

Tackling Problematic Device Usage, Phase One:

Design of campaign publications to inform, engage and support teachers, parents and family members in addressing problematic device usage behaviours (PDUB) amongst New Zealand Primary School children.

Research report of Master Of Design (11/10/2019), Art & Design School, AUT

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Problematic device usage behaviour (PDUB) amongst children is a growing concern globally. Psychological research suggests that excessive device usage adversely affect children’s healthy wellbeing, social skills and intellectual development. The digital classroom revolution in New Zealand¹ has unintentionally raised the concerns of primary school parents and teachers regarding increased daily screen-time among students.²

As a visual communication designer, I firmly believe that the clear use of visual language would help the public to develop a better understanding of this highly complex global issue.^{3 4 5} Under the framework practice-led research methodology, this project has focused on developing the concept and visual language that would be suitable for communicating complex and sensitive messages to target audiences effectively. A booklet and a flyer are the research outcomes, in phase one of this campaign.

This project was influenced by structuralism⁶, which suggested it is necessary to firstly help audiences to understand the real problem beneath the surface. The Threshold Capabilities Integrated Theoretical Framework (TCITF)⁷ provided a logical structure to generate and classify the contents based on psychological studies and would help audiences gradually develop their understanding of the PDUB. With the composition of risk-factor, neutral dialogue, avoiding stigma, limited humour, positive communication and bright tone, this project has established a visual language that could positively communicate the feelings and needs from children to the audiences and call on their empathy. The three theoretical frameworks of Distributive Cognition (DCog), Activity Theory (AT) and Actor-Network Theory (ANT)⁸ have provided a rational perspective of how to interpret aesthetic decisions. The illustrated blue penguin characters that have been inspired by anthropomorphism⁹ provide a unique visual presentation which is capable of communicating the sensitive messages.

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<div>ATTESTATION OF AUTHORSHIP</div>	<div>ACKNOWLEDGEMENT</div>
	<p>This project has received much support and many contributions. It would be impossible for me to achieve what I have done without this help.</p> <p>I would like to first thank my supervisors, Dr Chen Chen, David Coventon and mentor Ms. Fiona Grieve. They have made great efforts to lead me to a whole new level of understanding with art and design. Their encouragement, inspiration and advice has helped me through many hard times and lighted my path to escape from the mist of the unknown and uncertainty. With their kind support, I have managed to step out from my comfort zone and learn methods and methodology that will help me to keep improving and be ready to face more challenges in future.</p> <p>I would also like to thank AUT’s Art & Design School tutors, Dr Sue Jowsey, Dr Rachel Carley, Ms. Ivana Nakarada Kordic, Ms. Anna Miles and Dr Stephen Reay. Their well-taught classes have provided me with a solid foundation for this project. Furthermore, with their support and guidance, I have enhanced my knowledge regarding art and design and developed confidence to establish this research project.</p> <p>During the project development process, I have received much great advice from Mr. Adam Taylor regarding ethics approval principles. I am grateful for his significant input to help me develop a better understanding of research ethics and be prepared for future research which requires research participants.</p> <p>This project has received much external support that were critical to the project’s development and decision making. I would like to thank Sunny Brae Normal School’s Principal Lorene Hurd, who has helped me to confirm the vital importance of this project regarding the topic of children’s problematic device usage behaviour. Deputy Principal Karen Rodger from the same school helped me to arrange the consultative interview with school teachers Ms. Wendy Frazer and Ms. Melanie Hanson. They have provided abundant information and excellent advice, which was critical for this project. I want to thank them for their time and kind support.</p> <p>New Zealand Ministry of Education psychologist, Ms. Nicole Ashby, provided me with essential information regarding children’s problematic gaming issues in New Zealand and validated the contextual research I have done regarding gaming disorder, and device dependency. I am grateful for her time and involvement in the consultative interview.</p> <p>I would like to especially thank Dr Kaye Cederman, who has helped me from the beginning of this master’s study project and provided me with much professional advice regarding mental health issues. She has also provided me with professional proofreading services with the booklet and flyer and helped me to confirm that the psychological information I have included is correct.</p> <p>Most importantly, I would like to thank my family and friends who have encouraged me to undertake this Master’s Degree study. It has been a life-changing decision, and without their support, it would be impossible for me to make the first step.</p> <p>It has been a great honour for me to study in the wonderful city campus of AUT. Finally, I would like to say thanks to all staff members of the AUT city campus for providing world-class services to all students. Thank you for your effort and your warm heart for helping to plant the seeds of New Zealand’s beautiful future.</p>
<div> <div>Name: Zhenggang Sun</div> <div>Date: 10/10/2019</div> <div>Signature:</div> </div>	

Research question:

How to design printed campaign materials, aimed at informing teachers and parents of primary school children with problematic device usage behaviour (PDUB) based on visual and psychological research?

Positioning the research:

Children’s PDUB is a growing concern, with studies suggesting it can be an indication of mental health issues. In New Zealand, with the introduction of the digital classroom,¹⁰ the education of primary schools in New Zealand has become more dependent upon smart devices such as iPad/tablets and laptops. However, many parents and teachers are concerned this decision will cause more negative impacts on children.¹¹ Finally, the inclusion of Gaming Disorder into the World Health Organisation (WHO)’s newest diseases classification, **International Classification of Diseases 11th Revision(ICD-11)**,¹² has brought the concerns of digital gaming and smart device dependency under the public spotlight, as addiction to games and gaming devices might be seen as mental illness.

The New Zealand Government Ministry of Health document, ‘**New Zealand Health Strategy Future direction (2016)**’, has suggested five strategies that would be critical to achieving the goal of “All New Zealanders live well, stay well, get well”. One of the strategies is ‘People-powered’¹³, which proposes to improve the health information’s quality and availability. So, people can easily find the health information they need, and the information would be easy to understand and engaging to read. Therefore, I have found my opportunity as a visual communication designer to contribute towards tackling the challenge of children’s PDUB by designing a campaign regarding PDUB on children, that will help primary school teachers and parents.

This campaign will be informed by critical analysis of psychological research into impacts of PDUB on children, in order to highlight the issue to target audiences of primary school teachers and parents. As suggested by the “People-powered” strategy, this campaign needs to be easy to reach and easy to be understood by the target audiences while engaging to read. The original concept of this campaign would be launched on multiple media platforms, including an official website, short animation videos, social media accounts, email newsletter, radio interview programme, booklet and flyers. With limited time and resources, it would be impossible for me to aim for completion of the full-scale campaign within this Master’s degree project. Thus, I decided to break-down the campaign plan into three phases, as shown in Figure 1.

Due to time constraints of the period of study, and access to resources, this Master of Design has strategically focused on Phase One. The format of booklet and flyer has been the major design focus to help me to test and finally establish the fundamental visual language and communication strategy which would be carried on to the next phase.

10. Nikula.

11. Education Central

12. S. Higuchi et al, “Inclusion of Gaming Disorder Criteria in Icd-11: A Clinical Perspective in Favor,” Review, Journal of Behavioral Addictions 6, no. 3 (1/1/2017), <https://dx.doi.org/10.1556/2006.6.2017.049>

13. Ministry of Health, New Zealand Health Strategy: Future Direction, by Minister of Health (health.govt.nz: Ministry of Health, 2016).

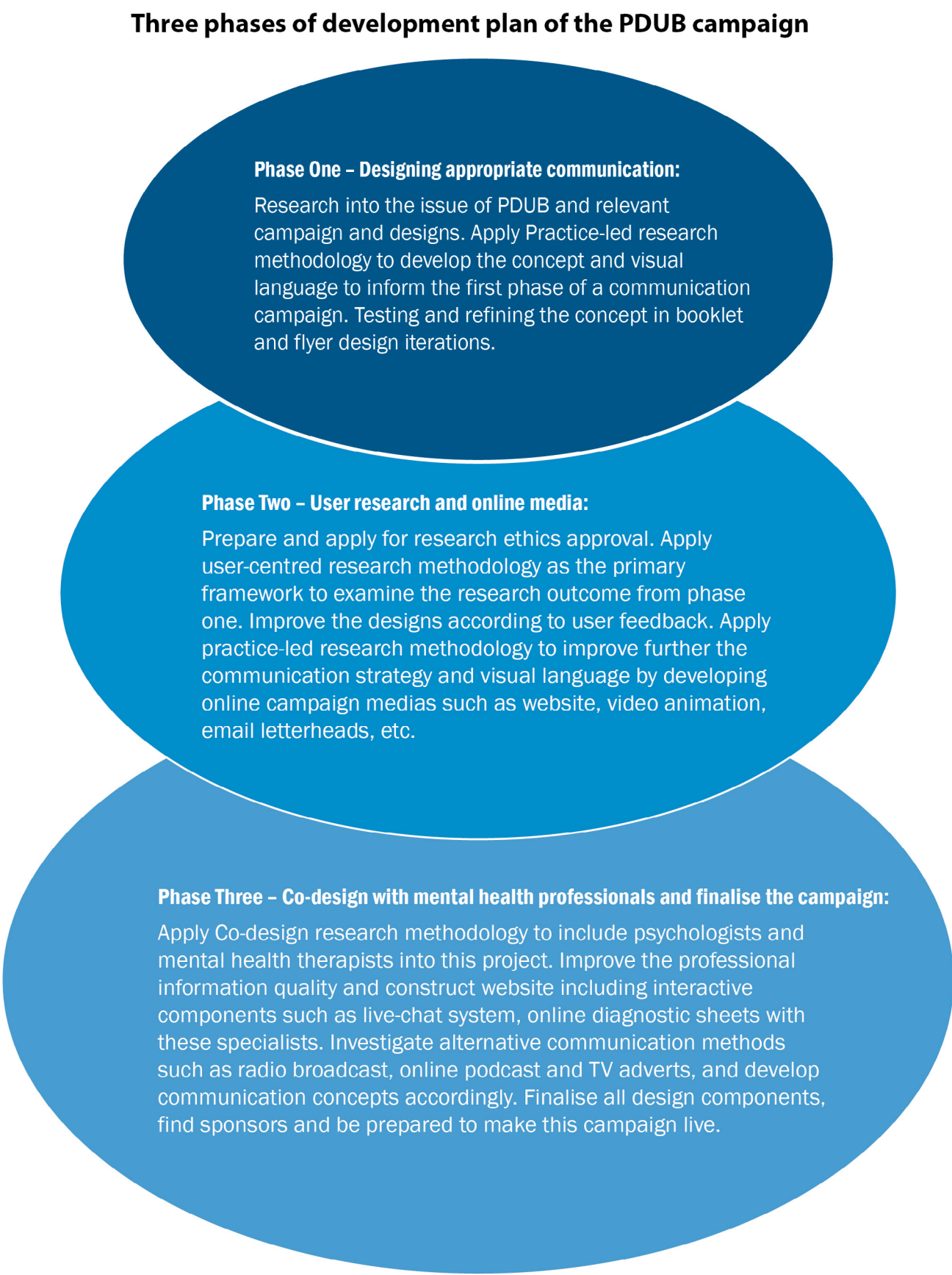


Figure 1.

Zhenggang Sun, *Three phases of development plan of the PDUB campaign*, 2019, diagram, AUT, Auckland.

Positioning the researcher:

The announcement of including ‘Gaming Disorder’ into ICD-11 is the initial force that drove me to this study. As a gamer who has recovered from PDUB during primary school age, I never believed gaming, and device usage behaviours were problematic in the first place. Instead, I considered that the excessive method of playing and emotional escape is the key to the issue. This empirical judgement that overly focused on gaming and device usage itself would reduce the chances of helping children to recover from PDUB.

As a visual communication designer, I would like to use my skill to explain this complex issue in an effective visual form that could encourage a better understanding. My design speciality was on 3D sculpture, prototyping and marketing focused graphic design, which isn’t ideal for informing people about this issue. Publication design, however, is an efficient design format of visual communication with in-depth information. The printed format would also make it ideal for communicating issues regarding digital devices. If necessary, it is also easier to covert the printed publication into a digital presentation, which would provide more communication options. While publication design shares some similarities with marketing focused graphic design, it has also identified many new challenges.

This project has provided me with an opportunity to challenge personally unknown areas in the communication design discipline and helped me to become a more competent graphic designer.¹⁴

14. Through literature research, I have improved my understanding of the principles of publication and booklet design.

Through design practices, I have self-taught how to use Adobe InDesign as the primary design tool.

Key term:

Problematic Device Usage Behaviour (PDUB):

This term refers to the device usage behaviours that would negatively affect the user’s health status, both physically and mentally. Including problematic gaming behaviour/gaming addiction/gaming disorder, internet addiction, social-media dependency, etc. Devices under this terminology would mainly indicate smart and portable devices that are capable of entertainment, gaming and website, video browsing, such as tablet PC, smartphones, mobile gaming devices, iPods/MP4 player, and laptops. While sharing many similarities of causes and symptoms, most of these issues were individually defined in the psychological research field.¹⁵ In order to better communicate these issues and reduce the complexity, I have created this term for this project which was inspired by two school teachers during a consultative interview.¹⁶ According to them, parents and teachers are more worried about device usage behaviours such as long-time website browsing and video watching. Through a telephone consultative communication¹⁷, psychologist Dr Kaye Cederman has confirmed that this term is valid as a generalised description of behaviour issues associated with digital devices.

15. As the official website of American Psychiatric Association (APA) has stated, the DSM-5 diagnostic criteria of internet gaming disorder should only be applied to internet gaming activities. Other activities such as problematic internet usage, social media dependency, smart device dependency will require other diagnostic criteria.

16. These interviews were conducted under the framework of “Exceptions to Activities requiring AUTC approval (6)” 6.5 and 6.6:

“6.5. A one-off interview where the object is to seek non-sensitive information and no opinions are sought.”

“6.6. A one-off interview of limited scope and depth with professional persons, authorities or public Figureures, (for example. politicians, scholars, prominent authors) in the area of their expertise. Such an interview must not comprise a major study.”

AUT, “Applying for Ethics Approval: Guidelines and Procedures,” accessed 14/3/2019.
<https://www.aut.ac.nz/research/researchethics/guidelines-and-procedures#6>

17. Ibid.

In Newark’s book, **‘What is graphic design?’**, he has stated that a graphic designer not only needs to make sense but also needs to be different enough from others.¹⁸ Therefore, to make sense, the designer needs to develop a reasonable level of understanding of the topic s/he is designing. And to be unique, the designer needs first to know what has existed. Thus, I have applied the contextual review at the beginning of this research and continued until I have finalised the content of the booklet and flyer. I have focused on two directions:

- 1. Understand the topic: In this direction, I have focused on research into relevant psychological journals and articles regarding PDUB such as problematic gaming, excessive screen time and smartphone usage. This direction is aimed to firstly, define the issue of PDUB, then through analysing relevant research information to compose the campaign messages.
- 2. Knowing what has existed: In this direction, I have focused on analysing communication strategies that have been applied to campaigns and designs that have similar focuses as my project. Through this process, I have found communication strategies that would be suitable for this project.

This contextual review report will firstly review the background research I have done regarding problematic device usage, then discuss how I did the study of health communication, relevant campaign and artworks that have helped me to develop the foundation of the visual language of this project.

Understanding the issue:

In Ian and Russell’s book **‘Visual Research: An introduction to research methodologies in graphic design’**, it stated that visual communication design as an activity of problem-solving.¹⁹ In the following case study of Matt Cooke’s design research map, “Definition” is the first stage for designers to develop a good understanding of the problem, find possible solution and audiences.²⁰

The issue of children’s PDUB is complicated and covers a wide range of abnormal behaviours associated with device usages, such as excessive screen-time, internet dependency, social media dependency. And problematic gaming has always been one of the topics raising most concerns among all these issues. As a gamer and a person who has experienced problematic gaming issues during primary school age, it has a greater meaning to me. Thus, I started the investigation from problematic gaming.

Kyle McDonald has reviewed the negative impacts of the gaming problem in New Zealand in a news interview and suggested it is necessary to increase public awareness.²¹ The research regarding video game addiction from Jana Goriup and Alexander Arnuš has suggested that excessive gaming as a compensational activity of escape emotion and would negatively impact on the player’s mental health and development.

18. Quentin Newark, What Is Graphic Design, Essential Design Handbooks (RotoVision, 2002), 14.

19. “The discipline of graphic design can be defined in a variety of ways – the most persistent definition over its relatively short history has described the role of visual communication as a problem-solving activity.”
Ian Noble, and Russell Bestley, Visual Research : An Introduction to Research Methodologies in Graphic Design, Ava Academia (Lausanne : AVA, 2005), 19~20.

20. Noble, and Bestley, 33.

21. “There’s been a couple of documented cases of deaths related to fatigue and dehydration. People can become so engaged that they lose track with friends and family and can potentially lose jobs.”
“World Health Organisation to Classify Excessive Gaming as Mental Health Condition by Next Year,” ww.tvnz.co.nz, 2017, accessed 16/9/2018.
<https://www.tvnz.co.nz/one-news/new-zealand/world-health-organisation-classify-excessive-gaming-mental-condition-next-year>

However, they suggest that gaming isn’t the core of the issue. Instead, gaming and other kinds of addiction are more likely an escape reaction for other difficulties and emotional loss.²² In the article, they suggest that other mental health issues can also be represented in the form of problematic gaming, and it is important for adults, including school teachers and parents to observe issues and help youth to overcome difficulties that beyond their problem-solving ability. A research study from Singapore has discovered that the parent-child relationship seems highly relevant to children’s problematic gaming behaviour.²³

Other than gaming, excessive device usage itself would also bring significant impact to the user’s wellbeing. Research regarding smartphone usage has suggested that heavy smartphone usage would affect the users’ information processing capacity and increase impulsivity.²⁴ The study from Jean M. Twenge and W. Keith Cambell has provided evidence that excessive device usage would severely impact on children and adolescents’ mental health and personality development.²⁵ This research found that children and adolescents who spend seven or more hours a day are more likely to develop mental health issues such as depression and anxiety,²⁶ which echoes the research from Jana Goriup and Alexander Arnuš.

A 2018 study regarding problematic smartphone behaviour from Claudia Figueroa, Jorg Macke, Camille Ong and Soesja Vogels, suggested that it is necessary to help smartphone users to establish a healthy and self-conscious smart device usage habit in order to maintain a balances between essential needs (such as social connection and work) while not overly impact user’s health condition. This study has also suggested that it is critical for the senior family members, especially parents, to be a good example of device uses and schedule family times such as organise attractive offline activities to help children to develop good device usage behaviour.²⁷

As suggested by WHO,²⁸ it is necessary to take early action when dealing with mental health issues. These investigations have indicated to me a possible resolution of this complex issue: Increase parents and teachers’ awareness of PDUB, improve the parent-child bond, and call for earlier action. As Rodriguez Estrada and Davis mentioned in their article *“In such an atmosphere soaked with visual elements, communication in society has become much more visually focused.”*²⁹ Thus, if I can visualise the various harms, the possible causes and illustrate suggestions from professionals to parents and school teachers, I may be able to help our society to reduce PDUB with our future generations in New Zealand.

22. “Despite the insecurity about the future, in their attempts to preserve a sense of meaning and personal integrity, the young often react wrongly when they escape to the world of stupor and addiction. The role of the school and the family is to help the youth on their way of recognising and curing the addiction.”
Jana Goriup, and Alexander Arnuš, "Some Sociological, Medical and Legislative Views on Video Game Addiction (a Slovenian Case Study)," article, Acta Technologica Dubnicae, Vol 4, Iss 1, Pp 25-40, no. 1 (2014).
<https://dx.doi.org/10.1515/atd-2015-0010>

23. Hyekyung Choo et al, "Parental Influences on Pathological Symptoms of Video-Gaming among Children and Adolescents: A Prospective Study," Article, Journal of Child & Family Studies 24, no. 5 (2015).
<https://dx.doi.org/10.1007/s10826-014-9949-9>

24. A. A. Hadar et al, "Using Longitudinal Exposure to Causally Link Smartphone Usage to Changes in Behavior, Cognition and Right Prefrontal Neural Activity," Brain Stimulation 8, no. 2 (1/3/2015).
<https://doi.org/10.1016/j.brs.2015.01.032>

25. Jean M. Twenge, and W. Keith Campbell, "Associations between Screen Time and Lower Psychological Well-Being among Children and Adolescents: Evidence from a Population-Based Study," Preventive Medicine Reports 12 (1/12/2018).
<https://doi.org/10.1016/j.pmedr.2018.10.003>

26. Twenge, and Campbell.

27. Claudia Figueroa, Jörg Macke, Camille Ong, and Soesja Vogels. "Familytime: How to Help Smartphone Users Reduce Problematic Smartphone Behaviour." Psychological and Behavioural Science (2018).
<http://www.lse.ac.uk/PBS/assets/documents/FamilyTime-How-to-help-smartphone-users-reduce-problematic-smartphone-behaviour.pdf>

28. “Early intervention is fundamental in preventing progress towards a full-blown disease, in controlling symptoms and improving outcomes.”
Chapter 3: Solving Mental Health Problems (www.who.int: World Health Organization, 2001), accessed 3/10/2018.
<http://www.who.int/whr/2001/chapter3/en/index1.html>

29. F. C. Rodríguez Estrada, and L. S. Davis, "Improving Visual Communication of Science through the Incorporation of Graphic Design Theories and Practices into Science Communication," Article, Science Communication 37, no. 1 (24/2/2015).
<https://dx.doi.org/10.1177/1075547014562914>

Knowing what has existed:

As many psychological studies have suggested, the PDUB can indicate mental health issues. In this case, my project would share many similarities with public health communication.

In Jessica Kuperavage’s 2017 essay about health communication, she suggested that use of risk is the most effective method to call people’s attention to health issues.³⁰ Amy Lauren’s 2018 journal article has provided a more detailed introduction to the fear-based campaign.³¹ It seems that to use fear, or risk related message is the most common way to attract people’s attention, thus increasing their awareness. However, it is also necessary to realise that fear, and risk messages can cause adverse effects, such as encouraging stigma towards a particular group. My research discovered the poster shown in Figure 2,³² which used a fear campaign to address the risk of excessive gaming. This poster has discussed the notion of risks associated with extreme gaming and provides brief statistical data about this issue. However, this poster didn’t indicate any actions that can be undertaken by audiences to make a change for the better.³³

In comparison, a short animation (Figure 3) from Child Mind Institute about children’s depression³⁴ has provided an example of how to address the risk with factors in a neutral dialogue and compose a positive message to call for action.

This video has used silhouette based forms and artworks, which are easy to read for all age groups. The greyish blue and dark red have visually represented the notion of depression. With the use of symbols such as maze, tears and weight, this video has shown an example of how to use visual language. As Helen Lloyd has stated in the educational booklet regarding visual language, the image, form, shape and all kind of visual elements would communicate information to the audiences, such as feelings and emotions, that is usually difficult to present in words.³⁵

According to the Australian Broadcasting Corporation’s mental health campaign ‘**Mental As**’,³⁶ stigma towards people who have mental health problems is a critical issue. Thus, the neutral dialogue and simple messages from “Speak Up for Kids: Depression” has reduced the chance of misunderstanding leading to stigma. Furthermore, instead of the use of risk and fear, this video has shown me an alternative communication method: Calling for empathy. As the report of the WISH Design in healthcare forum 2018 has mentioned, empathy is essential for healthcare designs.³⁷ Thus, the design can resonate with the users and therefore increasing communication efficiency. The aim of calling for empathy has then led me to research into design applications with anthropomorphism³⁸ and finally helped me developed the illustrated blue penguin character set.

30. “Of the many ways modern populations learn about risks to themselves and their communities, it is perhaps health campaigns that are most closely connected to the structure of risk itself.”

Jessica Kuperavage, "Visualizing Risk: Images, Risk and Fear in a Health Campaign," journal article, Journal of Medical Humanities 38, no. 2 (1/6/2017). <https://dx.doi.org/10.1007/s10912-015-9333-9>

31. “In the social sciences and advertising literature, fear-based campaigns have been defined as efforts to make individuals internalize a threat—of death, disease, suffering, loss of beauty, loss of social status, even social exclusion.”

Amy Lauren Fairchild et al, "The Two Faces of Fear: A History of Hard-Hitting Public Health Campaigns against Tobacco and Aids," American Journal of Public Health 108, no. 9 (2018). <http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=131143866&site=eds-live>

32. Kevin St, Social Campaign Poster - Video Game Addiction, 2014, Poster, www.Behance.net, accessed 9/10/2018. <https://www.behance.net/gallery/17111347/Social-Campaign-Poster-Video-Game-Addiction>.

33. “A successful campaign must identify factors within an individual’s capacity for change, make findings accessible, and persuasively argue for the benefits of change.”

Kuperavage.

34. Child Mind Institute, "Speak up for Kids: Depression," Speak Up for Kids, YouTube: Child Mind Institute 2013, animation, accessed 10/10/2018. <https://www.youtube.com/watch?v=Z-qzdRqrxC4>

35. Museum of New Zealand TePapa, Visual Language, by Helen Lloyd (Wellington: Te Papa, 2015), 5.

36. ABC, "Mental As " Mental As, ABC, accessed 20/8/2018. <http://www.abc.net.au/mentals/>

37. Andrew Zimmermann, Lenny Naar, Kyra Bobinet, Aaron Skar, The Human-Centered Health System: Transforming Healthcare with Design (Doha, Qatar: World Innovation for Health, 2018), 7. <https://www.wish.org.qa/wp-content/uploads/2018/11/IMPJ6078-WISH-2018-Design-Healthcare-181026.pdf>

38. Yuan, and Dennis.

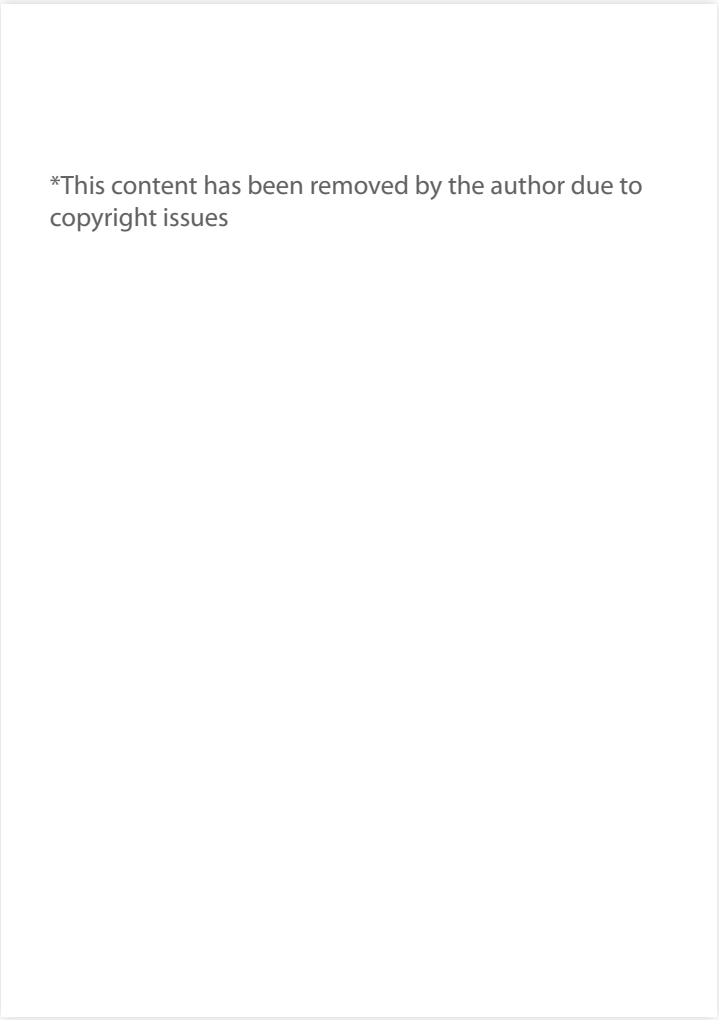


Figure 2.
The more playing video game, the more killing yourself

It has overly focused on fear.

Kevin St, *Social Campaign Poster - Video Game Addiction*, 2014, Poster, www.Behance.net, accessed 9/10/2018

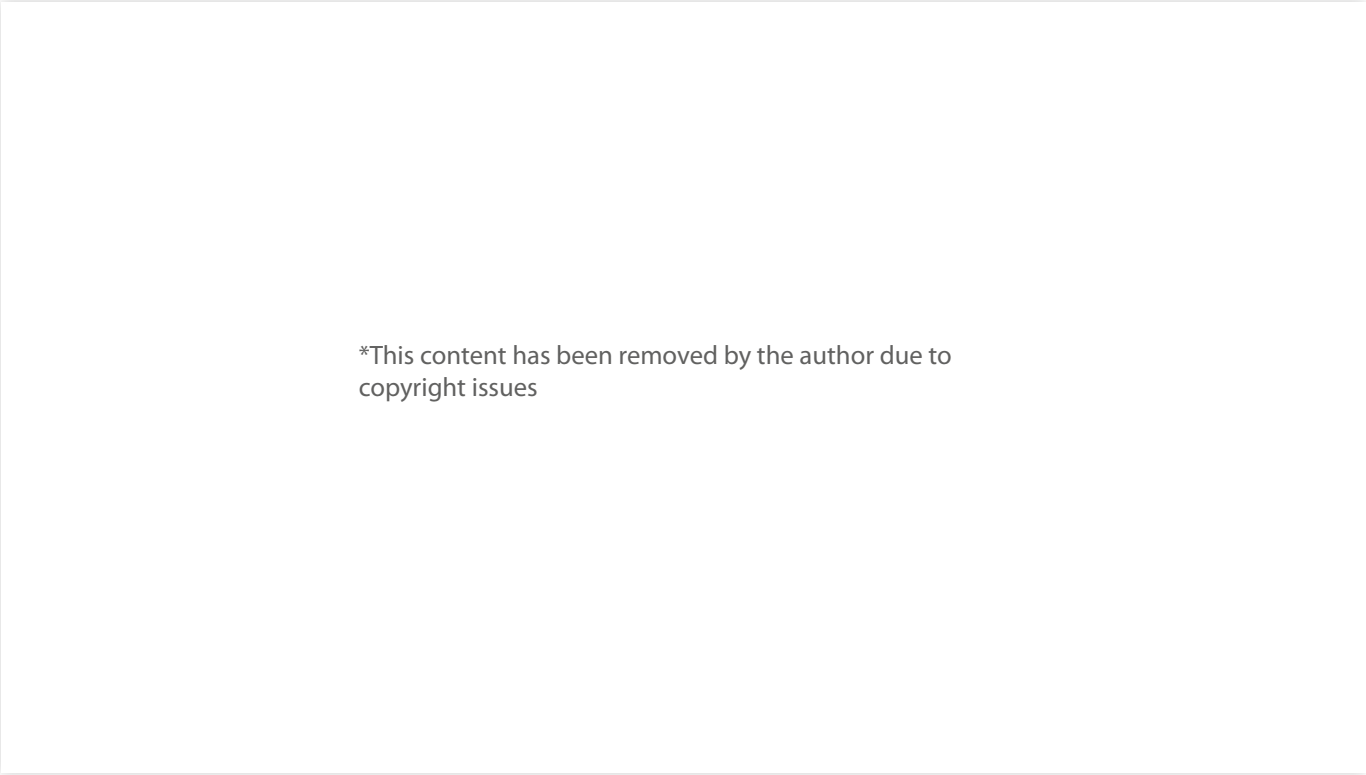


Figure 3.

Screen capture of the animation “Speak Up for Kids: Depression”. This animation has shown the unique advantage of visual language to communicate feelings and emotions.

Child Mind Institute, *Speak up for Kids: Depression*, 2013, animation, Speak Up for Kids, YouTube: Child Mind Institute, Accessed: 10/10/2018, <https://www.youtube.com/watch?v=Z-qzdRqrxC4>.

The booklet design from Think Place about rough sleepers in Auckland city (Figure 4)³⁹ provided an example on how to communicate a complex social issue in a simple visual form. This information booklet visualised stories from the rough sleepers in Auckland and revealed the hidden side of this complex social phenomena. The content layout and the neutral, objective manner has enhanced communication efficiency. The visual style, including uses of symbol and isotype characters, highly inspired me at the exploration stage of this project. This project also indicated that the design form of a booklet could be a starting point for constructing the underlying messages. As suggested by the study from Pablo Delgado, Cristina, Rakefet and Ladislao Salmeron, the printed publication still hold advantages on comprehension outcomes when comparing with the digital-based publication. According to their research, the printed publication can help the reader to stay focus, thus develop better understandings and memories of the reading, especially during time constraint reading scenarios.⁴⁰ As a design medium, the printed publication is easier to produce and more resource-friendly when comparing with other mediums such as animation and website. This means it would allowing me to test and develop the foundations of visual language and campaign messages while not be disturbed by technical issues and resource constraint. Through reading books regarding typography and publication at the later stage of this project, I have been prepared for this design format.^{41 42 43 44}

Through analysing the content and use of language in this booklet, I have determined a communication strategy they have applied, which shares some features from the *‘Threshold Capabilities Integrated Theoretical Framework’* (TCITF). This framework stated the educators need able to define the ‘threshold’ of the taught discipline and need to connect taught knowledge with real situations. Thus, teachers can prepare students with the most relevant “episteme, phronesis and techne”⁴⁵ to help transform them into professionals who will have the capabilities to keep developing themselves.

As the content in the rough sleeper booklet has shown, each chapter can be seen as a threshold of newer understanding. From ‘why do these people decide to live on the street’ to ‘how do other people think and react’, most of the information has been concluded into keywords or phrases, gradually leading readers to see this phenomenon in-depth from different perspectives. My design needs to help the audiences to accumulate essential knowledge to pass the threshold. Thus, they would have the capability to discover the real issue behind PDUB and take the most suitable actions. This framework is echoing with the structuralism concept of seeing beyond the detail and finding the broader structure, which is the driven mindset for me to analyse problems.⁴⁶ TCITF has provided me with a guide to arrange the contents of this campaign. I have then classified the contents of my booklet design into four parts:

1. The key-signs of PDUB;
2. The harms and effects of PDUB;
3. The reasons some children might develop such behaviours;
4. Provide suggestions to undertake.

39. S. Beaton et al, An Insight into the Experience of Rough Sleeping in Central Auckland (Lifewise, 2015).
<https://www.lifewise.org.nz/wp-content/uploads/2016/01/rough-sleeping-report.pdf>

40. Pablo Delgado, Cristina Vargas, Rakefet Ackerman, and Ladislao Salmerón. "Don't Throw Away Your Printed Books: A Meta-Analysis on the Effects of Reading Media on Reading Comprehension." Educational Research Review 25 (1/11/2018), 23-38.
<https://doi.org/10.1016/j.edurev.2018.09.003>

41. Jennifer Kenneth Visocky O'Grady, The Information Design Handbook (How Books, 2008).
<http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.spx?direct=true&db=cab05020a&AN=aut.b11428739&site=eds-live>

42. Victoria Squire, Getting It Right with Type / Victoria Squire, Hans Peter Willberg and Friedrich Forssman (2006).

43. Poppy Evans, Exploring Publication Design / Poppy Evans (Clifton Park, NY: Thomson/Delmar Learning, 2006).

44. Timothy Samara, Making and Breaking the Grid : A Graphic Design Layout Workshop / Written, Compiled, and Designed by Timothy Samara (2002).

45. Baillie, Bowden, and Meyer.

46. I have learnt structuralism from Kha Sean-Yang's book **‘Structuralism(2017)’**. I have developed an interpretation of structuralism concept as “the theory that encouraging people to see beyond the surface and finding the connections that indicating the root structure.” This theory has then become my primary mindset of problem-solving.

Summary:

Through the contextual review, I have investigated the issue of PDUB and how might it affect children. This investigation has helped me to confirm the essential nature of this project, indicated possible methods which I could undertake and the target audiences of primary school teachers and parents.

By reviewing relevant campaigns and designs, I have understood that the design for communicating sensitive and complex issue needs to have positive imagery. The messages need to be focused more on encouragement. The visual language of risk-factor, neutral dialogue, and positive language have provided design guidelines. Through reviewing mental health campaigns, I have learnt it is essential to avoid causing stigma to any particular groups or person. These processes helped me to generate a draft brief for this project: Designing informative publications which would visually present the potential risk of PDUB, illustrate the critical research findings and suggestions from concerned professionals, encourage a positive attitude, and finally call caregivers to stand with their children together to fight this global issue of the 21st Century.

*This content has been removed by the author due to copyright issues

Figure 4.
S. Beaton et al. *An Insight into the Experience of Rough Sleeping in Central Auckland*, 2015, Booklet, Lifewise, Auckland, <https://books.google.co.nz/books?id=RWl8rgEACAAJ>.

Research methodology:

The research methodology of this project is practice-led research, which was inspired by Maarit Mäkelä’s research journal **‘Knowing through Making: The Role of the Artefact in Practice-Led Research’**. She used her project as an example, explained the concept of use practices and products to reflect and preserve the research findings, and understandings. Furthermore, the process of practice and post-analysis of the artefacts will also encourage new ideas and alternative perspective.⁴⁷ The core of practice-led research is “*knowing through making*”, the product of such process should, therefore, reflect the understanding and knowledge has been gathered, discovered and tested during the research and contribute to further studies. Thus, this framework would enable me to keep refreshing my understanding of how to communicate this topic and provides me with freedoms to test different concepts and strategies. Therefore, practice focused methods, including drawing, design iteration, prototyping has constructed the body of this research. With the aim of refreshing understanding of design theories, an analytical cases study has also been added into this research framework.

Research methods:

Drawing:

Drawing is the primary research method I have applied in this project. As suggested by Rein and Martin, hand drawing is a critical method of visualising ideas and concept and improving the designer’s understanding regarding object, form and their visual thinking.⁴⁸ Although they have focused on the uniqueness of hand drawing compared with digital drawing methods such as 3D modelling in the architectural discipline. I have used digital drawing equipment of a drawing tablet, which is similar to hand drawings as I am still drawing by my hand, although on a different medium.

I have used the drawing method to produce drafts, visualisation of ideas and most of the prototypes. If I have created some ideas that could be developed further, I can seamlessly transfer the draft to other programs to establish enhanced prototypes.

At the early stage of this project, I have applied the drawing method by drafting posters to test the fear communication (Figure 5, 6, 7, 8). Through these practices, I have gradually learned how to control the tone of the message to avoid stigma by addressing risks with factor and encouragement language. These practices have contributed to the development of the isotype characters, which has dominated this project for an extended period. When I have realised the limitation of isotype character, the drawing method then helped me to test and develop the alternative character that can call upon empathies while communicating with neutral dialogue. (Figure 9, 10, 11). During the prototype development stage, the drawing method has helped me to test different visual representation and character layouts that could be applied to the final product (Figure 12).

47. Maarit Mäkelä. "Knowing through Making: The Role of the Artefact in Practice-Led Research." Article, Knowledge, Technology & Policy 20, no. 3 (2007): 157-63. <https://dx.doi.org/10.1007/s12130-007-9028-2>.

48. Martin van den Toorn Rein Have, "The Role of Hand Drawing in Basic Design Education in the Digital Age" (paper presented at the 2012 International Conference on Engineering and Mathematics, Faculty of Architecture Delft University of Technology 2012). <https://pdfs.semanticscholar.org/f0c8a6d1efbc23412f9577048e36192bd3.pdf>



Figure 5.
Draft poster for examining risk-factor concept. However, the deep dark visual presentation would increase the chance of causing stigma to gamers.
Zhenggang Sun, *Poster: Game Addiction #1*, 2018, poster, AUT, Auckland.

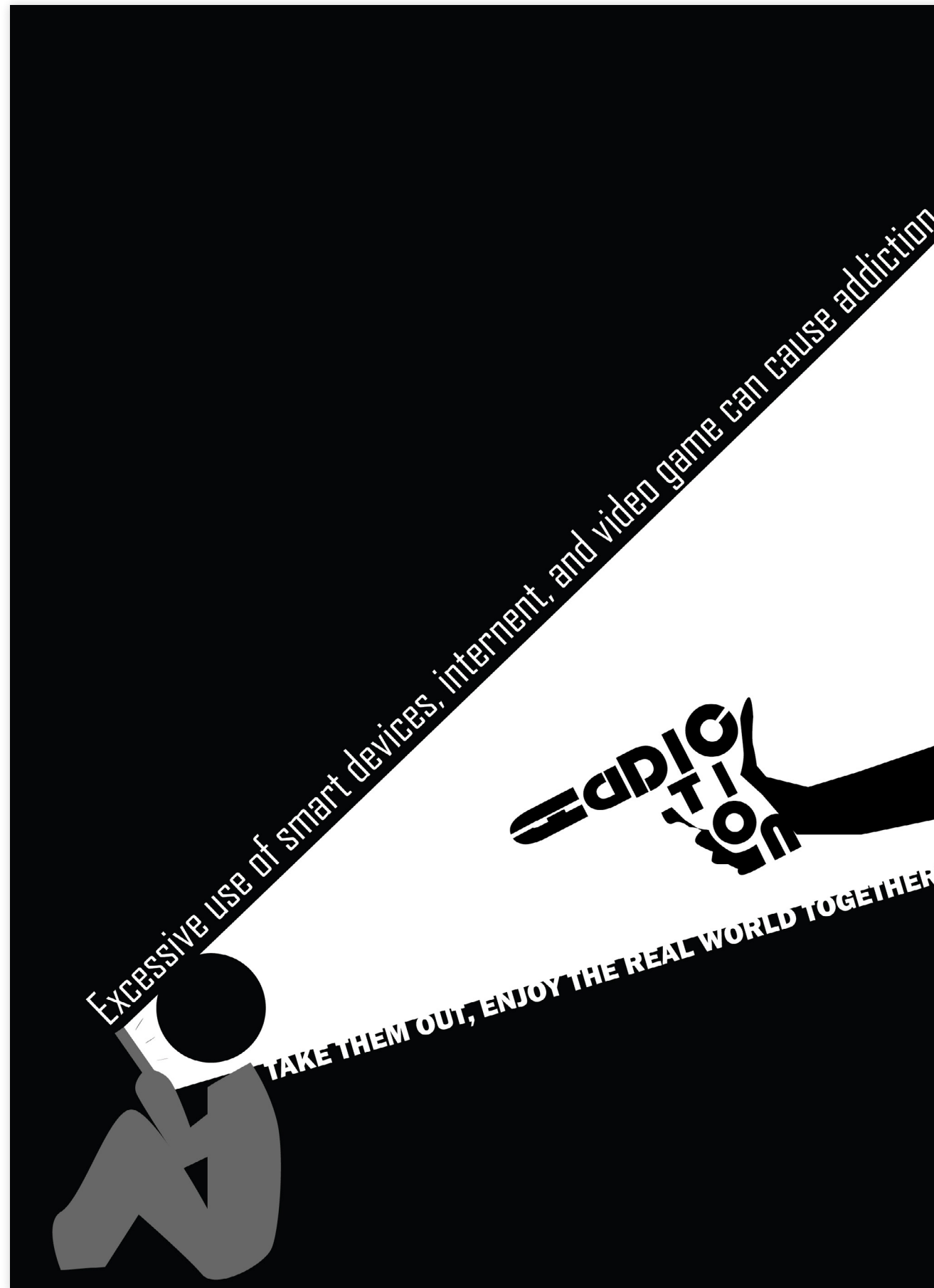


Figure 6.

Draft poster for examining risk-factor concept. However, the deep dark visual presentation would increase the chance of causing stigma to gamers.

Zhenggang Sun, *Poster: Game Addiction #4*, 2018, poster, AUT, Auckland.

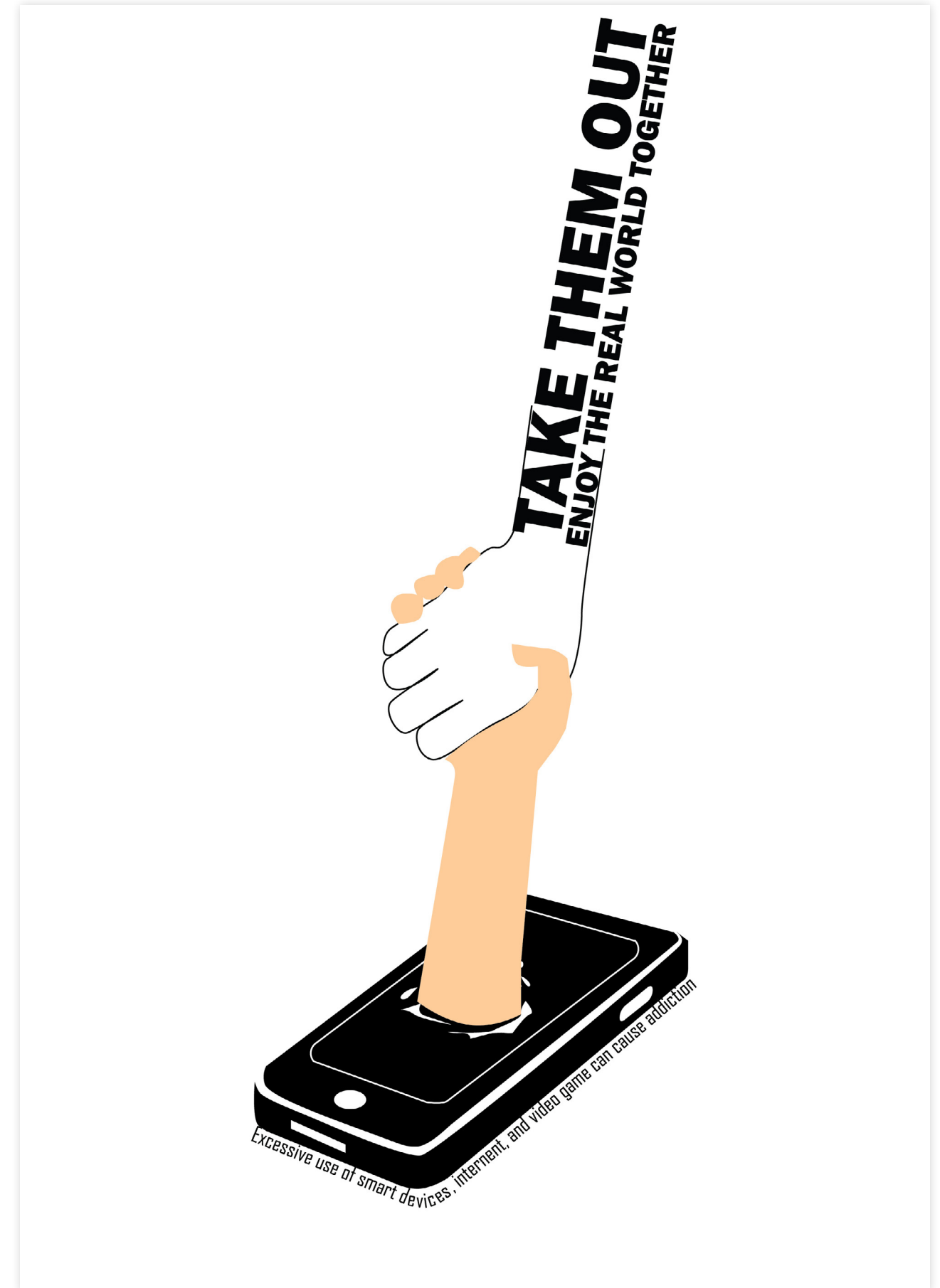


Figure 7.

Draft poster for Examining risk-factor and neutral dialogue. Rather than focusing on risks, this poster was more focused on calling for actions to help people who are having PDUB.

Zhenggang Sun, *Poster: Game Addiction #6*, 2018, poster, AUT, Auckland.



Figure 8.

Draft Poster, Examining risk-factor concept with isotype symbol character. This poster was my first attempt to visualise the key signs of PDUB.

Zhenggang Sun, *Poster: Game Addiction #7*, 2018, poster, AUT, Auckland.

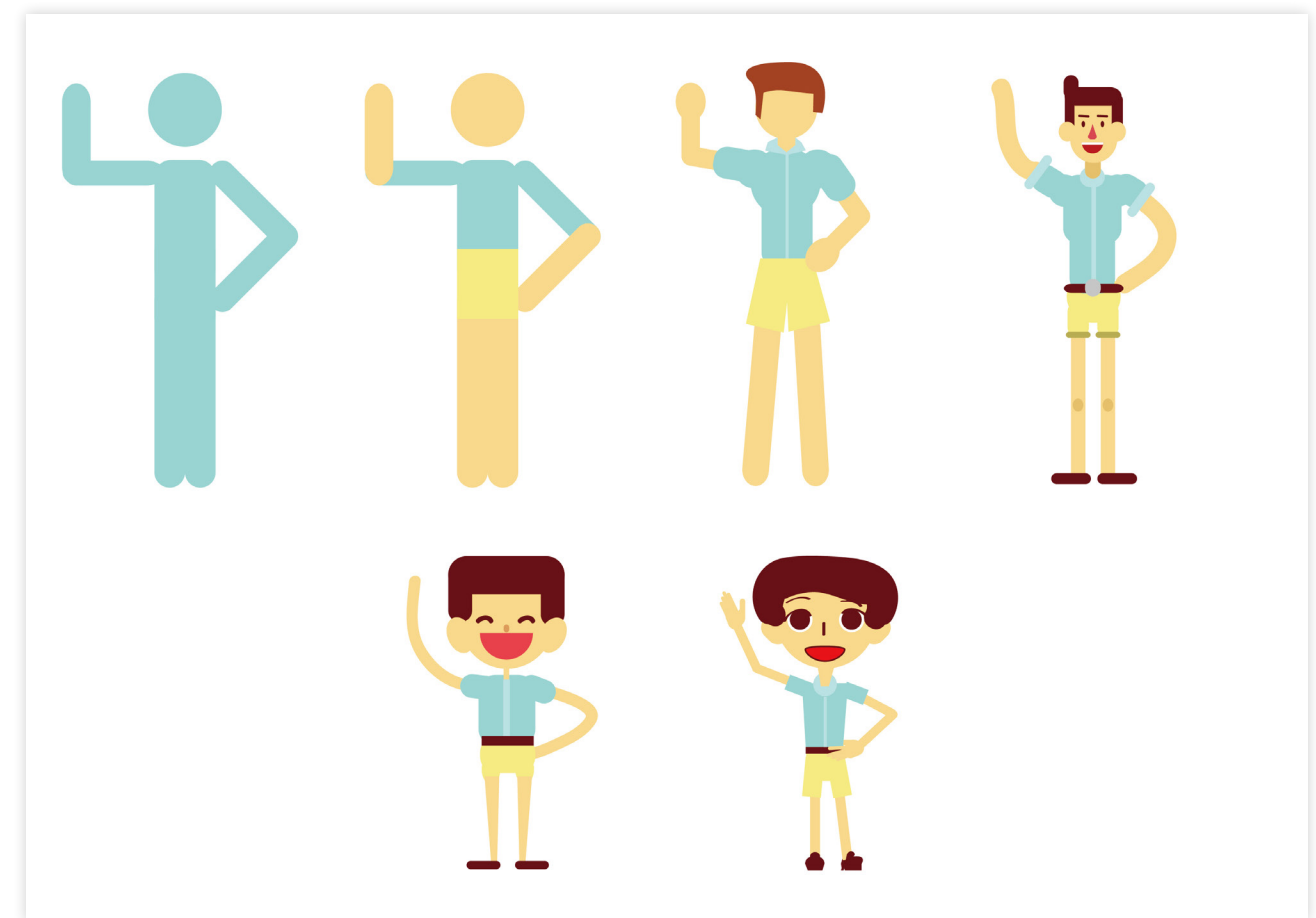


Figure 9.

Alternative character style test. This practice aimed to develop a more expressive character that can call people's empathy. However, the human form character would have potential to cause stigma.

Zhenggang Sun, *Character design iteration*, 2019, digital illustration, AUT, Auckland.



Figure 10.

Alternative visual style test. However, this style seems even easier to cause stigma and even cultural offence.

Zhenggang Sun, *Character design style test*, 2019, digital illustration, AUT, Auckland.

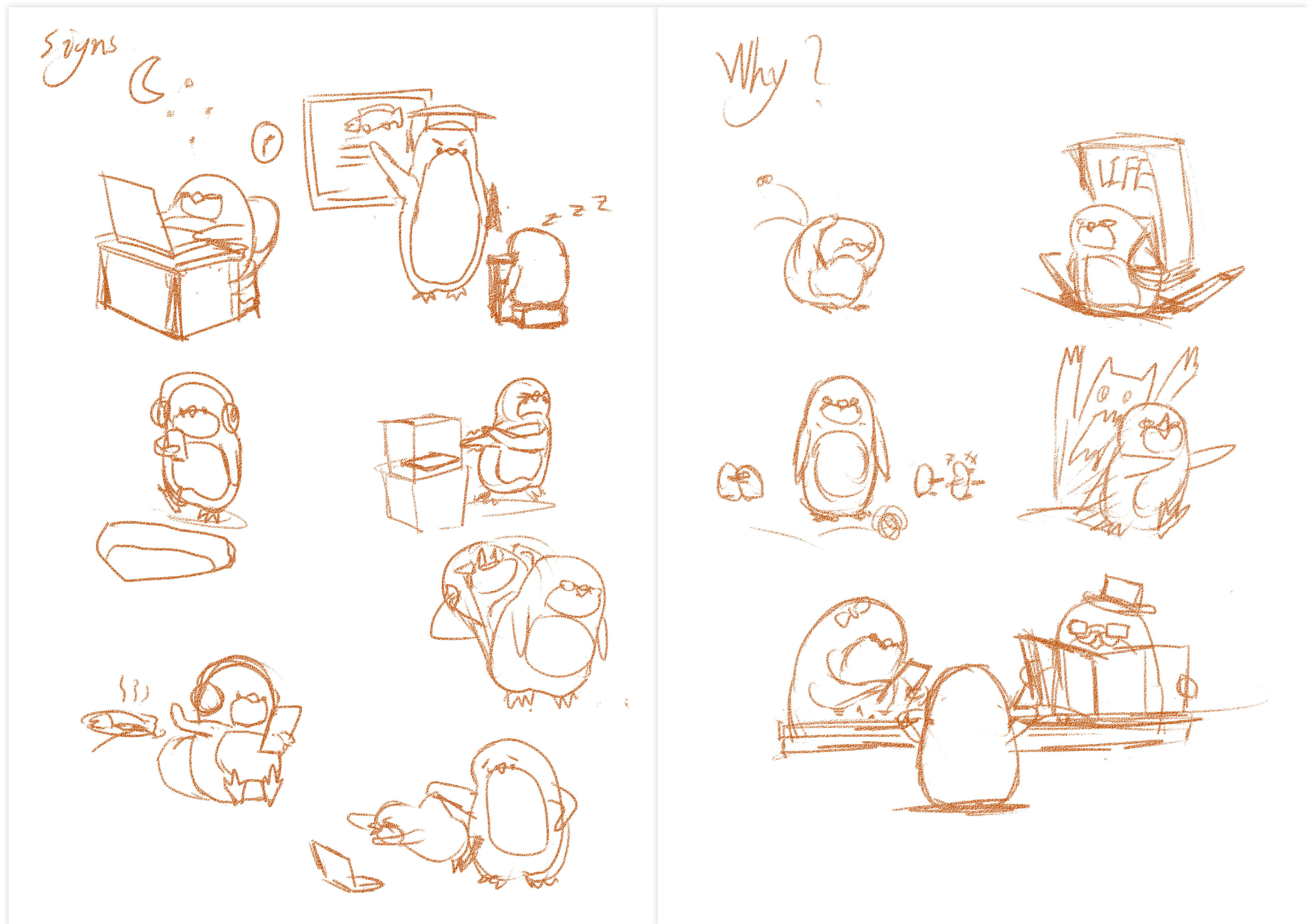


Figure 11.

Alternative character style and visual language test. If human is no good, how about a penguin? So, I have tried to draw out the key signs of PDUB with chubby blue penguins. These drawings indicated the great potential of this visual concept.

Zhenggang Sun, *Character concept draft*, 2019, digital drawing, AUT, Auckland.

DEFINE

What is “Problematic Device Usage Behaviour”?

Many digital devices are having very attractive entertainment features, and some of them were even designed to be addictive.

So, it is easy for peoples, especially children, who are lacking self-control abilities to overly attach to them.

If the device usage is negatively affecting the user's player's daily life, concentration, social connection and health wellbeing, then we can consider it is a problematic device usage behaviour.

Let's see some examples.

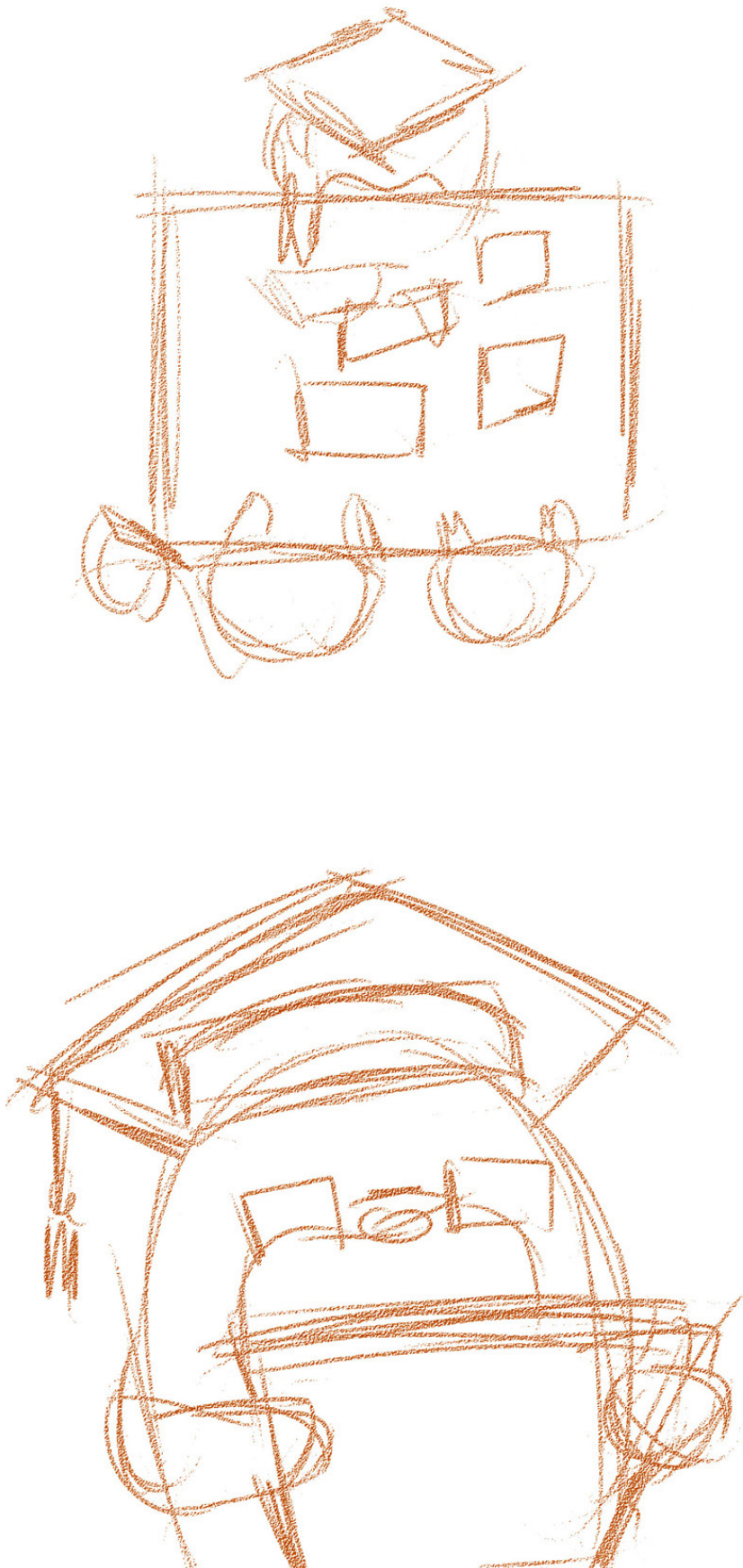


Figure 12.

From drafts to prototype. Drawing out all ideas enabled me to compare which one would fit the context better. The professor character looking at the opposite page provides more visual connections to the spread page.

Zhenggang Sun, *Process record: From draft to prototype*, 2019, digital drawing and illustration, AUT, Auckland.

Design iteration:

Design iteration is another core research method I have applied to this project. I was inspired by the article from Eder Rengifo regarding design iteration and development. In this article, he has suggested the design process framework of understanding, exploration and validation, and design iteration is the driven component of the exploration stage and reflects the increase of understanding.⁴⁹ For my project, design iteration method was focused on detail improvements driven by the focused analysis of communication efficiency and aesthetic uniqueness. From the simple visual form & limited colour (Booklet Ver 1.0), to the model that aimed to provide an overview in one page (Booklet Ver 2.0), to multi-level of messages (Booklet Ver 3.0~8.0), the iterations of booklet design helped me to develop a strategy of how to apply visual language to communicate the issue of PDUB under the strategic concept of structuralism. This method also helped me with aesthetic improvements. (Figure 13) As Mäkelä has suggested in her journal, making is one of the most rational methods to examine knowledge and encourage new understanding.⁵⁰ At the development stage, it has helped me to develop a page layout and colour palate that harmonise with the character and aesthetically engaging to read, which would increase the communication efficiency.

49. Eder Rengifo, "Iterations in the Design Process," Prototypr.io, 2018, accessed 30/2/2019. <https://blog.prototypr.io/iterations-in-the-design-process-41bd8d01f244>

50. Maarit Mäkelä. "Knowing through Making: The Role of the Artefact in Practice-Led Research." Article, Knowledge, Technology & Policy 20, no. 3 (2007): 157-63. <https://dx.doi.org/10.1007/s12130-007-9028-2>.

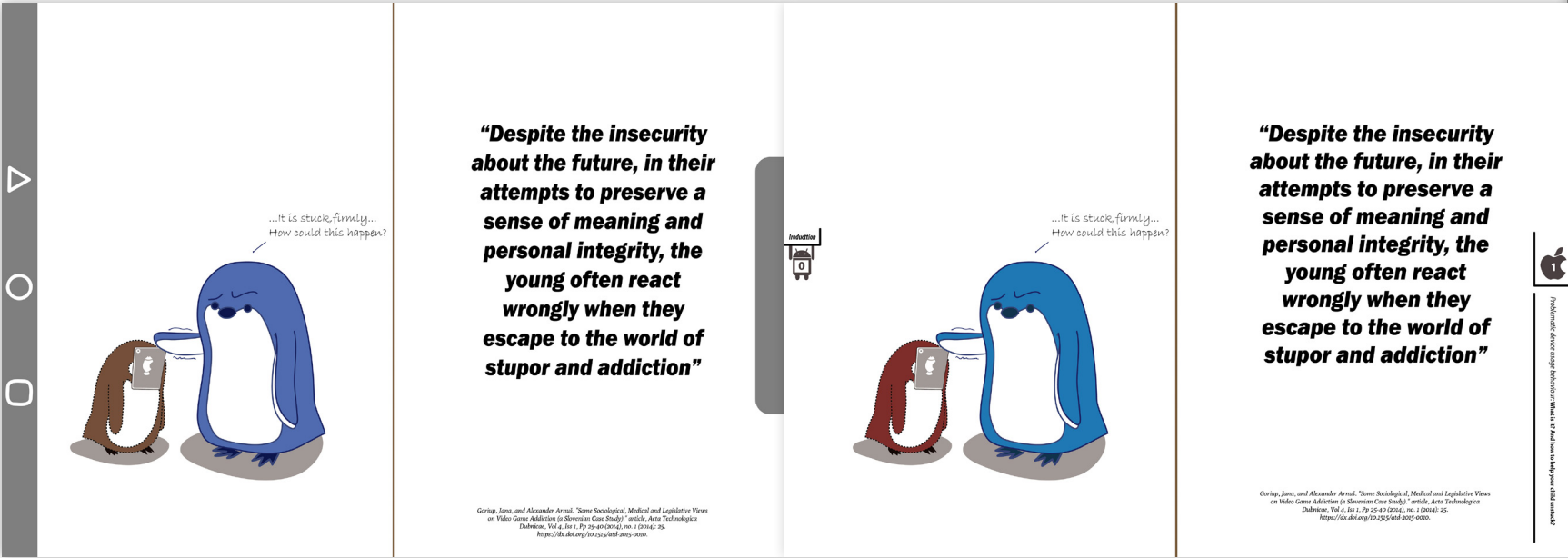
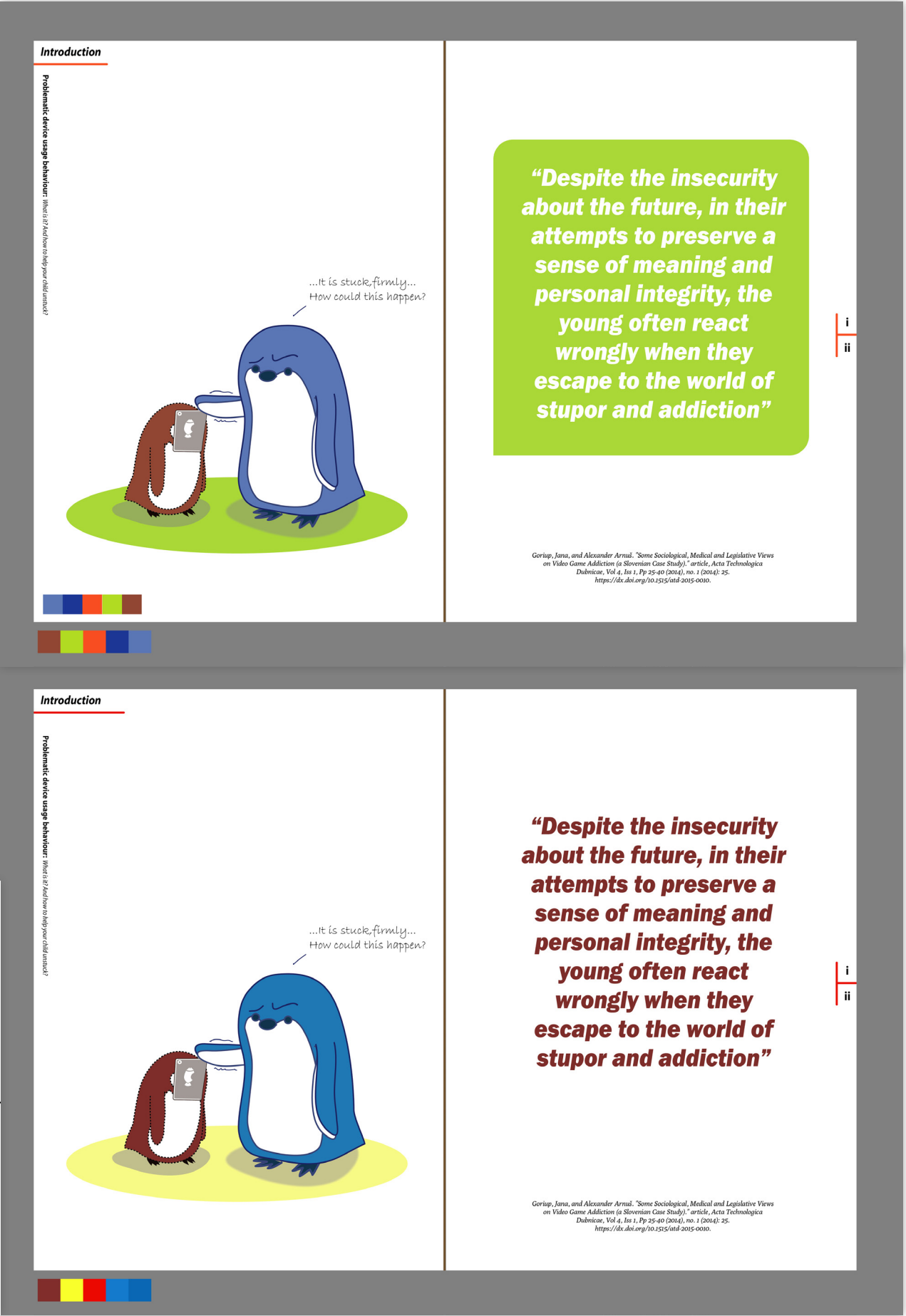


Figure 13.

Design iterations of page design and colour. While the left two options have more unique visual elements, but they lack harmony with other elements on the page which would disturb the reader's attention. Therefore, these options aren't ideal for providing efficient communication.

Zhenggang Sun, *Process record: Iterative design of layout and colour*, 2019, digital graphic design, AUT, Auckland.



Case Study:

The booklet regarding children’s PDUB is one of the primary design outcomes of this project. **‘The Information Design Handbook’**,⁵¹ provided me with an overview of information design. It included many guidelines, design principles and explained by case studies, which provided instruction on how to communicate efficiently via publication design. The following criteria have been applied during case selection:

1. Educational book. Such as skill training, popular sciences, history etc.
2. Books that suitable for both adults and children to read.
3. The contents need to be visually focused or at least maintain a balance between image and text content.
4. Target age group: 5~12 years old school children and their parents.⁵²

Each case would be evaluated according to Visocky O’Grady’s **‘The Information Design Handbook’**. I was mainly looking at:

- The information density on each page: Is the page overloaded with information? Does each page have enough negative spaces for the reader’s eye to rest?
- The balance between image and texts: Does this book have enough images to illustrate the text? Does this book have enough text to explain the core information?
- Information hierarchy: How easy it would be for readers to find the most important message on each page without being confused by sub-information?
- Information flows: How easy is it for readers to read through the information on each page without jumping back and forward?
- Consistency: Does this book design applied a consistent layout design? Does each page implement the same grade system?

I have selected five books for this case study and briefly analysed each book’s design according to the criteria above.⁵³

51. Jennifer Kenneth Visocky O'Grady, The Information Design Handbook (How Books, 2008).
<http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.spx?direct=true&db=cat05020a&AN=aut.b11428739&site=eds-live>

52. This target audiences consideration was only valid during this particular stage of research. The school teacher and parents are still the primary target audiences of this project.

53. Detailed study has been included into the appendix of this report, page 81.

I have found that almost all books that could leave me with a strong impression would break some rules to emphasise the design goal. For example, **‘The Silk Roads: A New History of the World’** has sacrificed background colour consistency to echo with the article theme and enhance the reading atmosphere. **‘Art-Tastic’** has almost ignored design consistency to address ‘fun’ and memorable reading experience.

This study has helped me to realise that while it is essential to understand the design rules and principles, but they are not absolute. For my project, to make everything simple and clear, while attractive to read would be the goal. As Beryl McAlhone, and David Stuart, has stated in their book, make people wonder and make them smile would enhance the design attraction and improve communication efficiency.⁵⁴ Therefore, clear orders of contents, relaxed, and humorous imagery that can track reader's attention and further explain the issue, enough negative spaces for readers' eyes to rest, limited information density on each page and enough contrast between different contents have become the critical design criteria of establishing an efficient communication for this project.

54. Beryl McAlhone, and David Stuart, A Smile in the Mind : Witty Thinking in Graphic Design (Phaidon Press, 1996), 18.

Prototyping:

“A prototype is a pre-production representation of some aspect of a concept or final design.”⁵⁵

Prototyping in this project can be seen as the continuation of drawing and design iteration. Drawing creates a concept. Design iteration develops it. Prototyping at the end would provide me with an overview of the finalised product. As Bradley Camburn et al. (2017) stated in their journal, prototyping will examine the research findings and thinking. It will also provide the researcher with an opportunity to connect their objective to techniques and providing suggestions and improvement from the product orientated perspective. Since the final products of this project are printed on paper, physical prototypes, in this case, would provide me with opportunities to see how the design would look like on paper, and examine the suitable quality of papers for the final product. (Figure 14, 15)

55. Bradley Camburn et al., "Design Prototyping Methods: State of the Art in Strategies, Techniques, and Guidelines," Design Science 3 (1/1/2017). <https://dx.doi.org/10.1017/dsj.2017.10>

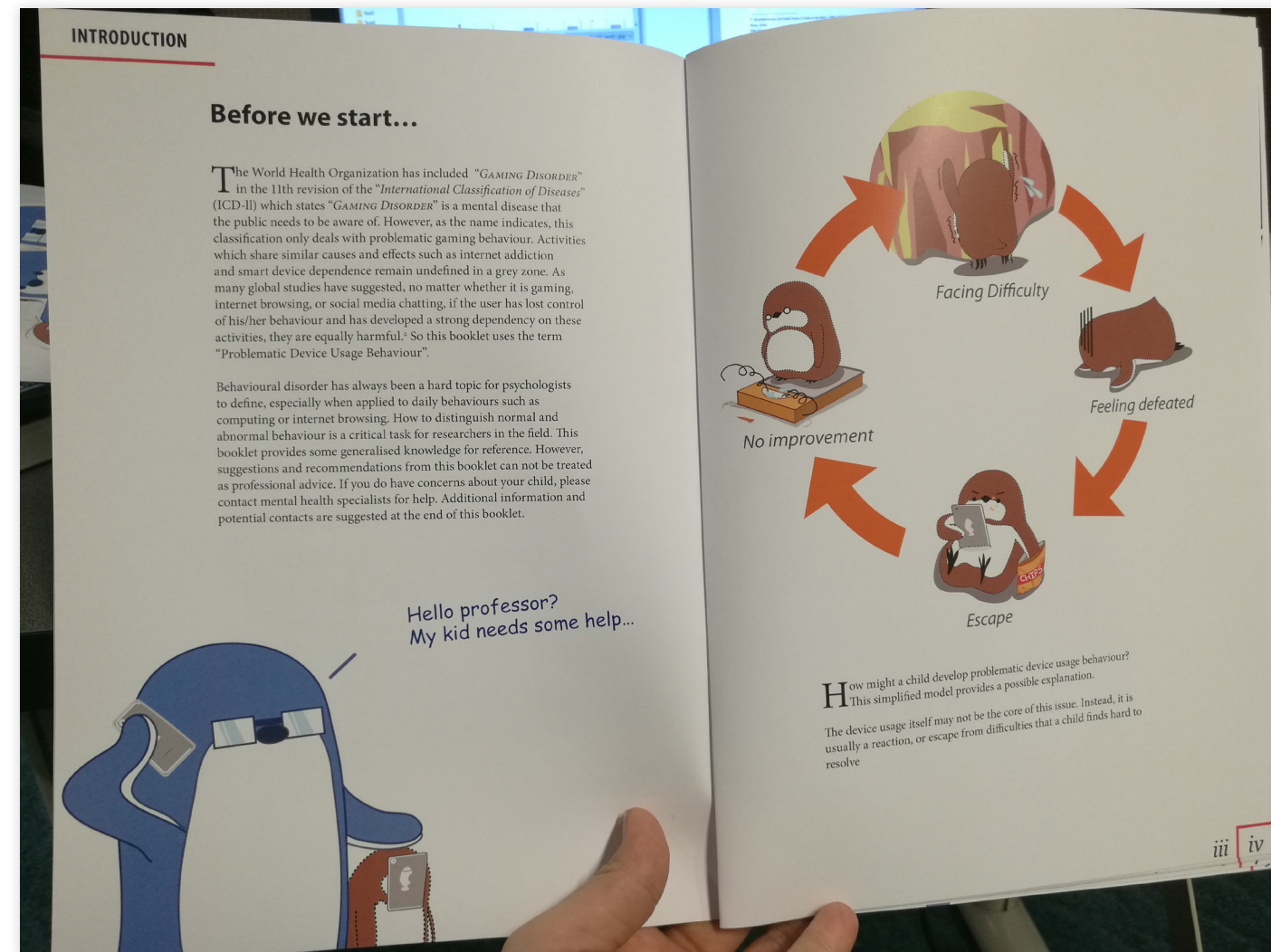


Figure 14.

Print of version five booklet. I have learnt the 160-gram paper as the content provides premium touch, but it is hard to flip for this thin booklet. The thickness of the paper also caused trimming problems with outer pages. The 12-point text is too big.

Zhenggang Sun, Photo of the fifth version booklet prototype, 2019, photo, AUT, Auckland.

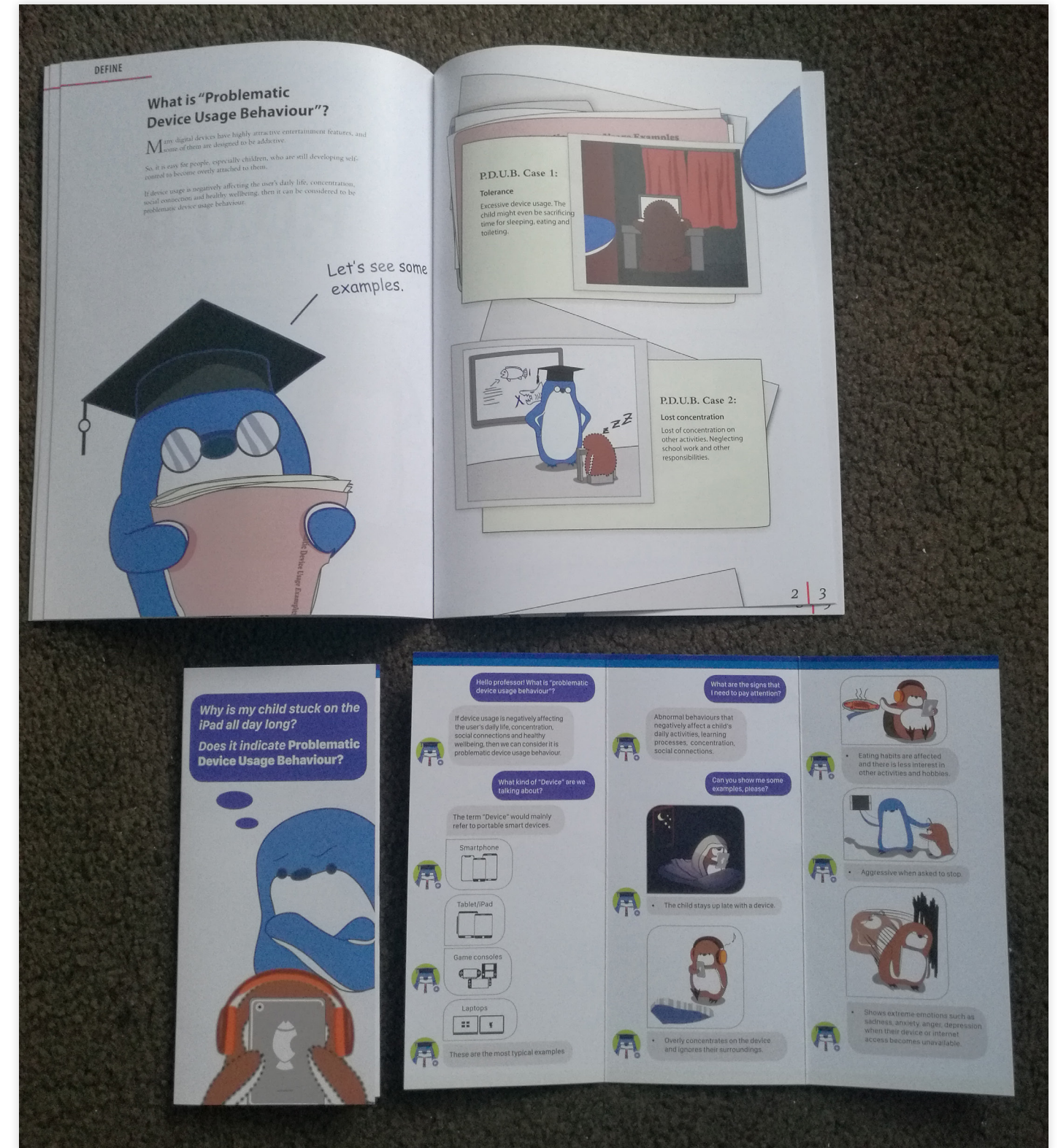


Figure 15.

Print of version seven booklet and flyer. They have improved on the issues found from previous designs, fixed text size, reduced paperweight and simplified the page number decoration. However, this prototype has also reflected some issues with content placement which is hard to see on screen. I need to extend the flyer's cover page to ensure it can cover pages behind.

Zhenggang Sun, Photo of the seventh version booklet and flyer prototype, 2019, photo, AUT, Auckland.

Concepts:

The concept of this project has two levels: the strategical level concept of structuralism that indicating the overall direction, and tactical level concepts, including rationalism, TCITF, aesthetic uniqueness, and anthropomorphism plus the three theoretical frameworks of distributive cognition, activity theory and actor-network theory that develop through later practices, which direct practices and technical decisions.

Structuralism as the core concept has indicated the content of campaign and method of communication, which should be focusing on providing a holographic view of the issue’s full structure and help audiences to construct a systemic understanding of PDUB. For the aim of reducing PDUB associated with school children in New Zealand, structuralism indicated that as a designer within the social structure, my focus of the first phase of this project should be entirely on undercover the concept of communication and most suitable visual language to carry out messages tackling this complex issue.

The TCITF framework has provided me with a logical structure to classify the booklet into four parts: Define, Effects, Cause and Action. Informed by critical analysis of psychological research, I have generated the fundamental content for this project and classify them into the four parts. The tone of the message in the booklet was focused on risk-factors with neutral dialogue. It has then been developed with visual elements together.

Rational thinking that is focused on designing a logical information structure, care of design usability and communication efficiency has taken a dominant position in this project. However, the review from Ida Engholm, and Karen Lisa Salamon has indicated that the attention to aesthetics and creativities that go beyond rational thinking should not be ignored.⁵⁶

As shown by the booklet “An Insight into the Experience of Rough Sleeping in Central Auckland”, booklet can be a very powerful communication medium. However, as a public communication medium, the booklet would be expensive to produce in large numbers when compared with alternative formats such as flyer. As suggested by the two school teachers from the earlier interview, the booklet can be a great communication toolkit for them when they have an one-on-one meeting with parents. However, they would also need a publication which can cover the fundamental information and cheaper to produce so they can handout to every parent during school meetings. Thus, the foldable flyer has been selected as an additional design outcome of this phase of the project.

Contents:

As a self-directed project, my role in this project was not limited to that of a designer and focusing on the visual contents. Instead, I have played several roles, including copywriter, director, resources finder and more. This one-man band situation has provided me with an opportunity to express a more personalised perspective regarding PUDB. However, it also means I have to develop everything from scratch, including the foundation for any design project, the content. Among all the roles, the copywriter is the most fundamental one. The content is generated based on psychological research^{57 58 59} and developed through my understanding of structuralism.

The researches regarding PDUB have suggested the usage of the digital device is not always the core of the causes. Instead, it is more likely a compensational reaction to other issues encountered by the user. Empirical judgements that entirely focus on device usage itself would reduce the chances of resolving this complex issue. As Levi-Strauss has suggested regarding studies of the social phenomenon ‘*Acquire meaning only if they are integrated into systems*’.⁶⁰ It is necessary to see beyond the surface and unpuzzle the broader structure to understand and discover a resolution of any social issue.⁶¹ Thus, to help the audiences to see beyond the device usage phenomenon and realise the real causes underneath the surface has become the guideline for me to generate the content of this design project. (Figure 16) This would require audiences to develop a better understanding of the complexity of this issue. Therefore, how to arrange the contents in a rational order would be the first task.

56. Ida Engholm, and Karen Lisa Salamon, "Design Thinking between Rationalism and Romanticism - a Historical Overview of Competing Visions," article, Artifact, no. 1 (2017). <https://dx.doi.org/10.14434/artifact.v4i1.20158>

57. Choo et al.

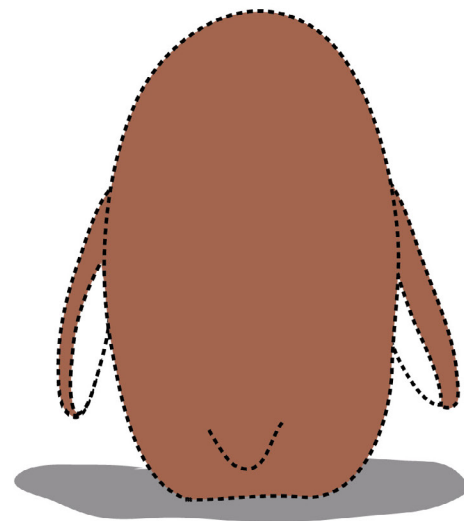
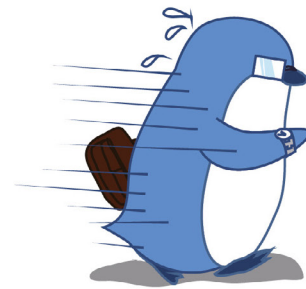
58. J. B. Saunders et al, "Gaming Disorder: Its Delineation as an Important Condition for Diagnosis, Management, and Prevention," Review, Journal of Behavioral Addictions 6, no. 3 (1/1/2017). <https://dx.doi.org/10.1556/2006.6.2017.039>

59. Goriup, and Arnuš.

60. Claude Lévi-Strauss, Structural Anthropology (Basic Books, 1963), 34. <http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.spx?direct=true&db=cab05020a&AN=aut.b1385172x&site=eds-live>

61. Sean-Yang.

CAUSES



Parent-child Connection:

Contemporary society's active pace of life contributes to the reduction of family interaction. Insufficient parent-child communication and connectivity reduces the child's feelings of security, self-confidence, and negatively affects their development of social skills.

Compensation # 1:

Negative emotions such as fear and insecurity can cause an escape reaction. Some children use their smart devices' entertainment features to compensate for their emotional loss.



Compensation # 2:

School children also face many pressures and challenges in their daily life. Device usage, therefore, provides the means to release pressure and reduce stress.

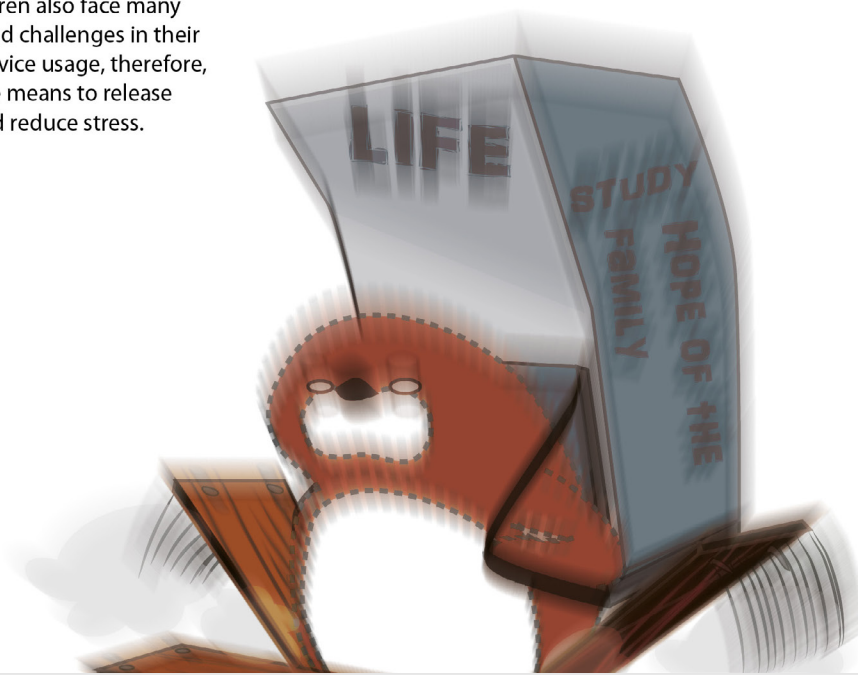


Figure 16.
A selected page spread from the sixth revision of the booklet. The chapter "Causes" has fully focused on revealing the fundamental issues that would be responsible for PDUB.
Zhenggang Sun, *Booklet content, 'Cause', Version 7*, 2019, publication design, AUT, Auckland.

Exploration

This stage was aimed to use design practice test visual languages found from contextual review and establish the initial concept of this project. Through design practices on awareness posters (Figure 5, 6, 7, 8), I have tested the visual language of fear-communication. The peer-review feedback from class⁶² has suggested it would increase the chances of causing stigma with careless messages. Therefore, through contextual review with campaigns and a design project regarding complex issues, I decided to use neutral dialogue to establish risk-factor that is more focused on the factor side which also encouraged me to develop a rational structure of communication. The structuralism thinking of uncovering the root of the issue has driven me to visualise the causes of PDUB through characterisations (Figure 17, 18). These efforts have subsequently contributed to the establishment of the initial concept, which then led to the creation of the first booklet of this project (Figure 19).⁶³

- 62. Which happened during the class of Mediate Practice, a postgraduate class alongside this Master study.
- 63. This booklet design has been included into the appendix of this report, page 61.

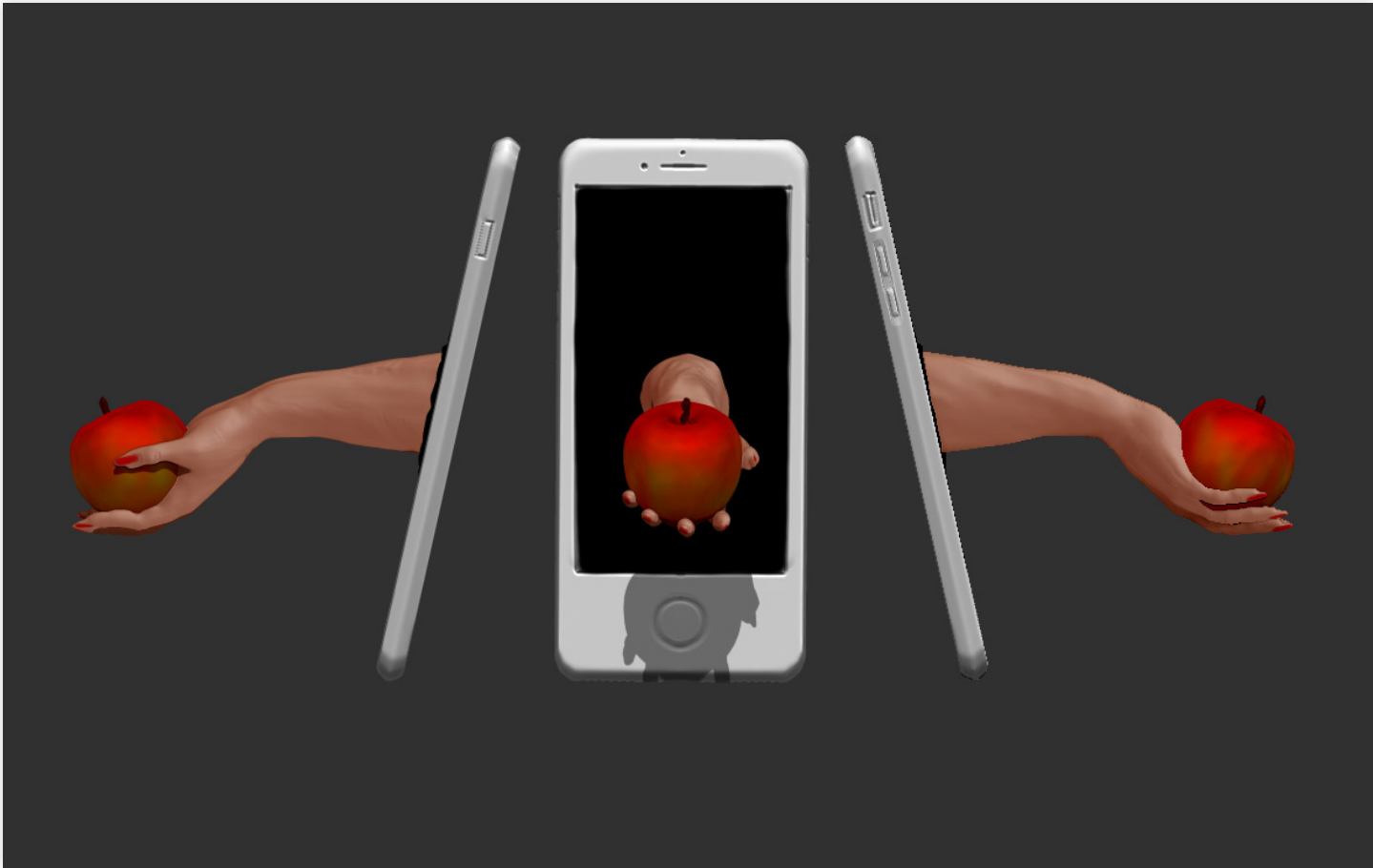


Figure 17.

Characterise the causes of Problematic Device Usage Behaviour, this one has been inspired by the fairy tale of the “snow white princes”. The Poisoning apple has become the visual representation of addiction.

Zhenggang Sun, *Illustrate addiction: ‘Do you want a magic apple?’*, 2018, digital 3D sculpture, AUT, Auckland.



Figure 18.

Use fairy tale reference to characterise the causes. The Pied Piper is a well-known character as a symbol of attracting children to a miss-leading path. This makes him a perfect symbol to visualise PDUB.

Zhenggang Sun, *Illustrate addiction: Pied piper character drawings*, 2018, digital drawing, AUT, Auckland.

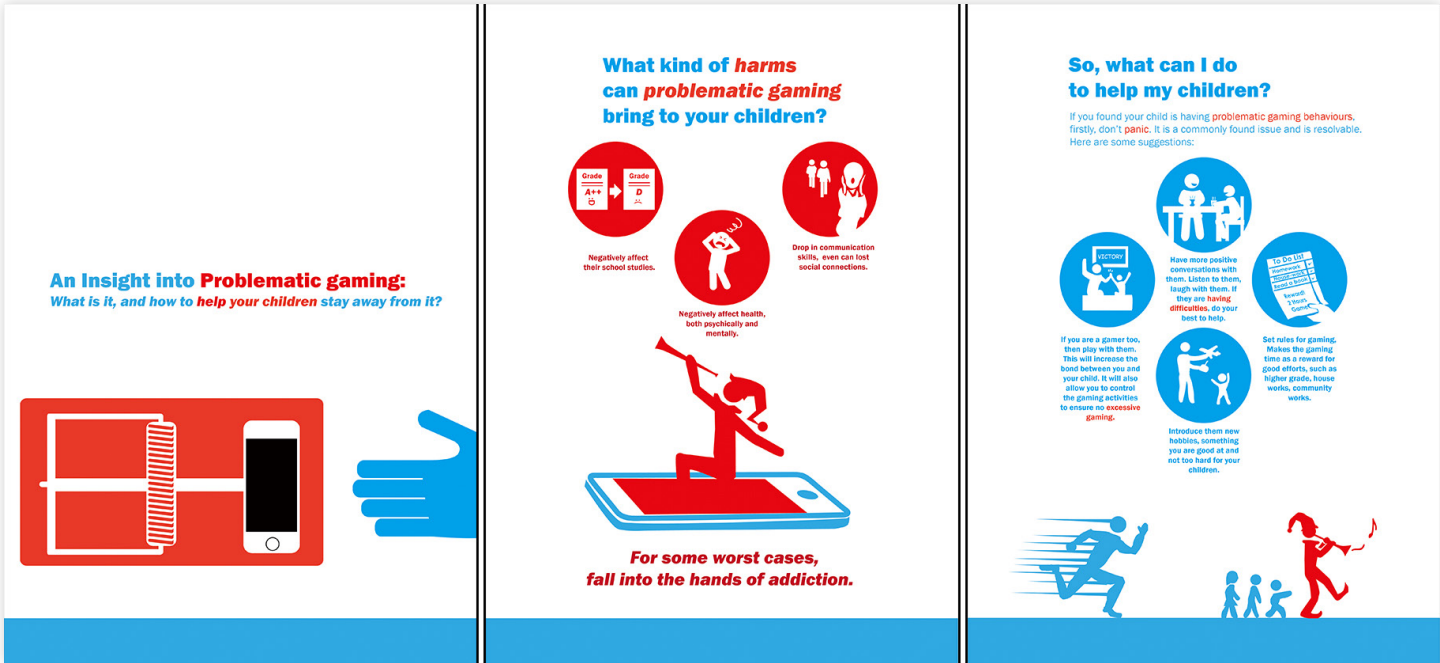


Figure 19.

Booklet Ver 1.0. This booklet was focused on risk-factor with neutral dialogue. The simple visual form and short message is aimed to help readers to quickly build an overview of the issue. Visualised “addiction” as Pied Piper would help reader to build an impression of the causes of the addiction would more likely be external factors rather than children themselves. The last scene of the defeated pied piper is an attempt to visualise the encouragement to the readers.

Zhenggang Sun, *Booklet 1.0: ‘An insight of problematic gaming behaviour’*, 2018, graphic design booklet, AUT, Auckland.

The in-class peer review⁶⁴ feedback regarding this booklet suggested the content structure directed by TCITF is logical and easy to follow. The combination of risk-factor and neutral dialogue would help the reader to focus more on the facts and therefore reduce the chances of causing stigma. The brighter colour composition of red and blue, which was aimed to visually differentiate risk and safety, has also provided an impression of encouragement. The use of limited humour has received the most positive feedback. This booklet helped me to establish the first visual language of this project, which combined risk-factor, neutral dialogue, limited humour, and avoiding stigmas. Driven by the concept of structuralism and aiming to discover the potential of this visual language, I have reviewed my childhood memories about gaming and device usage and developed the children's perspective of PDUB. Thus, encouraged me to create voice-over animation to speak of the children's emotional needs (Figure 20).⁶⁵

This animation practice has proven that using children's perspective to communicate the issue has great potential and should be further developed in the future phases. However, through this practice, I have also realised the limitation of the isotype character. It is expressionless, which makes it hard to call up empathy. Through further contextual reviews on health campaigns, I have also found the isotype character has been overly used in healthy wellbeing design projects. As Newark has stated, the graphic design needs to make sense while being unique.⁶⁶ I need to develop a visual language that could become the identity of this project.

64. Which happened during the class of Mediated Practice, a postgraduate class alongside this Master study.

65. Full animation link: <https://vimeo.com/329745951>

66. Newark, 14.

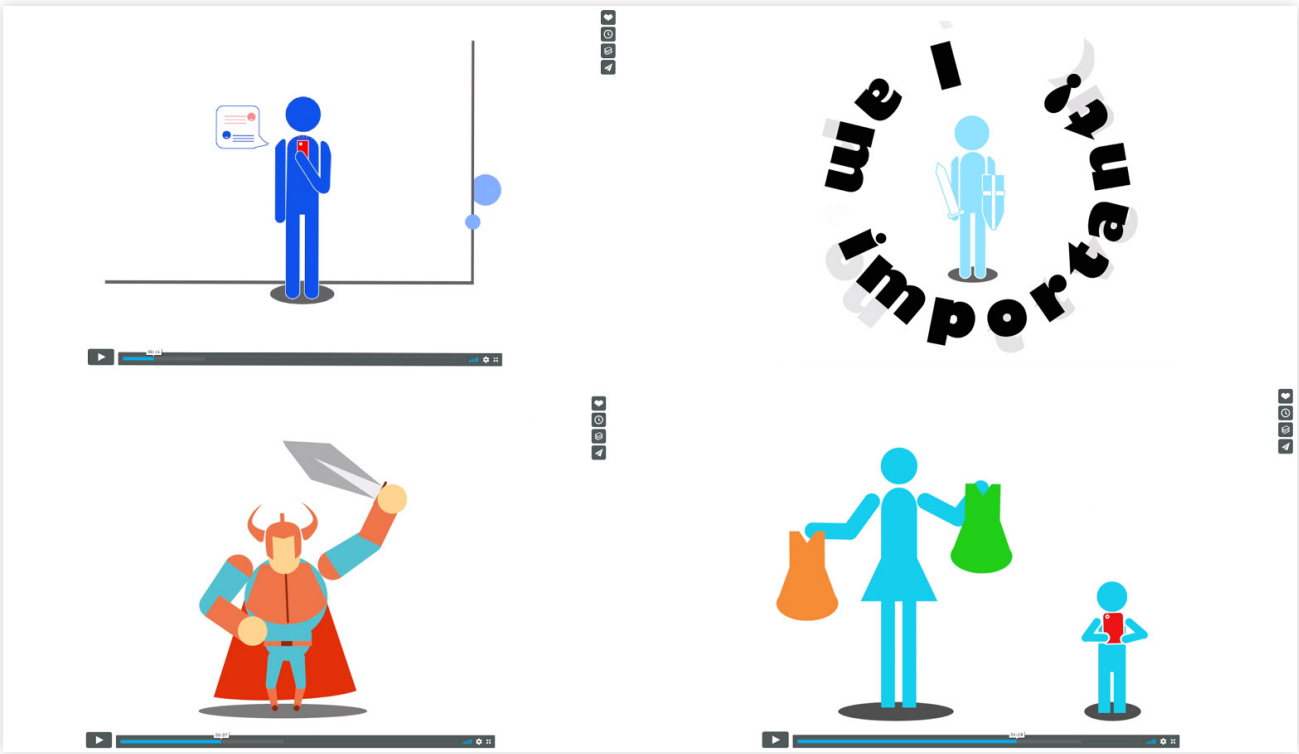


Figure 20.

Screen capture of the Voice-over animation. This animation has used an artificial child's voice to explain what they feel when the adults ask them to drop their devices and do something else. This perspective allowed me to help the audiences to review the issue from a new angle, which would make the connection to the issue of child-parent relationships and children's emotional need more obvious.

Zhenggang Sun, *Voice-over animation: 'Why do I like to play games'*, 2019, digital animation, AUT, Auckland.

Character development

The visual language that could express feelings, emotions and behaviour would bring extra advantages for this mental health issue of PDUB. Thus, the expressionless isotype characters won't be the ideal. I have considered developing stylised human characters (Figure 9, 10), but this kind of visual form would increase the chance of causing stigma and cultural offence. As Pirjo Suvilehto has discussed in the article: **'A study of animal characters as representations of humans: the animality/bibliotherapy test'**, readers would embed themselves into the story with their own memories, experiences to create their interpretations.⁶⁷ For sensitive cases, this embedding process would likely cause unnecessary association if the characters in the story are too close to real-life. This study has indicated the potential advantage of animal characters. Further research into anthropomorphism concept has suggested that non-human objects with human features such as facial expression, human-like acting would encourage positive impressions.⁶⁸ Animal characters with adorable appearance would promote a positive emotion of empathy and reducing unnecessary association with reality.

Thus, I have developed the cartoon-style blue penguin characters (Figure 21). As one of the beloved iconic native birds of New Zealand, it is easier for New Zealanders to recognise and accept them, which provides communication advantage.⁶⁹ The penguins' body shape is close to human, which makes them naturally competent to be anthropomorphised as a cartoon character. The round, simple and adorable appearances of these penguin characters provided them with high potential for humorous acting, which can help engage the reader without age barriers and help them relax.⁷⁰ Therefore, the illustrated blue penguin characters allow me to communicate sensitive messages with a lower chance of causing negative emotions. This character style has been then tested through a new booklet design (Figure 22) and an interview probe (Figure 23). The adorable appearance encouraged me to explore alternative design solutions such as a storybook that encourages parents and children to read together (Figure 24).

67. Pirjo Suvilehto, "A Study of Animal Characters as Representations of Humans: The Animality/Bibliotherapy Test," *Journal of Poetry Therapy* 32, no. 2 (3/4/2019). <https://dx.doi.org/10.1080/08893675.2019.1583414>

68. Yuan, and Dennis

69. As stated in the book, helping audiences to feel familiar with the design would increase their acceptance with the information. McAlhone, and Stuart, 52.

70. I have received highly positive feedbacks of the blue penguin character design from the school teachers I have interviewed. They were not impressed by the cartoon boy design (Figure 9) but impressed by the sketches of the blue penguin characters (Figure 11).



Figure 21.

The Little Blue Penguin Cartoon Character style test, more expressive action has highly enhanced the advantage of the visual language. Rather than simply explain the text, these images are self-explained and able to present "behaviour" more literally.

Zhenggang Sun, *Cartoon style blue penguin concept*, 2019, vector illustration, AUT, Auckland.

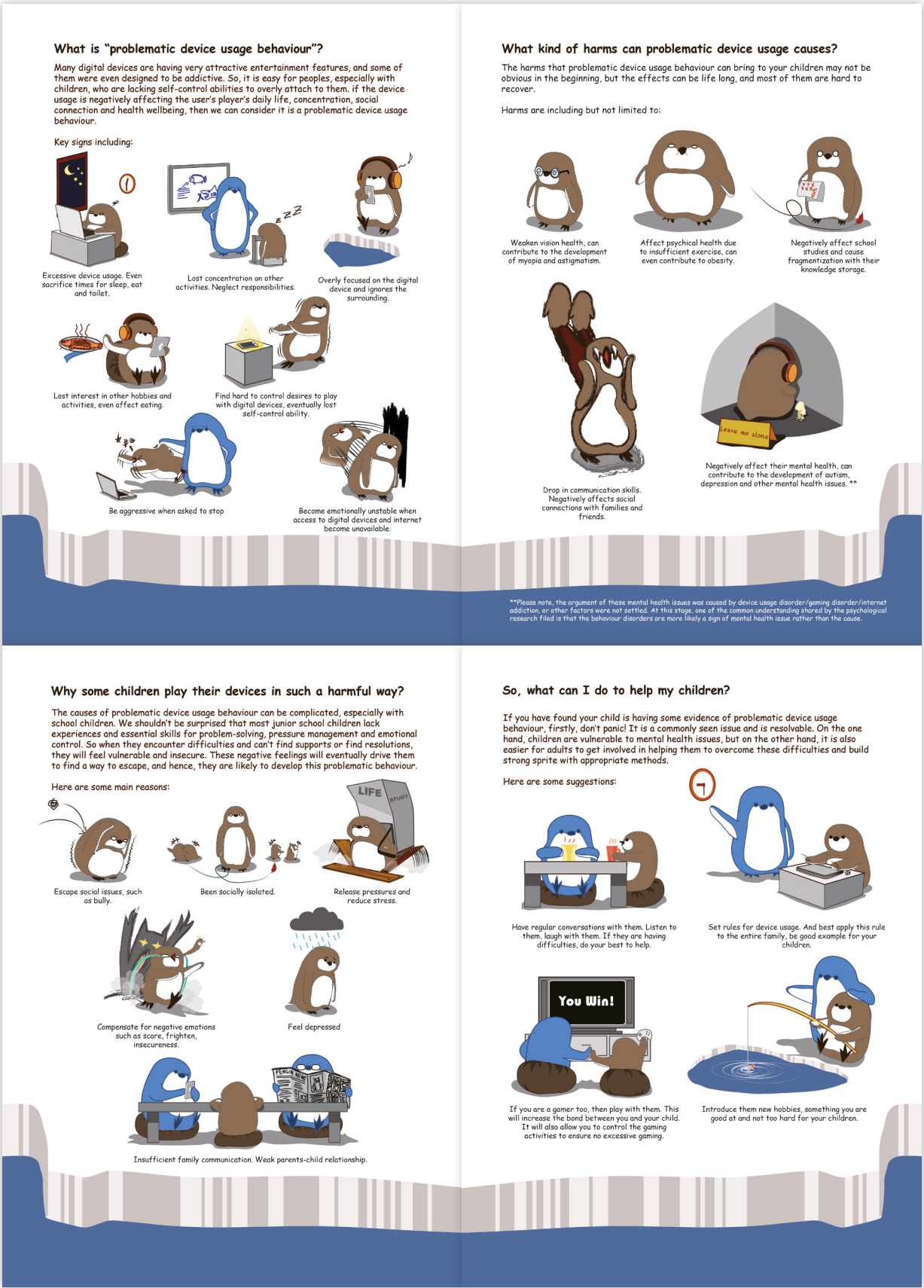


Figure 22.

Booklet Ver 2.0. Although the writing contents of this booklet is almost the same as the previous one (Ver 1.0), but the cartoon blue penguin character has obviously improved the visual attraction. However, on another hand, the information density has also highly increased and is causing information overflow. This indicated for the next iteration, the new design needs to consider the visual information withhold by the penguin characters and reduce the information amount on each page accordingly.

Zhenggang Sun, *Booklet 2.0: 'An Insight of Problematic device usage behaviour'*, 2019, graphic design booklet, AUT, Auckland.



Figure 23.

Interview Question book. Since most of the research regarding PDUB, I have found online is undertaken in foreign countries, which might be different from New Zealand's cultural context. Thus, a research probe that can help me gather information from local school parents and teachers would be necessary for the future phase. Through this booklet design, I also have realised that due to the large volume of visual information provided by the characters themselves, one or two scenes on each page with limited writing might be enough.

Zhenggang Sun, *Research probe: Interview question book*, 2019, graphic design booklet, AUT, Auckland.

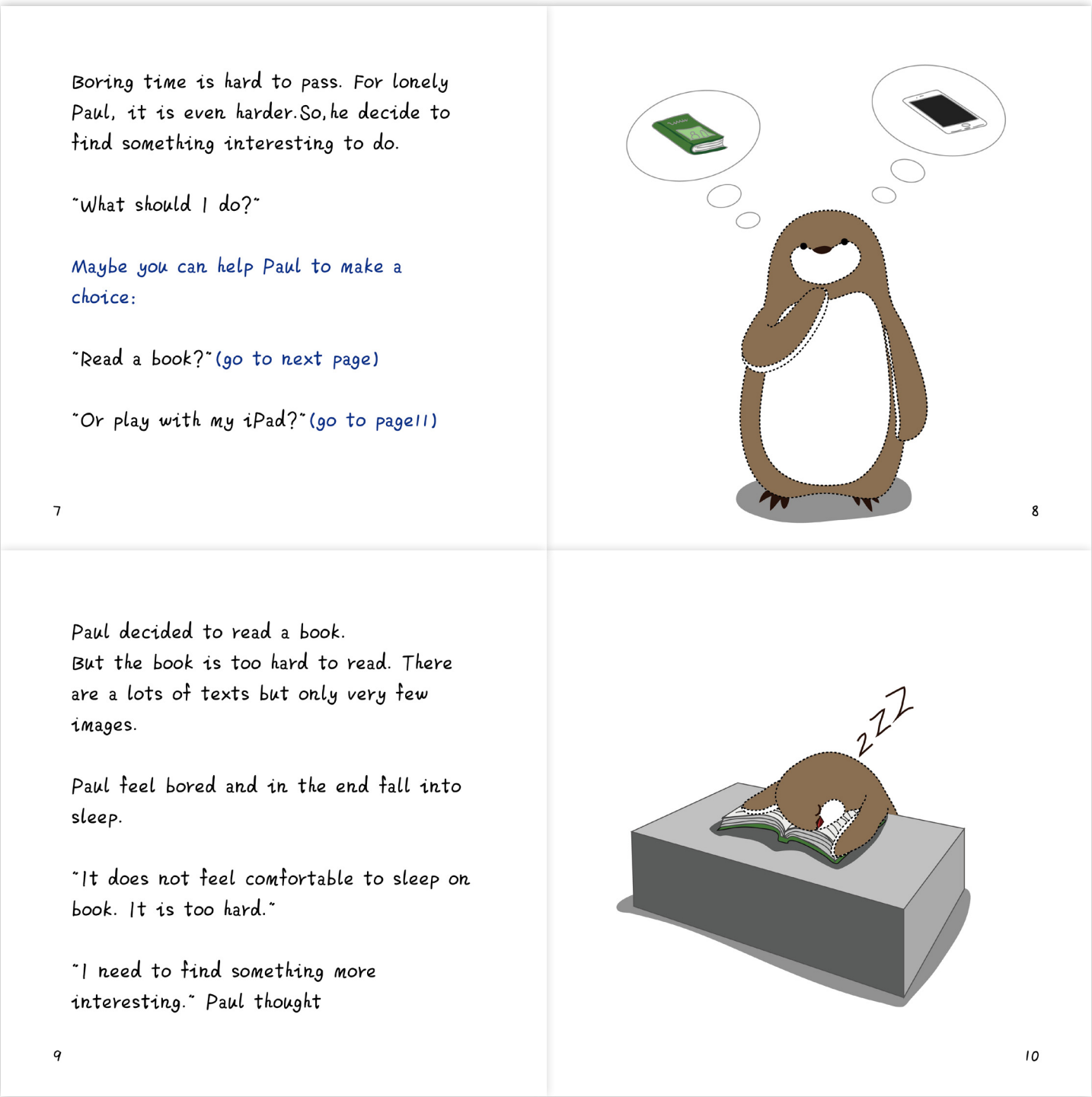


Figure 24. Storybook test. The blue penguin character has got great potential. The adorable appearance makes them a perfect character to communicate directly with children. This storybook was designed for young children to read with their parents together. Some pages in this book would ask the reader to make decisions to direct how the character would act. This way, I would have a chance to help the children and parents to exchange their perspective and increase their understanding with each other.

Zhenggang Sun, *Storybook: Paul, the shy little penguin*, 2019, graphic design booklet, AUT, Auckland.

Development of the booklet and flyer:

To design a booklet and a flyer that could visually represent the concept and test the visual language is the core of this project. The previous booklet design (Figure 19) while visually practising the concept of structuralism, reflected rationalism considerations of communication efficiency and established the new character design that was inspired by the concept of anthropomorphism, but the visual outcomes are far from ideal. Namely the typography and publication design. Jan-Henning Raff's article, 'Theoretical frameworks for the conceptualisation of graphic design in use',⁷¹ has provided me with the concept of applying theoretical frameworks to rationalise design decisions and improved analytical efficiency. In this article, the author has proposed three theoretical frameworks:

- **Distributed Cognition (DCog)**, which stated that people would tend to associate memories with the object of having unique visual appearances. This indicated me that unexpected way of presentations, irregular shapes and forms might help audiences to memorise the information better. QR code as an instant information access method that does not require long-term memorisation provided me with a resolution of how to conserve detailed online information within a limited design space.
- **Activity Theory (AT)**, which suggested the design needs to be associated with an existing activity system from the target user. For my case, this theory helped me realise that the booklet and flyer would serve different activities, which indicated the content, dialogue and emphasis would require different arrangements. The flyer, as the wide-spread and casual communication media, should focus more on the most critical information with simplified language. The booklet, as a more formal media, should provide detailed information and access to more in-depth readings.
- **Actor-network theory (ANT)**, which proposed a challenging question to designers to evaluate their creation: does the design preserve its uniqueness that is unable to be replaced by a worker/actor? For my case, what ensures that the booklet and flyer can't be replaced by a person who has the same level of knowledge? It would be the character acting that is able to convey messages beyond verbal communication. It might also be the quick access to alternative information and services through QR code.

These three frameworks, therefore, indicated design improvements from the conceptual level. Under the theoretical framework of distributed cognition, I have started with the cover of the booklet (Figure 25) and then developed two visual concepts. One has undertaken the recommendation of limiting decorative element ⁷² (Figure 26), and another was aimed to be visually outstanding (Figure 27).

71. Jan-Henning Raff, "Theoretical Frameworks for the Conceptualization of Graphic Design in Use," *Iridescent* 2, no. 2 (1/4/2012). <https://dx.doi.org/10.1080/19235003.2012.11428507>

72. Visocky O'Grady, 77.



Figure 25.

Cover design test. This design iteration was aimed at expressing visual uniqueness and playing with “wit” ideas to attract more attention from potential readers.

Zhenggang Sun, *Booklet cover test*, 2019, graphic design, AUT, Auckland.

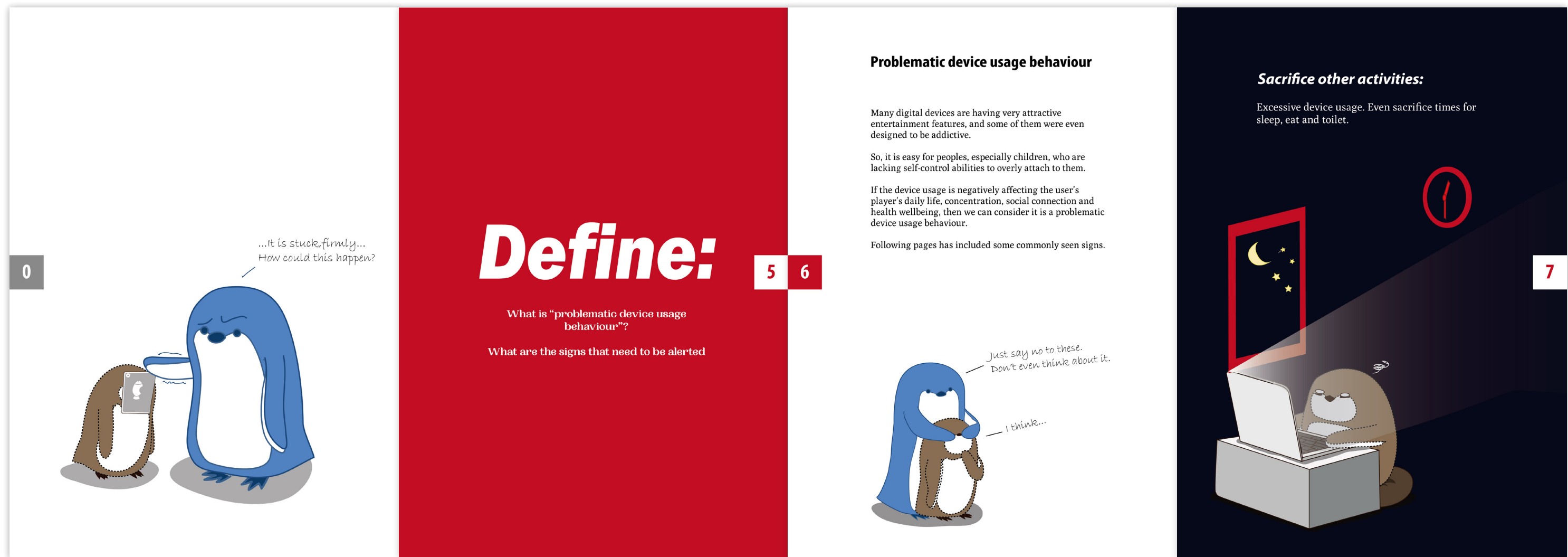


Figure 26.

Design Style test 1. This design was aimed to provide limited information on each page and break long information into short sections to help readers to memorise. It has applied the minimum decorative designs on the page but has assigned a colour to each chapter. As shown in the image, the "Define" chapter has been assigned with red colour, so the page number block has also changed to red to enhance this visual connection.

Zhenggang Sun, *Booklet design concept 1*, 2019, graphic design, AUT, Auckland.

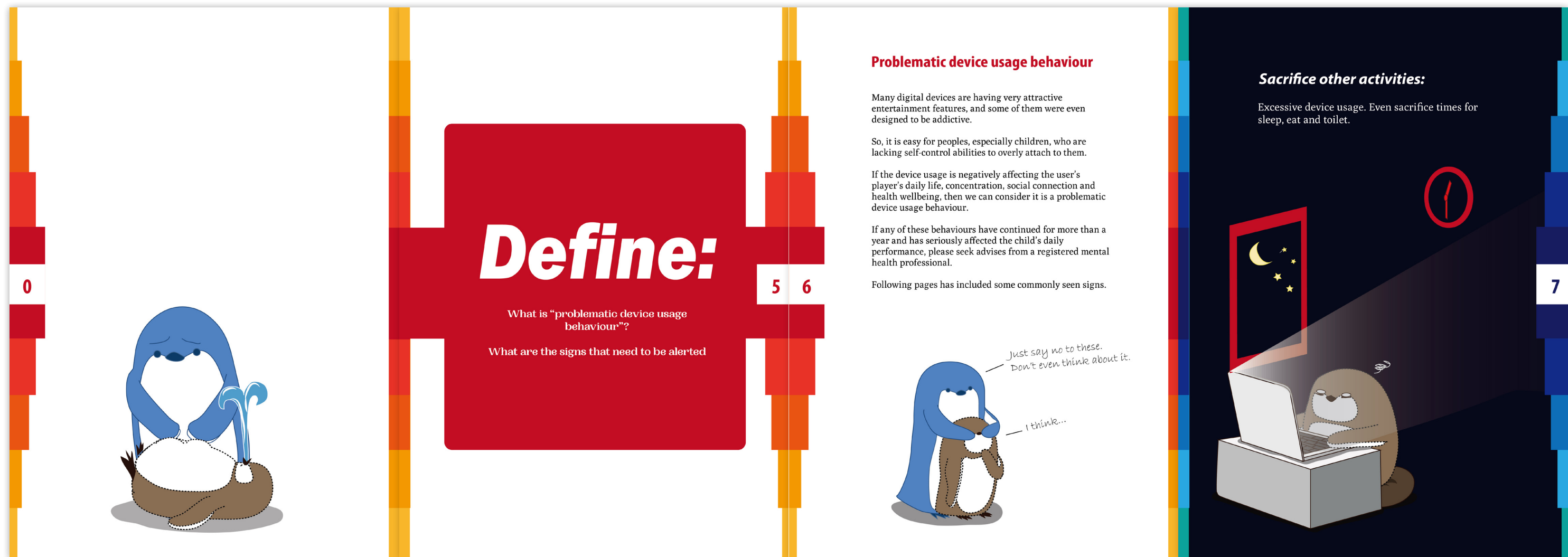


Figure 27.

Design style test 2. This design is more aimed to express the visual uniqueness and tries to attract more attention from readers by using bright colours. Same as the style 1, it has also assigned a colour code to each chapter. Both designs practice with mini-stories to help keep the reader entertained.

Zhenggang Sun, *Booklet design concept 2*, 2019, graphic design, AUT, Auckland.

Inspired by ANT, to unleash the unique potential of the cartoon blue penguin characters, I have included mini-stories to connect each chapter to enhance the narrative feature and help engage the reader's interests. By applying the thinking framework of AT, I have reorganised selection of the essential information and adopted the more outstanding visual concept to the flyer's design. For creating a personalised conversation atmosphere, the flyer's design layout has borrowed design elements from the Facebook messenger app (Figure 28).

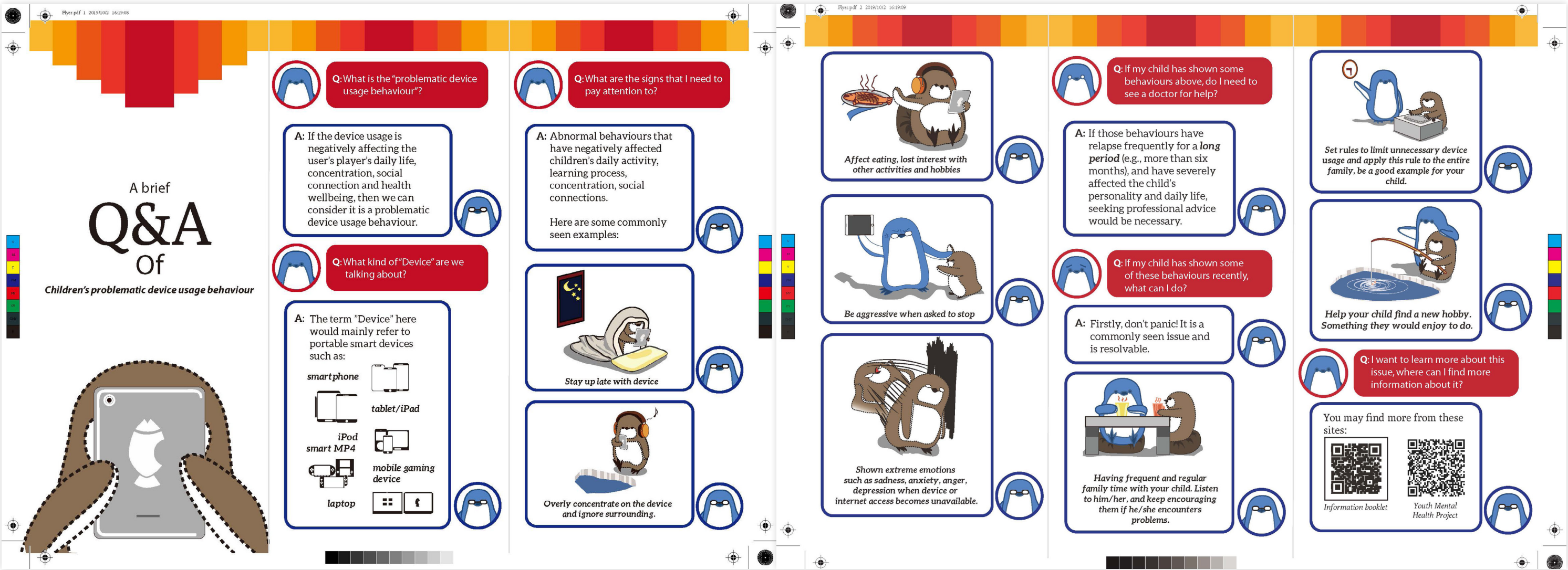


Figure 28.

Flyer 1.0. This design has focused on testing the hierarchies with font and colour. As the doctor character has assigned blue and serif font and parent character has been assigned with sans-serif font and red. However, the contrast was overly done, rather than distinguishing those blocks from each other, they are visually disturbing.

Zhenggang Sun, *Flyer 1.0: 'A brief Q&A of children's problematic device usage behaviour'*, 2019, graphic design flyer, AUT, Auckland.

The visual outcomes of these practices are still not ideal. The bright colour strips did establish a unique visual representation but were overly done and lacked harmony. The sharp contrast generated by different fonts in the flyer is visually disturbing. But this iteration has also proven the effectiveness of applying the three theoretical frameworks to support the design decision making. The design improvement started with colour management. I have used Adobe Colour to generate a new colour palette. To create a bright and colourful visual outcome, I have focused on the triad colour system. Through design iterations (Figure 12), I have tested several colour and layout options. These practices then lead to the third version of the booklet (Figure 29) and a new flyer (Figure 30).

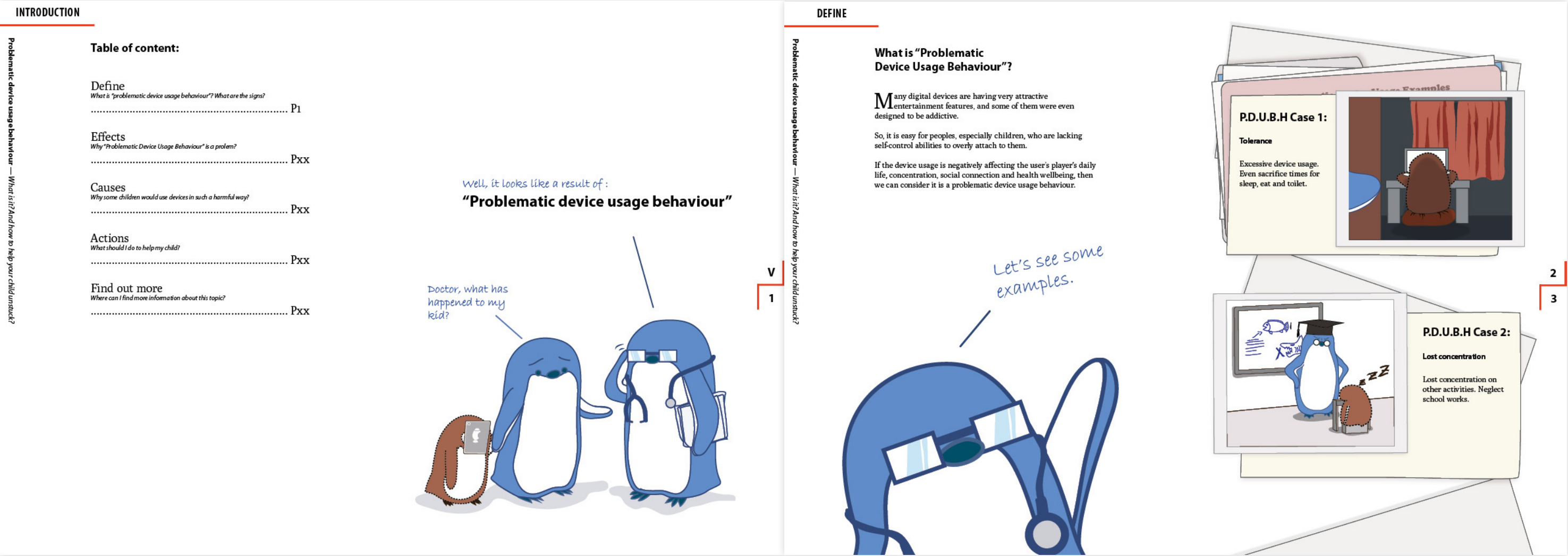


Figure 29.

Booklet Ver 3.0. This design has established the foundation of the following design iterations of the booklet. The main features are including: Inline-story, New hierarchy system on page layout and information density standard: Maximum 2 scenes on each page.

Zhenggang Sun, *Booklet 3.0: 'iStuck'*, 2019, publication design booklet, AUT, Auckland.

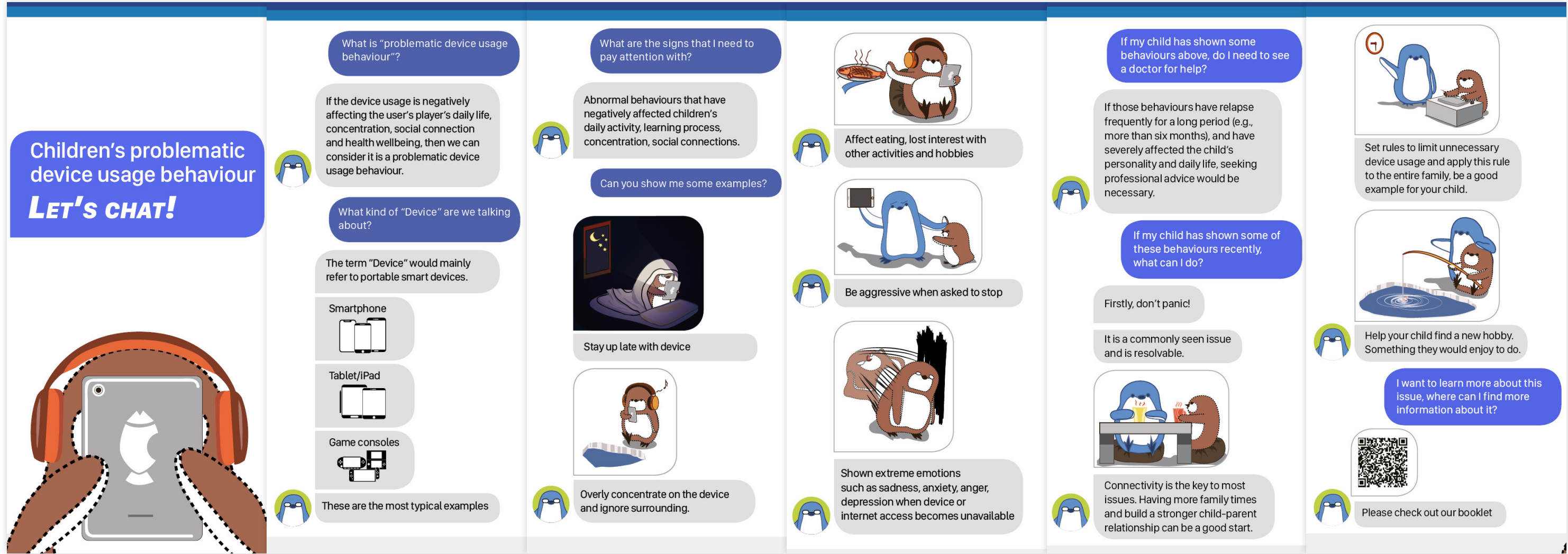


Figure 30.

Flyer Ver 2.0. This design has highly referenced the Facebook Messenger's UI design layout to build the visual connection and aimed to help the reader, young parents to feel familiar with the visual representation.

Zhenggang Sun, *Flyer 2.0: 'Children's problematic device usage behaviour, Let's Chat!'*, 2019, graphic design flyer, AUT, Auckland.

As the strategic concept of structuralism indicated, it is essential to establish a logical order to classify the complex information. Therefore, the design outcome from this project could help the readers to find the connections of the root structure of PDUB. Thus, each page/leaf should also establish a systematic visual order to arrange the information. Through arranging size, position, spaces and testing more fonts, the new design has established hierarchies between image, text and different blocks. The new booklet has designed a story which continued from the front cover until the end, and which aimed to enhance the reading atmosphere by providing a context for the information. It would also provide a logical framework to help readers process the information. The updated flyer aimed to enhance the visual connections of having a personalised chat with a mental specialist. So, the reference of the Facebook messenger interface was highly increased.

In the following design iterations, driven by the aim of enhancing the uniqueness of the character presentation and acting, I have increased the diversity of character identities and created a complete family. By applying special placement to the characters, I have enhanced the message and achieved the goal of using visual language to communicate messages beyond the capability of text and verbal communication (Figure 31). After the fifth iteration, the booklet and the flyer (Figure 32) has then been proofread by Dr Kaye Cederman.⁷³

73. This consultative communication was conducted under the framework of “Exceptions to Activities requiring AUTECH approval (6)” 6.5 and 6.6

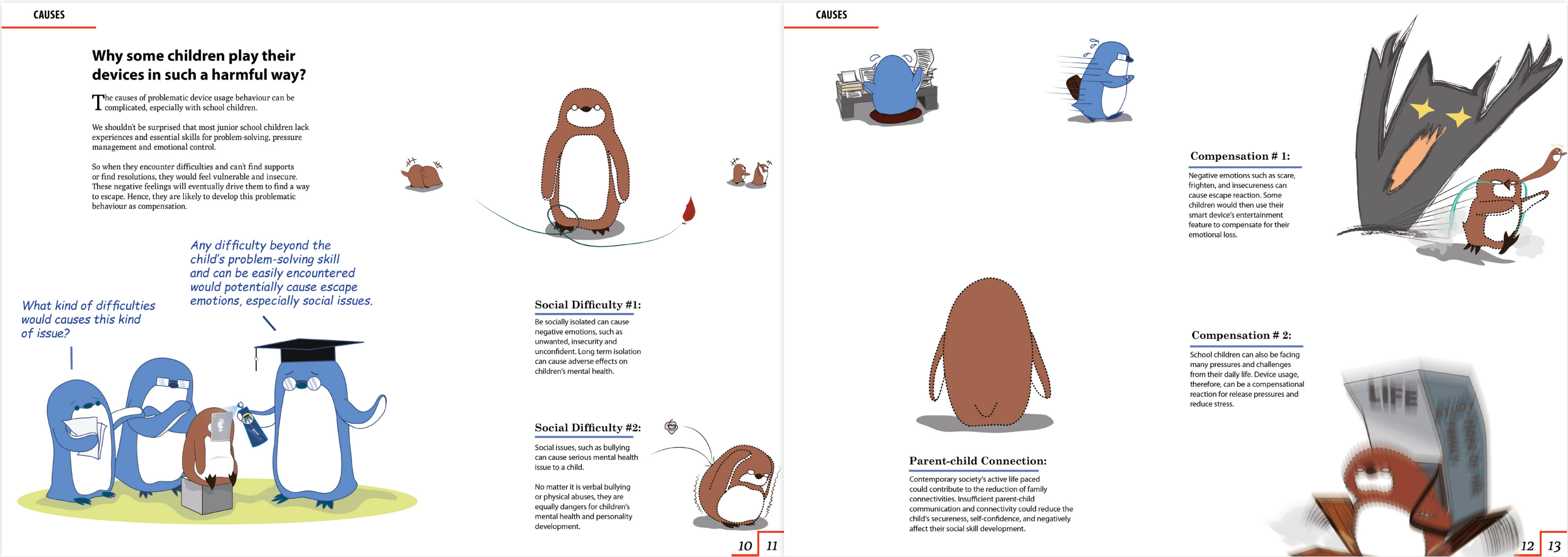


Figure 31. Booklet Ver 4.0. This design has improved the hierarchy system and presented a complete penguin family to increase the visual familiarity with readers. The shown page is focused on explaining the causes of PDUB, so I have applied special image placement to increase the visual presentation of feeling of fear, shock, insecurity and being isolated.

Zhenggang Sun, *Booklet 4.0: 'Support children with problematic device usage behaviour'*, 2019, publication design booklet, AUT, Auckland.



Figure 32.

Flyer Ver 7.0. This design has improved the cover. The adult's question about the children's device usage behaviour would provide a natural connection to the main content which is seeking support from a mental health specialist. The QR code at the end leaf is live now. It will direct the audiences to a Dropbox link to download an interactive PDF version of the booklet (Ver 7_online).

Zhenggang Sun, *Flyer 7.0: 'Why is my child stuck on the iPad all day long? Does it indicate Problematic Device Usage Behaviour?'*, 2019, graphic design flyer, AUT, Auckland.

Results and Findings:

Driven by the strategic concept of structuralism, I combined risk-factors, neutral dialogue, limited humour, positive message and bright tone together to form the basis of the visual language, to help the audiences of Primary School teachers and parents seeing below the surface of children’s PDUB and encourage a better understanding of this complex issue. It has then directed the refinement of the visual presentation through design practices, with the concept of maintaining a balance between the rational focus of communication efficiency and artistic centre of aesthetic uniqueness.

Inspired by the consideration of avoiding stigma that could be caused by using a human character, I have applied the concept of anthropomorphism and developed the illustrated blue penguin character set, which can attract attention, provide expressive acting and call for positive empathy. The three theoretical frameworks of distributive cognition, activity theory and actor-network theory indicated to me alternative perspective and methods to analyse and improve my designs with rational considerations.

This project has helped me establish the two-level concepts system that would be capable of tackling complex task of design for healthy wellbeing. Design has been commonly understood as a discipline of problem-solving. The strategical concept of structuralism, thus, would lead me to discover the root of the issue and establish the connection. On a tactical level, the concept of TCITF would provide a logical order of information arrangement. The three theoretical frameworks of DCog, AT and ANT have provided a resolution of how to maintain the balance between the rational focus of design function and aesthetic uniqueness. The concept of anthropomorphism has shown a great pathway to create designs that would be capable of communicating sensitive messages while being visually unique and attractive.

Conclusion:

Children’s PDUB is a complex issue. As many researchers have suggested, electronic devices are not necessarily the core of this kind of problem. And the first step to resolve this issue would require audiences to acknowledge the complexity and be careful with their judgements. Structuralism concept indicated to me that I need to help my audiences to realise the broader image beneath the surface. TCITF concept helped me identified the possible thresholds for helping audiences to gradually develop their vision to see the border structure behind the scene. To maximise communication efficiency and acceptance, I have developed a visual language that combined risk-factor, neutral dialogue, limited humour, positive language, bright tone, and avoid stigma. Inspired by anthropomorphism, I have developed the illustrated blue penguin character set to communicate the message with the visual language. The three theoretical frameworks suggested by Jan-Herring⁷⁴ helped me rationalise the aesthetic decisions and enabled me to maintain a balance between rational focus and aesthetic considerations to maximum communication efficiency with a unique and harmonious visual outcome.

74. Raff.

This project is the first phase of the entire three-phase campaign project regarding children’s PDUB issues. It has established a foundation of the visual language and the tone of the communication. However, the design outcome from this project is yet to be tested by the target audiences. I also need to find out how to reach audiences with higher efficiency. This should be the focus of future phases.⁷⁵

As suggested in Goriup, Jana and Alexander's article, family and school need to take responsibility for helping youths to recognise their problem and support them to recover.⁷⁶ Thus, primary school teachers and parents would be my target audiences. However, it won’t be easy to reach parents directly. I have obtained a suggestion from the consultative interview with two local primary school teachers.⁷⁷ They suggested that I could firstly reach the school teachers and through teachers then reach parents. In this way, it would increase the authority of the message to parents. In general, most parents would be paying more attention to the information suggested from a school teacher during a face-to-face meeting. In this case, printed forms such as information booklet and flyer would be the preferred form. This suggestion shall be examined during the second phase.

Therefore, at the next stage, I will need to design a research framework that encourages participant involvement and feedback mechanisms. I have been introduced to the concept of using research probes to help participant involvement and enhance the information gather process.^{78 79 80} The teachers and some parents from Sunny Brae Normal School have shown interest to support this project and they can become the participants of the second phase research. How to merge this project into the existing social structure would severely impact on the final outcome. The study from RSA has proposed the concept of “think like a system, act like an entrepreneur”, which suggested to use the entrepreneur mindset to review the project and plan forehead with reality barriers, such as cultural norms, media backlash and regulation restrictions, that will be encountered when this project is ready to facing reality.⁸¹ Thus, it is essential for me to establish a steady communication with potential funders and stakeholders of this project, such as government departments, research institutes and more schools during the second phase. Thus, the content of this project could be fine-tuned to suit the actual needs, and the co-design framework of the third phase could be established.

75. The initial research design of this project has included user-centred research methodology and was planned to use methods such as interview, focus group and survey on evaluating the design outcomes. However, due to the time constraint, the process of obtaining research ethics approval was unsuccessful. Thus, user-centred research has been moved to the second phase of this project.

76. Goriup, and Arnuš.

77. These interviews were conducted under the framework of “Exceptions to Activities requiring AUTEK approval (6)” 6.5 and 6.6

78. Elizabeth B. N. Sanders, and Pieter Jan Stappers, "Probes, Toolkits and Prototypes: Three Approaches to Making in Codesigning," CoDesign 10, no. 1 (2/1/2014). <https://dx.doi.org/10.1080/15710882.2014.888183>

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81. Rowan Conway, Jeff Masters and Jake Thorold From Design Thinking to Systems Change. RSA Action and Research Centre, 2017. https://www.thersa.org/globalassets/pdfs/reports/rsa_from-design-thinking-to-system-change-report.pdf

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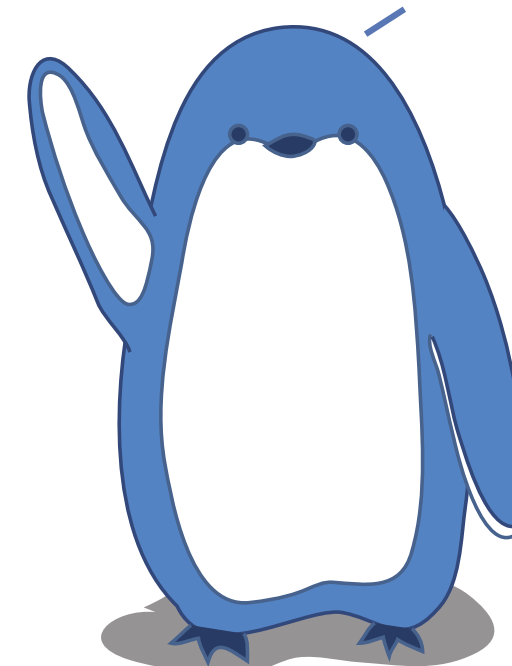
Pablo Delgado, Cristina Vargas, Rakefet Ackerman, and Ladislao Salmerón. "Don't Throw Away Your Printed Books: A Meta-Analysis on the Effects of Reading Media on Reading Comprehension." Educational Research Review 25 (1/11/2018): 23-38. <https://doi.org/10.1016/j.edurev.2018.09.003>

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Thanks for reading this report!
There are more contents
followed in appendices.

Maybe have a quick break from
the screen and take some fresh
air to think about PDUB?

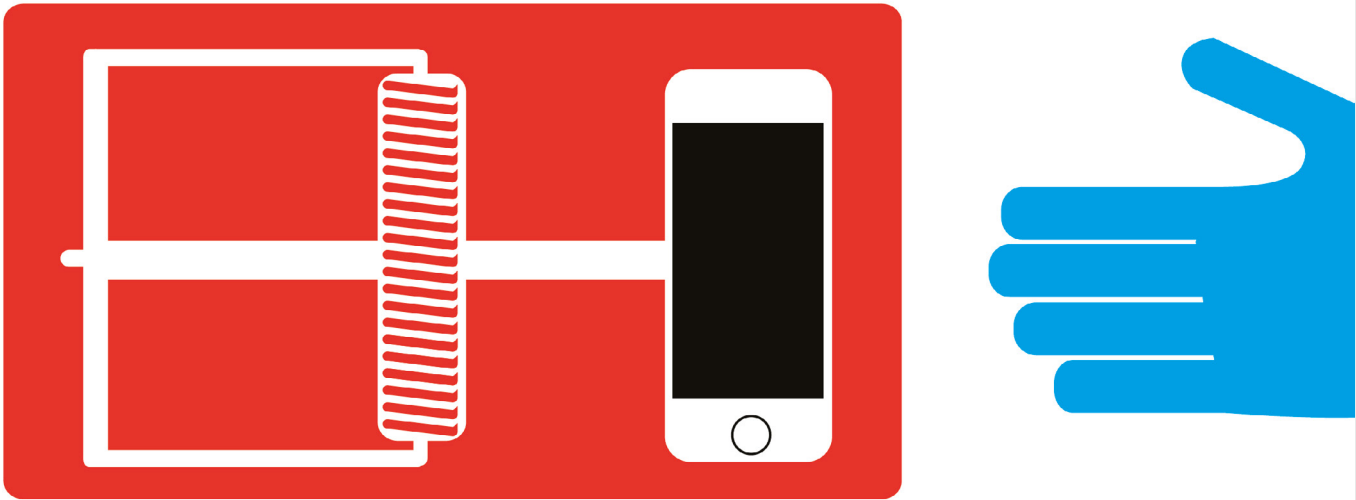


Booklet Version 1.0

This booklet has applied visual language to increase audience awareness of risk-factors with neutral dialogue. The simple visual form and the short, neutral message is aimed to help readers to build an overview of the issue of PDUB with higher efficiency. The visual format is limited to two colours: blue representing neutral and harmless; red representing harm and danger.

The red Pied Piper character in this booklet is supposed to represent “addiction” visually. This aimed to help the reader to build an impression of the causes of the addiction would more likely be external factors rather than from the child internally. The last scene of the defeated Pied Piper aims to visually encourage readers by showing them that the issue of PDUB is resolvable.

An Insight into Problematic gaming:
What is it, and how to help your children stay away from it?





What is Problematic Gaming?

Gaming behaviours that negatively affect the player's daily life, concentration, social connection and even health status.
Key signs including:



Excessive gaming, even sacrifice times for sleep, eat and toilet



Keep thinks games even when not playing.



Neglect responsibilities for gaming.



Overly focused on gaming and ignores surroundings.

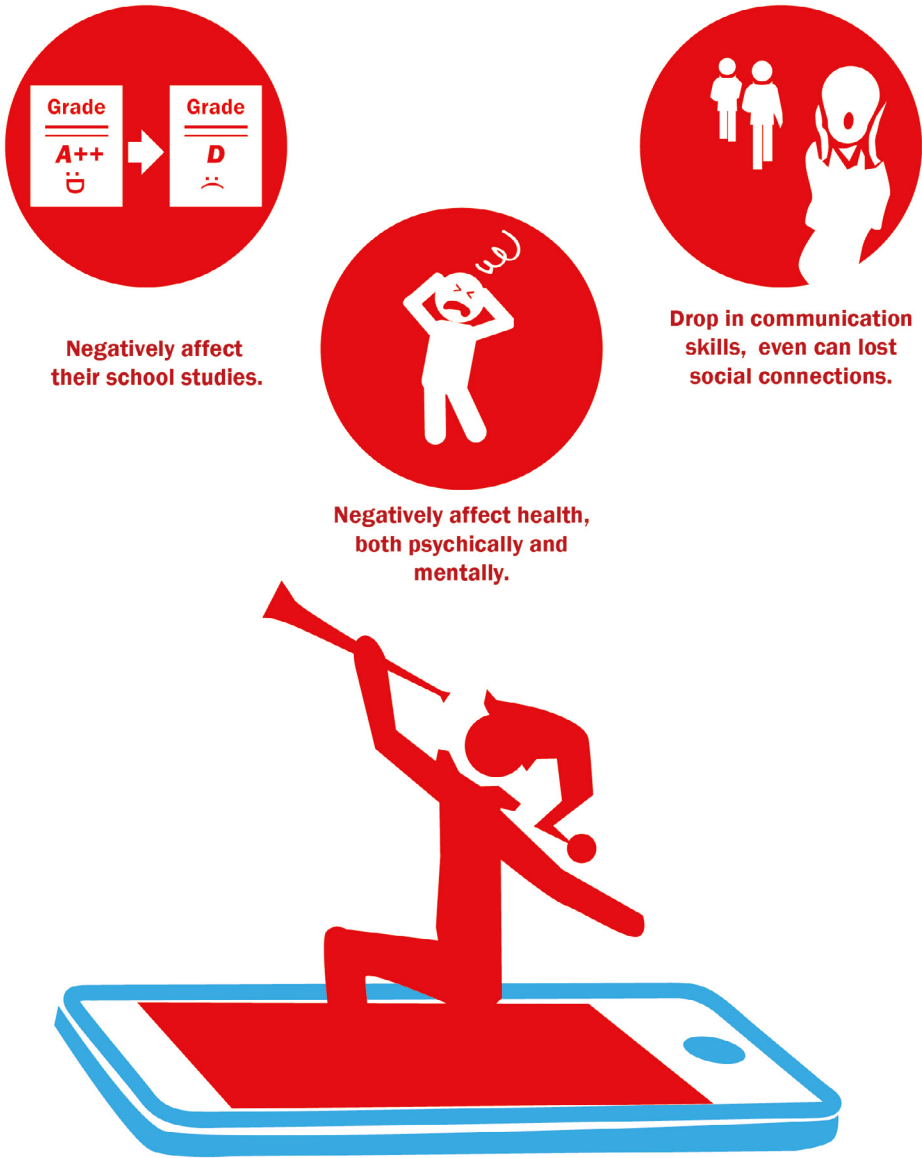


Lost interest with other hobbies.



Be aggressive when asked to stop.

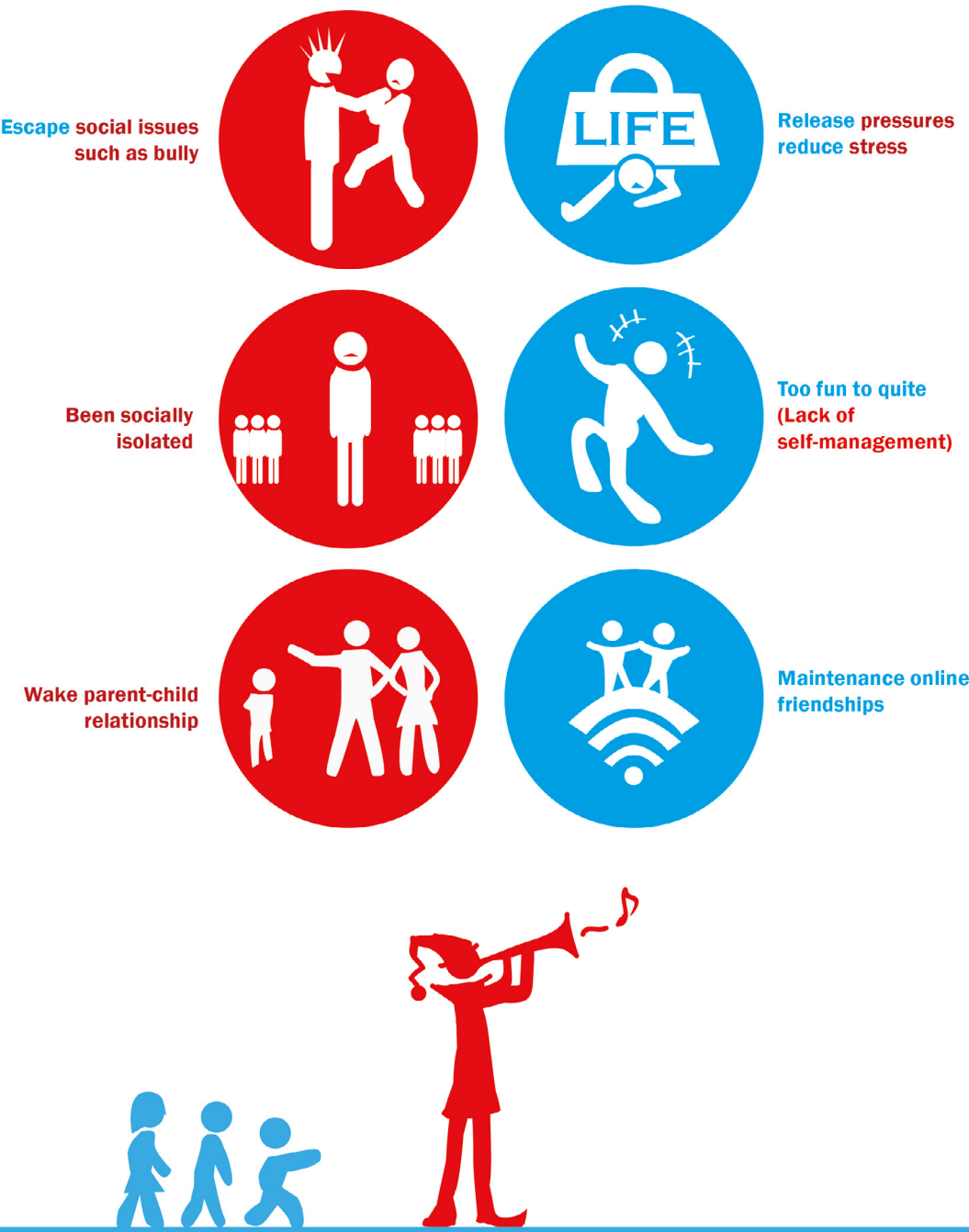
What kind of *harms* can *problematic gaming* bring to your children?



For some worst cases, fall into the hands of addiction.

Why some children play games in such a *harmful way*?

The causes of *problematic gaming* can be complicated, and here are some main reasons from school children:



So, what can I do to help my children?

If you found your child is having problematic gaming behaviours, firstly, don't panic. It is a commonly found issue and is resolvable. Here are some suggestions:



If you are a gamer too, then play with them. This will increase the bond between you and your child. It will also allow you to control the gaming activities to ensure no excessive gaming.



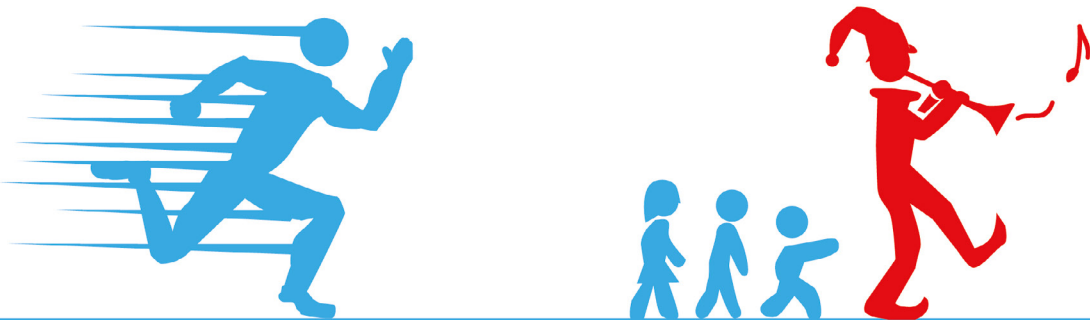
Have more positive conversations with them. Listen to them, laugh with them. If they are having difficulties, do your best to help.



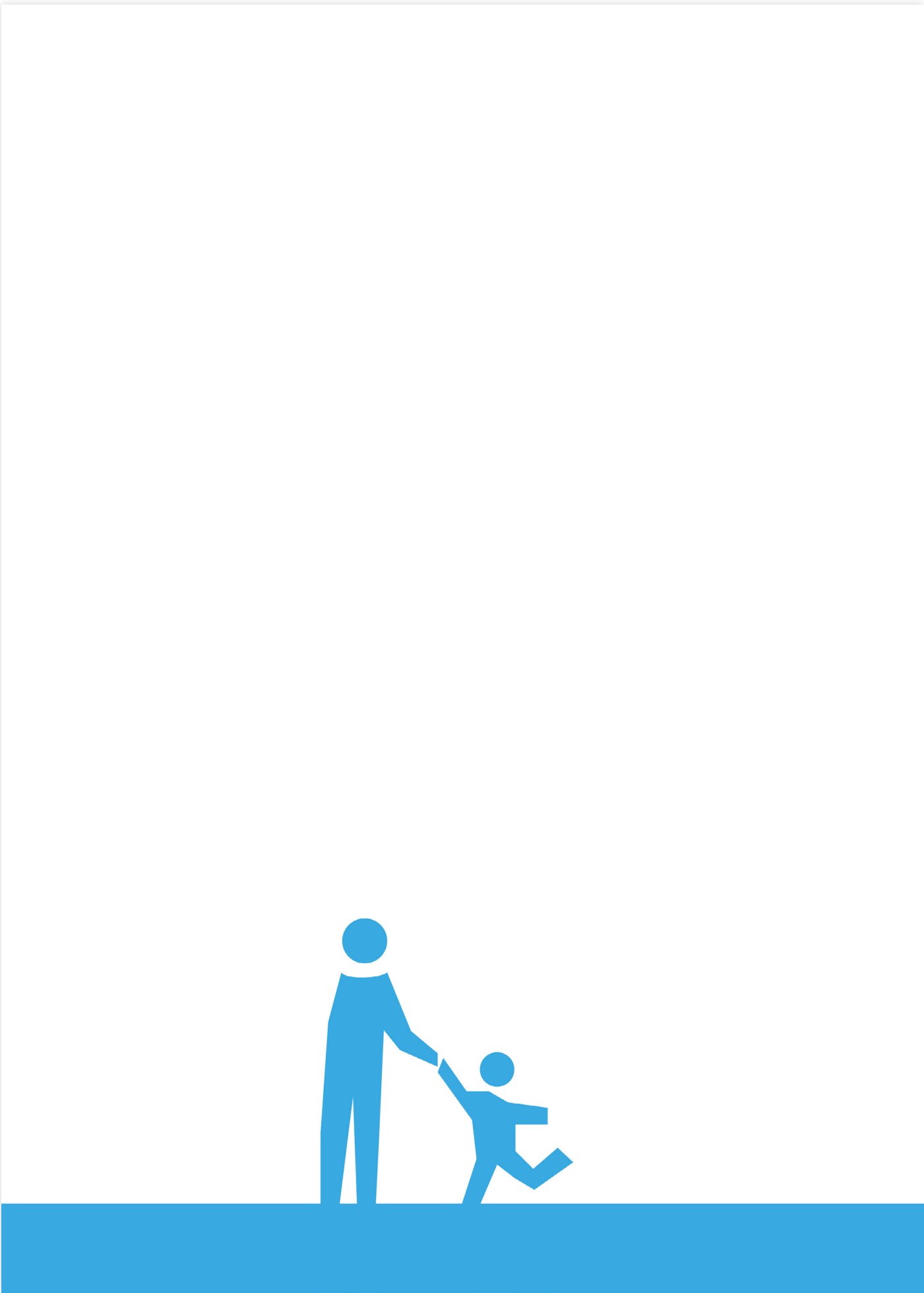
Set rules for gaming, Makes the gaming time as a reward for good efforts, such as higher grade, house works, community works.



Introduce them new hobbies, something you are good at and not too hard for your children.



Be a hero of your children
help them to overcome difficulties

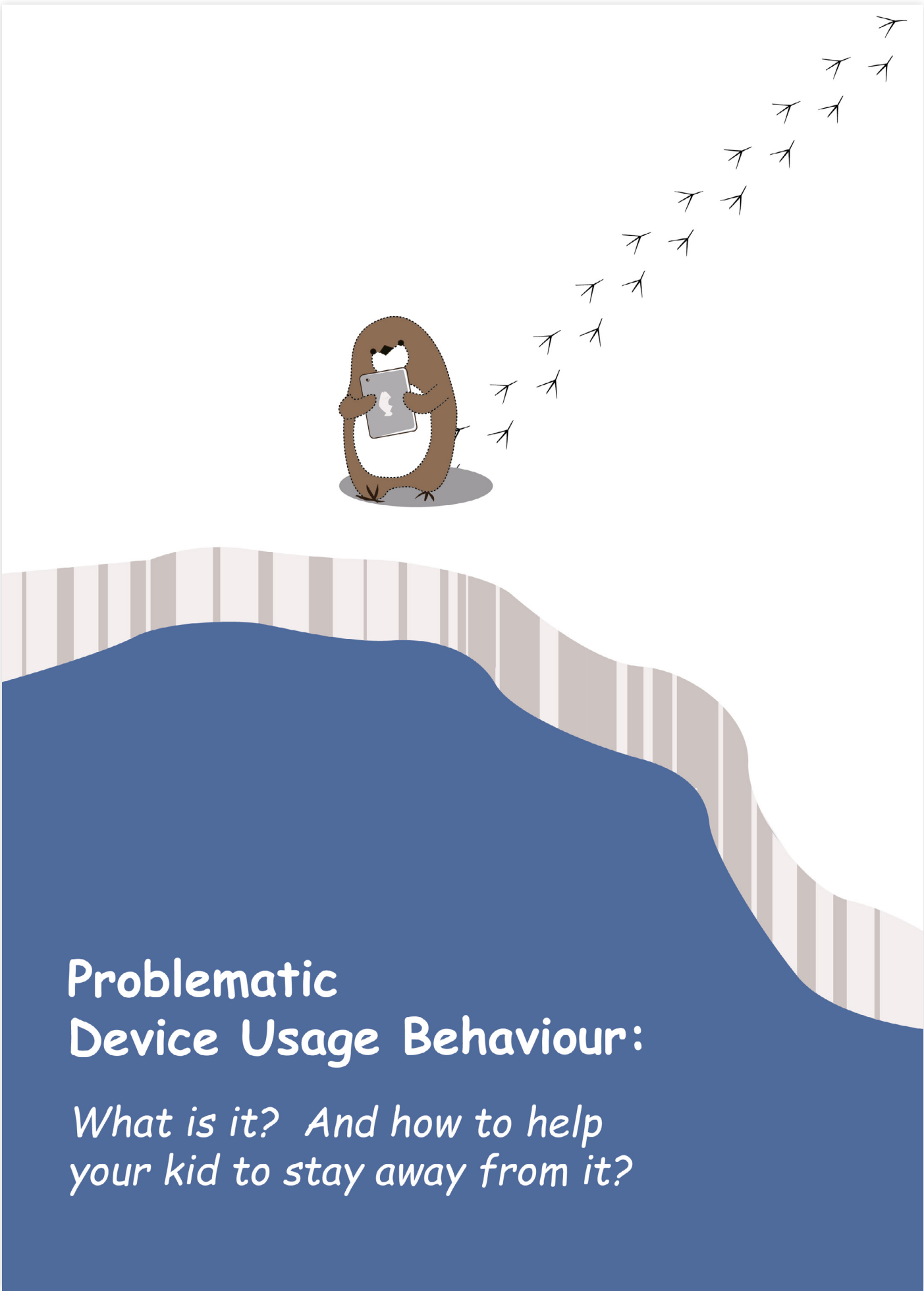


Booklet Version 2.0

This booklet aimed to test the newly designed illustrated cartoon blue penguin character. The visual enhancement brought by the new character is obvious. With the human-like body shape and expressions, this new character design allowed me to visually express emotion, feeling and behaviours with more freedom.

It has carried most of the written contents with few changes and enhancements from the previous design. I have also added more information, namely the introduction and the simple model of the difficulty-escape cycle. The introduction aims to provide readers with an overview of the important contexts of this booklet. The simple model of difficulty-escape cycle was inspired by the structuralism concept, which aimed to present the broader picture of PDUB with a simple visual presentation.

However, with the new character and more written content, the information density of this booklet has significantly increased, which caused information overflow. This indicated that for the next iteration, the new design needs to consider the visual information provided by the penguin characters and reduce the information amount on each page accordingly.

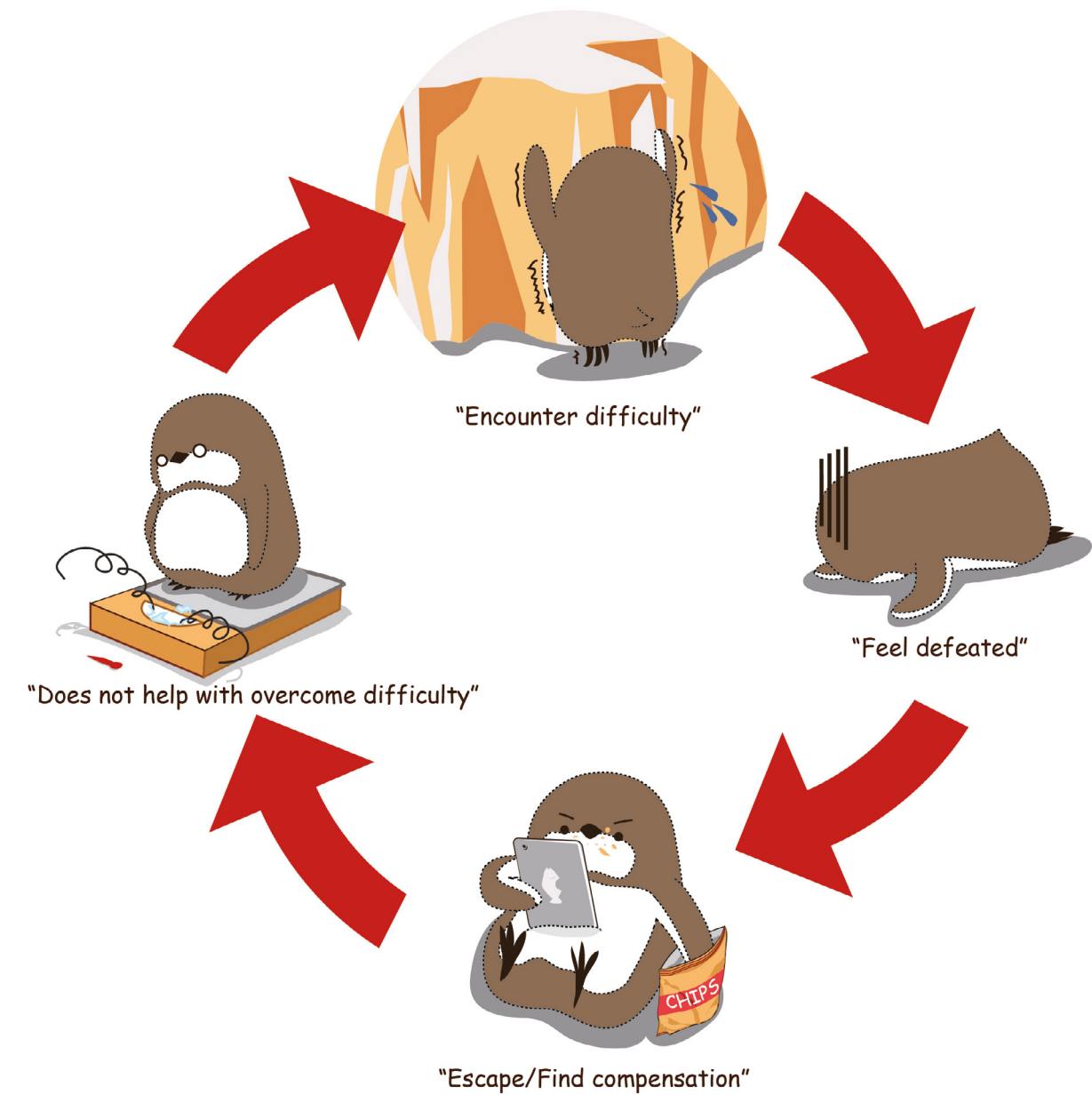


A prologue:

Many of us may already hear terms such as "Gaming Disorder", "Internet Disorder", "Internet Gaming Addiction", "Smart Device Dependence" and even more. These names are all very different, and they are refereeing various issues in practice. However, fundamentally, they are all sharing a similar root: A problematic digital device usage behaviour which can potentially cause harms to the victim's health and wellbeing, both psychically and mentally.*

The World Health Organization has included "Gaming Disorder" into the 11th revision of the International Classification of Diseases (ICD-11) which stated "Gaming Disorder" is a classified mental disease and shall be altered by the public. However, as the name sated, this classification is only dealing with the problematic gaming behaviours. Activities which shares similar causes and harms such as internet addiction and smart device dependence still stay in the grey zone. However, as many studies across global have suggested, no matter it is gaming, internet browsing, or social media chatting, if the victim has lost control on his/her behaviours and develop a strong dependency on these activities, they are equally harmful. So for this booklet, the term "Problematic Device Usage Behaviour" will be applied for most of the contents.

The behavioural disorder has always been a hard topic for psychologists, especially with daily behaviours such as computing or browsing internets. How to determinate the normal and abnormal from these behaviours is a critical task for the researchers in the field. This booklet will some provide generalised knowledge for reference. However, suggestions and recommendations from this booklet can't be treated as professional advice. If you do have concerns with your child, please contact mental health specialists for help.



This graph is a simplified model of how a child might develop problematic device usage behaviour. It is like a vortex, the more loops it goes, the harder it is for the victim to get out from it.

*World Health Organization, Public Health Implications of Excessive Use of the Internet, Computers, Smartphones and Similar Electronic Devices: Meeting Report, Main Meeting Hall, Foundation for Promotion of Cancer Research, National Cancer Research Centre, Tokyo, World Health Organization, 2015. <http://www.who.int/iris/handle/10665/184264>.

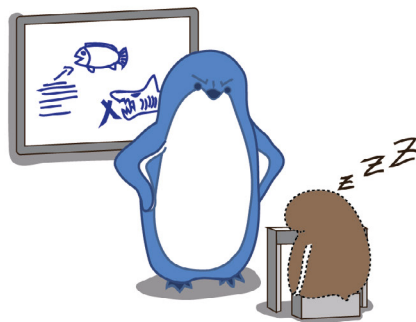
What is "problematic device usage behaviour"?

Many digital devices are having very attractive entertainment features, and some of them were even designed to be addictive. So, it is easy for peoples, especially with children, who are lacking self-control abilities to overly attach to them. if the device usage is negatively affecting the user's player's daily life, concentration, social connection and health wellbeing, then we can consider it is a problematic device usage behaviour.

Key signs including:



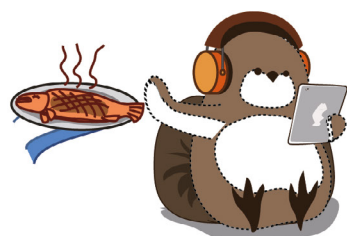
Excessive device usage. Even sacrifice times for sleep, eat and toilet.



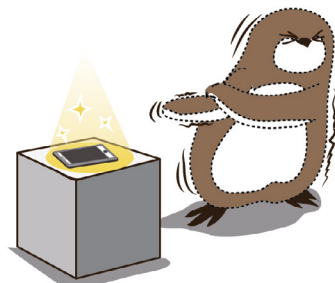
Lost concentration on other activities. Neglect responsibilities.



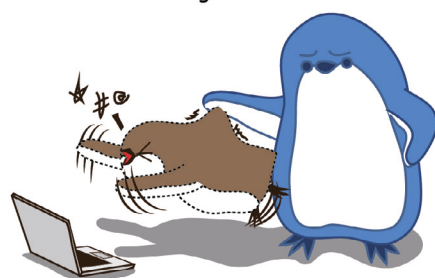
Overly focused on the digital device and ignores the surrounding.



Lost interest in other hobbies and activities, even affect eating.



Find hard to control desires to play with digital devices, eventually lost self-control ability.



Be aggressive when asked to stop



Become emotionally unstable when access to digital devices and internet become unavailable.

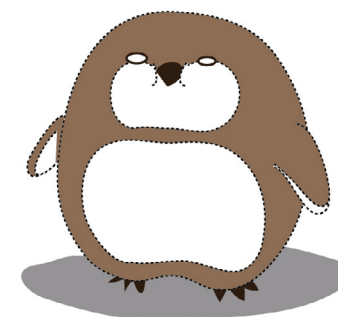
What kind of harms can problematic device usage causes?

The harms that problematic device usage behaviour can bring to your children may not be obvious in the beginning, but the effects can be life long, and most of them are hard to recover.

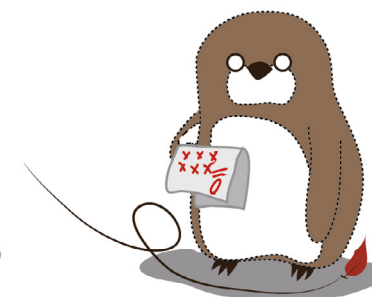
Harms are including but not limited to:



Weaken vision health, can contribute to the development of myopia and astigmatism.



Affect psychological health due to insufficient exercise, can even contribute to obesity.



Negatively affect school studies and cause fragmentation with their knowledge storage.



Drop in communication skills. Negatively affects social connections with families and friends.



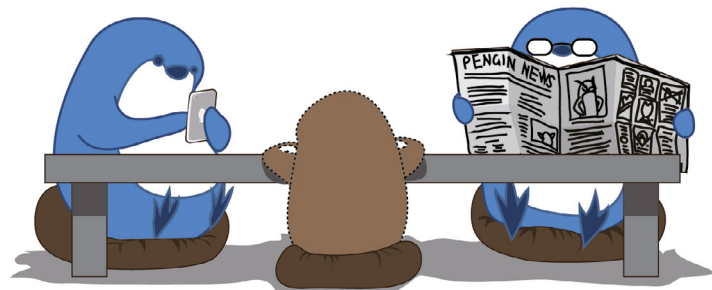
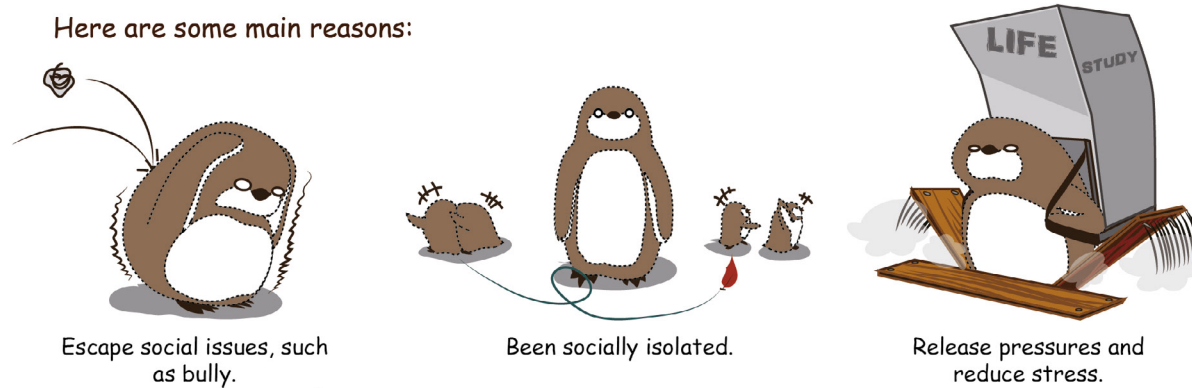
Negatively affect their mental health, can contribute to the development of autism, depression and other mental health issues. **

**Please note, the argument of these mental health issues was caused by device usage disorder/gaming disorder/internet addiction, or other factors were not settled. At this stage, one of the common understanding shared by the psychological research filed is that the behaviour disorders are more likely a sign of mental health issue rather than the cause.

Why some children play their devices in such a harmful way?

The causes of problematic device usage behaviour can be complicated, especially with school children. We shouldn't be surprised that most junior school children lack experiences and essential skills for problem-solving, pressure management and emotional control. So when they encounter difficulties and can't find supports or find resolutions, they will feel vulnerable and insecure. These negative feelings will eventually drive them to find a way to escape, and hence, they are likely to develop this problematic behaviour.

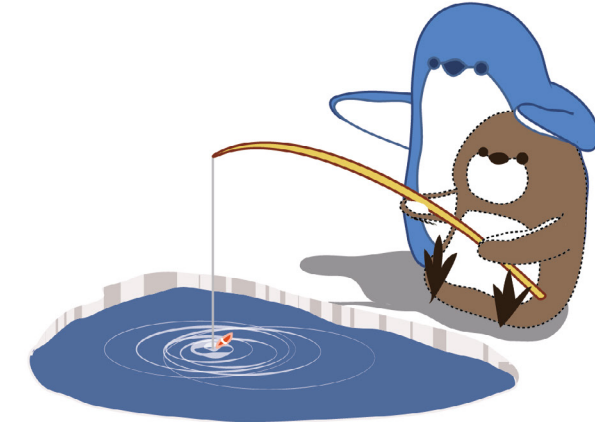
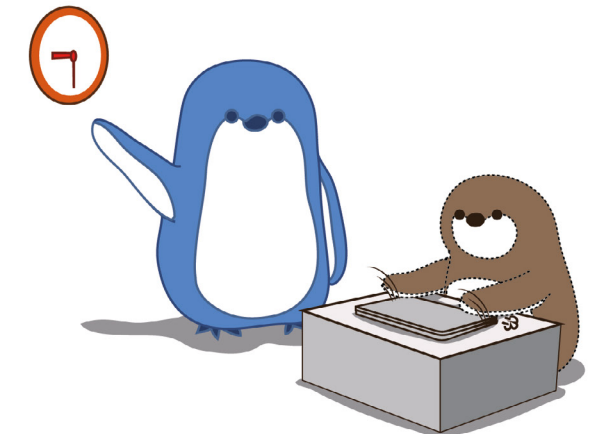
Here are some main reasons:

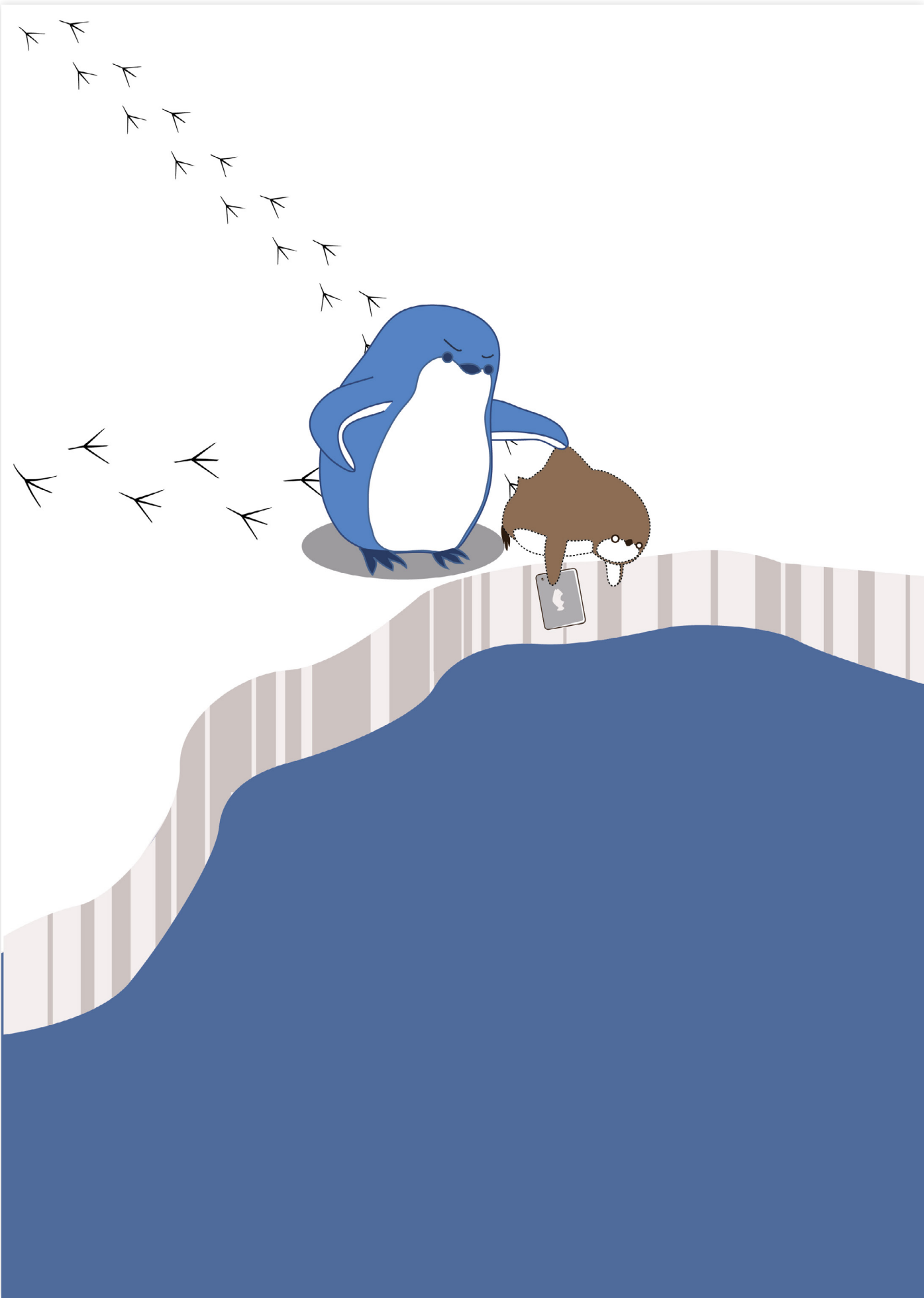


So, what can I do to help my children?

If you have found your child is having some evidence of problematic device usage behaviour, firstly, don't panic! It is a commonly seen issue and is resolvable. On the one hand, children are vulnerable to mental health issues, but on the other hand, it is also easier for adults to get involved in helping them to overcome these difficulties and build strong spirit with appropriate methods.

Here are some suggestions:





Case Studies

Since I have not previously done any book/publication design, several of case studies would, therefore, help me to construct a foundational understanding of the requirements and principles to apply. The following criteria have been applied during case selection:

- Educational books, such as skill training, popular sciences, and history.
- Books that are suitable for both adults and children to read.
- The contents need to be visually focused or at least having a good balance between image and text content.
- Target reader: primary school children and their parents.

Each case will be judged according to Visocky O'Grady's **‘The Information Design Handbook’**.⁸² I will mainly look at:

- The information density on each page: Is the page is overloaded with information? Does each page have enough negative space for the reader's eye to rest?
- The balance between image and texts: Does this book having enough images to adequately illustrate the text? Does this book have enough text to explain the core information?
- Information hierarchy: Can the reader easily find the most important message on each page without being confused with sub-information?
- Information flows: How easy is it for readers to read through the information on each page without jumping back and forward?
- Consistency: Does this book apply a consistent layout design? Does each page use the same grid system?

Photographs for each case were taken on my mobile phone's camera (Huawei Mate 8). Permission for photo shooting was gained through verbal communication with the bookstore shopkeeper.

82. Visocky O'Grady.

Case 1: Bright Ideas for Young Minds: 70 Step-By-Step Activities to Do at Home with Your Child⁸³

First impression:

This book was printed in full colour. Under the hardcover, the main contents were printed on heavy semigloss paper. The overall build quality of this book feels premium, although it is also quite heavy to hold with a single hand. The print quality of this book is above average. The colour of this book feels rich and natural. The semigloss finish also means this book can be read comfortably under most lighting conditions. The size of this book is larger than SR-A4 but smaller than A3, which means that parents and children can easily read this book together, as it was designed.

83. Educare, Best Start. Bright Ideas for Young Minds: 70 Step-by Step Activities to Do at Home with Your Child: Mary Egan Publishing, 2017.

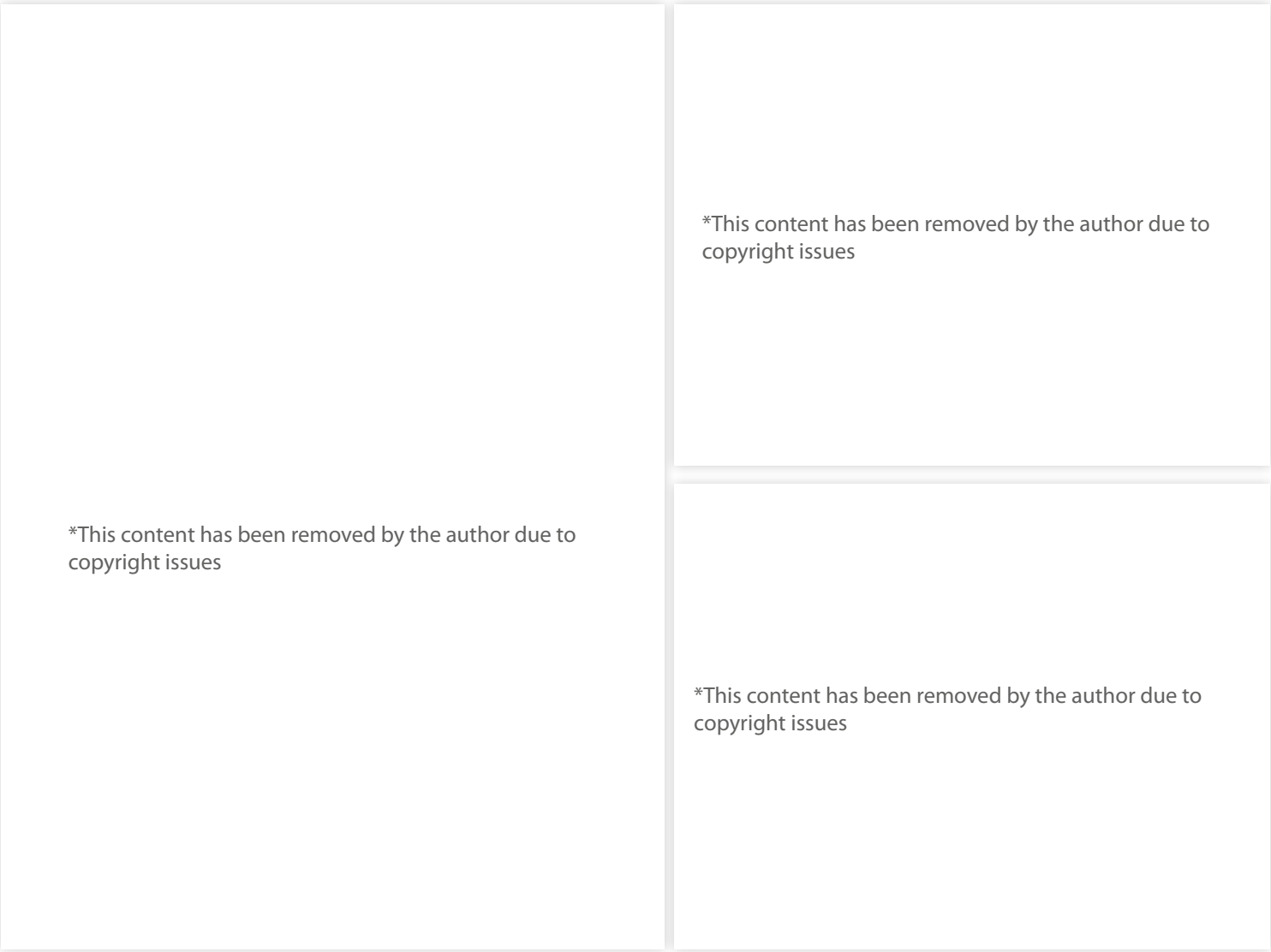


Figure 33.

Zhenggang Sun, *Case study photo references: 'Bright Ideas for Young Minds: 70 Step-By-Step Activities to Do at Home with Your Child'* , 2019, photo of book, Paper Plus, Blenheim.

1, Information density on each page: Moderate

The first impression of this book is that it seems to contain a large amount of text information, especially in the introduction section. However, since the text are printed in large font, it isn't hard for readers to navigate through. Each line is limited to 8~10 words, which makes it easy to read. The designers of this book have provided enough negative spaces between each block, which enhanced the readability and visual outcome of tidiness. After the introduction, each spread focuses on introducing only one activity and is illustrated with photo images. This arrangement enabled the readers to find the contents faster when they are skimming the book. Each page of this book would take me 2~4 minutes to read, and I didn't find it difficult to follow the content.

2, Balance between images and texts: Good

This book has applied a common layout style, which separates the text and image on different pages. Most of the left-hand pages in this book were dominated by text content and the right hand pages are for pictures. Since most of the pictures in this book were mainly designed to provide readers with impressions of introduced activities, the large print photos that use the entire page did enhance this design aim and maintained a good balance with the text dominated page. Since each spread of this book only focused on one activity, the large print photos can also be a break between pages. This can be helpful for readers to plan their reading.

3, Hierarchy: Clear

This book can be seen as an excellent example of how the content hierarchy should be arranged. While the text and images stay in separated groups and are organised with a good balance, the hierarchy within the text contents is also prominent. All headers have used a sans-serif typeface, and the body text has used a serif typeface. Visual features such as bullet points, dotted lines, bold type and darker background colours were applied to differentiate the blocks. The apparent weight difference between texts also makes a noticeable contrast. Readers can quickly find the most representative information on each page. Together with the large images, the reader can quickly understand what each page would introduce.

4, Information Flows: Good

The layout design of this book is easy for readers to follow. All information in this book was arranged with the order of top-to-bottom and left-to-right, which conforms to most English reader's reading habit. With a precise hierarchy arrangement, readers can easily find essential information. Different blocks have been separated with enough negative space, which also enhances the readability.

5, Consistency: Good

This book does have a highly consistent design layout. Other than the introduction section, it is obvious that the main contents of this book were designed under the same grade system with the same visual language.

Conclusion:

Somehow, this book can be seen as a textbook example of how a robust educational publication design should be presented. It has achieved almost all criteria mention in Visocky's book. However, as Newark has stated in his book ‘**What is graphic design?**’,⁸⁴ a designer not only needs to make sense but also need to be different enough from others. With clean and professional design, this book is undoubtedly capable of delivering information to readers. But on the other hand, it lacks unique features to be outstanding, in my opinion.

For me, this book has shown me a good example and provided me with some great guidelines on how to apply the design theories in practice. However, it has also presented me with a challenge: how to go beyond "good"?

84. Newark, 14.

Case 2: Timeline: A Visual History of Our World⁸⁵

First impression:

This hardcover book has come with a semigloss finish. Each page is printed with full colour. The build quality feels premium. The paper is heavy and not easy to leave finger marks. Since this book does not have too many pages, so it is relatively light and can be held comfortably in a single hand.

85. Goes, P. Timeline: A Visual History of Our World: Gecko Press, 2016.

*This content has been removed by the author due to copyright issues

*This content has been removed by the author due to copyright issues

Figure 34.
Zhenggang Sun, *Case study photo references: 'Timeline: A Visual History of Our World', 2019, photo of book, Paper Plus, Blenheim.*

1, Information density on each page: High

This book is very different from other books in this case study. Rather than consider it as an educational book, it is more on the artbook side. Featured with the full-spread illustration that represents the artist's interpretation of the critical moments of earth's history. Each page of this book does contain a large amount of information. The highly detailed image will require a relatively long time to read. Within those lively illustrations, the brush-stroke-like captions have perfectly blended into the drawings. However, although the information density in this book is relatively high, since it is pictures dominated, the reader doesn't have to go through every single detail to construct a good understanding of this book. From my experience, a quick skim through the book within 2 minutes can already provide me with a good impression of what this book is all about. I don't have to read any text since most of the imagery is already self-explanatory. On another hand, there are also many details on each page, which encourages the reader to spend a longer time to read and enjoy.

2, Balance between images and texts: Poor

This book can be seen as a typical example of what an image-driven publication would look. Although there are, in fact, many text messages "hidden" on each page. While each left-page would have one paragraph of body text with the title and separated from the illustration, more text messages are blended into the image and not easy to find. The body texts were designed to stay in low-profile so as not to conflict with the image. However, with a thin and lightweight font, these body texts can be easily ignored, which may not be ideal for information delivery.

The captions are very close to the image elements they are describing, which makes it easy for the reader to find the reference. However, since most of these captions were designed with a thin and small typeface, and the positioning with the image were not consistent (some captions on the bottom, some on the side, some on the top), so they are not visible and not easy to read. From what I can see, the book designer's intention was not to make a balance between text and image. Enjoy the illustration, only read when you have to. That might be the design aim of this book.

3, Hierarchy: Strong

This book is designed for readers who more enjoy viewing images. While most books use images to address the text, this book does the opposite. Images in this book are in the absolutely dominant position. Text contents, while not the main character in this book, also shown a good level of hierarchy. The spaces between the title of the page and the body text are enough to contrast. While both titles and body texts use serif typeface, the captions in the images have used a sans-serif typeface, which makes them easier to read in a relatively busy context. Image hierarchies are also apparent. By using scale, colour contrast, negative spaces and density of the background, the readers can easily find focus spots on each page without breaking the "flowing" visual outcome.

4, Information Flows: Great/Moderate

As the book title describes, this book is designed to represent a timeline, which flows from the past to the contemporary. The illustrations in this book look like a river flowing from left to the right. Contents are like the boats floating on the river. If the reader only considers the images in this book, this book can be regarded as a great example of information flow. However, when taking into account the text contents in this book, the experience of information flow would suffer. Especially with the captions, due to the placement design, some captions and images will require readers to read back and forward several times to understand. From this perspective, the text content in this book has been sacrificed for aesthetic priorities.

5, Consistency: Good

This book can be seen as an artwork as a whole. The same art style has continued from the cover until the index. Typefaces are consistent through the entire book. The captions, however, are not consistent. But since these captions were designed to blend into the images, so the visual representation does not break the design consistency.

Conclusion:

This book might be an excellent example of how an artist would design a publication. It doesn't follow all design rules but results in a beautifully done and unforgettable masterpiece from my perspective. When comparing with other books in these case studies, this book is undoubtedly the most outstanding and most attractive one.

However, as a racing car won't be suitable for supermarket shopping, this book's design style doesn't suit my project. This style is excellent for a brief introduction but may not be ideal for communicating highly complicated information that needs to provide readers with more detail in-depth. The heavily stylish illustration does highly enhance the overall aesthetic of this book, but at the same time makes me feel the information is subjective. Overall, this book has profoundly improved my understanding of publication design. It has also indicated the design rules can be compromised for aesthetics and other design aims.

Case 3: The Silk Roads: A New History of the World⁸⁶

First impression:

This hardcover full-colour printed book is slightly larger than SR-A4 size. The main contents of this book were printed on matte-finished paper, which suites the art style of this book, and is also easier to read even under strong lighting. Compare with the previous two books I have reviewed, the paper used in this book is not that heavy, but the quality still feels good enough. The overall build quality feels premium. I like the art style applied to this book, which resonates with the content.

86. Frankopan, P. The Silk Roads: A New History of the World: Bloomsbury Publishing, 2015.

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Figure 35.
Zhenggang Sun,
Case study photo
references: 'The Silk Roads:
A New History of the
World', 2019,
photo of book,
Paper Plus, Blenheim.

1, Information density on each page: High

This book is full of text. It isn't a book that allows you to skim through. Instead, this book was designed for serious readers. With the wider serif typeface and highly breathable negative spaces in-between lines and paragraphs, it is relatively easy for readers to navigate through without feeling lost. Each page of this book contains beautifully illustrated images to enhance the reading atmosphere. Together with the changing background to address different themes and topics. Each page of this book would on average take me around 2~5 minutes to read.

2, Balance between images and texts: Good

This book is text dominated, and images in this book were mainly designed for providing the historical context and to help readers to construct a visual impression of the body text. Comparing with the first book I have reviewed, ‘**Bright Ideas for Young Minds: 70 Step-By-Step Activities to Do at Home with Your Child**’, this book used a different method, which blends the images into the text. This method can enhance the visual impression and establish a stronger relationship between text and images. Which can be good for readers to memorise the contents. However, the blend-in method may also provide challenges for readers to track the line changes. For example, on page 52, the Chinese servant figurine, and coin illustrations have taken the large portion of the left side of the page and conflict with the text content on the right. As a result, the text content in this page doesn't have a consistent alignment, which might affect the reading experience and increase the chances for the reader to lose track. The following page, which applied the left-aligned text layout does provide a better reading experience for me. However, the obvious variation of the line length also caused a small level of "jumpiness" feel, which might not be an ideal reading experience. Plus, the illustration of this gentleman on page 53 has already been used on page 11, and the castle illustration has also been reused several times in this book, which did affect my impression of this book.

3, Hierarchy: Moderate

Most of this book is dominated by serif typeface. Although the designer of this book did apply methods such as italics and apparent size difference, the overall contrast between text contents aren’t as obvious as in other books in this case study. However, the well-arranged negative spaces would help readers to Figureure out the content's hierarchy and arrange their reading order.

The text content and images have been arranged in a harmonious way. The images in this book have applied some very effective attention tracking methods such as use of scales and background contrasts. The limited colour applied to these illustrations helped them to stay in harmony with the text content.

The most outstanding example of this hierarchy arrangement example I have found in this book is the two Xiongnu knights charging across the spread. (Figure 35) The entire left page was taken by the red knight who was shooting an arrow from a black neighing horse, which has profoundly enhanced the story of Xiongnu from the previous page. The arrow's direction has naturally led the readers' eyes to the next page and carry on with the text content. The second knight not only smaller but also the colour of the knight and the horse has been exchanged. The black colour, which is also the colour of the text, is now a more dominated colour of this page. Thus, the reader's eyes won't be overly attracted by the illustration. The density of the text has presented a higher hierarchy of reading.

4, Information Flows: Good

The layout design of this book has followed the most common left-right and top-bottom rule, which feels natural for most English readers. The well-arranged text-image hierarchy also makes the information in this book easy to follow. Captions positioning of the images are also followed the left-right reading habit, which doesn't require readers to jump back and forward.

5, Consistency: Moderate

The artistic style of this book is highly consistent. The artist has managed to apply the ancient hand-drawn illustration style through the entire book. This art style can be seen as the signature of this book. The font size, style and weight are consistent for their blocks. Most pages of this book have used the same grading system. Even for the pages that heavily blend images and texts, the negative space between the page's edges and main content is still consistent. The background colours, however, are the parts that lose consistency. The changes in the background colour with the text colour might affect the reading experiences, slightly. However, this kind of inconsistency would be mainly designed for echoing with the theme and topic that could enhance the reading atmosphere. While it did affect the reading consistency, it has also helped me to stay focused on reading this book.

Conclusion:

This is another example of how to break the rules to maximise the aesthetic and enhance the impression. However, while some parts have broken the rule, most parts still obey the most fundamental rule of information design: the arrangements are serving to maximise the information delivery. Some components that look as if they are disobeying the design rules can only mean the designer has found better solutions to enhance the communication experience. The strategies of how to manage the image-text hierarchy and how to break the consistency to help readers stay focused on the complex message would be helpful for my project.

Case 4: Star Wars Made Easy: A Beginner's Guide to a Galaxy Far, Far Away⁸⁷

First impression:

This hardcover full-colour printed book is in between A5~A4 size, which can be easily held by a single hand. For young readers who have small hands, this book might be more comfortable for them to hold. The main contents of this book were printed on medium weight glossy paper, which feels good but can be hard to read under direct light due to reflection. Considering how thick it is, it is still relatively light to hold, which is good for young readers.

87. Blauvelt, C. Star Wars Made Easy: A Beginner's Guide to a Galaxy Far, Far Away: Dorling Kindersley Limited, 2017.

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Figure 36.
Zhenggang Sun, *Case study photo references: 'Star Wars Made Easy: A Beginner's Guide to a Galaxy Far, Far Away'*, 2019, photo of book, Paper Plus, Blenheim.

1, Information density on each page: Very High

This might be the typical example of “encyclopaedia” type book. Which is filled with text and images. The text sizes in this book are slightly oversized when compared with other books in this case study. Therefore, while the negative spaces in this book aren't small, the overall visual presentation of this book is still on the busy side. Which makes it not easy for readers to stay focused on the block they are reading. However, on another hand, although this layout is busy, it isn't hard to skim through to build a quick overall image of the book. Considering this book is designed to introduce a popular culture, this kind of busy visual outcome might resonate with the movie's atmosphere. Each page would roughly take me 4~6 minutes to read.

2, Balance between images and texts: Moderate

The pictures and texts in this book are blended. The allocation of space between image and text on each page is around 50~50, which is good for younger readers. The combination of illustration and film scene can help readers to build a strong impression of the character and story. The connections between images and texts are strong. Which could help readers to make stronger memories of the content. However, the hierarchies in this book might need some improvement. The images and texts in this book feel like they are fighting for the reader’s attention. This made me feel a bit tired to read this book.

3, Hierarchy: Poor

This book did apply some good strategy for managing content hierarchy. Titles are all printed in bold and full capital, and body texts have a visible size different with titles and subtitles. The character's quotes have a different background colour and denser texts. The negative spaces between text and images are well organised. However, the typeface used for the body text is too thin, which is hard to read and also hard to attract enough attention from the more attractive images. The entire book was printed with sans-serif typeface, which also weakens the contrast between different contents. The negative space between text blocks could be improved, although this might be due to the thin font, which looks loose and requires more space to construct a solid block visual representation. I also feel the negative space between the edge of the page and the body content is insufficient.

4, Information Flows: Moderate

The layout of contents in this book does follow the left-right and top-bottom rules. Large text size has made information in this book not hard to read. It also has enough negative space between text and images. Image captions are well-positioned, so readers don't have to look back and forward.

5, Consistency: Good

The layout design of this book is highly consistent. While some images would break the gridding system with oversize prints, they won't overpower the consistency of the overall design. It is clear to see that most pages in this book share the same grid system.

Conclusion:

This book did provide an example of how easy it is to negatively affect reading experiences. Most parts of this book are well organised, but the questionable font and hierarchy arrangement have affected the overall presentation. From reviewing the design of this book, I can finally see the mistakes from my previous designs for this project and understand how to avoid them.

This book is designed for fanboys and readers who are interested in the theme so that might be okay for this kind of high-density information arrangement. For my case, however, making everything simple and clear to understand while attractive enough to read would be my top goal. Therefore, clear orders of contents, imagery that can track reader's attention and further explain the issue, enough negative spaces for readers' eyes to rest, limited information density on each page and enough contrast between different contents should be the critical design criteria for my design.

Case 5: Art-Tastic⁸⁸

First impression:

This hardback, full-colour printed book is roughly the same size as the A4~SRA4 paper. The bright and colourful cover is eye-catching, even from a far distance. The content of this book was printed on the heavy and uncoated paper, which is comfortable to flip and also feels premium and does also not pick up lights reflection. The readers can read this book under almost any type of lighting. For a hardcover book, it feels relatively light. An adult can comfortably hold it to read in a single hand. Young readers should also find it not too hard to hold this book to read. The covers of this book were glued on thick cards, and the readers can still see the edges of these cards, which is different from most other hardcover books. However, this arrangement is not very friendly for book storage.

88. Christchurch Art Gallery Staff, S. Pepperle, J. Collie, and R. Patrick. Art-Tastic: Christchurch Art Gallery / Te Puna o Waiwhetu, 2018.

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Figure 37.
Zhenggang Sun,
Case study photo references:
'Art-Tastic', 2019,
photo of book,
AUT, Auckland.

1, Information density on each page: Moderate

‘What is art?’, this book has tackled a hard topic. With the intention of introducing and explaining art, especially contemporary art, to young readers, this book did a great job to control information density while still managed to present most of the critical concepts of art.

Since it was designed for young readers, the language used in this book is straightforward and fun to read. All text contents in this book were printed with a relatively large size. The weights of these text contents are heavy enough to stand out from the eye-catching images. Since the target audience of this book would be children and young teenagers, the image contents in this book takes a large portion of most pages. Serious artwork is usually be accompanied by some delightful and funny hand-drawn illustrations in this book, which makes this book very fun to read, even for an adult. Many parts of this book also provided spaces for young readers to practice their art under instructions, which can be considered as a good feature for younger children. In average, each page of this book would take me around 2~4 minute to read.

2, Balance between images and texts: Good

It is hard for me to state that this book is image dominated. While the large portion of pages in this book are filled with art, photographs, drawing and symbols. Even many titles have been applied with heavy visual effects which makes them look more like a picture rather than text. However, I also didn't feel the text are the byplay. The text messages are equally outstanding even in some of the most image dominated pages. I think the large text size, heavy font-weight and lead spacing did make great contributions. Most pages in this book are visually full-on, but the highly breathable negative spaces in-between each content did help to reduce the overwhelming visual feel. As a result, this book is easy to read. Readers can easily position their eyes on the page and switching from content to content without being bothered by other information on the same page.

3, Hierarchy: Moderate

At first, when I opened this book, I was confused with the hierarchy arrangement. It was too busy when compared with most other books under the same category. However, once when I started to read, I found the layouts in this book are logical and easy to follow. While pretty much all contents in this book were printed in large size, whether text or image, the designer did leave large negative spaces to help readers to stay focused on the block they are reading. Colour, size, typeface and visual effects play key roles in this book to maintain information hierarchies. Pretty much all page titles in this book were designed with playful visual effects and printed in large size. The spaces between the body texts are small enough to make a difference while maintaining the logic connection. The spaces between non-related pictures and texts are big enough to avoid confusion.

4, Information Flows: Moderate

This book seems not to have an obvious starting point on each page. The readers can decide the reading order by themselves without affecting the information received. Since it is designed for children, this feature would be a big advantage to help the young reader maintaining their reading interest. Readers can always start to read from the part they feel most interested in and move on to other components to build the full picture. However, some text information with heavy visual effects and odd spacings are not easy to read. Some heavily stylised text in the paragraph will break the reading flow.

5, Consistency: Minimum

While some fundamental elements, such as body text's typeface, page number placement and negative spaces between edge of the page, are mostly consistent. The overall layout of this book is hard to find much consistency. However, since this book is designed to be fun and to encourage young reader's interest with art, the sacrifice of design consistency can be considered as a logical design decision. From the good side, this kind of inconsistency did provide the reader with a sense of contemporary artistic creativity, which is somehow meant to be different. With good information hierarchy arrangement, the absence of design consistency also seems not to have much effect on reading experience.

Conclusion:

This is another example of how to break the rule for maximising some particular design aims. This book has sacrificed design consistency to provide a fun reading experience. From my perspective, the entire book was based on the intention to entertain. It has achieved this aim with great success, in my opinion. The content of this book is carefully arranged. The language is fun and easy to understand. Young readers will enjoy the jokes and gags. And for adults, the information in this book also has enough depth for them to enjoy reading.

This book has indicated to me an alternative design direction, to entertain the audiences, and they may learn more when they laugh. Contemporary art is a serious topic, and some of them are even not close to fun and entertainment. From this perspective, this book's theme does share similarity with the topic I am trying to tackle. This book is only meant to be an introduction for young artists to make their first step, so even some of the explanation might be questionable, but it is enough to build the initial interest. For my project, it would also be impossible for me to answer all questions regarding children’s problematic device usage behaviour. My project aim would be to increase school teacher and parents' attention to this issue by helping them to build a fundamental understanding. As McAlhone has stated in his book, making people wonder and making them smile might provide me with a better chance to reach them.⁸³ How to create fun and make them acceptable might be one of the next tasks I need to consider for the new prototype. This book can be a reference for ideas.

89. McAlhone, and Stuart, 18.

