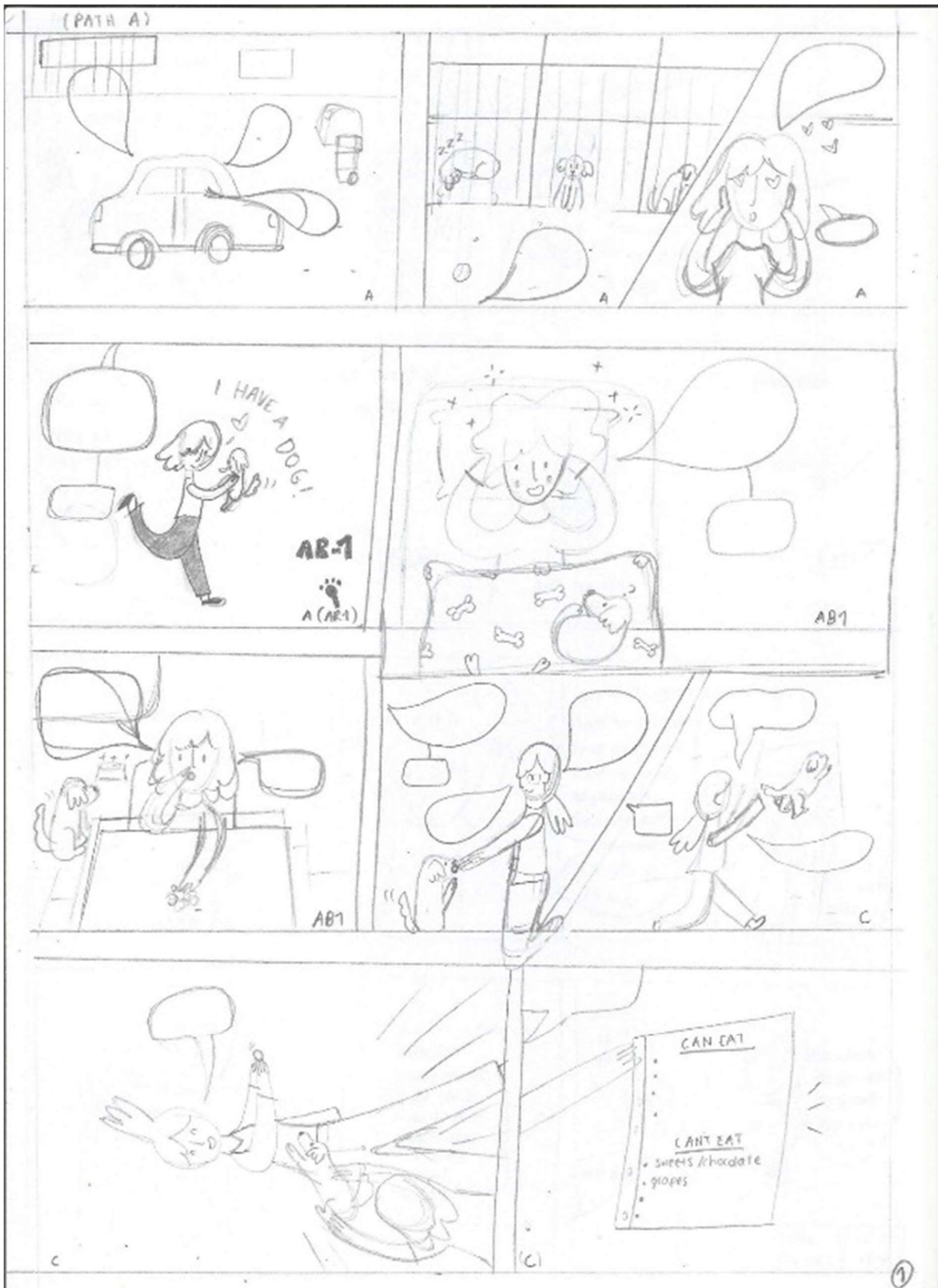


Figure 82: Comic Book Storyboard – Path A (1)

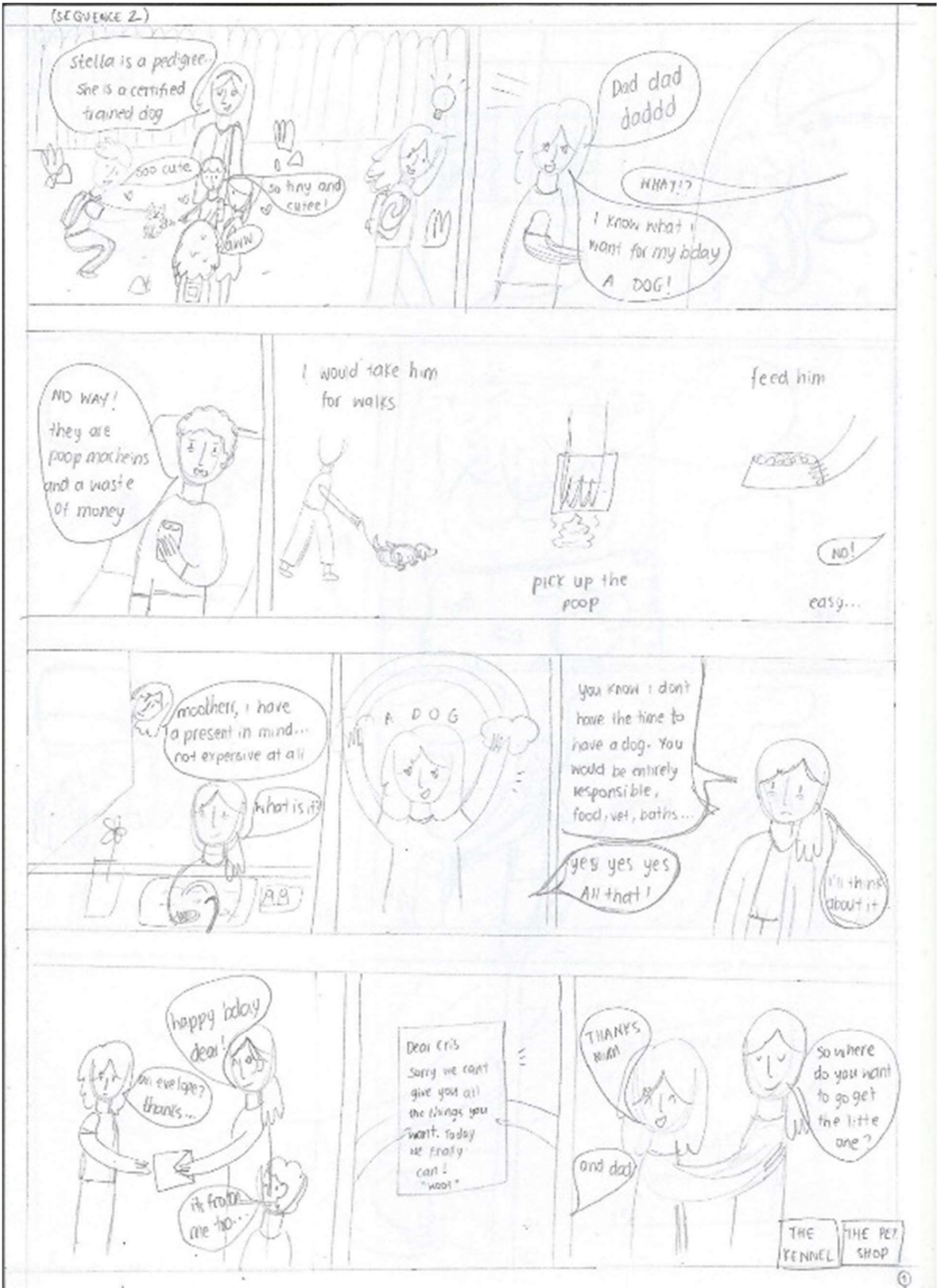


Figure 83: Comic Book Storyboard – Path A (2)

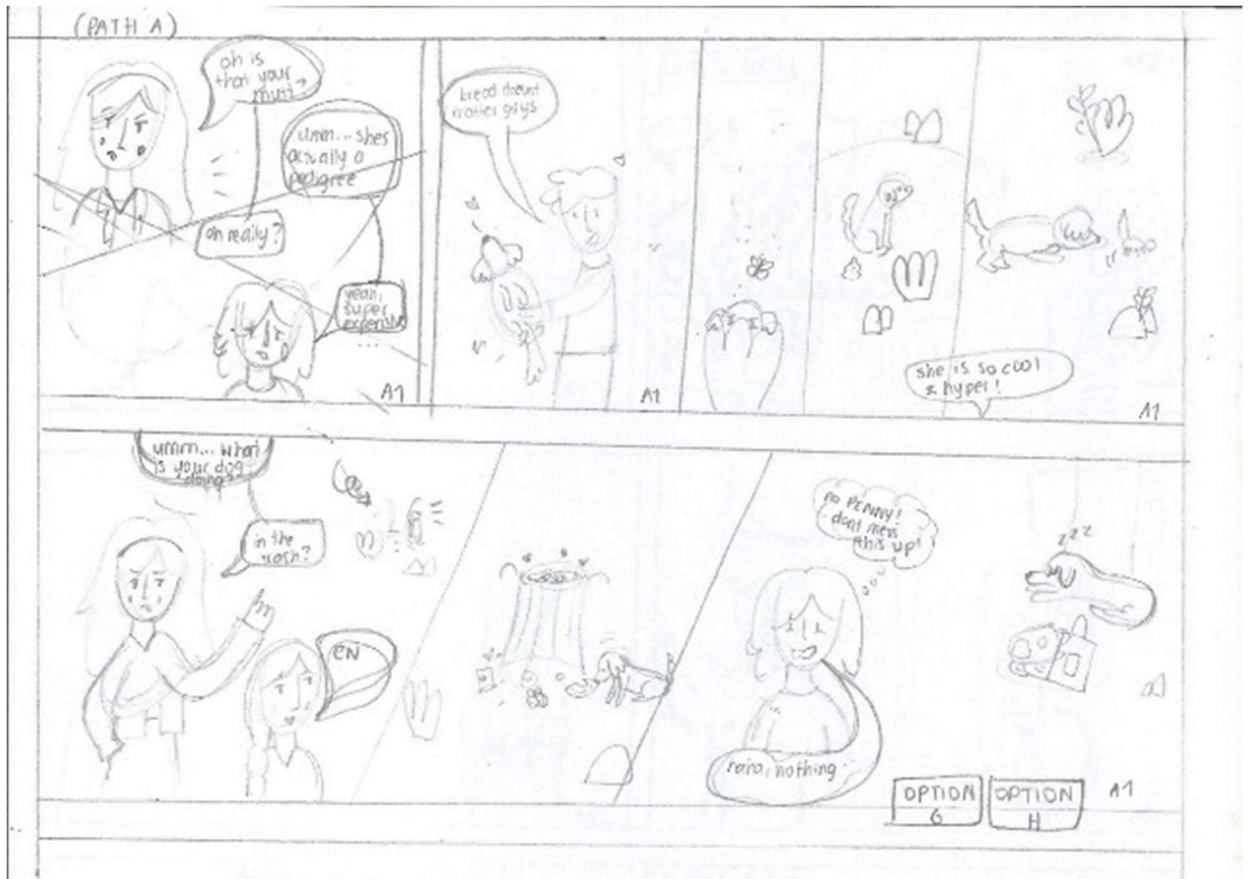


Figure 85: Comic Book Storyboard – Path A (4)



Figure 86: Comic Book Storyboard – Path A (5)

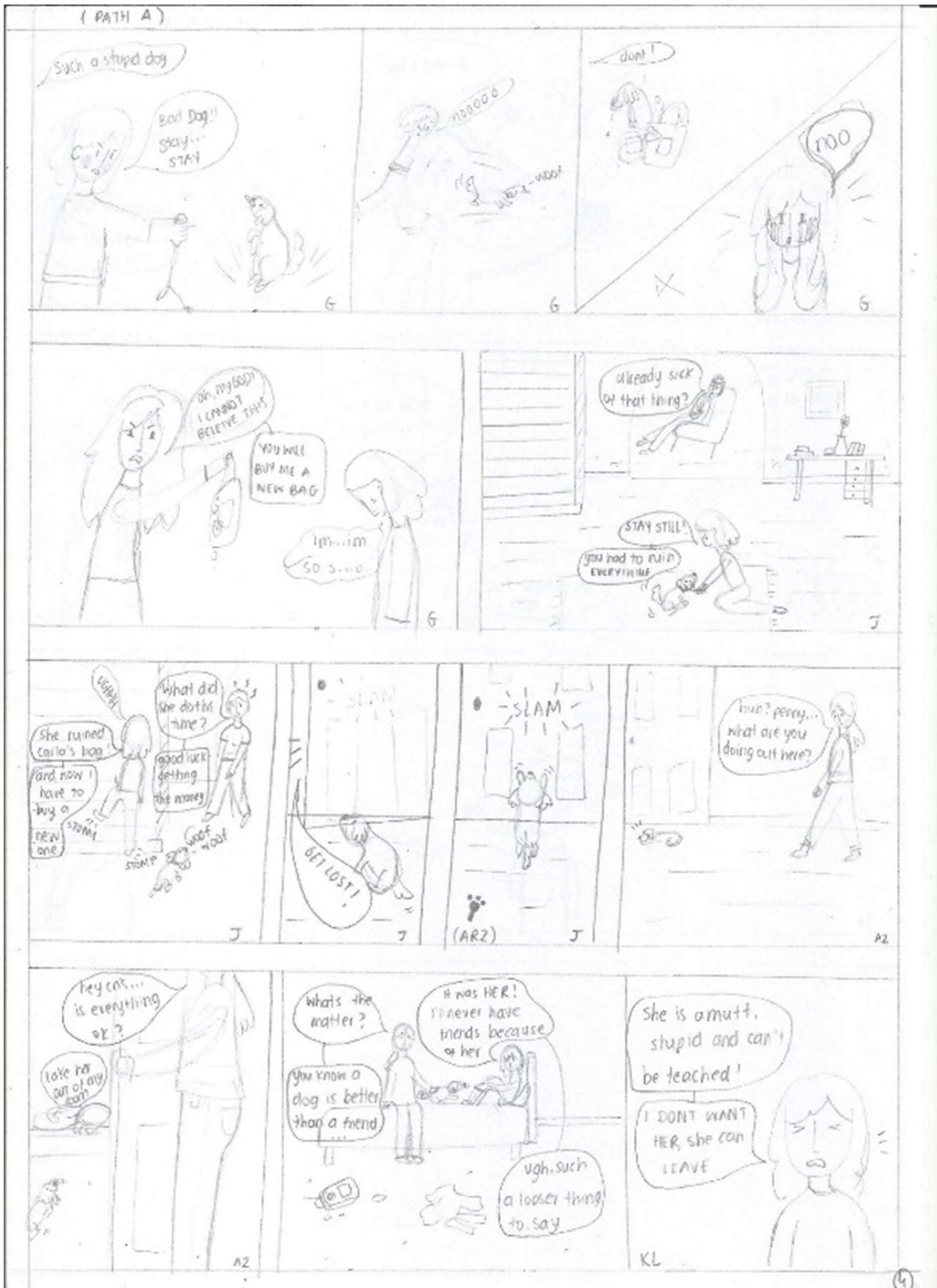


Figure 86: Comic Book Storyboard – Path A (5)



Figure 87: Comic Book Storyboard – Path A (6)



Figure 88: Comic Book Storyboard – Path A (7)

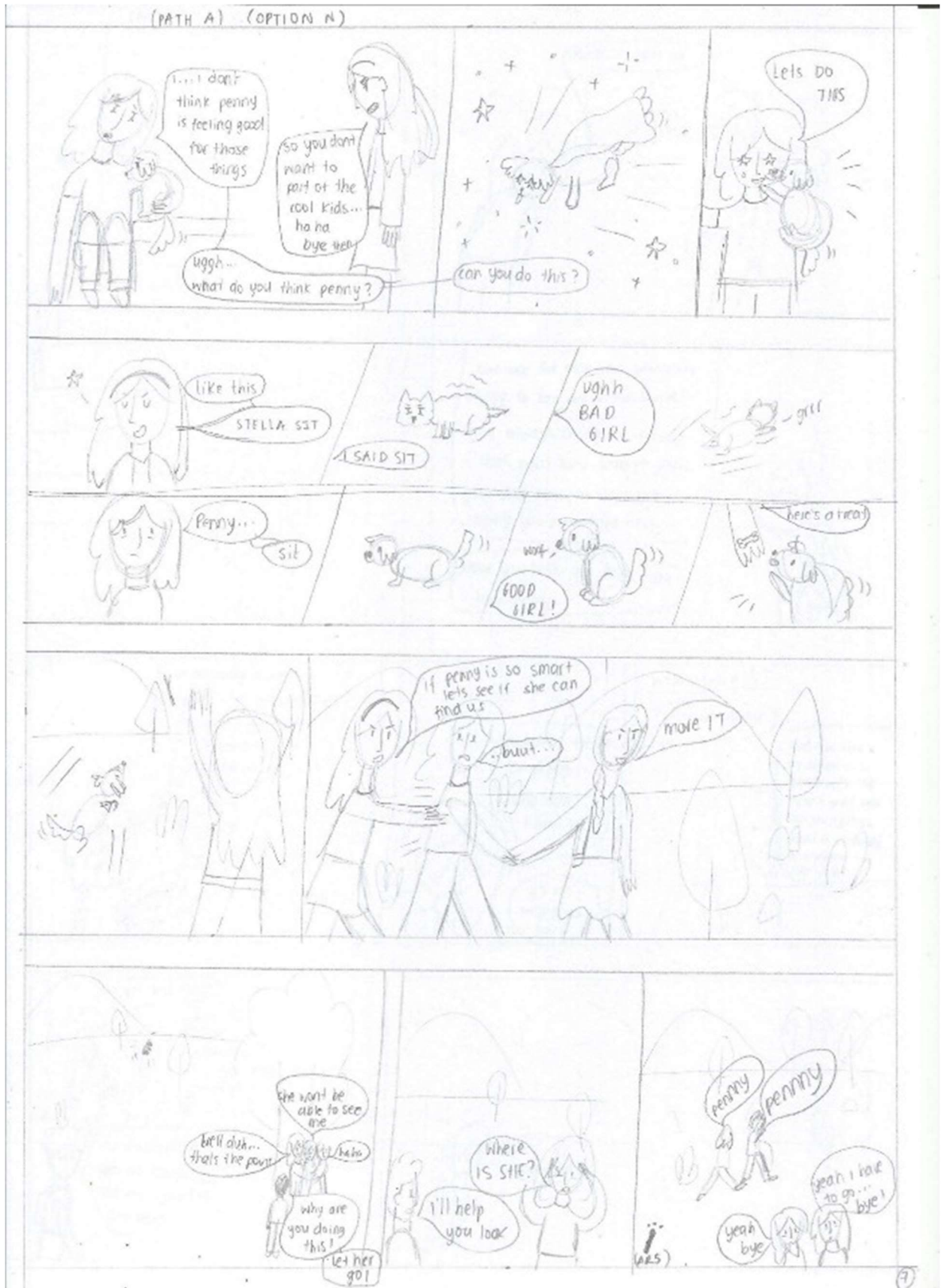


Figure 89: Comic Book Storyboard – Path A (8)



Figure 90: Comic Book Storyboard – Path A (9)



Figure 91: Comic Book Storyboard – Path A (10)

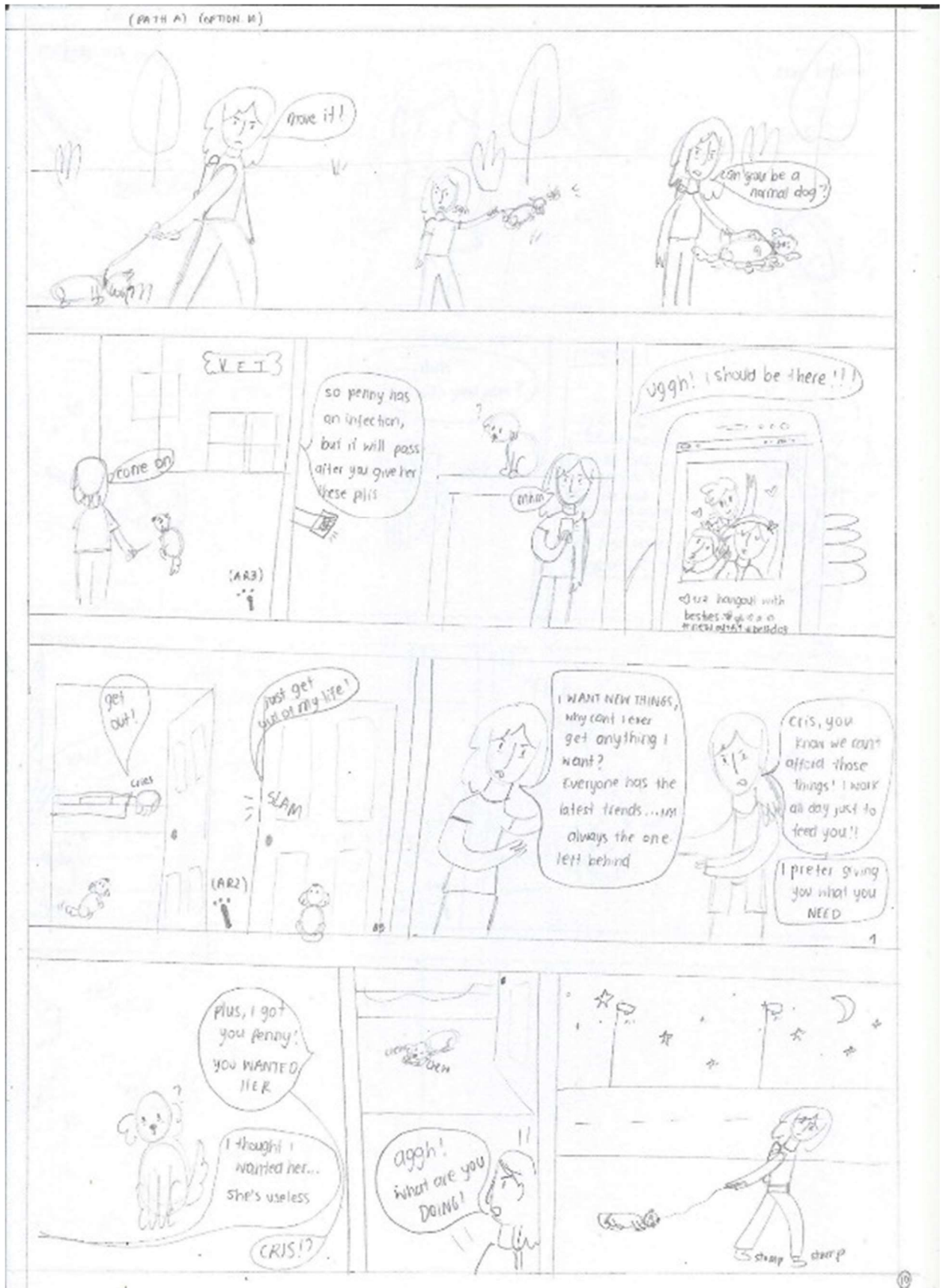


Figure 92: Comic Book Storyboard – Path A (11)

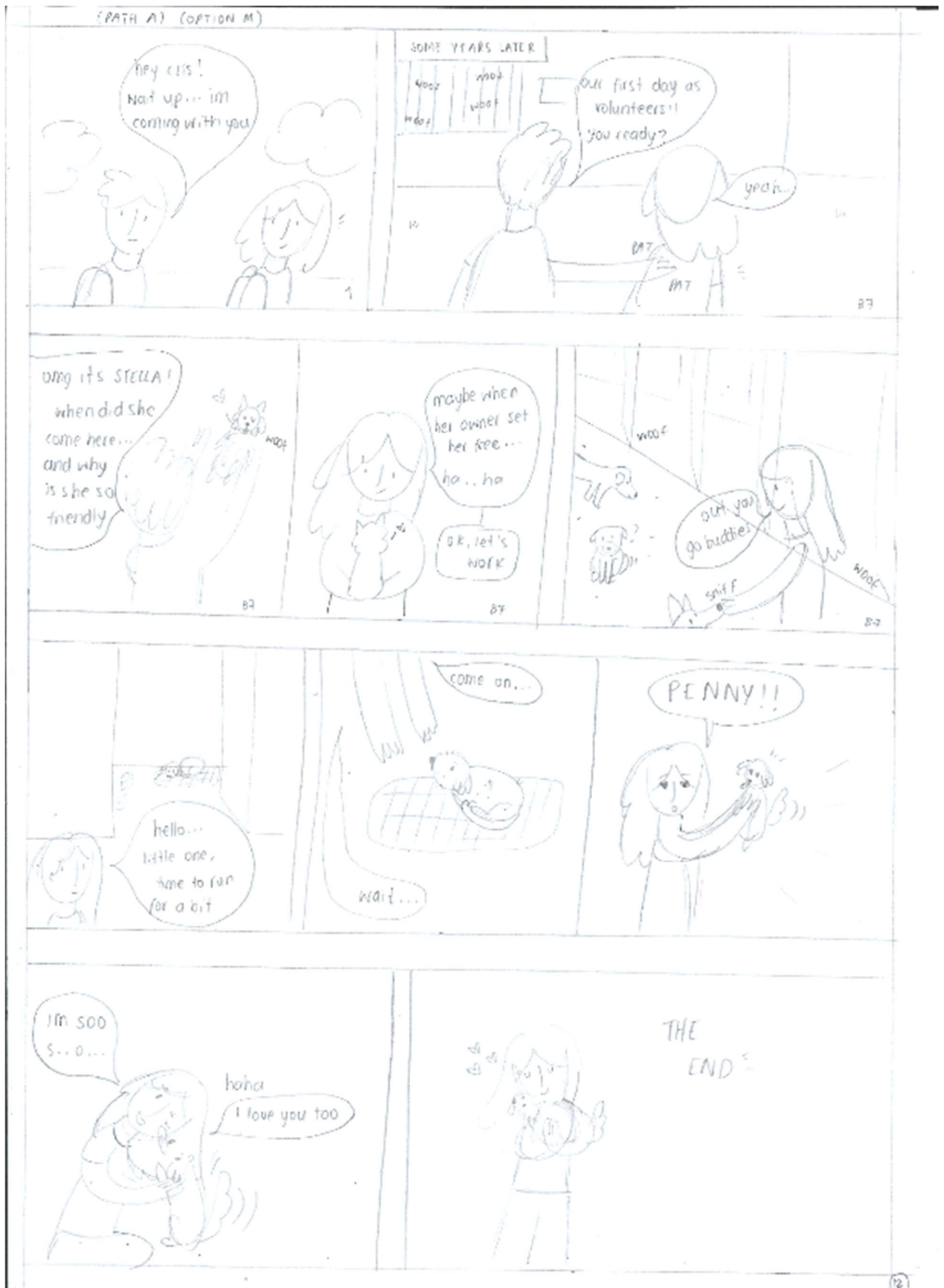


Figure 94: Comic Book Storyboard – Path A (13)



Figure 96: Comic Book Storyboard – Path B (2)

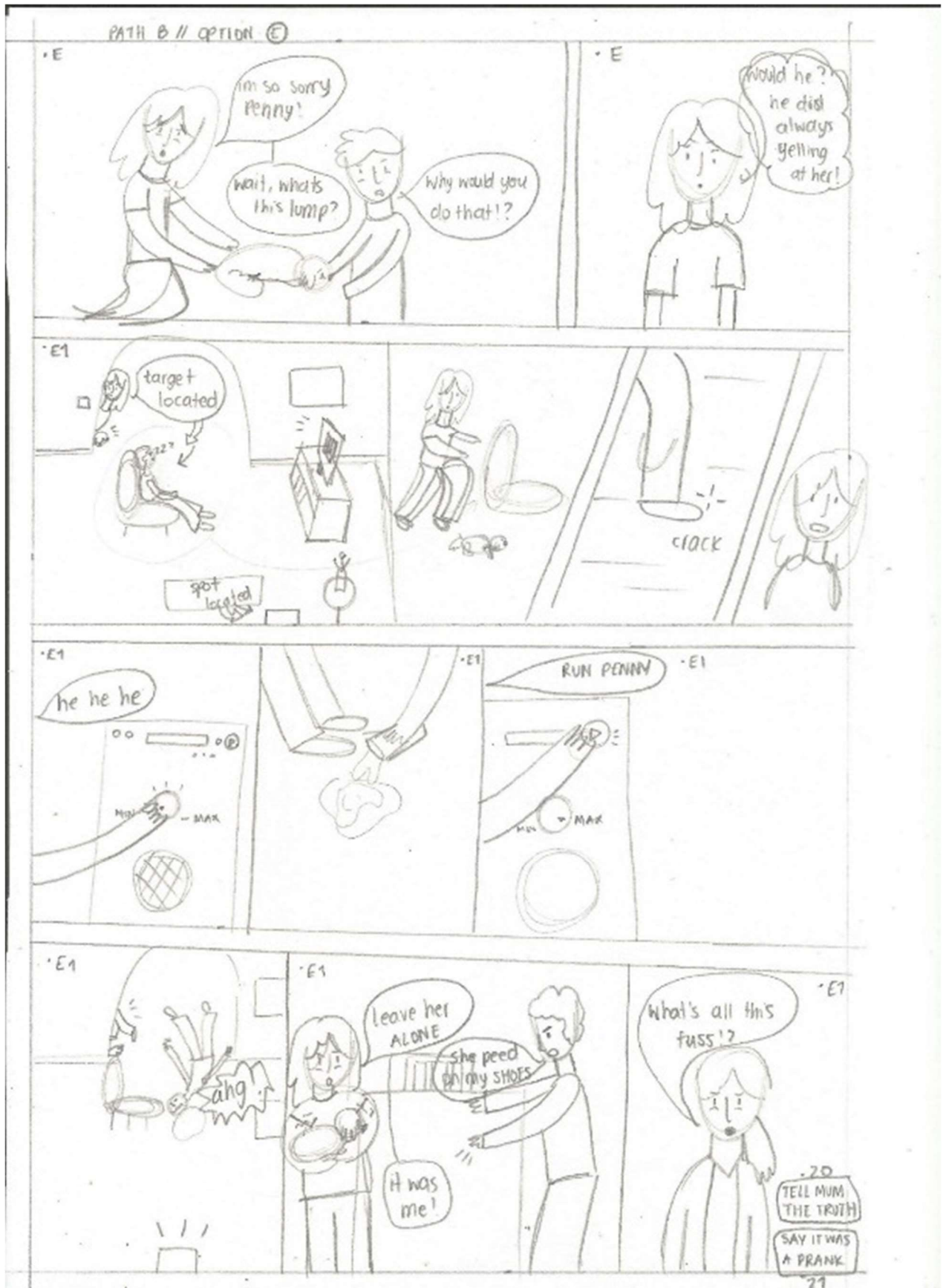


Figure 96: Comic Book Storyboard – Path B (2)



Figure 98: Comic Book Storyboard – Path B (4)

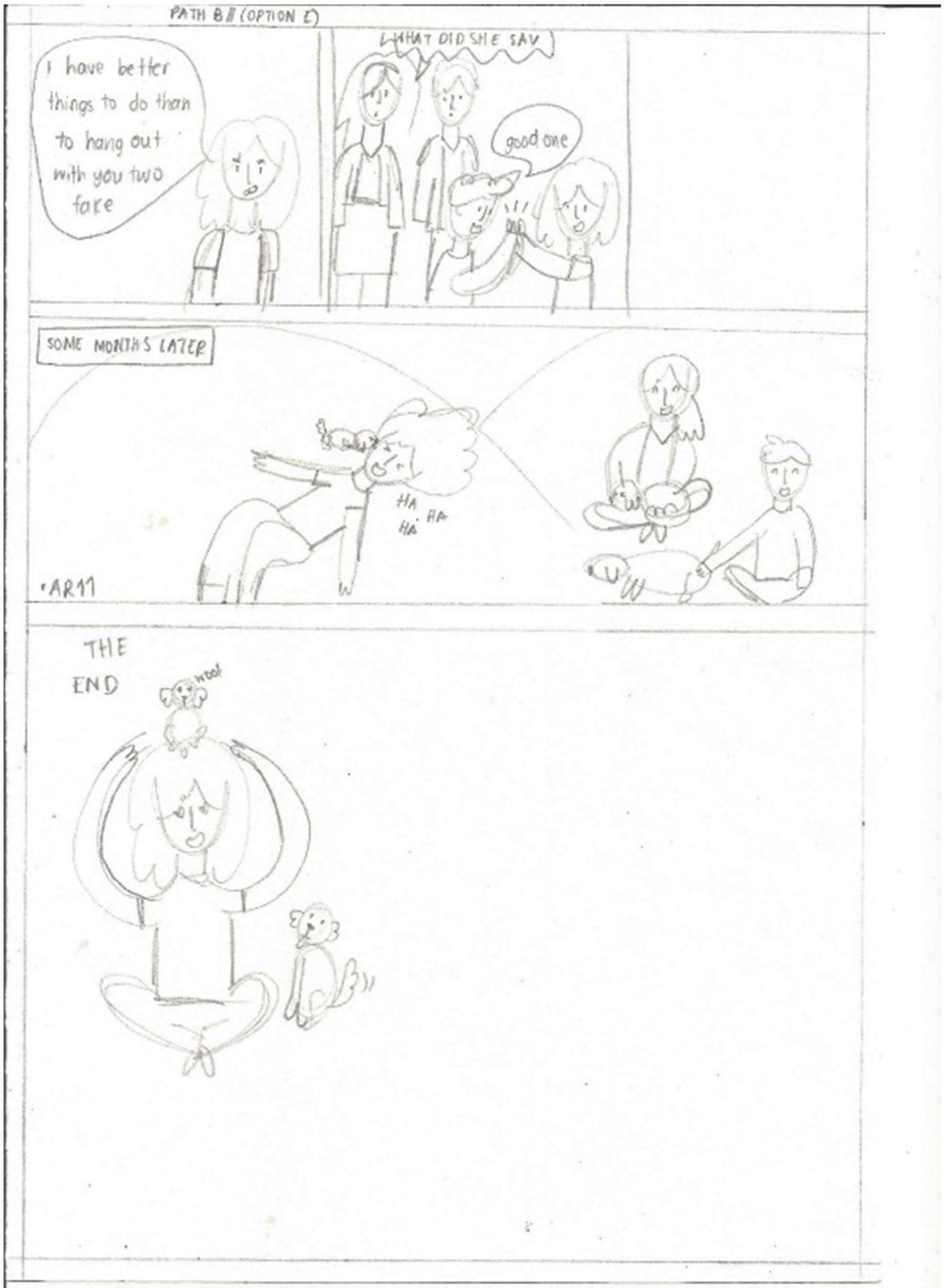


Figure 99: Comic Book Storyboard – Path B (5)



Figure 101: Comic Book Storyboard – Path B (7)

Appendix 3: AR application Script & Storyboard

1- AR1 (Importance of adoption- Why people should adopt, how dogs get there, how the system works)

EVENTS SEQUENCE

1- Penny + entire setting appears (Penny_happy_idle) + (cartoon_accent) + (dog_kennel)

2- Penny starts talking (Penny_happy_talking)

(P1) “Olá! Eu sou a Penny, muito prazer! Tu és o meu novo amigo?”

3- Penny continues talking (Penny_sad_talking)

(P2) “Eu pensei que tinha um, mas eu nunca mais o vi, fui à procura dele e estava tão assustada. Depois vim parar aqui porque estava sozinha.”

4- Penny goes towards the kennel (Penny_walking) + (dog_walking_park) + (dog_kennel)

5- Penny gets inside the kennel and talks (Penny_sad_talking) + (metal_door_closing)

(P3) “Este é o lugar onde vamos parar, quando ninguém nos quer.”

6- Inside the kennel, other dogs start appearing (Penny_sad_talking) + (bottle_cork//when each dog appears) + (dog 1) + (dog 2) + (dog3)

(P4) “Isto aqui somos muitos e não há espaço para todos. Há mais de nós a chegar de que a saírem, por isso ficamos todos muito apertados!”

7- Some dogs disappear (Penny_happy_talking)

(P5) “Até algum amigo novo vir e nós levar com eles.”

8- Penny goes back to the “garden” (Penny_walking) + (dog_walking_park)

9- Penny talks (Penny_happy_talking)

(P6) “Obrigada por me escolheres e me lewares contigo! Estou tão entusiasmada por ter um lugar só meu, com direitos a carinhos só para mim. Vamos brincar tanto!”

10- Penny stays sitting down (Penny_happy_idle)

11- Penny and setting disappears

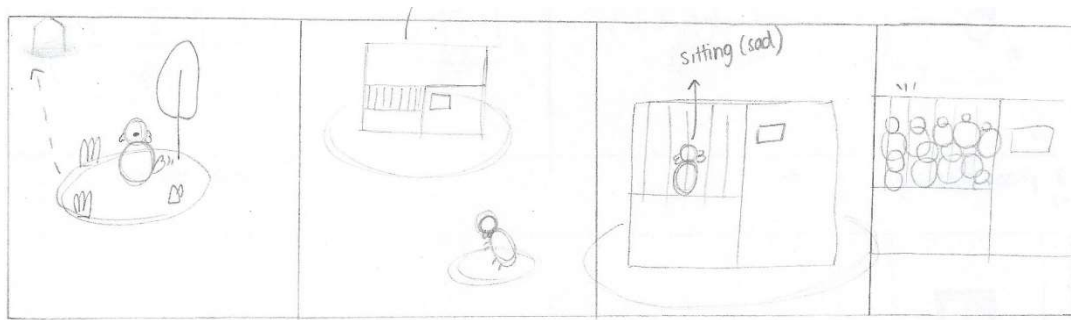


Figure 102: AR Storyboard - Sequence of Events of AR1

2- AR2 (Importance of education- Should be done by positive reinforcement, dogs have better behavior, understand you better)

EVENTS SEQUENCE:

1- Door appears

2- Penny runs trying to catch the door open (dog_running) + (penny_running) + (door_closing)

(P7) "Espera por mim!"

3- Penny sits down in front of the door (penny_lying_down) (puppy_whining2)

4-Penny talks (penny_lying_down_talking)

(P8) "Porque que não abres a porta? Eu fiz algo mal? Tivemos um dia tão divertido..."

Queres que vá buscar a tua meia preferida?

5- Penny lays down (penny_lying_down_talking)

(P9) "Eu não sei o que queres que eu faça."

6- Penny stays lying down (penny_lying_down)

7- Penny and setting disappears

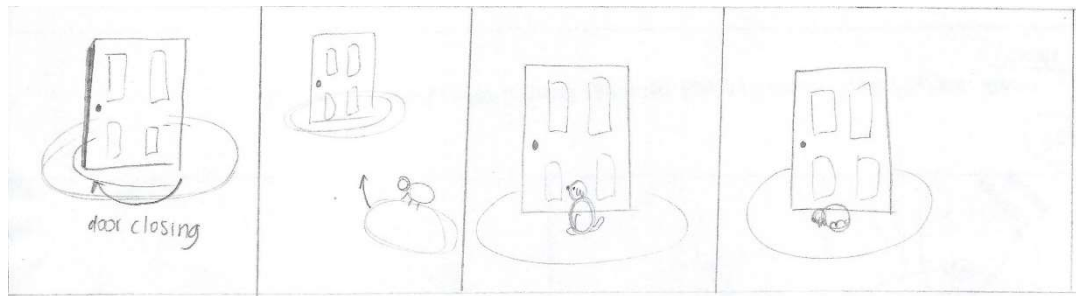


Figure 103: AR Storyboard - Sequence of Events of AR2

3- AR3 & AR9 (Importance of vet- Pets need their vaccines to be healthy, going to the vet is not a bad thing, how to make dogs like it)

EVENTS SEQUENCE:

1- Penny and setting appears (Penny_happy_idle)

2- Penny walks (penny_walking_scared_talking)

(P10) "Onde é que estamos a ir?"

3- Penny gets closer to the vet (penny_walking_scared_talking) + (dog_walking_park)

(P11) "Consigo sentir muitos nervos no ar...Mas eu confio em ti, não me levavas para um lugar assustador pois não?"

4- Penny enters the vet and disappears

(P12) "Ouch!"

5- Penny leaves the vet (penny_mad_talking)

(P13) "Eu odeio isto aqui!"

6- Penny sees a treat and goes towards it (penny_walking_eating) + (dog_eating)

(P14) "Ooh um biscoito!"

7- Penny eats the treat and talks (Penny_happy_talking)

(P15) "Já me sinto muito melhor, quando voltamos para comer mais disto?"

8- Penny stays sitting

9- Penny and setting disappears

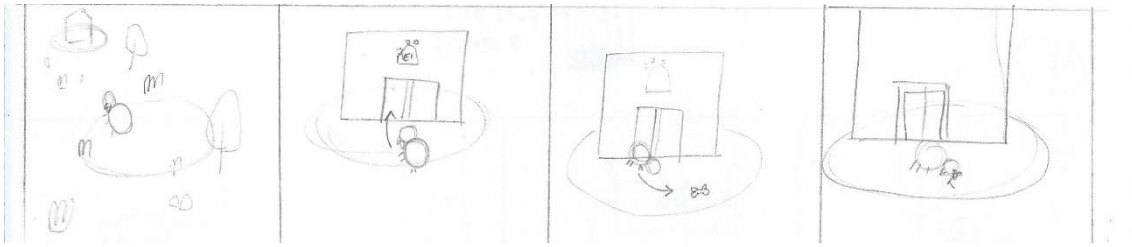


Figure 104: AR Storyboard - Sequence of Events of AR3 & AR9

4- AR4 (Lost- what happened to Penny, how she felt)

EVENTS SEQUENCE:

1- Penny and setting appears (Penny_happy_idle)

2- Penny talks (penny_happy_talking)

(P16) "Apanhei, apanhei! Viste? Joga outra vez!"

3- Penny talks (penny_sad_talking)

(P17) "Huh?"

4- Penny starts walking (penny_walking_scared) + (dog_walking_park)

(P18) "Onde estás?"

Eu não te vejo?

Oh não, também me vais deixar?

Não podes, divertimo nos tanto."

5- Penny falls in a hole (penny_falling) + (puppy_whining1)

(P19) "Ahhh, onde é que estou? Estou cega. AJUDA-ME!"

6- Setting disappears

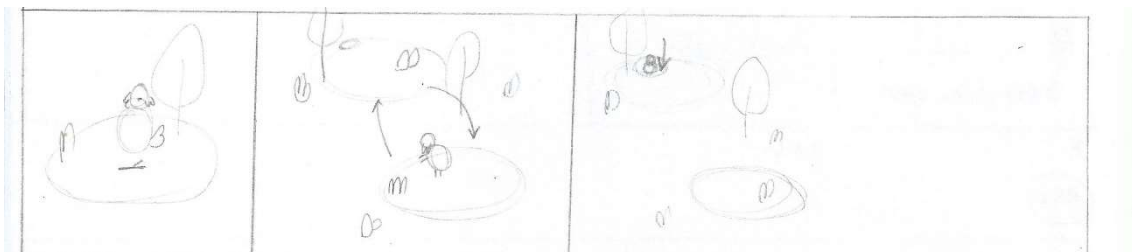


Figure 105: AR Storyboard - Sequence of Events of AR4

5- AR5 (Lost resolution- what happened to Penny, how excited she is that Cris back)

EVENTS SEQUENCE:

1- Penny and setting appears(penny_sad_hurt) + (puppy_whining2)

2- Penny talks (penny_happy_talking_hurt)
(P20) “*Voltaste?! Eu sabia que ias voltar.*”

3- Penny talks (penny_sad_talking_hurt)
(P21) “*Tive tantas saudades tuas. Eu tentei te procurar mas eu magoei me então voltei para junto desta árvore onde me deixaste.*”

4- Penny talks (penny_happy_talking_hurt)
(P22) “*E olha, ainda tenho o pau para brincarmos. Estou tão contente!*”

5- Penny stays sitting (penny_hurt_happy)

6- Penny and setting disappears

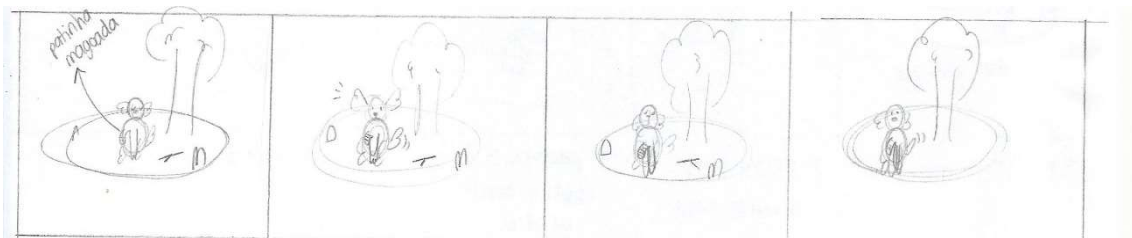


Figure 106: AR Storyboard - Sequence of Events of AR5

6- AR6 (Abandon- How Penny felt)

EVENTS SEQUENCE:

1- Penny and kennel appears, the kennel with the door open (penny_happy_talking) + (dog_kennel)

2- Penny talks(penny_happy_talking) + (dog_kennel)
(P23) “*Uma visita aos meus amigos? Yay, já não os via há muito tempo. Obrigada.*”

3- Kennel door closes (penny_sad_talking) + (metal_door_closing)
(P24) “*Espera onde vais? Eu estou presa, ajuda-me!*”

4- Penny talks (penny_sad_talking) + (dog_kennel)
(P25) “Hey, espera, onde vais sem mim?”

5- Penny howls (penny_howling) + (puppy_whining3)

6- Penny and setting disappears

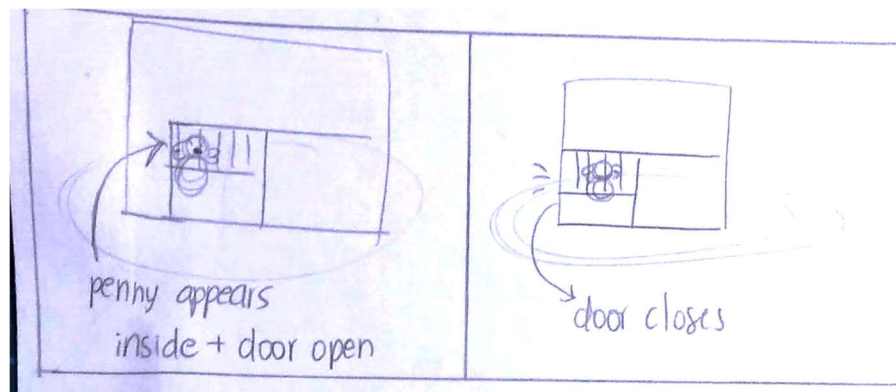


Figure 107: AR Storyboard - Sequence of Event of AR6

7- AR7 (Abandon resolution- what happened to Penny, how excited she is that you are back)

ASSETS: Bushes + Trees + Grass + Rocks + Penny

ANIMATION:penny_happy_idle + penny_happy_talking + penny_sad_talking

SOUND: puppy_whining1 + Voice (P26 + P27 + P28)

EVENTS SEQUENCE:

1- Penny and setting appears(penny_happy_idle)

2- Penny talks(penny_happy_talking)

(P26) “Estás de volta.”

Finalmente!”

3- Penny talks(penny_sad_talking) + (puppy_whining1)

(P27) “Por que demoraste tanto?

Eu pensei que já não me querias mais.”

4- Penny talks(penny_happy_talking)

(P28) “Tive tantas saudades tuas!”

5- Penny and setting disappears

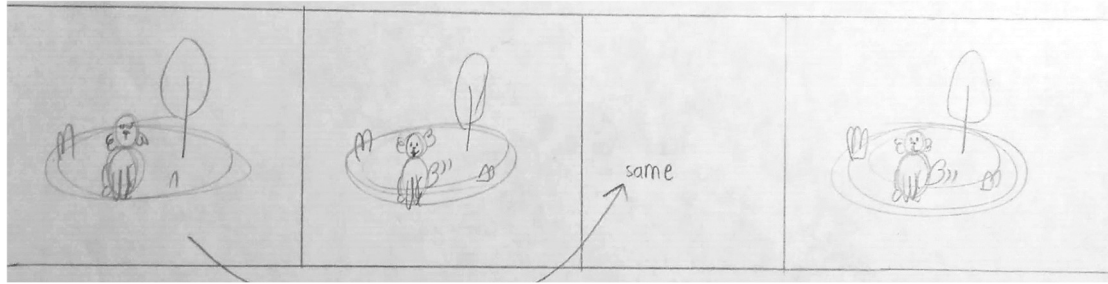


Figure 108: AR Storyboard - Sequence of Events of AR7

8- AR8 (Why pet shops are bad, why you shouldn't buy from them and raise awareness of puppy mills)

EVENTS SEQUENCE:

1- Penny and setting appears (penny_happy_idle)

2- Penny talks (penny_happy_talking)

(P29) "Olá! Eu sou a Penny. Queres ser meu amigo?"

3- Penny talks (penny_sad_talking)

(P30) "Eu nunca tive um a sério, os únicos humanos que conheci não queriam ser meus amigos, eles eram maus e nunca me davam festas."

4- Penny talks (penny_sitting_talking)

(P31) "Queres ver onde era a minha casa? Anda."

5- Penny walks toward puppy mill and goes inside (penny_walking_scared) + (dog_walking_park)

6- Penny inside the puppy mill (penny_sad_talking) + (dog_walking_inside)

(P32) "Eu, a minha mãe e os meus irmãos vivíamos aqui, estava sempre frio cá dentro, cheirava mal e o espaço era apertado."

7- Sound of dogs howling and crying (dog_kennel)

8- Penny goes towards pet shop (penny_sitting_talking) + (penny_walking_scared) + (dog_walking_inside) + (dog_pet_shop)

(P33) "Um dia um homem levou me a mim e os meus irmãos enquanto a minha mãe ficou lá presa, ela não parecia estar muito bem. Depois de repente vim aqui parar."

9- Penny goes back to the “garden” (penny_walking) + (penny_happy_talking)
(P34) “Nem acredito que vou ter um espaço só para mim! Estou tão entusiasmada.”

10- Penny and setting disappears

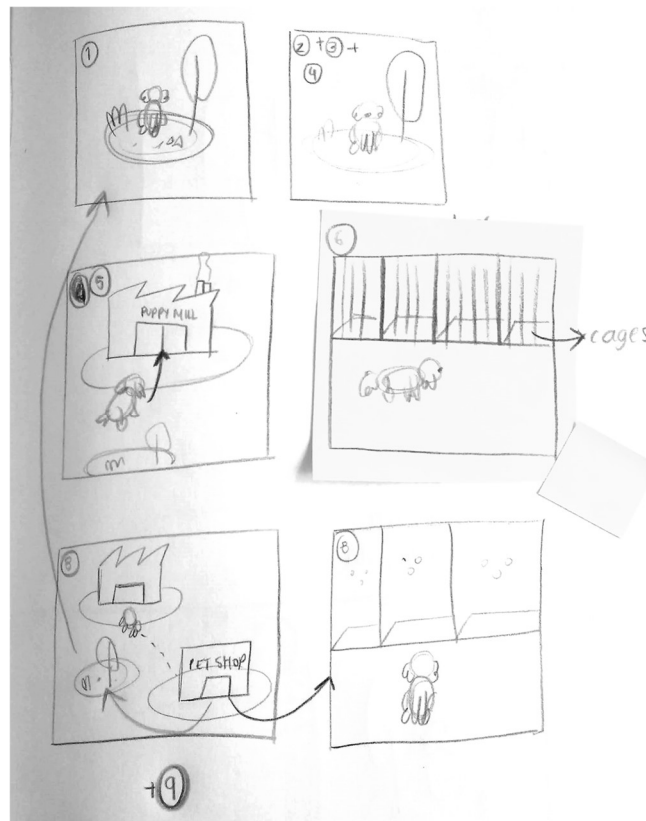


Figure 109: AR Storyboard - Sequence of Events of AR8

9- AR10 (Give-How Penny felt)

EVENTS SEQUENCE:

1- Penny and setting appears(penny_happy_idle)

2- Penny talks (penny_happy_talking) + (penny_walking_park)

(P35) “Vimos ver o nosso amigo?”

Yay, eu gosto dele, ele dá me sempre festas.”

3- Penny goes inside Pedro’s house and talks (penny_walking) + (door_closing)

(P36) “Espera, onde é que vais? Não entras comigo?”

4- Penny and setting disappears

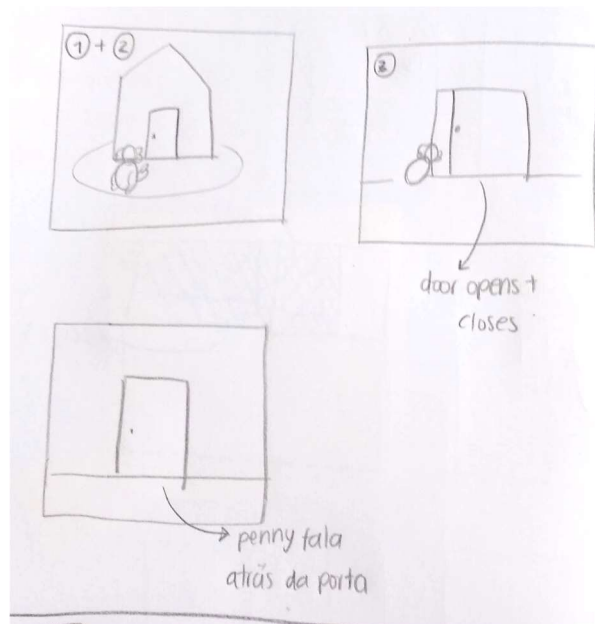


Figure 110: AR Storyboard - Sequence of Events of AR10

10- AR11 (Give resolution - Show that she puts her owner's protection above her)

EVENT SEQUENCE

1- Penny and setting appear (penny_scared)

2- Penny talks (penny_walking_scared_talking)

(P37) "Oh não, ele está aqui. Vem para trás de mim rápido!"

3- Penny runs to the back of the chair and talks (penny_walking_scared) + (penny_excited) + (penny_growling)

(P38) "Ele vem aí, eu protejo te!"

(P39) "Huh espera...ele não está!"

Yes, consegui derrotar lhe, já ninguém te vai magoar"

4- Penny and setting disappears

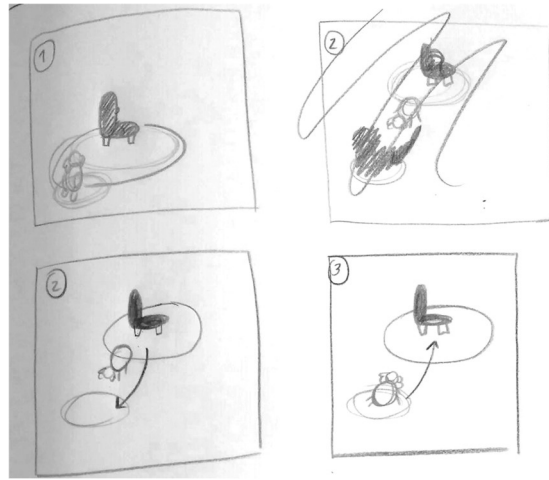


Figure 111: AR Storyboard - Sequence of Events of AR11

11- AR12 (Keep- How grateful pets are to be part of your family)

EVENT SEQUENCE:

1- Penny and setting appear (penny_happy_idle)

2- Penny talks (penny_happy_talking)

(P40) “Eu adoro estar contigo, divirto me sempre tanto.
As nossas brincadeiras são sempre o máximo.”

3- Penny sitting down (penny_happy_idle)

4- Penny talks (penny_happy_talking) + (penny_excited)

(P41) “Olha eu estou sentada como gostas, onde é que está a minha recompensa?”

5- Penny and setting disappears

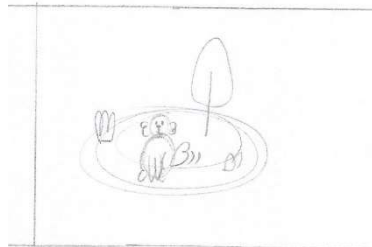


Figure 112: AR Storyboard - Sequence of Events of AR12

Appendix 4: Questionnaires

General Public Questionnaire About General Knowledge of Animal Welfare

Causa Animal - Público Geral

Somos alunos da Universidade da Madeira, do mestrado de Design de Mídias Interativas e neste momento estamos a desenvolver um projeto sob a temática da Causa animal. Neste sentido, este questionário tem como objetivo apurar qual é o conhecimento geral das pessoas sobre o bem estar dos animais na Região Autónoma da Madeira.

Para mais informações: <https://unleashed.m-iti.org>

*Required

1. Vives na Região Autónoma da Madeira? *

Mark only one oval.

- Sim
 Não

Dados pessoais.

Garantimos a confidencialidade de todos os dados recolhidos.

2. Sobre.. *

Mark only one oval.

- Feminino
 Masculino

3. Idade *

Causa Animal.

4. Tens algum animal de estimação? *

Mark only one oval.

- Sim
 Não, mas adoraria
 Não, e não quero
 Other: _____

5. Quais? *

Tick all that apply.

- Cão
 Gato
 Pássaro
 Pato
 Cabrito
 Porco
 Other: _____

6. Para ti, o que é o bem estar animal? *

7. O bem estar dos animais é algo que me preocupa muito. *

Mark only one oval.

1 2 3 4 5
Discordo completamente Concordo plenamente

8. Com que frequência vês animais abandonados? *

Mark only one oval.

- Nunca
 1-3 vezes por semana
 Muito frequentemente, quase todos os dias
 Todos os dias
 Other: _____

9. Fazes alguma coisa para ajudar? *

Tick all that apply.

- sim
 Não, alguém fará algo

10. O quê? *

11. Conheces alguém próximo que já abandonou um animal? *

Mark only one oval.

- Sim
 Não

12. Se sim, quais são as razões

13. Na tua opinião, quais as principais razões do abandono? *

Tick all that apply.

- Falta de espaço
 Falta de dinheiro para os contas do veterinário
 Alimentação é demasiado caro
 Foi uma oferta para a pessoa, e depois de algum tempo fartam-se
 Os donos vão de viagem e não têm onde deixar o animal
 O animal tem uma personalidade que não encaixa com a do dono
 O animal faz muito barulho
 Other: _____

14. Tens visto campanhas para a defesa dos direitos dos animais? *

Mark only one oval.

1 2 3 4 5

Raramente Muito frequentemente

15. Lembras-te qual era o tema das campanhas que viste?

Tick all that apply.

- Não me lembro
 Adoção
 Esterelização
 Para amar e cuidar dos animais de estimação
 Sobre comida e acessórios
 Para angariar fundos monetários
 Other: _____

16. Conheces alguma associação na ilha da Madeira? *

Mark only one oval.

- Nenhuma
 1-2
 3-5
 +5

17. O que pensas sobre o trabalho deles (Associações)? *

18. Em que aspecto achas que as Associações podiam melhorar? *

19. Onde é que costumavas encontrar informação relacionada com o bem estar animal? *

Mark only one oval.

- Facebook
- Outras redes sociais
- Televisão
- Jornal
- Locais públicos (cafés,...)
- Other: _____

NGO's Questionnaire About their View of Animal Welfare

Causa Animal - Associações

Somos alunos da Universidade da Madeira, do mestrado de Design de Mídias Interativas e neste momento estamos a desenvolver um projeto sob a temática da Causa animal. Este questionário tem como objetivo a recolha de informações/opiniões dentro dos elementos de associações diretamente envolvidas na temática da Causa Animal na Região Autónoma da Madeira. Todos os dados são confidenciais.

*Required

1. Nome da Associação. *

2. Morada da Associação. *

3. Cargo *

4. Quantas pessoas compõem a associação? *

Mark only one oval.

- Não sei
- 1-10
- 10-20
- Mais de 20

5. Há quanto tempo trabalha na associação? *

Mark only one oval.

- Menos de 6 meses
- 6 meses a 1 ano
- 1-2 anos
- Mais de 2 anos

6. A Associação tem espaço físico? *

Mark only one oval.

- Sim
- Não

7. Nesse espaço a Associação tem possibilidade de acolher animais resgatados? *

Mark only one oval.

- Sim
- Não

8. Quais os parceiros que colaboram com o vosso trabalho? *

Tick all that apply.

- Municipais, Juntas de freguesia e outras entidades públicas
- Voluntários
- Empresas privadas
- Veterinários, Spa's ou outras instituições relacionadas com animais
- Outras Associações não governamentais
- Other: _____

9. A população da RAM reconhece o nosso trabalho. *

Mark only one oval.

	1	2	3	4	5	6	7	
Não reconhece.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Reconhece plenamente.

10. O trabalho de terreno da associação abrange que território regional? *

Tick all that apply.

- Todos os municípios.
- Funchal
- Santa Cruz
- Machico
- Santana
- São Vicente
- Porto Moniz
- Calheta
- Ponta do Sol
- Câmara de Lobos
- Porto Santo
- Ribeira Brava
- Other: _____

11. Na sua opinião quais são as principais causas para o abandono animal na RAM? *

12. Quais os animais com maior propensão ao abandono? *

Mark only one oval.

- Caninos
- Felinos
- Outros animais domésticos

13. Indique-nos o porquê da sua opinião. *

14. Que medidas de prevenção/consciencialização a Associação costuma tomar junto da população? *

Tick all that apply.

- Campanhas
- Educação nas escolas
- Contato frequente com entidades municipais
- Apoio a famílias carenciadas
- Other: _____

15. Quais são os maiores problemas que a associação encontra diariamente no terreno? *

Tick all that apply.

- Ninhadas
- Maus tratos
- Abandono
- Falta de condições mínimas
- Other: _____

16. A associação conta com apoio de voluntários? *

Mark only one oval.

- Nunca
- Raramente
- Algumas vezes
- Muito frequentemente
- Sempre

17. Qual a percentagem de trabalho da associação que é feita por voluntários? *

Mark only one oval.

- 0%-25%
- 25%-50%
- 50%-75%
- 75%-100%

18. Considera o voluntariado uma tarefa em sociedade... *

Mark only one oval.

- Pouco incentivada e com pouca aderência
- Essencial na formação de consciências sociais
- Está bem assim
- Tenho outra opinião

19. Se tem outra opinião, indique qual...

20. Na sua opinião, a população da RAM tem uma atitude sobre a temática animal... *

Mark only one oval.

- Pouco interessada
- Interessada mas com uma atitude passiva e pouco interventiva
- Algum interesse, até demonstra que defende algumas medidas, intervindo periodicamente
- Atitude interessada e agressiva na defesa das causas animais

21. Quais são os meios de informação/divulgação utilizados pela Associação? *

Tick all that apply.

- Redes sociais
- Jornais
- Internet
- Publicidade, folhetos,...
- Presenciais
- Other: _____

22. Com que frequência mensal costumam realizar campanhas de adoção? *

Mark only one oval.

- Diariamente
- Mensalmente
- Trimestralmente
- Semestralmente
- Anualmente
- A associação não realiza campanhas de adoção
- Other: _____

23. Com que frequência costumam realizar campanhas para angariação de fundos monetários? *

Mark only one oval.

- Nunca
- 1 vez por semana
- 2 a 3 vezes por semana
- 4 a 5 vezes por semana
- Todos os dias

24. Que outro tipo de campanhas realizam e com que frequência? *

25. Acha que as Escolas podem desempenhar um papel importante na educação sobre o cuidado com os animais? *

Mark only one oval.

- Sim
- Não
- Talvez

26. Justifique. *

27. Acha que os municípios poderiam ajudar mais as associações? *

Mark only one oval.

- Sim
- Não
- Talvez

28. Como poderiam (os municípios) ajudar mais as associações? *

Tick all that apply.

- Monetariamente
- Recursos humanos
- Alimentação e outros recursos materiais
- Other: _____

29. Estaria disposto a ser contactado para futuros esclarecimentos acerca desta temática? *

Mark only one oval.

- Sim Skip to question 30.
- Não

Dados para contato.

Estas informações são confidenciais.

30. Nome.

31. Contatos. *

User Studies Before the Experience Questionnaires

Tell a Tail: Caminho Incerto (Antes)

Projeto de tese de mestrado de Interactive Media Design da Sarah Oliveira
Universidade da Madeira e M-ITI

Tell a Tail é um projeto transmedia, que inclui uma banda desenhada com realidade aumentada e um documentário imersivo com interatividade, sobre o bem-estar dos animais na Região Autónoma da Madeira.

Caminho Incerto é uma história em escolhes que caminho seguir e segues a Cris e o seu cão a Penny em aventuras emocionantes. A história tem pontos de Realidade Aumentada em que podes ver e ouvir o que a Penny tem por dizer.

*Obrigatório

1. Que numero te foi atribuído?

2. Idade *

3. Género *

Marcar tudo o que for aplicável.

Feminino

Masculino

Outra: _____

Animais de estimação

4. Tenho um animal de estimação *

Marcar tudo o que for aplicável.

Cão

Gato

Pássaro

Outra: _____

5. É melhor adotar ou comprar um cão? *

Marcar tudo o que for aplicável.

Comprar

Adotar

6. Porque? *

7. Os cães de raça são diferentes dos cães sem raça definida? *

Marcar tudo o que for aplicável.

Sim

Não

8. Porque? *

Ter um cão é uma grande responsabilidade:



9. (Se não tens um cão) Quero um cão porque *

Marcar apenas uma oval.

- Não quero ter um cão
- Porque é fixe, e eles são divertidos
- Porque os meus amigos também têm
- Porque quero alguém para brincar
- Porque adoro animais
- Outra: _____

10. Com que frequência achas importante levar um animal ao veterinário *

Marcar apenas uma oval.

1	2	3	4	5		
Pouco Frequentemente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muito Frequentemente

Banda desenhada

Esta parte é dedicada à banda desenhada Caminho Incerto

11. Gostas de ler? *

Marcar apenas uma oval.

- Sim
- Não

12. O que gosto mais de ler é: *

Marcar tudo o que for aplicável.

- Romances
- Banda Desenhada
- Memes
- Ensino e educação
- Infantil e Juvenil
- História
- Outra: _____

13. Já leste alguma história em que escolheste por onde seguir? *

Marcar apenas uma oval.

- Sim
- Não

14. Se sim, como foi a tua experiência

Marcar apenas uma oval.

1	2	3	4	5		
Confusa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Boa

Se não, achas a ideia interessante?



Tecnologia

Esta parte dedica-se à aplicação de realidade aumentada. Realidade aumentada é quando tens uma câmara e apontas para um lugar ou marcador e aparece uma imagem 2D ou 3D por cima.

Achas que realidade aumentada é interessante?



15. Já usaste uma aplicação de realidade aumentada? *

Marcar apenas uma oval.

- Sim
- Não

Se sim, gostaste?



Para ti, se livros tivessem Realidade Aumentada seriam mais interessantes?



User Studies Group AR Questionnaires

Tell a Tail: Caminho Incerto (Depois)

Projeto de tese de mestrado de Interactive Media Design da Sarah Oliveira
Universidade da Madeira e M-ITI

Tell a Tail é um projeto transmedia, que inclui uma banda desenhada com realidade aumentada e um documentário imersivo com interatividade, sobre o bem-estar dos animais na Região Autónoma da Madeira.

Caminho Incerto é uma história em escolhes que caminho seguir e segues a Cris e o seu cão a Penny. A história tem pontos de Realidade Aumentada em que podes ver e ouvir o que a Penny tem por dizer.

*Obrigatório

1. Que numero te foi atribuído? *

Animal de estimação

2. É melhor adotar ou comprar um cão? *

Marcar tudo o que for aplicável.

- Comprar
 Adotar

3. Os cães de raça são diferentes dos cães sem raça definida? *

Marcar tudo o que for aplicável.

- São diferentes
 Não são diferentes

4. Com que frequência achas importante levar um animal ao veterinário? *

Marcar apenas uma oval.

1 2 3 4 5

Pouco Frequentemente Muito Frequentemente

Banda desenhada

Esta parte é dedicada à banda desenhada Caminho Incerto

5. Acho que a duração da banda desenhada está: *

Marcar apenas uma oval.

1 2 3 4 5

Muito curto Muito comprido

Gostei que a banda desenhada tivesse vários caminhos por onde seguir



Gostei que fosse eu o/a responsável por tomar as decisões que afetavam a história



Ao tomar as decisões tive maior consciência e tentei tomá-las de maneira mais responsável e não aleatório



6. Completei *

Marcar apenas uma oval.

- 1 caminho
- 2 caminhos
- 3 caminhos
- 4 caminhos (todos)

7. Completei todos porque *

Marcar apenas uma oval.

- Fiquei curioso
- Queria descobrir todos os fins
- Queria aprender mais
- Uma história não é suficiente
- Não completei

Acho que deveria ter mais escolhas



8. Que tipos de escolhas querias *

Marcar apenas uma oval.

- Decisões sobre a vida da Cris
- Decisões sobre como ensinar a Penny
- Outra: _____

Por vezes eu imaginava que estava no lugar da Cris



Identifiquei-me com a história



9. Porque? *

Tecnologia

Esta parte dedica-se à aplicação de realidade aumentada

A aplicação de realidade aumentada tornou a história mais interessante?



Achas que a tecnologia utilizada contribuiu para mudar a tua sensibilidade sobre os assuntos abordados?



Com a aplicação ficaste a conhecer melhor a Penny?



Ficaste curioso(a) para descobrires mais sobre como são os cães



10. Ao juntar uma banda desenhada com uma aplicação de realidade aumentada achei que a história tornou-se mais: *

Sentiste que ao usar Realidade Aumentada criaste uma maior ligação emocional com a Penny?



A Realidade Aumentada aumentou o meu prazer ao ler esta banda desenhada?



Achas que é mais fácil aprender com a Realidade Aumentada?



Vais procurar outras experiencias de realidade aumentada?



Voltarias a repetir esta experiencia?



11. Porque? *

User Studies Group NOAR Questionnaires

Tell a Tail: Caminho Incerto (Depois Comic)

Projeto de tese de mestrado de Interactive Media Design da Sarah Oliveira
Universidade da Madeira e M-ITI

Tell a Tail é um projeto transmedia, que inclui uma banda desenhada com realidade aumentada e um documentário imersivo com interatividade, sobre o bem-estar dos animais na Região Autónoma da Madeira.

Caminho Incerto é uma história em escolhes que caminho seguir e segues a Cris e o seu cão a Penny. A história tem pontos de Realidade Aumentada em que podes ver e ouvir o que a Penny tem por dizer.

***Obrigatório**

1. Que numero te foi atribuído? *

Animal de estimação

2. É melhor adotar ou comprar um cão? *

Marcar tudo o que for aplicável.

Comprar

Adotar

3. Os cães de raça são diferentes dos cães sem raça definida? *

Marcar tudo o que for aplicável.

São diferentes

Não são diferentes

4. Com que frequência achas importante levar um animal ao veterinário? *

Marcar apenas uma oval.

	1	2	3	4	5	
Pouco Frequentemente	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muito Frequentemente

Banda desenhada

Esta parte é dedicada à banda desenhada Caminho Incerto

5. Acho que a duração da banda desenhada está: *

Marcar apenas uma oval.

	1	2	3	4	5	
Muito curto	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Muito comprido

Gostei que a banda desenhada tivesse vários caminhos por onde seguir



Gostei que fosse eu o/a responsável por tomar as decisões que afetavam a história



Ao tomar as decisões tive maior consciência e tentei tomá-las de maneira mais responsável e não aleatório



6. Completei *

Marcar apenas uma oval.

- 1 caminho
- 2 caminhos
- 3 caminhos
- 4 caminhos (todos)

7. Completei todos porque *

Marcar apenas uma oval.

- Fiquei curioso
- Queria descobrir todos os fins
- Queria aprender mais
- Uma história não é suficiente
- Não completei

Acho que deveria ter mais escolhas



8. Que tipos de escolhas querias *

Marcar apenas uma oval.

- Decisões sobre a vida da Cris
- Decisões sobre como ensinar a Penny
- Outra: _____

Por vezes eu imaginava que estava no lugar da Cris



Identifiquei-me com a história



9. Porque? *

Protocol for User Studies

Researcher side script

1- Welcome the participants. Thank the participants for the collaboration. Pitch by presenting and explaining the purpose of the study.

“Hello, my name is Sarah and today I will be conducted some tests with you about my master’s thesis project. First and foremost, I would like to thank your availability. We will be testing an interactive experience called *Tell a Tail: Caminho Incerto*, that is an AR comic book about Animal Welfare in Madeira Island.

I will need your feedback to understand the impact of this project and to understand where we should improve. So, I will be requesting that you fill out a questionnaire before and after the interaction with the project.”

1- Hand in the consent form.

2- Hand in the questionnaire for before

3- Divide the class into two groups for A/B testing

One group will only read the comic book (Group AR) and the other will read the comic book and have a smartphone to also experience the AR app (Group NOAR).

4- Start the experiment; Explain briefly how to hand the equipment

Group AR: Here you have a comic book that you could choose what branch to follow, that then leads to different possible endings. With the smartphone, you have access to an AR application where you will be able to interact with a comic book character.

Group NOAR: Here you have a comic book that you could choose what branch to follow, that then leads to different possible endings.

5- Observation process.

Were they confused that there were options on the comic book?

Were they lost throughout the comic book?

Did they have any difficulty following the colours?

Do they go back and forth?

Did they understand the comic book was readable?

Did they manage to put the AR world in the first try?

Did they understand that they could explore the AR world?

Did they follow Penny?

Does the user look immersed?

6- Hand in the post questionnaire.

Group AR questionnaire is different from Group NOAR questionnaire.

7- At the end: thank the participant.

Appendix 5: Comic Book Screenshots





unleashed.projectstudio@gmail.com



Unleashed Studio



unleashed.projectstudio



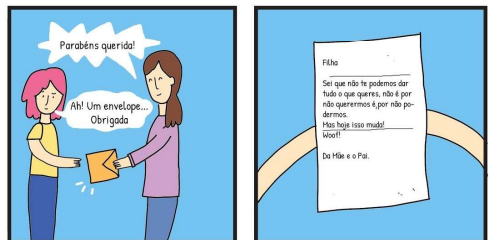
TELL A TAIL: CAMINHO INCERTO #1

Universidade da Madeira e M-ITI
Projeto de tese de mestrado de MDM1

Autor & ilustrador: Sarah Oliveira
Título: Tell a Tail: Caminho Incerto
Ano: 2019
Estúdio: Unleashed



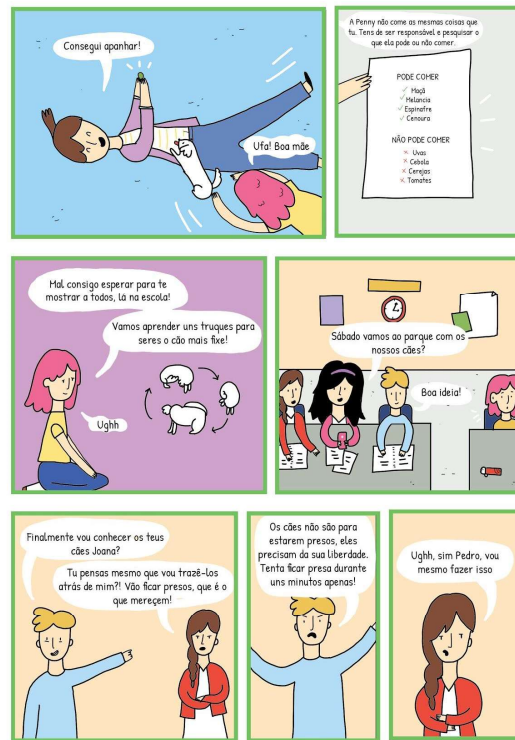
www.unleashed.m-iti.org



IR AO CANIL (pág.8)

IR À LOJA DE ANIMAIS (pág.28)

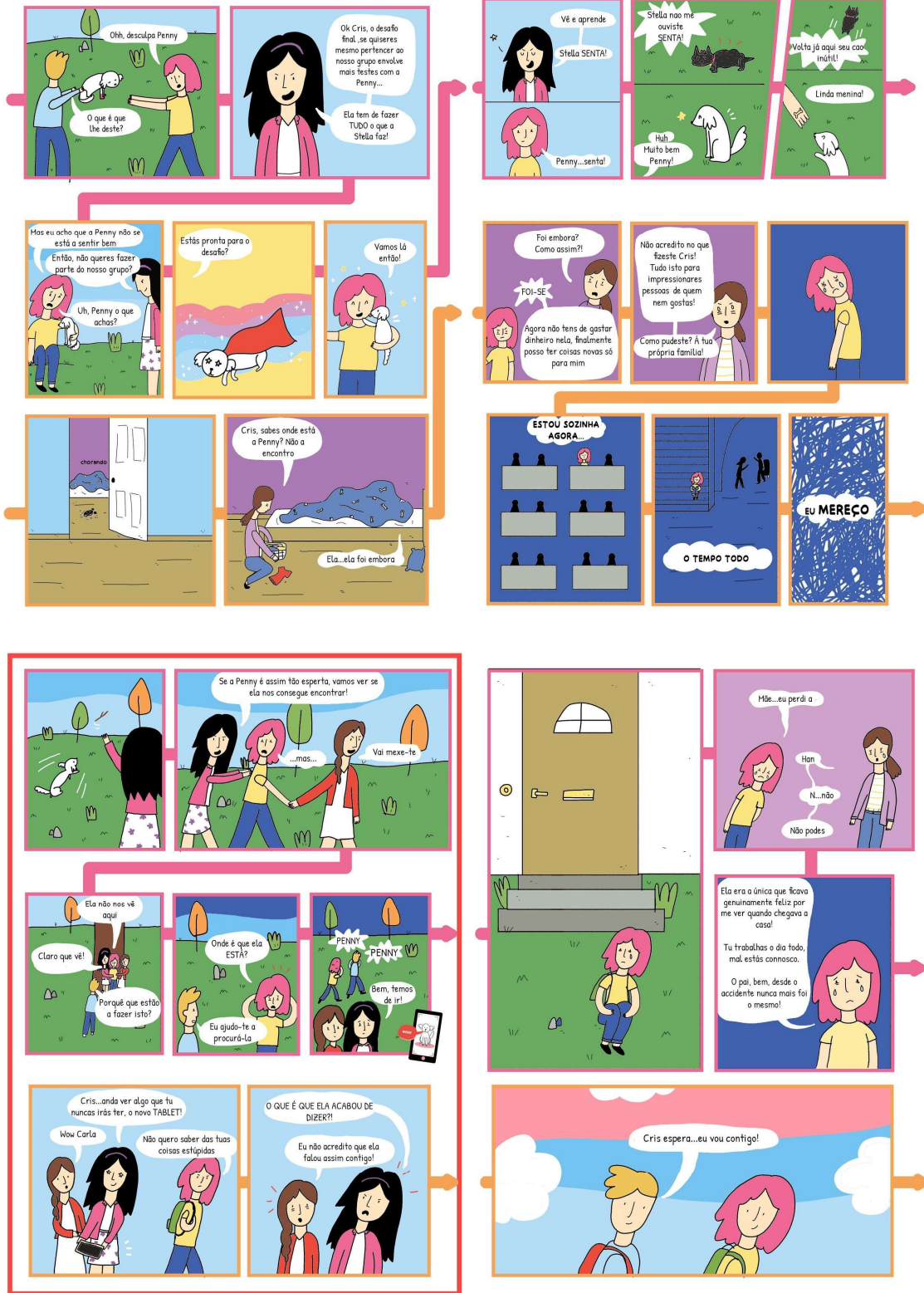
PATH "A"

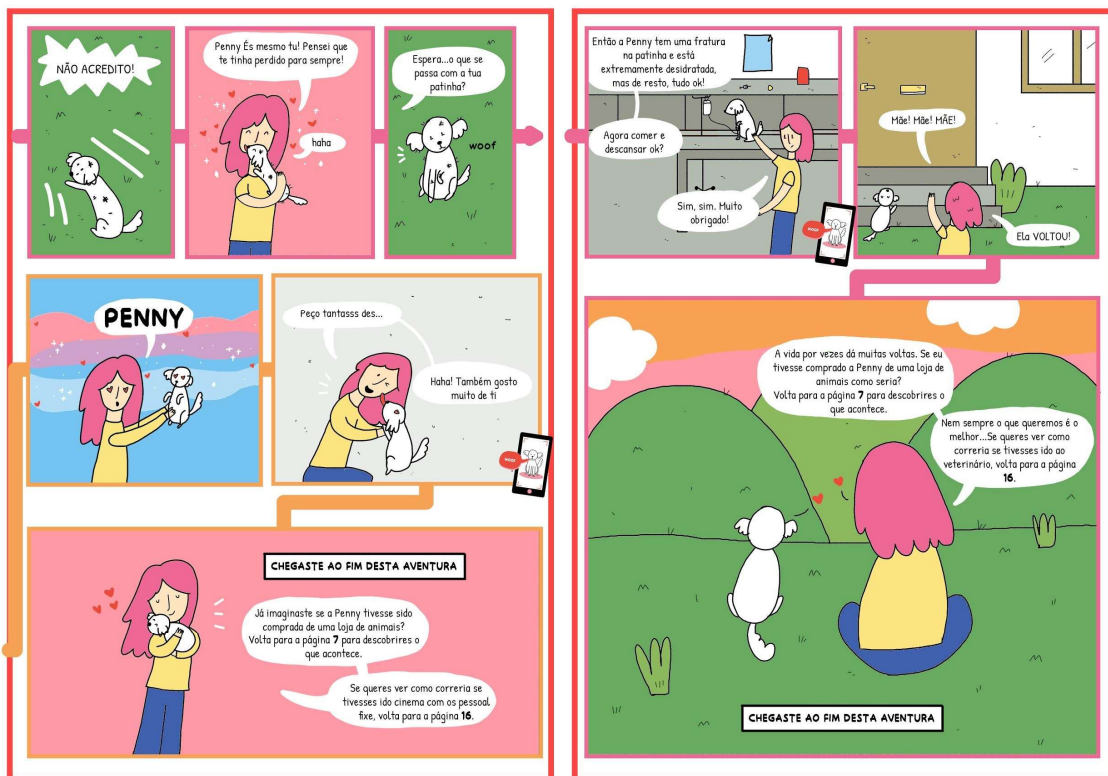
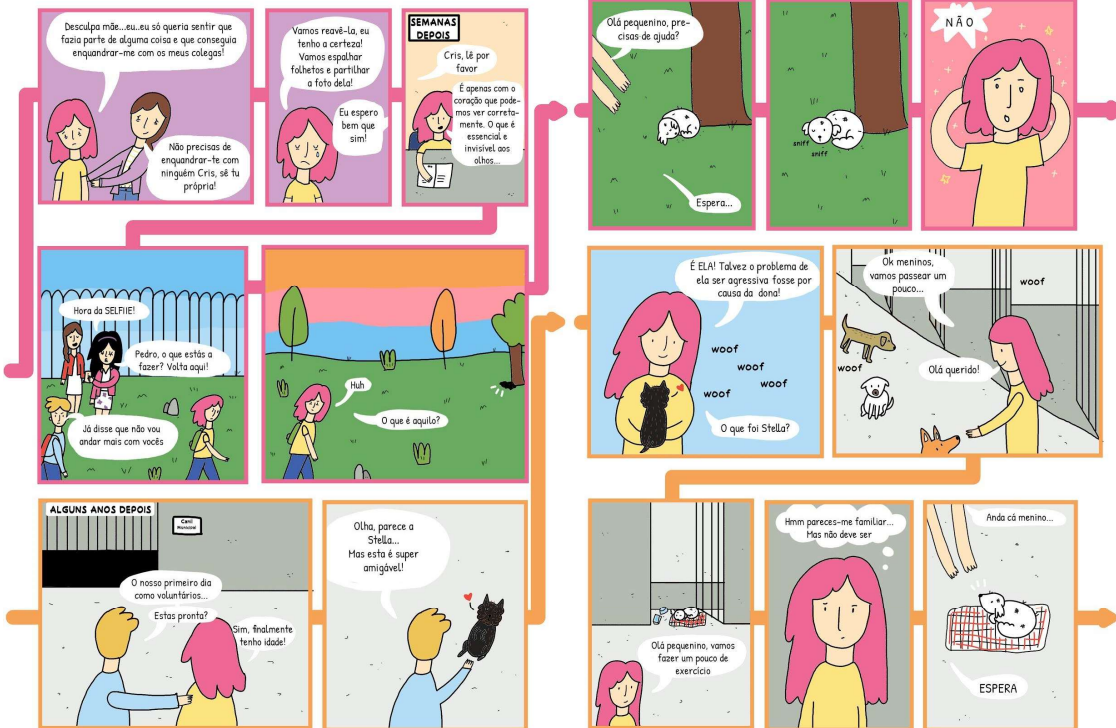


IGNORAR A PENNY (pág. 12)

REPRENDER A PENNY (pág. 12)







PATH "B"

NA LOJA DE ANIMAIS

Eles parecem estar tão tristes cá...

É verdade! Mas olha ali, aquele cão tão giro. E que nome adorável... Penny!

Olá pequenina, queres vir para casa connosco?

A Senhora diz que ela ainda não está esterilizada.

Mas isso não importa porque ela vai ficar dentro de casa, não é?

É verdade. Mas a esterilização é um benefício para a saúde geral da Penny. Não é apenas para a Penny não ter bebés.

EM CASA

Agora tens de a ensinar para ela ser uma cadela muito bem educada, e se calhar uns truques giras!

Huh?!

Como é que vou fazer isso?

Com REFORÇO POSITIVO

Sempre que a Penny faz algo bem, dá-lhe um biscoito para ela associar a algo positivo!

Não Penny! Dentro de casa não!

Muito bem Penny!

Linda menina!

Se continuas assim, amanhã vais ser um sucesso!!

O DIA QUE VOU FAZER PARTE DO GRUPO DO PESSOAL FIXE

Vais te portar bem hoje não vais?

Hoje é a minha oportunidade perfeita para fazer amigos!

NO PARQUE

Calma Penny!

Ughhhhh

Onde é que foste buscar esse cão? À rua...

Haha

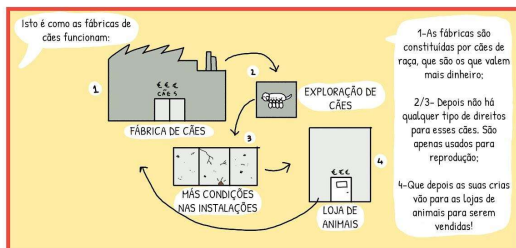
Tira-lhe já do pé da Stella! Ela só vai lhe stressar!

M...mas...ela foi da loja de animais. Ela é de raça pura!

Isso não importa nada!

Até se fosse de rua era melhor porque assim não apoias as indústrias como as fábricas de cães, que ganham dinheiro através da exploração deles!

NÃO COMPRE!



A sério?!

Não fazia ideia que isso era assim, como é que é possível?!?

A maneira de ajudar quem realmente precisa, os animais é...

...de lugares que realmente querem o bem deles!

Chega de conversa aborrecida! Vamos falar sobre o MEU fim de semana super fixe!

Sim, sim! Finalmente algo interessante!

Ew, o teu cão está no lixo!

Não Penny! Sai daí!

NÃO FAZ ISSO!

ficar com a PENNY (pág.32)

VOLTAR COM O GRUPO (pág.31)

Haha, ela estava só a brincar. Mas já aprendeu a não ir para lá.

Não é com violência que se ensina os cães Cris e tu sabes disso!

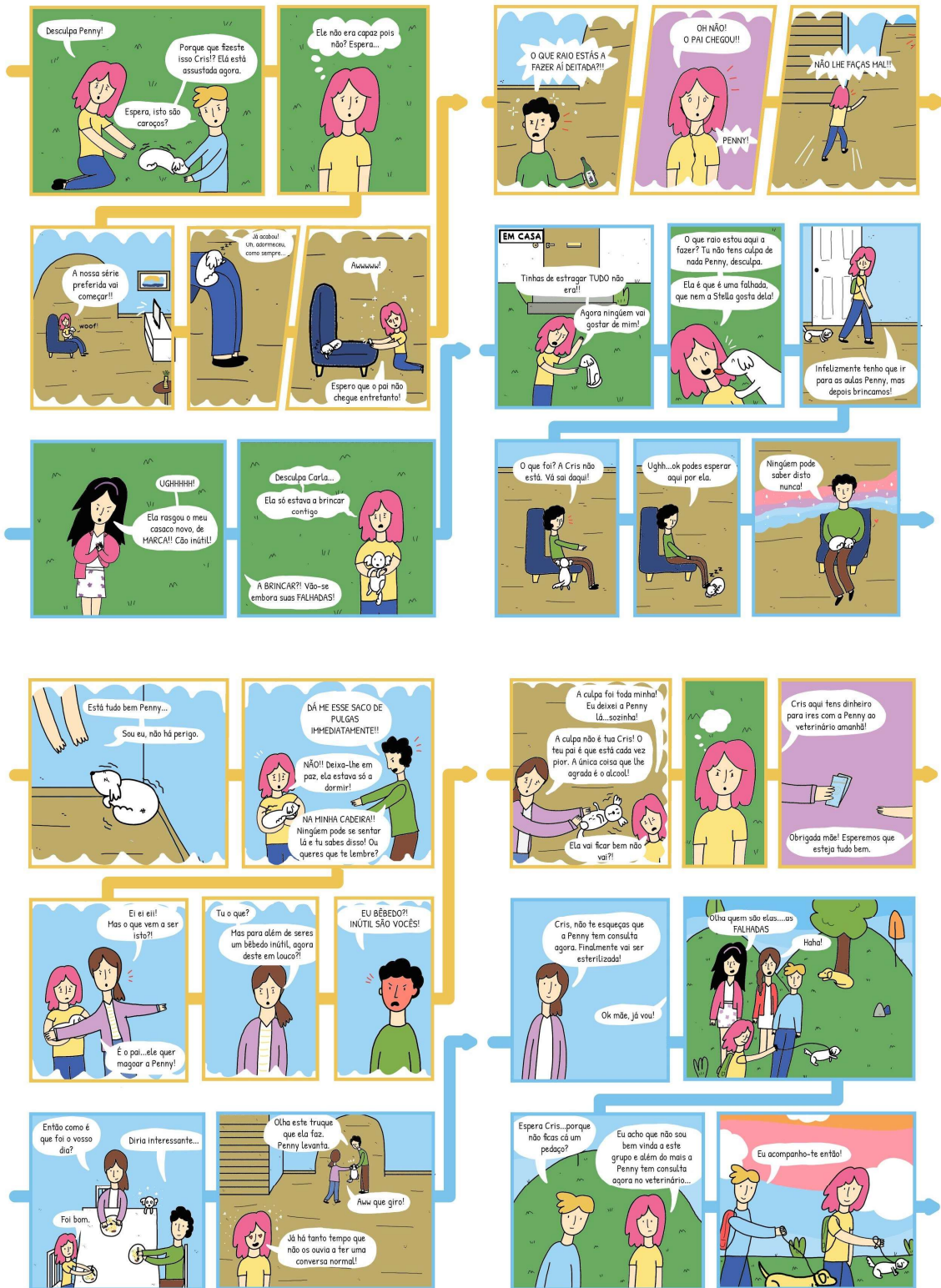
Ai que tédio...cães mal ensinados dá nisto!

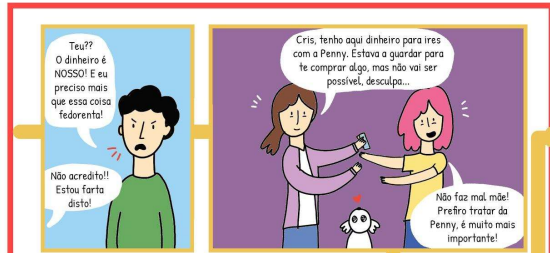
NÃO ACREDITO!

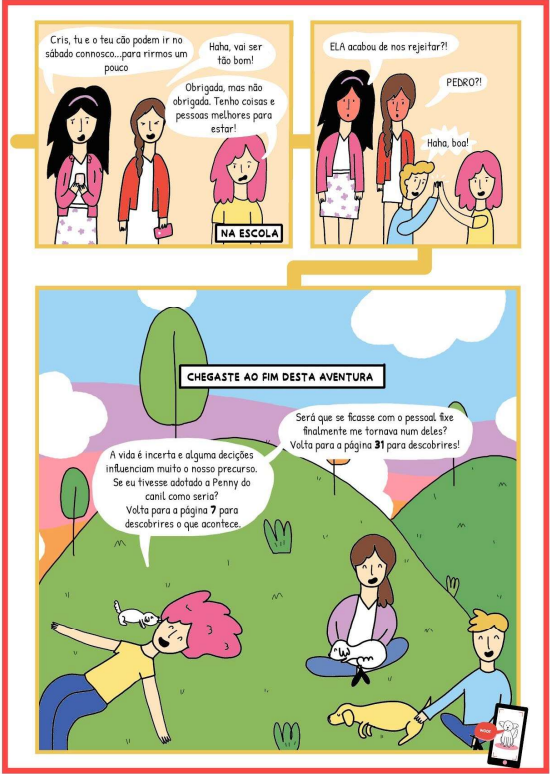
STELLA, VOLTA JÁ AQUI!

Tudo por causa do mau exemplo do TEU cão estúpido!

Tira-a daqui já!!







A Nossa Universidade

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