

UNIVERSITY OF GIRONA
FACULTY OF TOURISM

MASTER'S THESIS

YUN-JHONG HO

EUROPEAN MASTER IN TOURISM MANAGEMENT
FACULTY OF HUMANITIES, UNIVERSITY OF SOUTHERN DENMARK
SCHOOL OF ECONOMICS AND BUSINESS, UNIVERSITY OF LJUBLJANA
FACULTY OF TOURISM, UNIVERSITY OF GIRONA

MASTER'S THESIS

Towards the Future Aquariums:

A Ground Theory Approach of Aquariums' Societal Perceptions

Girona, July, 2023

YUN-JHONG HO

Table of Contents

List of Tables.....	ii
List of Figures.....	iii
Abstract.....	1
Chapter 1 Introduction.....	2
Chapter 2 Literature Reviews.....	5
2.1 Defining Aquarium.....	5
2.1.1 A Glance of Aquarium History.....	5
2.1.2 Aquariums as Public Places.....	7
2.2 Roles of Aquariums.....	11
2.2.1 Aquariums as Entertainer.....	12
2.2.2 Aquariums as Educator.....	14
2.2.3 Aquariums as Exploiter.....	15
Chapter 3 Methodology.....	19
3.1 Grounded Theory Approach.....	19
3.2 Semi-Structured Interviews.....	21
3.3 Demography.....	23
3.4 Theoretical Sampling & Coding.....	27
Chapter 4 Findings & Analysis.....	28
4.1 Intricate Roles of Aquariums.....	29
4.2 Education as the Core Value.....	34
4.3 Entertainment as the Facilitator.....	40
4.4 Ethics as the Stimulant.....	44
4.5 A Future of Challenges and Opportunities.....	51
Chapter 5 A Grounded Framework: Towards the Future Aquariums.....	55
5.1 Free-Choice Learning.....	57
5.2 Edutainment.....	60
5.3 Posthumanism.....	63
Chapter 6 Conclusion.....	69
6.1 Suggestions.....	71
6.2 Limitations & Future Researches.....	72

References

Appendix

List of Tables

Table 1 List of the Interview Participants.....	24
Table 2 Aquariums Types.....	25
Table 3 Participants' Demography.....	26
Table 4 Coding in Practice.....	28

List of Figures

Figure 1: Grounded Theory Method Proposition Map.....	22
Figure 2: Emerged Themes of the Interviews.....	29
Figure 3. Sub-themes of Q1: Aquarium’s own perceived societal roles.....	30
Figure 4. Sub-themes of Q2-Q4: Education roles in aquariums.....	35
Figure 5: Aquariums’ Narratives of Education Significance.....	37
Figure 6. Sub-themes of Q5-Q6: Entertainment roles in aquariums.....	41
Figure 7. Sub-themes of Q7-Q8: Ethical roles in aquariums.....	46
Figure 8: Aquariums’ Narratives in Tackling Ethical Concerns.....	48
Figure 9. Sub-themes of Q9-Q10: Societal Changes & Future Agenda.....	52
Figure 10. Conceptual Framework Emergence.....	55

Abstract

Aquariums employ various roles in society; encompassing education, entertainment, and ethics. However, doubts concerning their existence and purpose persist. Taking into account the intricate relationship of societal perceptions, this study seeks to examine the implications for the future aquariums. Adopting a grounded theory method, the research aims to identify applicable theories that can guide aquariums in the years ahead. Drawing on the narratives of aquarium staff members, semi-structured interviews were conducted to understand how aquariums engage with diverse societal perceptions. The interviews also explored the shifting perspectives of aquariums on the general public and the potential impact of these alterations on future agendas and priorities. The analysis focused on three pillars: education, entertainment, and ethics, examining how aquariums perceive their educational impact, engage in creating immersive experiences, and address ethical considerations.

The study revealed three emergent theories aligned with the narratives of aquariums: free-choice learning, edutainment, and posthumanism. These theories are proposed as guidelines to enhance the impact of aquariums. By adopting these approaches, aquariums can adapt to evolving societal expectations and position themselves as dynamic institutions capable of addressing contemporary issues. Finally, practical steps are suggested as a roadmap for aquariums to align their operations with the emerging theories, ensuring their continued relevance and impact. The findings of this research provide valuable insight and guidance for aquarium professionals, enabling them to navigate the changing landscape of aquarium experiences while fulfilling their responsibilities in education, entertainment, and ethics.

Keywords: Aquarium; Societal perception; Grounded theory; Marine education; Aquarium entertainment; Marine ethics

“To appreciate nature, as well as art, the mind requires special education, without which the eye and the ear perceive but little of the miracles passing before them”

-Ocean Gardens (Humphreys, 1857, p.3)

Chapter 1 Introduction

There is no place more enchanting than aquariums.

The chill runs down one’s spine upon entering a large room with a dim and chilly atmosphere. The once-mysterious and deep-under group of the greatest vitality is suddenly revealing its genuine colour to the naked eye. The only thing separating us from the vibrant marine life is a few centimetres of glass tanks. We are living in a dream of many years of homo sapiens, back then to discover the purest and most secret form of life, one would have to dive into the water with vast wealth and resources required. Through the long historic development, today’s aquariums embrace their multifaceted functions (Packer & Ballantyne, 2010). From academic purposes of studying underwater life forms to creating values in recreation and leisure, aquariums function in today’s complex society while employing different strategies and operational priorities. Thus, it is served as the main mission of this paper, to challenge oneself in reconceptualising the roles of aquariums.

However, aquarium studies have frequently centred on its biological and scientific function. Numerous papers devoted to these institutions were frequently written by marine biologists or environmental scientists, with a focus on the direct effects of aquariums on the natural world and frequently involving their ongoing projects. This is an undeniable function that aquariums play in our society, also well-supported by extensive academic research. Taking into account the author’s tourism background, however, it was deemed necessary to examine these social roles of aquariums via different lenses. Humanity research in aquariums frequently examines three directions: educational function, contribution to tourism development, and ethics (Minteer & Collins, 2013), thus these pillars have been identified as the main three pillars for the author to adopt throughout the study.

Another research gap identified by the author is that the majority of studies have examined these topics from an external perspective. For instance, examining aquarium education based on specific student groups visiting; determining its tourism value based on local communities; or studying ethics in collaboration with animal rights activists. There appears to be a lack of representation in the narratives of aquariums themselves; Therefore, this existing research gap was identified as a great potential in providing valuable insights regarding aquariums' multifaceted roles from the staff's perspectives. How do they react to these social roles that they have portrayed? How would they interact with external perception? To what extent have these perceptions influenced their actual operation or even future priorities?

Given the qualitative nature of this research, the author then determined that adopting a grounded theory method was appropriate. Glaser and Strauss (2017) defined the grounded theory method as a systematic approach to discovering theory from data obtained through social research. By employing this methodology, the author was able to examine the narratives of aquariums in a comprehensive and structured manner, while being granted the flexibility to explore the data nimbly, thereby facilitating the emergence of relevant conceptual framework. The unanswered questions surrounding aquariums served as the primary motivation for employing this method, with the hope of generating valuable insights through the course of this research. Therefore, this paper would like to address the needs of qualitative research by asking:

Exploring the Narrative Perspectives of Aquarium Staff Members:

To what extent can today's aquariums align their operational strategies with the future needs of society by integrating education, entertainment, and ethics?

The journey of this paper embarks with an overview of the various literature. Such as the historic development of aquariums, which assists in an understanding of the important social composition of aquariums and the factors that might have indirectly prompted aquarium's modern-day roles. It also allows the author to define aquariums coherently, using academic definitions that were labelled and attached to aquariums throughout their historic development. Furthermore, the various existing roles that aquariums played in modern tourism would also be examined revolving around their current function in

education, entertainment, and ethical consideration. Understanding how the world might have perceived aquariums in terms of these disciplines. Exploring if there is still room for aquariums to improve in order to meet the needs of future society.

The next stage of this research was gathering primary data through semi-structured interviews. Various aquariums from around the world were invited to participate, and online interviews were conducted to directly obtain their narratives about the societal perception of aquariums. The goal was to understand further how aquariums fit into the complicated fabric of society, particularly in terms of the three pillars of education, entertainment, and ethics. The examination focused on the aquariums' narratives and the types of interactions present. The obtained data was then subjected to a rigorous theoretical coding process to determine the primary themes that emerged from the aquariums' narratives.

Lastly, the identified themes from each of the three pillars were used to build a conceptual framework for the future of aquariums. An unconventional approach was adopted in this section of the study, in which emergent conceptual framework were presented alongside relevant literature evaluations. Each of the conceptualisation represents a different yet interrelated concept that deserves careful examination. This approach was chosen to introduce multiple perspectives and recognise aquariums' complex and growing identities in the present context. Moreover, it serves to facilitate the development of guidelines for future aquariums to adhere to.

The author aims to delve into the future roles of aquariums within the realm of tourism, exploring their significance and relevance from a profound philosophical perspective. Central to this investigation is the fundamental question of whether aquariums possess the potential to actively foster human awareness and promote sustainable practices, or if their scope for such contributions remains inherently constrained, relegating them to mere agents of exploitation. Considering the critical context of sustainable needs, tourism dynamics, ethical considerations, and marine education, this study aims to provide valuable philosophical insights that can inform and guide future practises within the aquarium industry, paving the way for a more meaningful, thoughtful, and responsible approach to aquarium operations in the years to come.

Chapter 2 Literature Reviews

2.1 Defining Aquarium

In the introduction chapter of this paper, the author aims to employ academic definitions to explore the historical development of aquariums, shedding light on their evolution into the institutions we see today. The journey will commence with an exploration of how aquariums initially emerged as a means for curious scientists to observe marine life through glass tanks, and then transformed into a fascination driven by collectors and enthusiasts for the affluent upper class, showcasing their wealth. The objective of this chapter is to establish an academic foundation for the credibility of this research and to remind the author of the need of discussing the historical events that have shaped the modern aquariums. To comprehensively examine the diverse roles of modern-day aquariums, it is necessary to delve into their historical context, as aquariums have risen, shifted, failed, and revived throughout history. By doing so, an opportunity for reflection and repositioning within the field can be facilitated.

2.1.1 A Glance of Aquarium History: From Glass Tank to Sea Museums

“There is no way in which the beauties of their form and markings can so well be seen as through perpendicular, even-moulded glass. Here we see them undistorted by refraction, and can watch their graceful movements without disturbing them” (Sowerby, 1857, p. 14). The attempts of humans to observe aquatic life close to home have a long history, dating back to the Greek civilization, Roman Empire, Tang Dynasty, and 16th century Japan (Brunner, 2012). Documented history infrequently mentions the domestic fish-keeping practise of the ruling classes and the privileged. However, the earliest development of aquariums for academic purposes started in the mid-19th century Britain, when biologists and botanists struggled to keep fresh-water fishes alive while put in a self-contained glass tank to examine. They soon realised that the key of sufficient oxygen and a functioning life-cycle was a way to sustain these under-water creatures lively (Sowerby, 1857). Once the code was cracked of how to maintain a so-called water vivarium, it had thus become a boost for scientists in examining aquatic life while keeping their feet dry. The very early appearance of the aquarium, however, was mostly privately-owned fish tanks developed for research purposes.

Scientists were steadily determining how to construct a more stable, large-scale aquarium for the study of saltwater creatures. The term aquarium first appeared when English marine biology collector Philp Gosse argued that the term ‘vivarium’ lacked an aquatic connotation and was more frequently used to refer to amphibians and insects (Gosse, 1853, 1856). He chose the term ‘aquarium’, which at the time already had a linguistic explanation of a water reservoir or a tank for plants, as a result of being “*neat, easily said, and remembered.*” (p.250) Gosse was referred to as the ‘pioneer and propagandist’ of aquariums by Brunner (2012) because of his ‘contagious enthusiasm’ for pushing himself to develop aquariums and eventually popularising their use in marine studies. With the success of Gosse and pharmacist Robert Warrington, as the latter successfully introduced the Gosse’s concept with sea-water fishes (Sowerby, 1857; Edge, 2014), the modern usage of aquarium was coined. It later led to the country’s fascination toward fish tanks among the general public, and gradually shifted the usage from research to entertainment purposes.

The term ‘aquarium mania’ was described by Wood (1868) in the 1850s. As a result of the successful standardisation of aquariums, aquarium ownership is becoming a prestigious social trend among the wealthy. The mania swept through Great Britain, with stores opening solely to sell aquariums and newspapers containing instructions on how to maintain one at home. However, the trend waned rapidly as Wood described “*like a hothouse plant, very luxuriant under artificial condition, but failing when deprived of external assistance.*” (p.4) Eventually, due to the need for constant maintenance and care, the general public eventually abandoned most household aquarium ownership. As Wijgerde (2016) quoted the observation from aquarist William Lloyd: “*so long as aquaria are made for houses, instead of houses for aquaria, no satisfactory result could be obtained.*” (Wijgerde, 2016, *The rise and decline of public aquaria in Europe* section, para. 4)

The tale of the aquarium did not end here. In fact, this is the beginning of the transformation of the aquarium from the usage of domestic husbandry to a massive entertainment venue. When marine biologist Anna Thynne displayed her corals and sponges in the first bio-balanced marine aquarium in Westminster Abbey in 1847, it was the first aquarium for display purposes established (Brunner, 2012; Stott, 2003). In

addition to being a pioneer in the development of salt-water tanks, surpassing many of her male peers, Thynne's unprecedented act inspired many biologists in their later development of sizable aquaria. In 1853, the zoological garden of Regent's Park opened its marine vivarium, also known as the 'London Fish House'. It was the first of its kind to use a stable system that required little air and water change (Edge, 2014). Due to the continuous research and innovation of biologists and zoologists, the primary obstacles to establishing aquariums were overcome, and the opening of London Fish House marked the beginning of the proliferation of aquariums throughout the United Kingdom, continental Europe, and the United States (Edge, 2014; Holdworth, 1860; Sowerby, 1857). To quote Humphreys (1857) stated in the book '*Ocean Gardens*': "*their first exhibition created a sense of wonder little less intense than, long years ago, by the first public display of the elephant to the people of cold northern countries*" (p.12), illustrating the anticipated growth of public aquariums in the coming centuries.

2.1.2 Aquariums as Public Places

Only under professional circumstances could the modernization of commercial and large-scale aquariums begin, in other words, early-day aquariums typically coexisted and integrated with an already well-established zoology institution (Brunner, 2012). Phineas T. Barnum, a legendary figure in American show business, saw the audience's yearning for aquariums when visiting the London Fish House of the Regent's Park and sensed a lucrative business potential. In 1856, Barnum began displaying large-scale aquariums in his American Museum in New York. Along with the aquarium and other exhibits, artworks, and performances, the museum had become a cultural symbol in New York, attracting a large number of people (Saxon, 1989; Dennett, 1997). Soon after, numerous public aquariums followed the path of commercial success and opened their doors to the America's curious visitors, such as Smithsonian's Aquarium in Washington D.C. (1857) and Aquarial Gardens in Boston (1859), and (Saxon, 1989; Brunner, 2012; Warner, 2015).

In Europe, the widespread trend of public aquariums has flourished almost as a competition to see who is the most impressive. Important continental Europe aquariums include the Jardin d'Acclimatation in Paris (1860), the Viennese Aquarium Salon (1860), and the Marine Aquarium Temple in Hamburg (1865) (Brunner, 2012).

Jardin d'Acclimatation first opened its door to the public in 1860 as a zoology park, where Paris's first public aquarium was integrated into a windowless, brick construction (Brunner, 2012; Le Gall, 2018). The aquarium's new method of blocking natural lighting, which was initially intended to prevent the overgrowth of algae in the tanks, inadvertently produced a theatrical effect in the atmosphere that enthralled visitors with the unique experience they could have. As Brunner (2012) commented that Jardin d'Acclimatation "*presented as a copy and simulacrum of the submarine world— the aquarium became a completely new experience, ... never before had visitors been able to see so many marine creatures in such a concentrated form and without external influences.*" (p. 104) Despite being ravaged by the turmoil of the Franco-Prussian war and losing its original collection of exotic animals to a hunger-driven crowd during the siege, Jardin d'Acclimatation was able to recover quickly in the late 1870s and has remained a beloved leisure destination for Parisians to this day (Jardin d'Acclimatation, 2018).

The railway system is another advanced modern technology that greatly benefits the establishment of an aquarium. The opening of the Semmering Railway, which gave landlocked countries like Austria direct access to the Mediterranean Sea, greatly facilitated the pursuit of marine life among the population (Adelsberger & Eicher, 2008; Brunner, 2012). In 1860, the Viennese Aquarium Salon opened its doors to the curious public, exhibiting marine life (Nyhart, 2009). Gustav Jäger, a devoted marine zoologist, designed the first aquarium of its kind in Vienna after conducting years of experiments. However, unlike the Semmering railway, which remained an important infrastructure for the country and was later designated a UNESCO cultural world heritage (UNESCO, 1998), the Viennese Aquarium Salon enjoyed only a brief period of splendour before closing due to a lack of sustaining funds.

The Marine Aquarium Temple in Hamburg opened its doors in 1865. It was designed to outpace its rival London Fish House by incorporating two galleries with ten large-scaled glass tanks in its centre, surrounded by even more smaller tanks containing exotic fishes, such as the Japanese Giant salamander and colourful sea anemones. (Bettziech, 1865; Brunner, 2012). As described by the German author Bettziech (1865) in the Magazine '*Die Gartenlaube*' as "*The art temple, the studio for the exhibition and culture of aquatic creatures*" (p. 388), people appreciated the newly developed aquarium for all of these

reasons given that it was praised as a triumph of science, aesthetics, and practical applications together. Aquarists remarked, however, that despite the aquarium's flawless construction, ordinary fish such as herring and mackerel would be killed within a day. Thus they commented: "*how little is man able to mimic, what nature accomplishes with ease.*" (Brunner, 2012, p. 106)

In the 1860s, aquariums were challenged with a novel element in terms of their development: aesthetics. This is a result of the high demand of the enhancement in visitors' experiences. Aquariums had shifted from merely displaying marine life for scientific purposes to satisfying the visual fulfilment and immersion needs of their audiences. Brunner (2012) referred to this phenomenon as 'grotto style' aquariums, which are constructed in imitation of the eclecticism of the Italian Renaissance of the 17th century. Not only were the tanks decorated as a cave, but also the exhibition room, in order to immerse the audience completely in a unique sensation. As Smith et al. (2004) mentioned: "*To enter the display, the visitor walked into a darkened cavern that was meant to give the impression of descending into the sea. The artificial rock walls were festooned with replicas of the sea floor to increase the illusion, ...the only light that entered the grotto came from the tanks.*" (p. 2)

The Boulevard Montmartre Aquarium at Paris World Exposition and Unter den Lindenre Aquarium in Berlin, both opened in 1867, perhaps best represented the adaptation of grotto design among those aquariums built in this era. Once visitors descended through an artificial grotto filled with stalactites, they entered a room with a glass ceiling that allowed them to observe fish as if they were at the bottom of the ocean. This was one of the most popular attractions at the Paris World Exposition (Smith et al., 2004). The Unter den Lindenre Aquarium, while also hosting exotic birds, reptiles and mammals, was known for its extraordinary design. Described by Haikal (2020) in the book '*Master Pongo*', Unter den Lindenre Aquarium was a fantasy world "*full of grottoes and boulders, coves and spiderwebs woven from iron. Here a serpentine path beckoned, there a waterfall plunged into the depths.*" (p. 66) Despite having a similar design, the reaction of the two aquariums differed greatly. While the Unter den Lindenre in Berlin was well-received by visitors and King Wilhelm I himself, its counterpart in Paris has been harshly criticised since its customers were forced to dislocate their necks and endure discomfort

while seeing few fish from below (Brunner, 2012).

As evidenced by the examples of grotto-styled aquariums, aquariums in this era faced significant obstacles because their designers prioritised aesthetics over functionality and zoological needs. In the late 1870s, most aquariums struggled to maintain both the quality of their displays and the animals' health (Wijgerde, 2016). Due to its energy consumption and maintenance requirements, the aquarium's upkeep was extremely costly. In the meantime, aquariums also experienced a high animal mortality rate, but restocking would require a lengthy logistical process. The public's extreme dissatisfaction and waning interest resulted from the fact that visitors to aquariums at the time would pay and walk through a facility that displayed murky but empty tanks. Major aquariums were forced to close their doors, while others remained open with side businesses to maintain profitability. Such as the Crystal Palace Aquarium transforming into a monkey house and the Unter den Lindenre Aquarium being forced to sell artificial salt water and rent tanks to nearby restaurants for keeping fresh lobsters and trout (Brunner, 2012; Wijgerde, 2016).

However, the downfall of public aquariums in the 1870s can best characterise the current position of aquariums in tourism industries. As aquarium managers struggled to maintain profitability with aquarium admission alone, they began to incorporate additional attractions to maximise their market functionality (Brunner, 2012). Multiple leisure activities, such as magic shows, fairs, and circuses, began to occur concurrently, creating an economic cluster. This approach may be common even in modern aquarium operations. Many modern aquariums sustain themselves by opening cafés, restaurants, and souvenir stores, while others include marine mammal performances, shows, and unique overnight stays. Some successful cases such as Ocean Park Hong Kong incorporated themselves as an ocean-themed amusement park with rides and facilities (Yim, 2010); The collaboration between Sea Life Berlin and Hotel Radisson to integrate an aquarium inside the hotel lobby (which later experienced the tragedy of AquaDom explosion in 2022) (Braun, 2011).

When examining the history of aquariums, one can see that what we have today is the result of centuries of efforts by predecessors. We are standing on the shoulders of others; one must constantly remind oneself that all of the great opportunities we have for viewing the richness and fragility of an untamed nature are the result of great efforts. From

technological breakthroughs inspired by a passion for marine life in the early 1950s to aquarium mania in the 1960s, all of these developments have contributed to the tourism industry becoming what it is today. However, the function of aquariums continues to evolve. It evolved from a method for biologists to study the underwater wilderness to a hobby for the wealthy in which they competed to amass the most impressive and rare collection. Even when aquariums transitioned from private to public, their operators and visitors expected different roles that encompass aesthetic, experience, and profitability elements. This is precisely why this paper will investigate the many roles that aquariums play. While contemplating the history of aquariums, their future rests on our study of numerous potential applications. And, perhaps, at the end of this paper, one could provide deeper and more meaningful goals for future aquariums and their visitors.

2.2 Roles of Aquariums

As today, especially those who reside in urban settings, we rarely encounter wild creatures in the wild. Establishments such as zoos and aquariums provide a link between humans and animals by revealing the hidden life of a pristine environment. However, the functions implied by aquariums' activities are likely more complex than merely facilitating interactions between animals and humans. From a multidimensional and multi-stakeholder perspective, aquariums can play a variety of roles, depending on the viewpoints from which their presence is examined.

According to the preceding chapter, the history of the aquarium has steadily transitioned from private institutions to public venues, from research-based marine life observatories to leisure-driven sea museums (Brunner, 2012). It is undeniable that aquariums have always evolved through a variety of forms to become the prevalent shape we associate with today. According to Packer & Ballantyne (2010), the commonly associated roles of aquariums including: “*the collection and display of exotic animals; scientific research; the provision of entertainment, recreation, and leisure; zoological education; animal welfare advocacy; conservation fundraising; in situ and ex situ conservation programs; and conservation education.*” (p.25) As a result, the purpose of this chapter is to elaborate on the primary roles that aquariums serve, such as (1) Entertainer; addressing aquariums' contribution to the broader tourism sector and destination, as well as the leisure and

recreational activities that are engaged. (2) Educator; centring aquariums' function as marine education institution and providing advocacy in zoological conservation topics and facilitating knowledge and learning through the visitation, and (3) Exploiter; facing the fundamental ethical and moral challenges that aquariums bear and examining the critiques and rationales that have arisen among conservation, animal welfare, and animal captivity. It is hoped that the end of this section would provide one with a coherent overview towards the multiplicity that aquariums play.

Examining the motivations of visitors prior to their visit is a significant way to investigate the roles that may have influenced the behaviour of aquariums. Such as Falk et al. (2008)'s research on visitors' motivation in zoos and aquariums, they used a set of categories to identify the visitor's prior motivation to the venues, namely explorers, facilitators, professional/hobbyists, experiences seekers, and spiritual pilgrims. These categories can be further subdivided into interests such as learning interests, social interests, 'been there, done that' interests, and a passion for nature. According to their findings, there was no dominant role that the visitors associated themselves with, but sometimes a single visitor could identify with more than two identities. This serves to illustrate the multifaceted role that environments such as aquariums can play, allowing visitors with varying motivations to develop their individual interests (Cater, 2010). Over these motivations, notions of aquariums as entertainer and educator can be implied, whereas notions of aquariums as exploiter are less apparent, but can be interpreted among those who identified as professional/hobbyists, as this group of visitors may have a higher degree of awareness in animal-related topics such as ethics or welfare.

2.2.1 Aquariums as Entertainer

Aquariums in the tourism industry have demonstrated their significant roles in providing visitors with recreation and amusement. It is undeniable that aquariums have sometimes contributed to a destination's robust tourism offerings and broadened tourists' options. However, economic considerations may have played a role in the evolution of aquariums from academic institutions to centres of significant leisure activities. As suggested by Brunner (2012), aquariums in the late 19th century began to develop a cluster economy and sell combined tickets with circuses, performances, and fairs in order to maintain their

profitability. It leads to how modern aquariums may incorporate recreational activities alongside the display of marine life to maximise and optimise revenue generation. The phenomenon of so-called ‘merformance’ is an example of aquarium-driven entertainment. ‘Merformance’ refers to a group of performers dressed up with artificial tails to mimic the mythical creature of mermaids and performing in the tanks, sometimes along with other animal creatures (Davis & Strandvad, 2020). Merformance often involved a high level of technique, aesthetics and interaction between visitors, and also demanded extensive training. It is popularised and has become a major activity in the promotion of some aquariums. Davis & Strandvad (2020) noted that despite the fact that a connection between merformance and the reinforcement of ecological messages and environmental awareness has been observed, the outcome is neither confirmed nor proven to be effective.

An involvement of entertainment can also imply a high degree of commodification of an aquarium’s operation strategy, which is sometimes influenced by and coexists with the demographics of the aquarium’s visitors. Ong (2017) observed, when examining the Chimelong Ocean Kingdom in Zhuhai, China, that the tendency of taming and culturing the animal-human relationship occurred at the venue. The Ocean Kingdom, to quote the author, “*is essentially an expensive big-budget project complete with the world’s largest aquarium tank and other aquarium and zoo facilities for staging marine mammal viewings, world class rides, multi-media shows and daily fireworks performances.*” (p. 196) As the aquarium is equipped with state-of-the-art facilities and technologies, Ong found that the highly aestheticised animal display is influenced by China’s political and demographic ideals. As a result of the advocacy of the ‘one-child policy’, public venues maximising children’s experiences and the Ocean Kingdom appealed to the middle-class, who are dominantly one-child families desiring secure and safeguarded space for their children while engaging in family-friendly activities such as shopping, dining, and animal performance viewing. The Ocean Kingdom’s emphasis and prioritisation on visitor experience and recreation results in the “*personification of park animals and the broader aestheticisation of the park space shape visitors into less thinking and less critical consumer-citizens revelling in the rather mindless visually centred consumption of decontextualised animal displays and simulations.*” (Ong, 2017, p. 205)

2.2.2 Aquariums as Educator

Learning institutes for marine science, biology, and environmental education, such as aquariums, facilitate both schoolchildren and the general public connect a closer tie with life under the sea and also realise why the protection of marine ecosystems and species is crucial (Kelsey, 1991). This very role of educator that aquariums are playing in a way resembles the educational notion of a museum. In Hein's (2011) definition of a museum, he described institutions containing objects or exhibits with historical, scientific and natural values with the statement of public access and education as a museum. Aquariums, or "sea museums" as some may call them, therefore have inherited the similar educational function as museums. Yet many aspects of aquariums, such as the level of entertainment provided, the ethical issues involved, and the profit-driven operation, may make it difficult for them to be considered as the traditional museums (ICOM, 2022). Nonetheless, the educational value that an aquarium may provide will be emphasised in this section, positioning aquariums in close proximity to museums.

As was evident from the previous chapter, a group of zoologists and biologists expressly encouraged the establishment of aquariums for educational purposes in order to facilitate the academic examination of marine life (Humphreys, 1857; Wood, 1868). Even if aquariums of today have transformed into entertainment and money-making fronts, scholars continue to pay close attention to and document the aquariums' educational implications. The general understanding of science learning, or the knowledge acquisition and stimulation towards marine biology and science via the presentation of live animals and media-based information displays, may be the most prominent education aspects that arise in the aquariums (Falk & Adelman, 2003; Schwan et al., 2014). To impart the information to the public, other techniques, such as individual interpretation, guided tours, interactive activities, and the development and design of the ambience, were created. Hence, the aquarium's spatially-coordinated displays and agenda have fostered visitors' general knowledge acquisition and fostered a rich learning environment (Schwan et al., 2014).

Aquariums also frequently incorporate the concepts of marine conservation and environmental sustainability into their visitors' learning objectives. Adelman et al.(2000),

for instance, had proven that through the visit, the aquariums appeared to be able to alter or affect the visitors' knowledge in conservation and further enabled future practices. Examining student groups in aquariums, Ballantyne (2004) discovered that aquariums allow conservation messages to be captured and emerge within a more emotional context, as the students' environmental awareness is positively inspired by witnessing the negative impact of human behaviour on animals during their visit. Thus, stating that "*it is an essential first step in enabling the future caretakers of the marine environment to take appropriate, informed action in their everyday lives.*" (Ballantyne, 2004, p. 162)

The so-called 'marine education' emerged in both formal and informal settings, and the primary responsibility of marine educators in places such as aquariums is to capture learners' interests and inspire them to take action by utilising the learning experience (Klopfer et al., 1980). However, educational functions continuously face challenges and shortcomings in their efficacy. Such as the tendency of some aquariums to be entertainment-centred may lead to the imbalanced interpretation of educational messages (Kim & Snively, 2007; Davis & Strandvad, 2020); the rather 'short-lived' changes and actions of tourists after their visit and the lack of follow-up and preparation from the educator themselves make it difficult for a lifelong commitment or activism to emerge (Adelman et al., 2000; Ballantyne & Packer, 2005); and most prominently the discussion of aquariums using their educational function to justify the ethical issues of marine animal captivity (Cater, 2010; Lloro-Bidart, 2018), which will lead us to the following section: aquariums as exploiters.

2.2.3 Aquariums as Exploiter

"Are we playing God?" This is perhaps the heart of many concerns and discussions revolving around the ethicality in the settings such as zoos and aquariums. Due to the intense human-animal interaction that occurs in aquariums, their daily operations and practices are frequently questioned in their morality. In the most radical sense, it is possible to say that zoos and aquariums are the result of human exceptionalism and anthropocentrism; however, such a claim tends to ignore the lengthy history of aquariums' development, and the purposes of aquariums are often far more complex than simple human hedonism. It would be improper to address the wickedness of aquariums without

recognising their contributions and facilitations in terms of entertainment, education, and conservation. However, as those characteristics were aforementioned, the following chapter will focus on the major ethical issues that arise in aquariums, revealing the most significant critiques and discussions. Consequently, the purpose of this chapter is to label aquariums as the role of exploiters and seek to provide an overview of this specific role that sometimes could complicate and controvert aquariums' very existence.

In aquariums, animal welfare and captivity, particularly of marine mammals, represent one of the most significant ethical challenges. Even though marine mammals such as dolphins and orcas are scientifically proven to possess high intelligence and cognition (Wursig et al., 2009), they are frequently used in aquarium entertainment programmes. There have been reports of marine mammals in aquariums suffering from mental or physical illness and even engaging in suicidal behaviour due to the fact that their living environment in aquariums is vastly different and inadequate from their natural habitat (Grimm, 2011; Ventre & Jett, 2015). While some may argue that aquariums provide extensive animal care, it is questionable whether aquariums can provide a healthier and safer ex-situ habitat than the natural one. Studies even suggested that invertebrates or fishes can suffer from a high mortality rate in captivity (Sprung, 2002; Hemdal, 2009). The moral acceptability of animal captivity was not only debated in relation to aquariums' use for entertainment, but also in relation to breeding, animal acquisition, research, and aquariums' profit-making functions (Minteer & Collins, 2013). The argument focuses primarily on the suffering of animals as a result of anthropocentric approaches centred on human needs and desires, which frequently disregard or reject the agency of animals.

The phenomenon of touch pools is an additional ethical issue in aquariums that is intriguing. The term 'touch pool' refers to a shallow and open tank of exhibits designed to encourage the actual interaction between humans and animals through touching creatures such as invertebrates, fishes, and smaller sharks or stingrays (Ogle, 2016). The aquariums of today place a heavy emphasis on experience enhancement and the potential educational value behind it. Touch pools are widely used and are becoming a conventional facility in nearly all aquariums around the world, as "*interactive experiences usually stimulate a vivid curiosity in visitors on top of the passive visual engagement.*" (Biasetti et al., 2020, p. 339). However, the debates centre on the prospect that the overall

educational effectiveness of touching pools may be diminished while the animals were subjected to intense and unwelcome human interaction. Biasetti et al. (2020) also noted that the living conditions for animals in touch tanks are significantly less ideal, as they are more polluted, disturbed, and shallow. While some may argue that the purpose of a touch pool should be educational, studies based on the values of visitors who participated in touch pool experiences have shown that, despite an increase in marine knowledge and overall appreciation, no immediate conservation-based thinking was recorded, and it remains to be seen whether touch pools can actually alter the future actions of participants (Ogle, 2016). Lloro-Bidart & Russell (2017) also revealed that, despite the fact that visitors experienced close contact with animals, such as sharks, little learning occurred and animal protection awareness was virtually non-existent. They further described touch pools as the ‘political deployment’ of animals in aquariums, by creating a false impression that sharks are touchable and safe in order to promote conservation messages. However, the visitors did not perceive such messages as was intended and remained mainly focused on the entertainment aspect of the experience.

However, utilitarianism, which by definition is to justify bad deeds and determine the goods by the ultimate outcomes (West & Duignan, 1999), is one of the most used theory to defend aquariums’ ethical dilemma in animal exploitation. According to utilitarianism, in order to make an informed assessment (in this case, of the good/bad nature of aquariums), the interests of all parties and captive animals must be weighed equally. (Regan, 1996). In other words, stakeholders such as staff, visitors, locals, and even governors who benefit from having or not having aquariums, their diverse yet competing interests must not be underestimated or overlooked in comparison to those of the animals. Utilitarianism has a tendency to seek a balanced pain/pleasure relationship (Mather & Anderson, 2007), making it a frequent defender of the justification for animal exploitation because it places their interests alongside human interests such as entertainment and education equally. As Dobson (2011) once commented, when examining the marine wildlife tourism such as sport-fishing, that utilitarianism “*provides a lens through which the consequences of any action in terms of costs and benefits can be evaluated and decisions made regarding the action which will generate the greatest amount of good for the most number of sentient beings with an interest in the activity*” (p. 128).

Nonetheless, one could argue that placing human and animal interests on an equal footing is unfair because animals are positioned as an ‘object’ and passively receive decisions that are made by the human with little self-agency. As modern society has moved beyond blindly believing animals have no interests, to reconsidering the suffering they may have endured (Gray, 2017), a duty of care has been imposed on us to re-evaluate our relationship with animals. To better theorise the roles and positions of modern aquariums in society, it is essential to investigate the current ethical approaches aquariums are utilising. Ultimately, without addressing the agency of the animals, zoos and aquariums would fail to convey the appropriate educational or conservational messages, limiting them to a glamorous but empty entertainment venue. As what Gray (2017) believes: “*It is possible for zoos to be operated ethically. Yet it is not easy. The rigours of thinking and acting ethically require an ongoing examination of beliefs and activities to steer a course through the challenges of animal ethics.*” (p. 208) The future of aquariums will continue to be challenged, and there is no justification that can be offered without a full examination that employs the multifaceted ethical perspectives.

Chapter 3 Methodology

3.1 Grounded Theory Approach

As a novice researcher, the grounded theory method may provide incentives for the author to dive into particular nuances in the social phenomena. Given the purpose of this article is to examine the repositioned and reconceived possibilities of aquariums in contemporary society, the author deemed the inductive, qualitative grounded theory method appropriate. It was hoped that by the end of the paper, the grounded theory method would contribute to the development of a new scope for aquarium studies and give the industry a rethought approach to studying aquariums.

The emergence of the grounded theory method can be characterised as a pioneering effort that shaped the qualitative sciences while the quantitative approaches dominated academia (Matteucci & Gnoth, 2017). Proposed for the first time in the 1960s by sociologists Barney Glaser and Anselm Strauss, the grounded theory method is described as a comparative, positivistic, and interpretive approach to qualitative research (Strauss & Corbin, 1997). In other words, the grounded theory method seeks “*the discovery of theory from data systematically obtained from social research*” (Glaser & Strauss, 2017, p. 2). In contrast to the majority of quantitative studies, which mainly rely on existing theories and hypothesis testing, the grounded theory enables the emergence of new theories that have been examined and identified by the researchers through field investigations and data collection.

To conduct a comprehensive grounded theory method, the procedure entails the collection of data through empirical materials and the application of open coding to facilitate the emergence of new theory (Charmaz, 2006). Depending on the type of grounded theory methods (objectivist, post-positivist, and constructivist) employed by the researchers, these categorisations may or may not be preceded by literature reviews (Matteucci & Gnoth, 2017). In contrast to deductive approaches, grounded theory methods rarely employ hypotheses and instead directly derive theory from collected data. The theory is also derived in an iterative manner, which means that the process of data collection and analysis is cyclical until a certain saturation point is reached and no new findings are added (Delve et al., 2021). The coding process of grounded theory includes the stages of

open coding, axial coding, and selective coding, as the categorisation must be continuously refined during the cyclical data collection/analysis process. The objective is to identify the central category that could connect all the codes and serve as the theory's foundation. (Charmaz, 2006).

In spite of the fact that today's grounded theory has been rewritten and repositioned by numerous researchers, the three most prominent versions have been characterised as the *objectivist*, *post-positivist* and *constructivist* grounded theories (Matteucci & Gnoth, 2017). The *objectivist* grounded theory is frequently associated with Glaser's grounded theory's original development. It bared the idea that no prior theory should be espoused and the rigorous coding system should be implemented. It also emphasised that data categories should arise as naturally and objectively as feasible. The *post-positivist* grounded theory, however, has slightly moved its scope towards a more deductive approach as it permits the predefined theoretical framework to be adopted. Using existing theory, researchers can facilitate a more systematic understanding of the interconnections and consequences of the data. Lastly, the *constructivist* grounded theory allows for an even more flexible position for researchers to analyse social phenomena, encouraging their personal position and prior knowledge to be examined alongside the collected data, thereby emphasising that "*generalisations of the data are contingent, agentic, and conditional*" (Matteucci & Gnoth, 2017, p. 52)

Tourism studies have long been characterised and examined through the scope of grounded theory methods. As Jennings and Junek (2007) mentioned: "*tourism is a socially constructed and determined phenomena that is constantly being reframed and reinterpreted and reconstructed. ... Grounded theory informed by the interpretive social sciences paradigm is one way to achieve holistic, depth-ful, theorizing that accounts for the lived experiences of the people engaged in touristic experiences.*" (p. 207), studies of tourists and their interactions with the tourism environment can gain a new level of comprehension through grounded theory. Another example of grounded theory in tourism studies can be Dohn's (2011) work when analysing students' situational interests and experience in aquariums. Through grounded theory, the researcher was able to identify the triggered sentiments among students when taking part in aquarium's activities, and giving these seemingly 'intuitive' findings a strong theoretical grounding while engaging

the open coding process to create meanings and generalisation for the data.

Consequently, the use of a post-positivists grounded theory method was deemed reasonable and appropriate for this paper, as the topic of aquariums' self-reflection and narratives are seldom examined and the nuances can be rather subtle. The approach of post-positivist grounded theory was determined to be the most appropriate method because it facilitates the emergence of the conceptual framework more effectively and allows the prior exploration of existing literature to complement more rigorous methods of analysis. Using the premise that data collection and analysis are iterative and cyclical, the following section will elaborate on the paper's approach to its data and its use of theoretical coding to better understand any nuances that may have emerged.

3.2 Semi-Structured Interviews

According to Kallio et al. (2016), qualitative research that adopts semi-structured interviews (SSIs) has to follow certain phases in order to create a comprehensive guide for its data collection. These are: (1) Identifying prerequisites in relation to the selected research questions, (2) Reviewing and retrieving relative literature reviews, (3) Interview guides formulation and operationalisation, (4) Pilot testing and, (5) Completion of the cohesive interview guides.

In terms of the prerequisites of selecting SSIs, as this paper employs grounded theory approaches to probe the various roles aquariums play in social phenomena, SSIs would facilitate the research by retaining the flexibility of the analysis. Semi-structured interviews permit the interviewer to have a predetermined list of questions, but also allow for the interviewer to ask follow-up questions and explore unforeseen responses. This enables the interviewee to freely express their thoughts and experiences. Besides, data collection and analysis are performed iteratively via grounded theory methods. It is ideally suited to utilise semi-structured interviews as they can be easily used to collect additional data and refine emerging categories and themes in a cyclical manner. Thus, using SSIs as the data collection methods was determined as suited for this very paper.

Several preliminary literature reviews on the second phase of SSIs formation have been conducted in this paper. The various roles that society perceives aquariums to play were

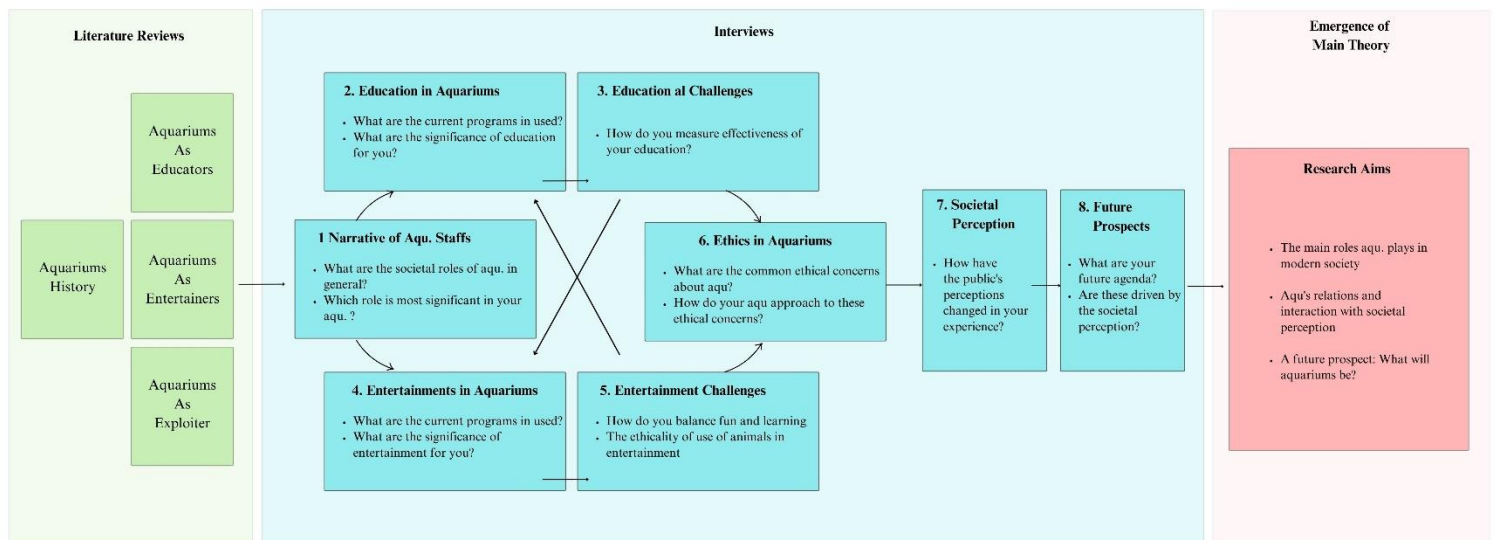
presented, and a theoretical framework was developed for the subsequent data collection. The roles of aquariums as entertainer, educator, and exploiter will be examined separately in order to identify the aquariums' perspectives in terms of the interaction, confrontation, or justification of these perceived roles.

During the design phase of the interview questions, the author adhered to several guidelines. According to McIntosh and Morse (2015), the formulation of the SSIs' questions should follow the rules of *specification*, *division* and *tacit assumption*. *Specification* refers to being clear and precise when posing questions, ensuring that interviewees comprehend what is being asked. The *division* principle entails breaking down difficult topics or questions into smaller, more manageable pieces and assuring that question stems are appropriately phrased and arranged so that they can be communicated easily. In the context of this paper, the distinction between questions referring to the different roles of aquariums (entertainer, educator, and exploiter) as distinct domains will be clearly addressed. Finally, the *tacit assumption* principle, or to address the potential assumptions and biases that both parties may be carrying. Priority will be given to ensuring the neutrality of the questions' wording, avoiding aggressive and judgmental language, and creating a comfortable environment for the interviewees when formulating the questions.

As the detailed questions for this paper were being developed, a pilot test was conducted to assess their viability and make any necessary adjustments. The participants included the author's thesis advisor, who reviewed the overall academic applicability and validity of the questions, and the author's acquaintances at a museum/ocean-themed park, respectively. In consideration of the interviewees' demographics, these acquaintances of the author were chosen to conduct the pilot testing because they share a similar background and knowledge to the intended participants; this is to ensure that the feedback received is applicable to the full study. After careful review and testing of the interview questions, a final version of the SSI questions was constructed (see appendix 1.)

As the interview questions were designed, a proposition map was also created in order to visualise the flow and intended missions of this grounded theory research (Figure 1)

Figure 1: Grounded Theory Method Proposition Map



3.3 Demography

Understanding the exact number of aquariums in the world is difficult due to the fact that aquariums may exist in various forms. According to the statistics of the Association of Zoos and Aquariums (AZA, 2022), its accredited members in 13 countries include at least 67 facilities, despite the fact that their types include aquariums, zoo-aquarium fusion facilities, theme parks, and science centres. The Alliance of Marine Mammal Parks and Aquariums (AMMPA, 2023) has granted membership to 69 facilities in 17 sovereignties, including amusement parks, dolphin interactive programme providers, and aquariums. As per MarineBio (2017), an online community for marine biologists and conservationists, there are at least 200 aquariums in the world, including both publicly-owned and privately-franchised aquariums.

Aquariums also exist in different scales. Such as the Guinness world record holder for the largest aquarium, Chimelong Ocean Park in China, a total of 48 million litres of water tanks are incorporated into a largescale theme park with roller coasters and firework performances that attracts 10 million visitors annually (Guinness World Record, 2014; Ong, 2017); to a miniature aquarium, the Akvarij-Terarij v Mariboru, located in the City Park of inland Slovenian city of Maribor, has welcomed only 50,000 visitors annually since 1956, displaying 170 different species in its 39 tanks, including a special exhibition of the Adriatic creature and venomous reptiles (Akvarij-terarij Maribor, 2023).

As there is no clear indication of the actual size of the research's target population, the

sampling technique for this work was designed to follow a set of criteria. Due to the study topics, it was considered that interviewing aquarium personnel would be appropriate in order to gather their viewpoints on the roles aquariums play in society. As a result, the research samples are allocated the following criteria:

- A full-time employee of the selected aquarium.
- Participate in the management and decision-making of aquariums.
- Familiar with their aquarium’s operational conducts, priorities and agendas.

The data collection period stretches from 1st of May to 15th of June. The participants were chosen randomly via the email invitation that the researcher has sent, either through the aquarium’s general mail address, online inquiry form of their website, or directly through the specific personnel’s mailbox if the information was available. 67 invitations were sent, 12 responded with the interests of participating and 10 interviews were conducted at the end. (Haus des Meeres Vienna and National Malta Aquarium initially agreed but cancelled the interview during the communication.)

All interviews were conducted through an online platform due to the constraint of the researcher’s physical location. Upon the completion of the data collection, 10 individual interviews were conducted with 10 aquariums from different global regions. Prior to each interview, each participant was also asked to fill in a short online survey, which consists of questions that help the researcher better understand the demographical data such as the position of the participants, years of experiences, operational type of the aquarium (public and private), and customer base...etc. The aim of this pre-interview survey is simply assisting the researcher in acquiring accurate data that represent the participants accordingly. And perhaps these data would also contribute insights in terms of how their distinctions might later influence the interviewee’s responses.

Table 1. List of the Interview Participants

No.	Name	Location	Remarks
1	National Marine Aquarium	Plymouth, United Kingdom	
2	Kotka Maretarium	Kotka, Finland	Finnish Baltic Sea specialised

3	Aquatika Karlovac	Karlovac, Croatia	Freshwater aquarium
4	National Museum of Marine Biology & Aquarium	Pingtung, Taiwan	
5	Pula Aquarium	Pula, Croatia	
6	Cairns Aquarium	Cairns, Australia	
7	Bermuda Aquarium, Museum & Zoo	Flatts Village, Bermuda	97-years-old zoo/aquarium hybrid
8	Two Oceans Aquarium	Cape Town, South Africa	
9	Odysseo Oceanarium	Port Louis, Mauritius	
10	Seahorse World	Tasmania, Australia	Seahorse specialised

Four of the ten aquariums that participated in this study are located in Europe, two in Africa, two in Oceania, and one each from Asia and North America (Table 1). Initially, the author intended to collect data from each of the regions across the globe. However, it has been observed that the willingness of Asian and South American aquariums to join is relatively low. This is believed to be due to the language barrier that occurred during communication, making it difficult to reach aquariums that may be interested in joining.

Table 2 Aquariums Types

No.	Ownership	Ttl. Volume of Water (in mil. litres)	Ttl. No of Species	Visitor Base
1	Private	4	300	Regional
2	Public	0.7	60	National
3	Public	0.3	80	National
4	Public	16*	608	National
5	Private	0.55	300	International
6	Private	3	150-200	National
7	Public	1.04	162	Regional
8	Private	6	256	Regional
9	Private	2	200	National
10	Private	0.4	41	National

*Approximate volume. Unit provided in tonne, thus requires author's own conversion.

It was also interesting to see the diversity of aquariums in terms of their demographic composition, which included aquariums of varying sizes, visitor bases, specialisations,

etc (Table 2). Most of the aquariums that participated in the interview were privately owned. The author used numbers such as total volume of water, total number of species, and visitor type to determine the scales of the aquariums. The Taiwan National Museum of Marine Biology and Aquarium is the largest aquarium joining the research, with more than 15 million litres of water used in its three buildings to house 608 species of marine animals. The establishment with the smallest presence was Aquatika Karlovac, a freshwater aquarium in the centre of Croatia. It contains only 0.3 million litres of water and 80 species, all of which are indigenous to the nearby freshwater ecosystem.

Table 3 Participants' Demographic

No.	Roles in the aquarium	Position	Years in the Industry
1	Education Dept.	Managerial	10-20 years
2	Administration Dept.	Managerial	>20 years
3	Administration Dept.	Managerial	10-20 years
4	Education Dept.	Operational	>20 years
5	Science Dept.	Managerial	>20 years
6	Education Dept.	Operational	10-20 years
7	Administration Dept.	Managerial	>20 years
8	Sustainability Dept.	Managerial	>20 years
9	Science & Education Dept.	Managerial	>20 years
10	Science & Education Dept.	Operational	5-10 years

In terms of the interviewees, their detailed personal information was also recorded in order to determine whether their distinctions could subsequently influence the responses (Table 3). This includes their roles within the institution, their current position, and their years of experience in the aquarium industry. Five of the ten interviewees are from the education department (school engagement, community engagement, and marine literacy), followed by three each from the administration (marketing, curating, sales, and public affairs) and science departments (animal care, biology, research, and husbandry). Additionally, the presence of a sustainability department was observed and individually noted. The majority of interviewees have over 20 years of experience and are in a managerial position. This is because the invitation sent implied the preference of participants to be “involved with the decision-making process” and “familiar with the aquarium’s current conducts, priorities, and agendas”, which reflects on the ultimate demographic data with more participants having senior experience and managerial roles.

3.4 Theoretical Sampling & Coding

The coding processes are the most crucial aspect of the grounded theory method, as it enables the emergence of the nuances of social phenomena through a series of rigorous coding. As SSIs become the primary means of data collection, it is crucial to process and analyse the extracted data, in this case the narratives and words of the aquarium staffs in response to the various roles their aquarium plays. These words necessitate processing, which is itself a form of analysis. The initial phase of data analysis entails familiarising oneself with each conversation by looking for individual perspectives and language nuances (Daengbuppha et al., 2006)

In addition, the data will be ordered chronologically by event in order to maintain an iterative and cyclical coding process. Each time when an interview is conducted, the open coding will be used to analyse and identify the discrete concepts. When additional data are extracted, these coding results will be used and compared, and they will serve as the foundation that is continuously reviewed, regrouped, and adjusted in order to uncover the hidden theme and pattern within the data. This latter stage, also known as axial coding, aims to generate a tentative statement and introduce additional subcategories and potential paradigms. Once all the intended data have been collected, it is expected that a 'core category' will be identified and serve as the research's central theme. This is the process of selective coding, which can facilitate the integration and development of the final conceptual framework, thus permitting the research questions to be answered and theorised.

The interview data are extremely valuable as they represent the direct narratives of aquarium staff members. Despite the fact that only 10 interviews were conducted, the outcome was quite substantial and produced intriguing speculation for additional analysis. As the coding process in practice, intriguing nuances have been spotted along the process. The following table (Table 4) can be seen as an example of how the coding process was conducted for this research. Each of the interview questions was conducted similarly, until the end of data collection, a selective coding was conducted to identify the unique theme as the core category that will later help the emergence of the conceptual framework.

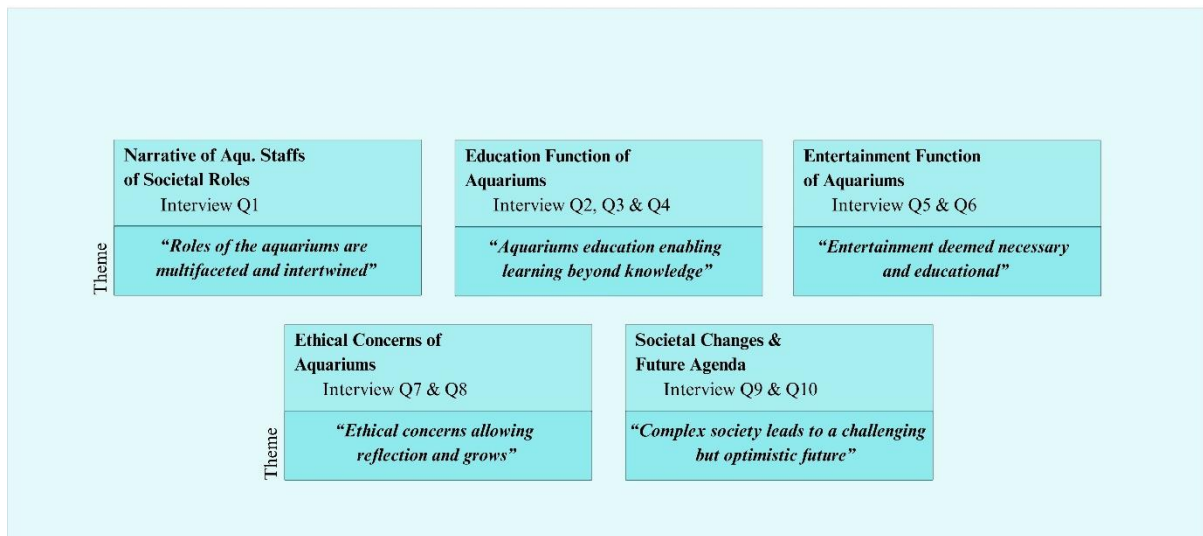
Table 4. Coding in Practice of Interview Question “What are the general societal roles of aquariums?”

Open Coding (No. of the participants)	Axial Coding	Main Theme
Visitors learn about animals (1); Inform public what we have in our nature (2); Get to know the wildlife in urban surroundings (3, 8);	Education - Knowledge Based Learning	
Encourage engagement with natural world (1); Represent the wildlife (3); Bring animals to view to people that normally would never see them (7)	Education - Nature Connectivity	
Established as biological association for scientific research (1); Conducting science research to expose the secret life of underwater (4);	Education - Research	
Set up to drive conservation (1); Involve directly in conservation projects (9);	Conservation - In Practice	Roles of the
Create awareness and respect (5); Let visitor care about nature (6)	Conservation - Awareness	aquariums are
Inform about what everyone can do in everyday life (2); Focus on action and behavioural change on the population (9)	Conservation - Behaviour	multifaceted and intertwined
Let people have fun (1); Creating excitement (7); Social Connection (8)	Entertainment - Sentiments	
Develop tourism (2); Become major attraction of the destination (7); Attract tourists by entertainment (9)	Entertainment - Tourism	
Work is funded in part by people paying to come in (1); Make profit to generate more education and conservation (9)	Profit	
Engage charity work (1); Good example for the use of EU funds (3)	Other	

Chapter 4 Findings & Analysis

Following the coding procedure, several codes have emerged as the main themes of the study. Corresponding to each of the five interview sections, five themes were identified as the core notions that arose from the staff’s narratives (Figure 2). This chapter examines in depth each of the unique themes identified by the author in order to comprehend how these themes emerged across 10 participants from around the world, as well as their correlation and application to the emergence of the final conceptual framework.

Figure 2: Emerged Themes of the Interviews



4.1 Intricate Roles of Aquariums

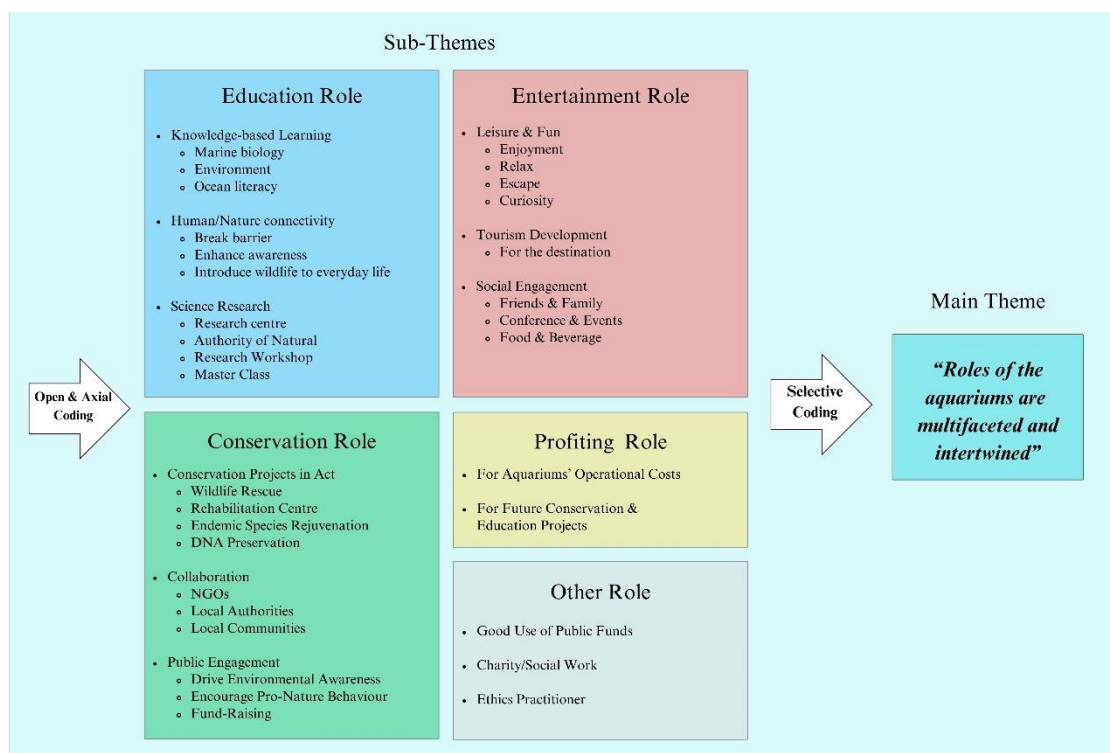
According to evaluations of the relevant literature, the primary societal functions of aquariums are to educate and entertain the public. Such as using aquatic life as a selling point to develop regional tourism or adopting educational messages to diversify aquarium businesses’ offerings (Packer & Ballantyne, 2010). On the other hand, the advocacy of environmental activists or organisations occasionally raises questions regarding the ethics of aquariums. The author has therefore predetermined that the inherent social functions of an aquarium will nonetheless always involve education, entertainment, and ethics. However, it is intriguing to learn that, according to the aquarium’s staff members, they may have viewed their societal roles as far more intricate and complex than these literature reviews indicated.

At the very beginning of the interview, the participants were introduced to their first question of *“How would you describe aquarium’s general roles in society?”* (Q1) The interviewer encouraged the participants to approach their responses from a broader perspective, indicating that their answer in this regard is not limited to their institution but

to aquariums worldwide. This method was also based on the guideline of Kallio’s (2016) in terms of conducting and commencing a semi-structured interview, in which an open question was recommended to be posed at the outset as an icebreaker between the interviewer and the interviewees. As the later phase of the interview requires interviewees to openly discuss their perspectives on challenging topics such as the use of animals in entertainment and ethical concerns in aquariums, the use of an ‘ice-breaking’ question appeared to effectively engage the participants and reduce their potential nervousness.

Despite being the very first section of the data collection, this question yielded the most diverse set of responses, even after the authors had performed axial coding. This is likely due to the open nature of the question and the encouragement to answer beyond participants’ own aquarium. 10 aquariums provided 33 distinct responses regarding the roles they perceived that aquariums are playing in society. These responses were subsequently categorised according to five axial codes: **Education**, **Conservation**, **Entertainment**, **Profiting**, and **Others**. (Figure 3)

Figure 3. Sub-themes of Q1: Aquarium’s own perceived societal roles



The selective coding phase of the coding procedure has determined that the following set of responses all share the same theme of: *“Roles of the aquariums are multifaceted and intertwined”*. There are two main reasons for selecting this theme. First, there is a large deal of variation in participants’ responses, yet it is still possible to identify a pattern and classify each response into one of the five categories. For instance, the responses of *“it’s very important for Finnish people to know what we have in our nature”* (Participants 2.)

and “*We bring animals to view to people that normally would never see them*” (Participants 7.) may appear to address two drastically different directions. However, both aquariums elaborated in their interviews that in order to fulfil these roles, proper education was required. Consequently, the decision was made to label both of these responses as **Education**.

Second, many of the responses contain multiple concepts that can be categorised. To put it simply, even when the staff members were defining the roles of their own aquarium, they might have taken into account the interrelated nature of their work. For instance:

“The roles of us are that we need to present marine life to the people who are coming here, we need to change (people’s mindset) in the conservational portion. You need to also do some research because we have the resources to do that” (Participant 5.)

“We want to educate the local population and the visitors that came from abroad on the topics related with the marine environments or challenges and again, to inspire people to take actions.” (Participant 9.)

Both of the aforementioned responses contain elements that can be incorporated into the **Education** and **Conservation** codes. As there is no precise boundary between these codes, the interdependence and complexity of these roles must be acknowledged. In the meantime, the author kept in mind that the codes were used exclusively to facilitate the coding process of the grounded theory approach, and that one’s focus should be on the emergence of the final theme and how it would be connected to the responses of the 10 participants. To further demonstrate the complexity of the societal roles of aquariums, the following examples illustrate how the author categorised the responses based on their similarities. From the category of **Education**, to which all ten participants responded with such a notion, this was the role that aquariums perceived themselves to play the most prominently. Some of the responses from this category includes:

“It’s connected with the desire of communities to get an unofficial education about nature and wildlife.” (Participant 3.)

“We teach people about the animals. The more that people understand the more that they’ll care about the animals in the end.” (Participant 6.)

“We also work with some universities around Australia for some scientific study and research about the native seahorses.” (Participant 10.)

“Aquariums are one of the institutions that have the highest credibility selling the information related with the environment.” (Participant 9.)

The above responses were initially coded as ‘*Knowledge Learning*’, ‘*Human/Nature Connectivity*’, ‘*Science Research*’ and ‘*Credibility/Authority*’. During axial coding, it was determined that the aquariums’ defining characteristic among these responses was their educational function. Because of education functions the aquariums were able to expand their roles into more distinct directions.

The presence of the code **Conservation** as the second most common response from interviewees, with eight out of ten aquariums responding with the concept of conservation, is another significant finding of this section. In addition to being significantly intertwined with education in some instances, Conservation frequently stands out as the most prominent answer in many responses. During the initial phase of open coding, several labels were assigned to these responses. For example:

“Aquariums have lots of information about water protection and what everyone can do in everyday life so that we don’t pollute our waters and nature anymore” (Participant 2.) (Coded as *Raising Awareness*)

“What we mostly do is very much around education and getting people to be aware of what they can do in terms of conserving the ocean” (Participant 8.) (Coded as *Encouraging Behaviour*)

“For sure we would have conservation, not only about the actions that you tried to transpire people to take, but being involved directly in conservation projects” (Participant 9.) (Coded as *Encouraging Behaviour & Ongoing Projects*)

In a later phase, these responses were regrouped under the term of **Conservation**, as they all implied, directly or indirectly, a desire to protect or preserve the marine environment. Despite the fact that their approaches may vary, such as adopting direct conservation initiatives, encouraging visitors to take action, or spreading environmental awareness within their displays, they all share a commitment to conservation. In the end, it was determined that **Conservation** was the overarching theme of all of them. It was also noteworthy to realise that although conservation has been identified as one of the major themes emerging from the aquarium’s own narratives, it was not the author’s primary focus when conducting the literature reviews. Primarily in part to the fact that marine conservation frequently involves environmental, scientific, and biological aspects, the author, who is a tourism-major, overlooked that aquariums also play an important role in society in terms of conservation.

Seven out of the ten participants’ responses included codes for **Entertainment**. Indicating that entertainment is a vital component of the majority of aquariums’ self-perceived roles,

despite the tendency for aquariums to characterise entertainment as less prominent or a lower priority for their institution at the outset of the interviews. It has been observed that the Notion of Entertainment focuses on three subcategories: the emotional factor, the tourism factor, and the historic factor, with the majority of them focusing on the emotional factor that aquariums can employ in their operations. Fun, relaxing, and socialising were documented as keywords to demonstrate that the emotional factor has become the primary reason aquariums serve as entertainment venues.

“Some people visit aquariums to learn about animals, some just for a fun day out”
(Participant 1.)

“I believe that the majority of the general public come to the aquarium for their purposes of leisure, feelings and experiences” (Participant 4.)

“Aquariums are not only connecting people to nature and the ocean, but allowing people to escape to the outside and get away from the urban busyness. There is also a place for people, families and friends to connect. We are the places where families can take their children just for fun outings” (Participant 8.)

In terms of tourism factor of entertainment role, it was primarily mentioned by the participants of how an aquarium could contribute to the local tourism development (participants 3); and from a historical perspective, some aquariums acknowledged that entertainment used to be the primary focus of their societal role, whereas in recent years a shift in focus was observed and led aquariums to employ a stronger presence of education and conservation roles. (Participant 6. & 7.) Nevertheless, **Entertainment** was identified as a significant role that aquariums undertake; their perspectives on adopting entertainment and its relationship to education/ethics will be discussed in a subsequent chapter (see chapter 4.3).

Finally, **Profit** and **Others** were coded to several responses as the author found it necessary to address them individually, or just simply they did not fit into any of the aforementioned codes. The notion of profit was captured among 2 of the interviewees. For example, *“Aquariums promoting conservation through education and research, and that work is funded in part by people paying to come in”* (Participants 1.) and *“profit here is different from other business, as we can make profit to generate more education tools, more conservation and scientific projects.* (Participants 9.) Both aquariums elaborated that the societal roles of aquariums involve the function of generating revenue and to be financially self-sustained, and further enabling future projects such as education and conservation to take place. In terms of the code of Other, the responses include aquarium as a charity (Participants 1.), aquarium as ethical thinker (Participants 2.) and aquarium

as a good example of the use of public funds (Participants 3.)

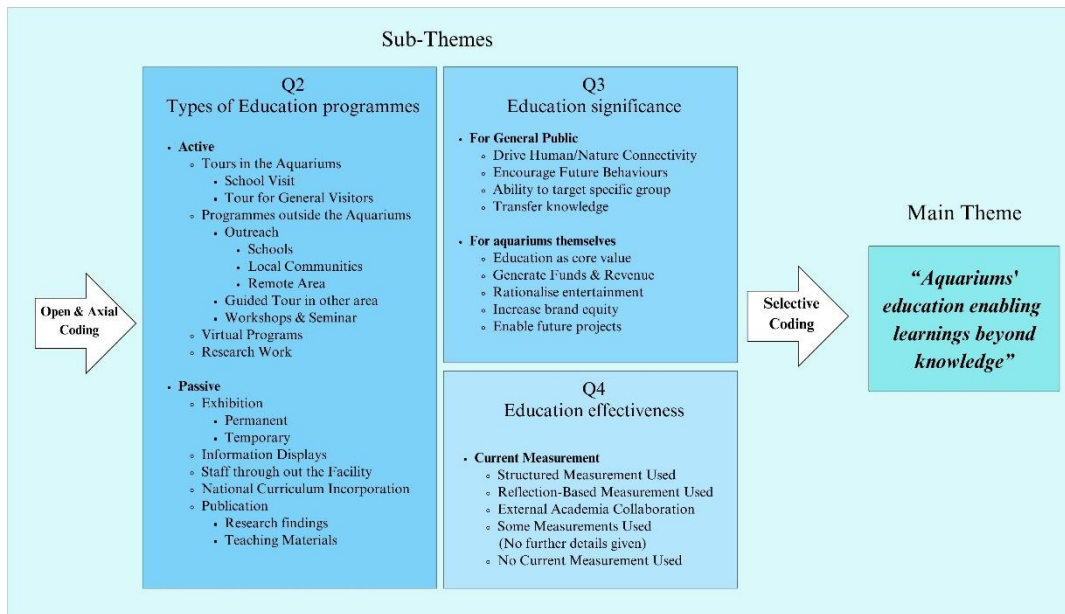
In a nutshell, while education emerged as the most prominent role at the very beginning of this research interview, it was surprising to learn that it is closely intertwined with conservation and significant emphasis on entertainment. While understanding the nature of aquariums' roles are multifaceted and intertwined, the discussions went beyond the predetermined codes, reflecting the complexity and interdependence of the societal roles of aquariums. By acknowledging and embracing this complexity, aquariums can navigate ethical challenges, enhance their self-reflection, and continue to contribute to society's evolution, raising the compelling question of how aquariums have positioned themselves in terms of education, entertainment, and ethics?

4.2 Education as the Core Value

Several questions were posed to the interviewees during the interview regarding the educational role that aquariums serve in society. The questions were divided into three sections. At the outset, the question of "*What are your current educational programmes?*" was posed. This allows participants to introduce their existing educational offerings, which may include onsite, outreach, or virtual programmes. The second question that was addressed was "*What are the significance of these education programmes for your aquarium?*", as the aquariums participated were asked how important these educational programmes are to them and why. The final question in this section refers to the previous literature review, which suggested that education in aquariums faced the challenge of measuring effectiveness (Adelman et al., 2000; Ballantyne & Packer, 2005); The interviewer addressed this issue in two manners, according to the flow of the interview. Some participants were asked "*What are the current approaches or measurements used to track the effectiveness of your educational programmes?*" and some were asked "*How do you prolong the learning effectiveness of your education to the visitors' daily life?*". Both questions addressed the challenge of education effectiveness, and their purpose was to identify what approaches aquariums may have implemented, or if they had not, their interaction and narrative regarding this issue.

During the selective coding, it was determined that the sub-themes in all three questions of the educational section share the main theme of "*Aquariums' education enabling learnings beyond knowledge.*" (Figure 4.) This theme was deemed ubiquitous, as all three questions pertaining to the educational section of the interview touched upon it to varying degrees. Subsequently, it was determined that this theme best describes the current approaches and relationships between aquariums and their education function, as arose from the 10 participants across the globe.

Figure 4. Sub-themes of Q2-Q4: Education roles in aquariums



First, it is enthralling to examine the educational programmes implemented by our ten participating aquariums (Q2). In a detailed categorisation, these programmes were classified as either active or passive educational tools, based upon how they addressed their audience. The most frequently mentioned active educational tool is ‘*school visit*’, with eight out of ten participants mentioning such programmes, which typically involve specific educational institutions (schools) to participate in a prearranged guided tour of the aquarium. As they observed, the majority of aquariums believe that school visits are the primary focus of their educational programmes, as these types of activities correspond with the most important learning agenda. In particular, the following participants made comments regarding educational visits to aquariums:

“We have guided tours for school children, children in daycare and for the adult groups. For school children we always say that it’s very important to take guiding, because some fish species are so small that you don’t notice them, and we can tell a lot of stories about our fish ... It is very important to tell what is happening and what (the kids) can see but can’t understand why fish behave in this way.” (Participant 2.)

“We also have an amazing education program for school students with a particular curriculum and a workbook. Depending on what level they are, whether they’re little ones to year 12 in between ... with their education book and we actually do a proper school curriculum education” (Participant 6.)

Despite the fact that the importance of adopting school visits can almost universally be observed through the majority of aquariums, other active programmes mentioned by participants include school outreach programmes, general tours for visitors in their facility,

workshops and seminars, scientific research work, summer camp, and guided tours to natural settings. It is intriguing that aquariums do not limit their educational programmes to students in school alone. The majority of participants mentioned their education beyond the typical school-based programmes, with many also involving the general public, the local community, or even other aquariums. Participant 1 mentioned, for instance, that their aquarium's education work was divided between two supervisory positions: school programmes manager and public and community engagement manager. When asked to characterise the distinctions, participant 1 stated: "*We tend to describe the difference as formal and informal learning.*" As the division of the work is typically divided with or without the participation of another academic institution. "*But we're essentially the same team. We are very keen to advocate that learning should be experiential. For some people, it's great to learn from a textbook or ... the opportunities of snorkelling out in the ocean. (The education team goal is) to give people immersive experiences and (we believe) learning doesn't have to just be academically.*"

In addition, it was crucial to note that many of the aquariums' later-mentioned educational functions were classified as passive programmes, which entail primarily information displays without staff participation. This includes permanent and temporary exhibits, signs and information displays, publication of research results, and educational materials for external educators.

When aquariums were asked the significance of the education in their facility (Q3), their responses are where the main theme of the "*Aquarium education enabling learning beyond knowledge*" most reflected from. All responses can be broadly categorised into two types: the importance for the general public and the importance for aquariums themselves (Figure 5). Contrary to the author's prediction, which assumed that knowledge-based learning would be the most prevalent motivating factor for education in aquariums, only three participants cited '*transferring knowledge*' as the reason why their education is important.

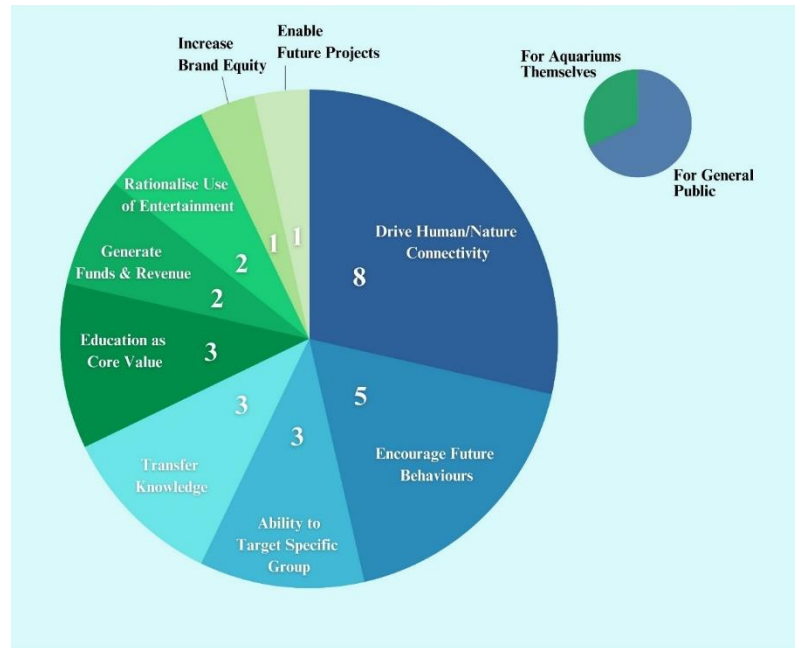
However, '*drive human/nature connectivity*' was the most popular response, cited by eight of the participants in their narratives. This may imply that education in aquariums has a far greater significance than traditional knowledge-based learning agendas in connecting humans to the natural environment. According to some of the participants, education in aquariums connects humans to nature in multiple ways:

"Education in aquariums allows emotional intellectual and physical relationship with the ocean and doing things that are beneficial and supportive ... if we can bring our teaching into schools, then it means that we're reaching people who don't necessarily have an interest in the ocean" (Participant 1.)

“Education itself is hard to be profitable, but why are we still doing this? Because the value of letting people understand the ocean and further changing their behaviour is way beyond revenue” (Participant 4.)

“I suppose you give them a better idea of what Tasmania are made up of in the marine environment. Instead of wine, grapes and cattle products and stuff like that. We also have some awesome marine environments and animals in the water” (Participant 10.);

Figure 5: Aquariums’ Narratives of the Significance of Their Education Programmes



Aquariums seek to bring humans closer to the ocean for multiple reasons, as demonstrated by the preceding example. For instance, to provide a glimpse of marine life to those who may not normally have access to the ocean, to comprehend and further encourage people’s behaviour, or simply to inform locals about their surrounding environments. In most aquariums, the goal of education is to tear down barriers between humans and nature and introduce people to the ocean. One might claim that this is what distinguishes aquarium-based education from traditional classroom-based education, as well as its most significant contribution to society.

The significance of education in an aquarium for the general public also included the capacity to promote future pro-environmental behaviour and the ability to target specific groups (e.g., young students, college professionals, or senior citizens). Aquariums also approached this question from the perspective of why education is important for their own institution, as opposed to the responses that primarily focused on education’s significance for the general public. Responses included: education as a fundamental value, education’s contribution to revenue generation, and education as the justification of the

use of entertainment. Two aquariums responded that education is the main rationale for the use of animals in entertainment contexts. This leaves an interesting remark for a later chapter (chapter 4.3), which will explore the entertainment functions of aquariums. To quote participant 8:

“As a facility, (we come across) more and more realisation of you can’t just keep animals in captivity for leisure activities and fun ... if we were just a fun visit with no education aspect then I certainly wouldn’t work here. Education is very much around the reason why we exist.” (Participant 8.)

Lastly, when the education function of the aquarium was mentioned to the participants during their interviews, it was in reference to the challenges of maintaining the effectiveness of learning within an aquarium environment. Participants were asked what type of measurement they employed to gauge the effectiveness of their visitors adhering to their visit (Q4). If not, how would they react if such challenges were posted to their institution in the future? The responses were subsequently organised into two sections: the current methods used, in which types of measurement will be identified in terms of how aquariums measure the efficacy of their education programmes, and their responses to the need to measure effectiveness. It was intriguing that the main theme of *“Aquarium education enabling learning beyond knowledge”* could still be observed among the responses and continue to contribute to the development of the final conceptual framework.

Four aquariums (Participant 2, 5, 6, and 7) use a reflection-based measurement to track the effectiveness of their education; that is, they use tools such as questionnaires, follow-up emails, or surveys to directly understand and identify the learning that has occurred among their visitors. This was subsequently determined to be the most prevalent and perhaps the most intuitive approach for smaller-scale aquariums to adopt, as no extensive academic research is required and aquariums can easily monitor their visitors’ knowledge through direct communication. However, it may be difficult to maintain the validity or applicability of these approaches if a less rigorous structure is adopted, and their contribution to the future enhancement of the aquariums may be limited.

Two aquariums (Participant 1 and 9) adopted a structured measurement, both of which appear to have gone beyond the reflection-based measurement by employing a more rigorous and possibly academic-based structure. Participant 1 stated that so-called *Generic Learning Outcomes* (GLOs) served as the primary metric for measuring the learning effectiveness of their aquarium. Commonly, institutions such as museums and libraries use GLOs to evaluate the learning that has occurred through their institution (Brown, 2007). The metric employs 5 indicators to track the learnings that occurred,

namely acquisition of knowledge, attitudes and values, behaviours and acts, skills, and enjoyment and creativity. To comment on their approaches: “*What we’re doing is capturing the intention to change behaviour rather than evidence that behaviour has changed ... what we’re trying to do is encourage the adoption of behaviours that people will take with them for a lifetime.*” (Participant 1.) Similar to the aforementioned method, participant 9 cited interview-based data collection regarding the learning effectiveness of their visitors. In addition to inquiring about the learning itself, the aquarium probes the emotional factor by asking visitors what emotion they experienced during their visit. A set of emotional indicators, both negative and positive, were also employed to further make sure the actual emotions occurred can be captured. It was stated: “*we know that people will learn, and the emotional element is very important on the learning process and on the behaviour change process.*” (Participant 9.)

With the GLOs or emotional indicators adopted by previous participants, both methods embody the concept that recognising the learning that took place in the aquarium should extend beyond the traditional knowledge-based learning agenda. It was also an indication that some aquariums already have this concept in mind, which can assist them in enhancing the efficacy of their educational programming and optimising the learning outcomes and societal benefits that aquarium education can provide. Regarding the remaining participants, two of them collaborate with external academia (typically local universities) to track learning effectiveness; one aquarium mentioned that some degree of measurement might be taken, but no details were provided (not the interviewees’ line of work); and one aquarium acknowledged that no current measurement was performed, but that the intention to create such a measurement was discussed internally.

To sum up, aquariums’ educational function exemplifies their adaptability and flexibility in meeting the needs of contemporary society. From understanding aquariums’ self-perceived educational role and the interactions or approaches aquariums use to optimise the value of their education, it is possible to claim that aquariums themselves are repositioning the education they provide. It is enthralling to imagine a future for aquariums in which the role of education only grows in significance. The complexity of incorporating education into institutions such as aquariums will not only necessitate a transformation of the aquariums themselves, but also permit the creation of larger value.

A conclusive theory regarding aquarium education has emerged. Alongside the main theme of “*education in aquariums enabling learning beyond knowledge*”, the concept of ‘free-choice learning’ was found to be congruent, while its relevance will be later introduced and discussed in greater detail (chapter 5.1)

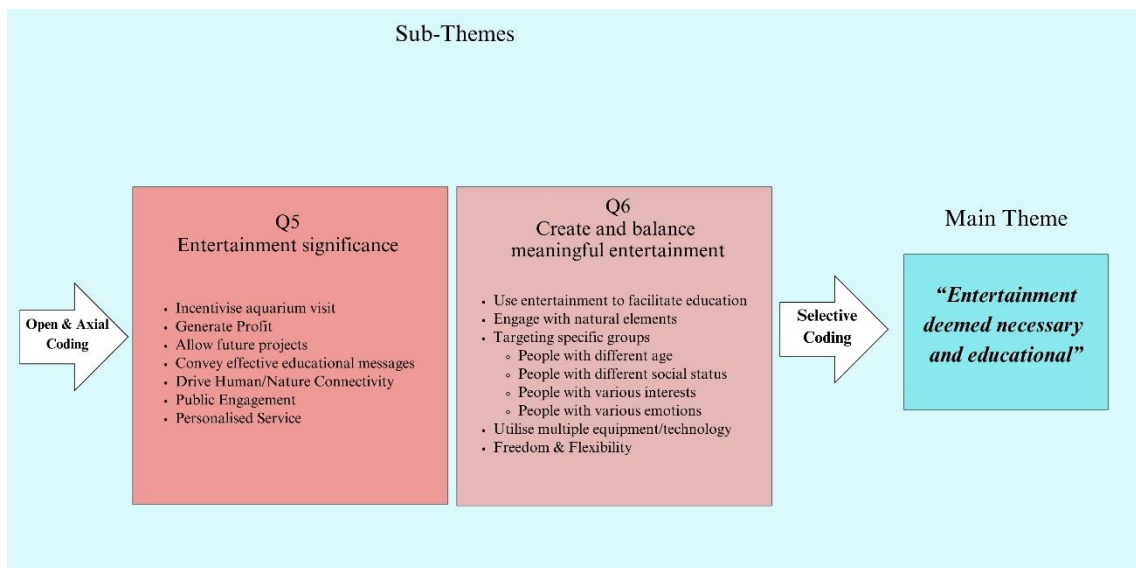
4.3 Entertainment as the Facilitator

The incorporation of entertainment into aquariums is becoming an integral component of the institution. However, it serves as a double-edged sword, raising concerns and posing challenges while also attracting visitors and generating income through entertainment value. In the third section of the interview, the author asked questions that directly addressed aquariums' entertaining aspects. Similar to the education section, this section began with the query "*What is the significance of having entertainment programmes at your facility?*", in order to determine the significance of these programmes for the interviewees. The second question was "*How do you create and balance meaningful entertainment programmes?*", mainly focusing on the previously found literature review suggesting entertainment factors in aquariums are facile and devoid of the other messages (Davis & Strandvad, 2020; Ong, 2017). While ethical concerns regarding the use of animals in entertainment frequently spark debates as to whether aquariums can be justified.

In contrast to the preceding section, however, the interviewees were not asked about the different types of entertainment programmes employed in their facilities for two reasons. For the first, a number of participants have already mentioned leisure or recreation-related programmes or activities when describing the educational programmes they implement. The second reason is that, in contrast to educational programmes, many of these entertainment features were frequently visible on aquariums' official websites or social media, allowing the author to readily observe the types of programmes that should be considered more entertainment or leisure oriented. As a result, it was decided that the section will begin with a question about the significance of these entertainment programmes. When interviewees required further clarification of what the author meant by 'entertainment', their current programmes that the author has identified to be entertainment prior to the interviews would be given as examples.

Regarding the final axial code found throughout this section, the author has observed "*entertainment deemed necessary and educational*" as a common theme among the responses (Figure 6). This was the central theme that the majority of participants responded either directly or indirectly elaborated on. In contrast to the educational section, in which the responses were diverse and it could be difficult to observe a common theme, the coding process for the entertainment section appeared to be relatively uniform across all aquariums, and the main pattern can be readily identified. This could suggest that many aquariums have similar views on entertainment, from which they perceived entertainment with a shared perspective, and the cause for this could be an intriguing topic for further examination.

Figure 6. Sub-themes of Q5-Q6: Entertainment roles in aquariums



To begin with, aquariums were given the opportunity to elaborate on the significance of their entertainment programmes (Q5). Comparing the responses to the same query addressing the educational significance, as previously stated, a relatively uniform pattern can be observed. 6 aquariums mentioned the responses of ‘*incentivise aquarium visit*’ and ‘*generate profit*’, which are the most prevalent. These represent the most common narratives as to why entertainment matters to the aquariums. The author found out that a similar orientation can be identified as both of the responses focused on the capability of entertainment to encourage visitation. Additionally, they both implied that aquariums have an inseparable relationship with entertainment, as it is essential for the operation’s survival.

The response of ‘*incentivise aquarium visit*’ centres on how entertainment can attract the attention of the general public and encourage them to visit aquariums. To quote from several participants:

“Our main goal in the first five years was to attract as many tourists as possible, ... not everybody is interested in watching fishes but some are interested in arts, music or sports activities and we combine them all together in this specific and very attractive public space” (Participant 3.)

“People are attracted by beauty. If you don’t have a beauty element, it’s very hard to bring people to them. And beauty can lead you to love and love can lead to protection ... And once people are inside of the aquarium, they will be flooded with not in quantity, but there’s much quality of educational elements that eventually can have an impact on people.” (Participant 9.)

“We showcase here something pretty much unique to Tasmania or even unique to the world ... There are a lot of selling points or entertainment values for the general public to visit our facility” (Participant 10.)

The other response of ‘*generate profit*’ emphasises the value of increasing the number of visitors, which contributes to the revenue growth. From the responses, the growth of revenue is very essential for the survival of the facility, as some aquariums mentioned that that are privately owned or received little funds by the public sectors. To quote some of the participants:

“We have to make profit in order to survive. After all, aquariums are not simply non-profit charity and no one would be willing to operate with a deficit. Having reasonable profit, not profiteering should be understandable” (Participant .4)

“Aquariums should understand what are their obligation and gaining. Let’s say if you are popular with the people, of course your budget is fulfilled and you can pay all these employees and electricity which is highly used in aquariums.” (Participant 5.)

“In some other aquariums where they charge a visitor \$250 to come in and sit next to a penguin and get your picture taken. What does that person learn? I don’t know ... But entertainment is part of the parcel to how aquariums can operate more efficiently and effectively by bringing in revenue.” (Participant 7.)

Other notable responses regarding the importance of entertainment elements to aquariums include: ‘*Allow future projects*’ (3 responses), in which aquariums describe how their conservation, research, and educational projects are made possible by the revenue and funds generated by entertainment. ‘*Convey effective messages*’ (3 responses), aquariums have observed a tendency of more effective education messages as the visitor’s willingness and initiative to learn strengthens by using entertainment. ‘*Enhance human/nature connectivity*’ (3 responses) is the only code with the identical response when the educational significance was previously analysed. It emphasises the capacity of entertainment to bridge the gap between humans and animals and facilitate understanding and awareness of the natural world.

In general, the codes that arose from the entertainment significance of aquariums all share the concept of “*entertainment deemed necessary and educational*” to varying degrees. It is undeniable that the use of animals for human entertainment frequently raises ethical concerns and is difficult to justify, even though the majority of aquariums claim that entertainment is integral to their very existence. Aquariums cannot survive without entertainment, the absence of which could result in a lack of financial sustainability and

eventual closure. However, aquarium entertainment can be rationalised if it coexists with other aspects, such as education.

Hence, the second part of the entertainment section addresses the issue “*How do you create and balance meaningful entertainment programmes?*” (Q6) This is the basis for understanding how entertainment is effectively and properly utilised and how aquariums interact with entertainment issues and concerns. Notably, this topic was not addressed in 4 of the interviews conducted by the author. During the initial phases of interviews, the emphasis of data collection was on the natural flow of communication, as interviewees were free to explore the topics they were most interested in discussing. The author soon realised, however, that because the majority of participants work in education or science-related departments, there is a prevalent tendency to focus on educational aspects of aquariums and overlook their entertainment value. Due to the interview’s semi-structured nature, the author had the flexibility to modify questions during data collection. By adding question addresses what proper entertainment programmes are for the aquariums, it would allow the author to fill in the blank and explore the entertainment aspect more cohesively. It is important to recognise that the following data was collected from only seven aquariums (Participants 1, 6–10), but its relevance to the overall emergence of the conceptual framework should be regarded as equally crucial and legitimate.

Among all responses, ‘*using entertainment to facilitate education*’ was the most prevalent narrative in terms of creating meaningful entertainment, with five out of six responses containing the notion. This relationship between entertainment and education was viewed by many aquariums as a crucial method for enlarging and enhancing the significance of their entertainment programmes. It is demonstrated in numerous narratives that education was used to convey specific marine knowledge messages to the audience. According to the observations of many aquariums, learning becomes more effective and ingrained in the audience when a ‘fun’ agenda is implemented. The sense of enjoyment, or emotional factors, enables the aquariums’ educational function to achieve broader outcomes. As a result, entertainment is a prominent facilitator to optimise and prolong the learning of many educational programmes with the ability to connect and engage the audience; simultaneously, education creates meanings for entertainment programmes to become more than glamorous advertising strategies that sometimes raise ethical concerns. To quote a few of our participants:

“I like to make sure that my customers are getting the education that I want them to know and that they understand it but also make it fun for them as well so it can go down very well. I can do it in a relaxed, friendly or fun way, but I’m still getting that message across to them.” (Participant 6.)

“I think the trick is, in terms of learning, to look at the different ways in which people learn. Some people experience and learn through reading or watching a video, and some other people learn by using their hands and getting stuck in. What we try to do is look to match the different styles in which people learn and provide different opportunities for people to learn in the aquarium.” (Participant 8.)

“It’s quite clear that when people are in a safe and fun environment, the likelihood and the ability to learn is higher ... Like many times some of the best teachers (in schools) were people with charisma and the ability to tell stories, and involving the topic that they did very well” (Participant 9.)

Numerous aquariums have undoubtedly demonstrated that incorporating entertainment allows education to be more engaging, resulting in enhanced learning effectiveness. In this section of the interviews, it was discovered that entertainment is not only a significant factor in sustaining aquariums financially (as indicated by the aforementioned ‘entertainment significance’ section), but that many aquariums view entertainment as a gateway to meaningful education.

Other responses provided by aquariums regarding how to create meaningful entertainment include: Engaging visitors with the natural elements; Targeting specific groups (ages, interests, social status, etc.); Utilising multiple equipment/technology to create interactivensess; and finally, ensuring programmes to be free and flexible. Their relevance was not discussed in this paper as each of them have only 1-2 aquariums responded with such notion. However, the overarching theme of “*entertainment deemed necessary and educational*” is omnipresent across all responses. Due to the presence of their entertainment programmes, many aquariums were able to connect their audiences with the intended educational messages and facilitate learning. This finding suggests that in the future, aquariums will become more increasingly entwined with entertainment, and aquariums must recognise the significance of adopting an educational message within.

Therefore, it was deemed that the notion of Edutainment is relevant with the narratives of the aquariums. The notion of it will be later introduced (Chapter 5.2) as how a future aquarium could position and optimise their entertainment programmes.

4.4 Ethics as the Stimulant

The ethical concerns and claims that aquariums are exploiters of natural resources were likely the most intense argument against them. Due to the close relationship between humans and animals, the existence of aquariums raises inherent ethical concerns, as demonstrated by a review of relevant literature. Using animals for human purposes was

deemed unethical for a variety of reasons, such as animal rights advocacy and protection of the environment from a variety of perspectives. Consequently, the purpose of this section of the semi-structured interview was to collect data from the aquarium staffs' perspectives regarding ethical concerns and their narratives of interacting with these concerns.

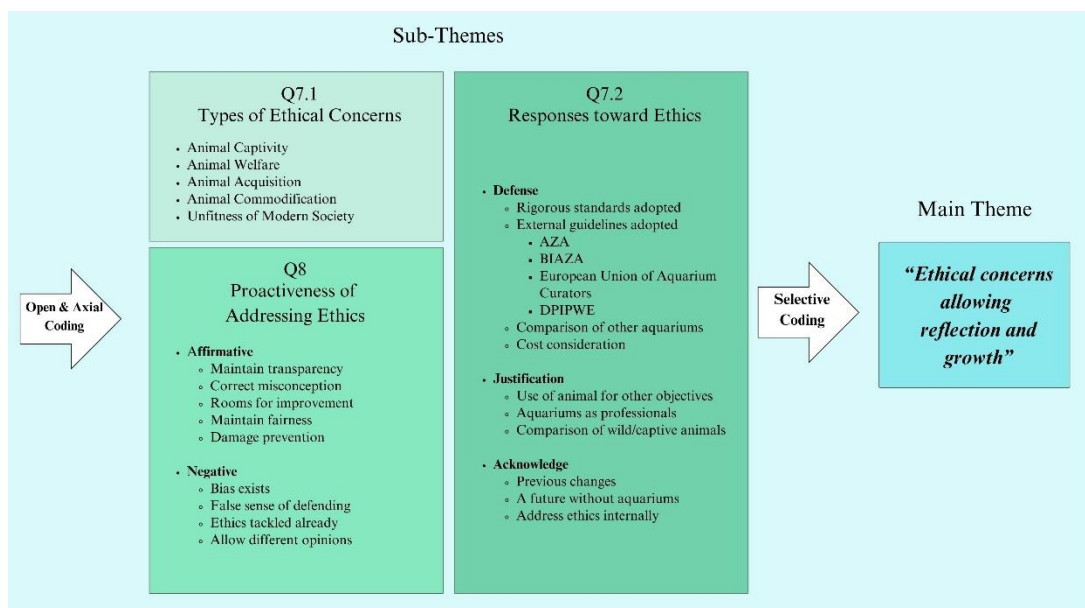
During the interviews, a number of questions were posed to the participants regarding ethical considerations. First, aquariums were asked, "*What are some of the common ethical concerns you have heard about aquariums in general?*" This question was formulated and specified to be applicable to all aquariums in the world. This is intended to encourage aquariums to share as many ethical concerns as they are aware of, rather than concerns that are associated with their institution, as this may cause reluctance to answer the question. The second question was posted as "*How do these concerns apply to your institution? How do you tackle and interact with them?*" The objective was to comprehend the approaches aquariums have taken to address the ethical concerns of which they are aware. Frequently, the question was never even asked, as participants frequently responded to the first questions with their approach to ethical concerns. Lastly, the question of "*Should aquariums address ethical concerns more proactively to the general public?*" The purpose of the question was to collect narratives regarding the relationship between aquariums and ethics and, more importantly, a possible future action of incorporating ethics into the aquarium visitors' experience.

Unexpectedly, the overall responses of the participants to the ethical questions were not as reserved as the author had anticipated. In contrast to the author's presumption that the data collection for this section would be challenging due to the sensitive nature of the topic of ethics, all participants displayed a very active attitude and willingly expressed their points of view. It was believed that it was due to the fact that the initial invitation included a summary of the research in which ethical concerns were highlighted as one of the primary objectives. And throughout the interview, the interviewees were reminded that the purpose of this section was not to judge or criticise their approaches, but rather to gain an understanding of their viewpoints. The overall theme was then identified as "*Ethical concerns allowing reflection and growth*", as a common pattern was observed among the majority of participants across three questions. (Figure 7)

To comprehend the relationship between aquariums and ethics, it is necessary to investigate the awareness of aquariums in relation to ethical issues (Q7.1). In response to the question "*What are some of the common ethical concerns you have heard about aquariums in general?*", aquariums generally perceive four main types of ethical concerns, namely animal captivity, animal welfare, animal acquisition, and animal

commodification. ‘Animal captivity’ was the most prominent response, as all ten aquariums responded with such a notion. It was also the only code that appeared to apply to all ten participants, out of all the codes provided throughout the analysis. It appeared that aquariums as a whole are all aware that the most significant ethical concerns involve keeping animals in an unnatural, artificial environment. Many aquariums stated that, regardless of how realistic or nearly identical their tanks are to animals’ natural habitats, there are always those who argue that the captivity of animals is unethical given that animals are not allowed to live ‘freely’.

Figure 7. Sub-themes of Q7-Q8: Ethical roles in aquariums



“I think that the idea of keeping animals in captivity is contentious for some people and aquariums aren’t exempt from that. I’ve known people who object to keeping animals in captivity, like zoos, aquariums, or even pets in a domestic setting.” (Participant 1.)

“The same ethical question in all of zoological gardens, is it ethical to remove the animal from the natural habitat and put it in the artificial surroundings in order to display it to somebody who has paid the tickets? Should you take a living being outside of their life?” (Participant 3.)

“There are definitely factions of society that view aquariums and zoos as evil places where they put animals in cages or glass bowls, they don’t see the whole picture.” (Participant 7.)

In addition to sentiments of animals not being in their natural environment, animal welfare is another common concern regarding aquariums. Concerns about animal welfare focus on animals’ overall condition, longevity, and health. In other words, aquariums are conscious of concerns that frequently relate directly to the animals’ welfare and living

conditions. Other common ethical concerns are ‘*animal acquisition*’ and ‘*animal commodification*’, with the former referring to the process of aquariums acquiring their collections by capturing wildlife animals, and the latter to the use of animals for profit and human entertainment. To quote a few participants with their responses of these issues:

“There are questions around exhibit size, are animals there being well-fed and well-cared for? Does the exhibit match their environment in which they would normally be found in the wild?” (Participant 8.; coded as *Animal Welfare*)

“People also have many concerns about the sea turtles, without knowing they will be released in two days and yet they think about we keeping the sea turtle. Like, people don’t know there is a difference when you keep an animal 365 days a year, or you’re keeping the turtle for three months because the turtle is sick and it needs to be healed.” (Participant 3.; coded as *Animal Acquisition*)

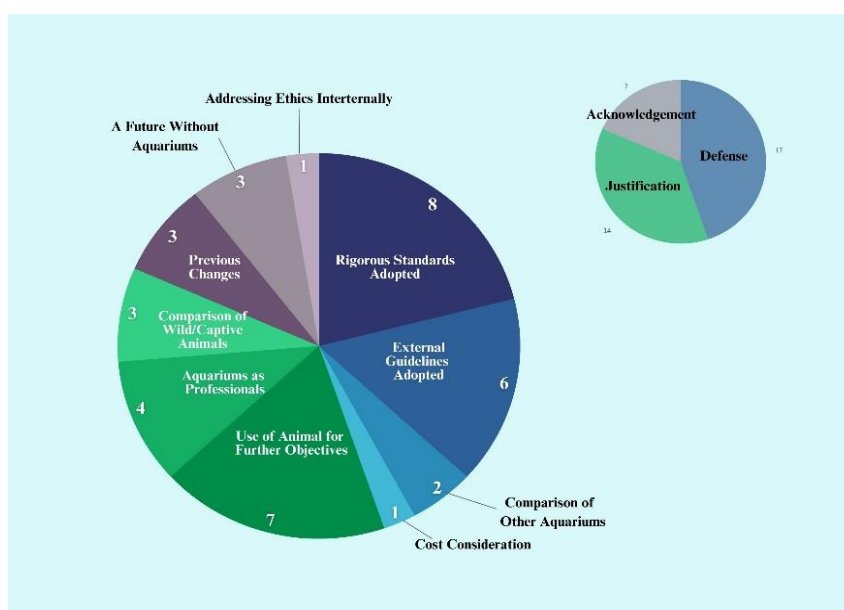
“Aquariums many times are questioned about if they should keep and use the animals for entertainment purposes. I see this in a very straightforward way is that, you shouldn’t use animals if you don’t have at least educational conservation projects” (Participant 10.; coded as *Animal Commodification*)

The aquariums defined the types of common ethical concerns following the first question. It was noteworthy that animal captivity was one of the most pervasive issues that all aquariums, regardless of their size or location, have encountered or been aware of. It was important to understand in which ways that the aquariums interact with these concerns. Therefore, by asking the follow-up question of “*How do these concerns apply to your institution? How do you tackle and interact with them?*” (Q7.2), their responses toward tackling ethical concerns were analysed and put into categories. To begin with, there are 10 different narratives being recorded in terms of how aquariums respond to ethical concerns that might be posted to them. The following figure represents all the categories and the frequency of their appearance. (Figure 8)

In terms of dealing with ethical concerns, aquariums were found to have very diverse narratives to interact with these concerns. With 10 different narratives recorded, 3 main categories were observed. They are **Defence**, **Justification**, and **Acknowledgment**.

Defence being the type of narrative that aquariums used to confront the ethical concerns by elaborating their approaches or standards, essentially denying the accusation of ethical concerns applying to their institution. It was the most typical type of narrative, with numerous aquariums defending their practices as being very different from what ethical concerns were alleging.

Figure 8: Aquariums' Narratives in Tackling Ethical Concerns



For example, the code of *'rigorous standards adopted'* reflects those responses that indicate the aquarium's current operation has already adopted certain standards or approaches in order to ensure that their animal residents are in an ideal environment. With 8 aquariums expressing this idea in their responses, it was the most prevalent narrative across all aquariums. Numerous aquariums also claimed that external regulations had been adopted to guarantee that the aquariums met the required standards. The British and Irish Association of Zoos and Aquariums (BIAZA), the European Union of Aquarium Curators, the Association of Zoos and Aquariums (AZA), and the Tasmanian Department of Primary Industries, Parks, Water and Environment (DPIPWE) are examples of external bodies that the participants have chosen to follow. Other narratives worthy of mention that fall under the category of defence include *'comparison to other aquariums'*, in which the responders pointed out other aquariums' approaches, which are typically more entertainment-oriented, and stated their operation is very different from them; *'Cost consideration'*, in which one of the aquariums (participant 4) simply stated acquiring animal displays, such as marine mammals, would cost a great deal of money and mistreating an animal would damage the institution financially speaking.

In terms of the category of **justification**, it refers to the narratives that did not deny the allegation of ethical concerns, but rather used a variety of reasons to interact with the accusation. It was also a recurring concept to emerge from the interviews, as aquariums frequently explain why, despite ethical concerns being expressed, the operation of aquariums is deemed necessary. Among all responses fall into justification, the most prevalent one being *'use of animals for further objectives'*, with seven aquariums expressing a similar concept. Frequently, these objectives include the communication of

intended educational messages, the improvement of human-nature connectivity, and the promotion of public conservation interests. It was deemed necessary for many aquariums, that regarding the ongoing ethical concerns, it is justifiable to include animals in their agendas so long as an additional objective is pursued. Aquariums also responded with '*aquariums as professionals*', in which they asserted that a team of qualified professionals closely cares for the animals. The author decided to categorise these narratives in the category of justification because, unlike the category of defence, narratives asserting aquariums as professionals did not typically argue that ethical concerns are invalid. They elaborate on how aquariums could be more professional in their treatment of animals, suggesting that coexistence with ethics is feasible. The last narrative documented into justification is '*comparison of wild/captive animals*', with 3 aquariums stating that animals in aquariums, due to the intensive care they receive, generally live a healthier and less stressful life than those in the wild. They also specified that, due to the intervention of aquariums, some endangered species were able to flourish again and be preserved in an artificial environment, as their natural habitat had been severely damaged.

This section's final remark was the category of **acknowledgement**, which was also the lowest-ranking category being recorded. In this type of narrative, it was observed that some aquariums take a rather proactive approach to ethics, embracing the ethical consideration to coexist with their daily operations and promoting further discussion. Three aquariums (participant 4, 5, 10), for instance, mentioned '*previous changes*' and brought up ethical concerns regarding their facility and the alterations made. These aquariums discuss ethics openly and, more significantly, are willing to share with the author the changes made to their operations in order to be more ethical. '*A future without aquarium*' was another narrative categorised as an acknowledgment that the author found quite unexpected. Despite coming from various parts of the world, three aquariums (participants 2, 8, and 9) have all expressed their vision of a future society without aquariums. To quote from participant 8: "*Ideally, we would love to put ourselves out of existence. If we were doing our work really well, then that's the ultimate aim. Our vision is an abundant and healthy ocean, if we had that reached, we certainly wouldn't need to exist.*" It raises the intriguing future research of how and why aquariums have reached this level of self-awareness, in which aquariums approach ethical concerns from a more-than-human perspective and take into account the agency of their animal actors. Coincidentally, the last type of narrative observed in this category, '*addressing ethics internally*', was also only mentioned by participant 8, as the aquarium expresses that ethics is an integral part of the company culture and that employees are constantly encouraged to engage in brainstorming and debate about ethics.

Many aquariums viewed ethics as an opportunity to rethink their operational strategies

and to take every step with care. The main theme of *'Ethical concerns allowing reflection and growth'* is evident in all three categories of narratives, leading to the intriguing observation that aquariums embrace ethical discussions to be emerged. Which also raises the follow-up question of whether aquariums should address ethics proactively?

As the last question of *"should aquariums address ethical concerns proactively?"* (Q8), a slight division can be observed among 10 aquariums. 7 aquariums provided affirmative narratives in terms of agreeing the value for an aquarium to address ethics proactively. Aquariums who agree on proactively addressing ethics mostly stated on the basis of *'maintain transparency'*, *'correct misconception'* and *'rooms for improvement'*. To quote some of the affirmative narratives from the participants:

"I don't think ethics is something that as an industry that we should be shying away from and I think where there are misconceptions then we should be addressing those misconceptions ... It's important to be transparent about what's happening and simultaneously to ensure that the standards that we are transparently and appropriately" (Participant 1.)

"But we also want to hear from those people who have different opinions. Because you can always learn from that ... and things today are not so black or white and we can go step by step for the better." (Participant 2.)

"Certainly, the values that the aquarium has are transparency and honesty. We will never try to hide the facts or information. We'll always be open about a situation as open as we possibly can." (Participant 8.)

"Prevention is better than cure ... We want people to leave the institution feeling that they've got their questions answered. And they got the concern addressed and not leaving the institution felt like: Oh, it's just a fish farm that crowded all the fish and tried to make money." (Participant 10.)

While the other 3 aquariums expressed negative narratives, suggesting ethics should not have to be addressed proactively in aquariums for various reasons. It was not to be interpreted that the aquariums themselves avoid speaking ethics, but rather adopt an approach that's rather passive, waiting until the ethical concerns emerged and then to deal with them. Some of the narratives include *'bias exists'*, *'false sense of defending'*, *'ethics tackled already'* and *'allow different opinions'*. To quote from the participants:

"I think that if you make a conscious choice to bring ethics out to the forefront and explain it to everybody before the public actually ask you that question, which sort of makes it sound like you're defending what you're doing." (Participant 6.)

“For those people that have their strong ethical opinions, they have to make their own decision on what kind of facility we are. So, I don't think zoos and aquariums should be specifically targeting those people as that's necessary” (Participant 7.)

“It's not something that we try to be pessimists in the same sets we try, especially among the people that still doubt the intentions of the aquariums ... I am right at the moment in history where most of the problems were already solved and so I didn't have to face those things. I believe today most of the aquariums do things really well.” (Participant 9.)

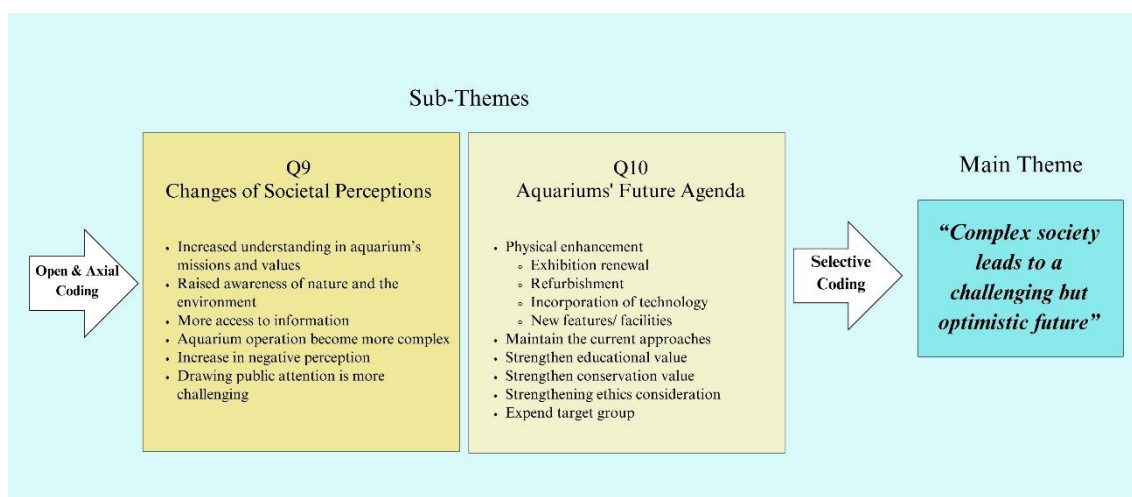
Overall, it is still observable that the majority of aquariums believe that ethics should be addressed more actively within their institution. This finding correlates with aquariums' responses to the preceding question, as their approaches of interacting ethical concerns tend to be more proactive. Aquariums believed that embracing the concept of ethics would afford them the opportunity for self-improvement and growth. Even among the three aquariums that expressed a lower intention to do so, their justifications frequently centred on how ethics should coexist within the facility naturally and without excessive intervention.

In conclusion, after examining the relationship between aquariums and the ethical concerns raised about them, it is believed that ethics has become a stimulant for aquariums' self-reform and improvement. Ethics became a constant reminder for the staff of the aquarium to question their institution's very existence. And having ethical concerns emerge and be acknowledged could also be advantageous for aquarium operations. When we, the human actors, were encouraged to adopt a more-than-human way of thinking, the concept of posthumanism emerged as this section's leading theory. Thus, posthumanism is identified and regarded as the dominant theory for the future aquariums, which the greater details and relevance will be discussed in Chapter 5.3.

4.5 A Future of Challenges and Opportunities

At the last part of the interview, the participants were addressed with questions regarding their observation of societal changes and their future agenda; this was the section of the interview where the participants were given chances to reflect everything they have expressed. Together with questions of *‘how have the societal changed through your experience’* and *‘what are the future agenda for your aquarium’*, a sketch of the future of aquariums can be observed through the narratives of the aquarium staff. The main theme emerged was *“complex society leads to a challenging but optimistic future.”* (Figure 9) The responses gathered was generally quite diverse but share such tendencies.

Figure 9. Sub-themes of Q9-Q10: Societal Changes & Future Agenda in aquariums



When aquariums were asked to describe changes in their societal perception (Q9), the author stated that such observations could be based on the experience while working in their institution, or on a broader perspective based on how they may have perceived changes through external platforms such as the media. Both positive and negative narratives were documented, indicating that aquariums held a variety of attitudes towards the shift in societal perception. *‘Increased understanding in aquarium’s missions and values’* was the most common narrative to which 6 out of 10 aquariums appeared to agree. The staff noted seeing a trend among the general public, that people are gaining a greater appreciation for the fundamental mission of aquarium operations. Several aquariums remarked that, in comparison to their early years, the public of today closely aligns with the mission (typically conservation or marine education) that their facility is intended to convey.

“In the beginning, the big challenge was who in the world will come to us and look at the freshwater fish? And (six years after opening), we have proved that, no matter the looks of the fish, their story can still be very big and interesting.” (Participants 3.)

“Five years ago, when I used to talk about conservation message. If I turn my back half the crowd would leave. I said to the audience today: ‘but I’m doing that now, not one of you have left, you’ve all stayed here and wanted to hear my message at the end.’ That’s how far we’ve come.” (Participants 6.)

Moreover, a narrative captioned *“raised awareness of nature and the environment”* was

presented by half of the participants. Several of them mentioned that today's public is more aware of our natural actors, with some aquariums attributing this to the increased accessibility of media and improved education, which has resulted in a heightened awareness of the once-remote marine life. However, many aquariums stated that a greater awareness of the natural world not only facilitate a better grasp of the aquarium's core mission, but also raise ethical concerns regarding the animals in aquariums, making this change of general public in both negative and positive influence to the aquariums.

“There's undeniably been a rise in the environmental significance of the ocean, both as a victim and a hero in topics like climate change. People are more aware, concerned or anxious about the climate and the environment.” (Participants 1.)

“There are more concerns (from the general public) about how big the enclosures are. This is the main topic, which the meetings of aquariums curators' unions always discuss, what shall we be an aquarium in 20 years to exist?” (Participants 5.)

Some other responses that aquariums stated as the changes including *‘more access to information’*, *‘increase in negative perception’* and *‘drawing public attention is more challenging’*. Many of these accounts portray the aquariums as both a challenge and an opportunity, depending on how they interpret and respond with these changes. The following question was posed to find out the answer and better understand how aquariums envisioned their future operation, based on these societal changes they have observed.

As aquariums were asked *“how will your institution change in the foreseeable future? What are the agenda and priorities?”* (Q10), it was hoped to learn how aquariums envisioned their futures with the complexity of societal perception intertwined with their operation. This is also the last question of the interview, giving participants the opportunity to synthesise their previous responses into a concluding statement.

To the author's surprise, *‘physical enhancement’*, emerged as the most prevalent response, with six out of ten aquariums responding in the affirmative. The term *‘physical enhancement’* can refer to the addition of new exhibitions, new features to the facilities, refurbishment and modernisation of the structure, and the incorporation of new technology. The reason that physical enhancement is the most prevalent agenda may be

related to what aquariums have observed regarding the change of the public. Such as the aforementioned narratives stating that it is more difficult to attract public attention or to compete with the easily accessible media of today, aquariums realise they must continuously update and innovate in order to thrive and survive.

“There are many technologies that can assist in the experience of the exhibition. One could only appreciate (the exhibits) passively before, but if I can use some technologies, I may be able to understand and appreciate more about creatures.” (Participant 4.)

“At some point in time, we will have to address the fact that our building is 100 years old. We’re going to probably have to tear it down and start new... A total aquarium replacement.” (Participant 7.)

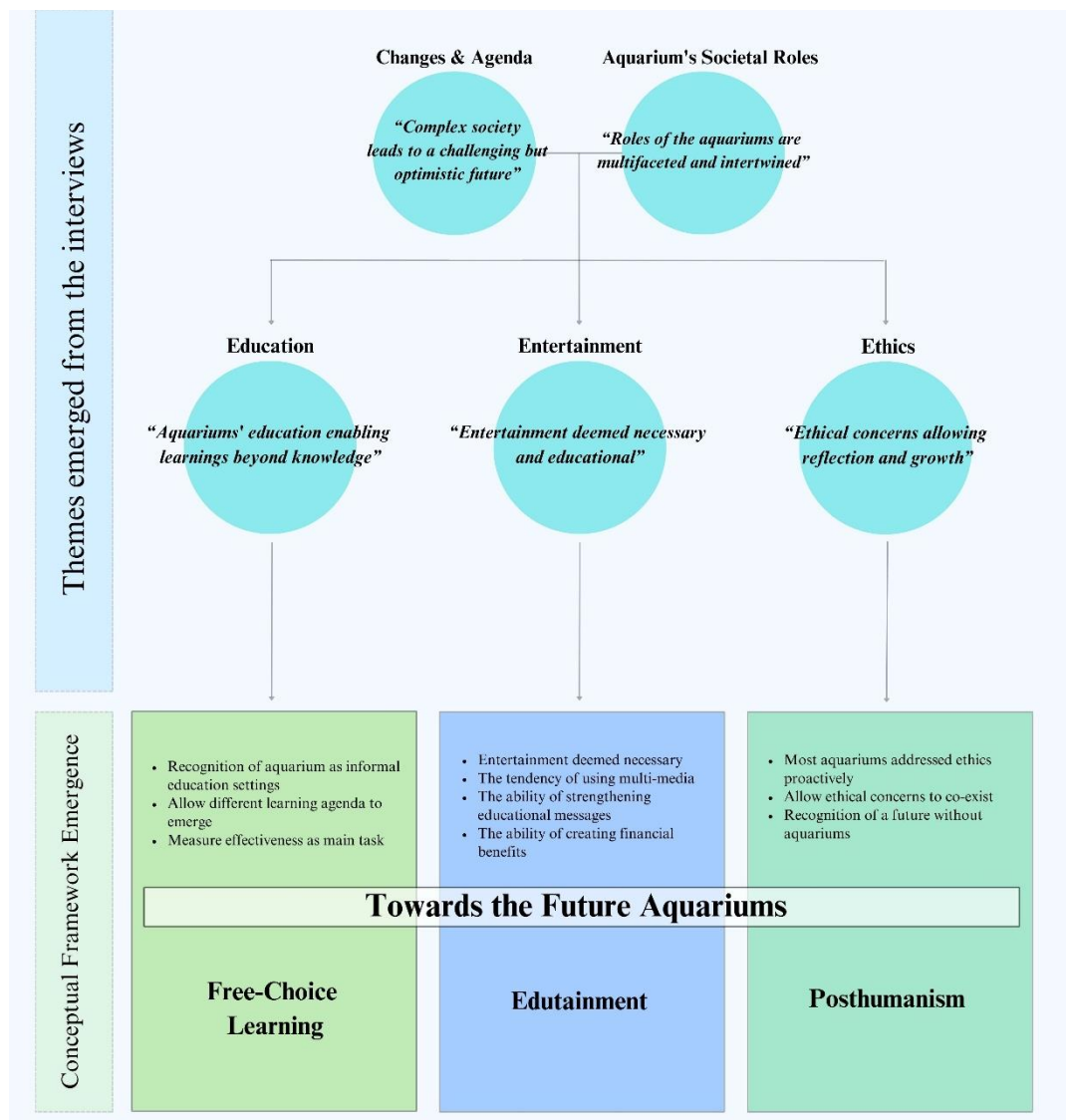
In addition to expressing an intention to ‘*maintain the current approaches*’, many aquariums have also expressed a desire to ‘*strengthen educational value*’ and ‘*strengthen conservation value*’. All three narratives are equally prevalent among the participants, with many stating that a focus on education, conservation, or both will be on their agenda, and that aquariums will inevitably move toward the direction of becoming more educational and sustainable in the future. However, only one aquarium stated that ‘*strengthening ethics consideration*’ would become a priority on their agenda in the future; this indicates that, despite the fact that many aquariums have previously demonstrated a willingness to deal with ethics more proactively, it may be difficult for them to incorporate actual steps towards coexisting with ethics into their practices. Aquariums would be required to take further actions if ethics were to appear on their actual agenda; until then the effectiveness of which would remain uncertain.

During the section of the interview in which aquariums were asked about future-related questions, the author had the opportunity to examine in detail how changes in societal perception could potentially impact their operational agenda and priorities. It was discovered that aquariums were conscious of the fact that the society in which they operate is becoming more complex, and efforts were observed by aquariums around the globe to diversify their operations while maintaining their core values as education and conservation actors. The examination of this research indicates that the future of aquariums will be full of challenges. However, if aquariums were to take the necessary

steps, they would be able to create greater value for society.

To summarise what has been discussed throughout the analysis, the narratives of aquariums around the world demonstrate an awareness of their position in contemporary society. Nevertheless, the complexity of modern social needs and public perception will continue to force aquariums into an uncharted territory. In response to the grounded theory method of this study (figure 10), the author would like to propose three fundamental theories that resonate with the research’s findings: **Free-choice Learning**, **Edutainment**, and **Posthumanism**. These theories were believed to be pertinent to various aquarium aspects, yet they were able to integrate them into a single concept cohesively. In the following chapter, the author will discuss how these theories were thought to be the fundamental concepts for future aquariums.

Figure 10. Conceptual Framework Emergence



Chapter 5 A Grounded Framework: Towards the Future Aquariums

As the narrative of aquariums in relation to societal roles has been examined, it is time to present the theoretically concluding conceptual framework that best explains and unifies the findings. As the research was designed with three primary pillars on the entertainment, education, and ethics of aquariums, it is only appropriate to address each of these roles with theories that could be implemented in the future.

In this part of the thesis, the author would like to use an unconventional approach, as the following section would be introduced as the emerging theories, despite each of them being distinct yet intertwined concepts that require dedicated studies. This is intended to introduce multidimensional perspectives into the approach and recognise the complexity of the aquarium's shifting identities in the present. The following section will introduce the concept of **Free-choice learning**, the theory of how a learner's enhanced agency can add value to their learning agenda, corresponding to the notion of aquarium learning as an informal setting and the ability to go beyond knowledge-based learning; **Edutainment**, a theory addressing the need to use fun elements to increase educational value, which corresponds to the aquarium's narrative regarding the necessity and educational value of entertainment in aquariums; and **Posthumanism**, a philosophical approach of a 'more than human' perspective, which could enable aquariums to address their inherent ethical concerns in a proactive and advantageous manner.

All three theories will be presented with their respective literatures, using the words of scholars to demonstrate their significance and correlation with the themes that emerged from aquarium narratives. In the conclusion, the author will elaborate on the applicability of each theory to the future operation of aquariums and provide recommendations for aquariums to proceed towards a future that corresponds with their vision.

5.1 Free-Choice Learning

As described in the previous chapter that the roles of aquariums could also consist of the function as an educator, several educational theories may also be applicable to aquariums, as it can be considered as an educational institution comparable to museums. During data collection, it was discovered that many aquariums regarded their institution to be an informal setting for learning. Some even emphasise the educational value of aquariums based on the visitors' conscious decision to enter the facilities. As a result, the author identified that the concept of free-choice learning has a strong resonance with the narratives of aquariums and has the potential to serve as a guideline for future educational approaches in aquariums. In this section, the concept of free-choice learning and its applicability to real-world aquarium practices were chosen specifically for examination. In order to reframe the concept of marine education and the potential for sustainable approaches, it appeared important to examine free-choice learning in the educational aspect of the aquarium's educator role.

Free-choice learning is not a concept that has only recently appeared in educational studies. In contrast, academics would argue that it is a natural human behaviour that has always existed. Since the establishment of educational institutions such as schools, learning outside of such institutions has been characterised by the concept of free-choice learning. As mentioned by Falk et al. (2011) in the book '*A companion to museum studies*' that, so-called free-choice learning is defined as: "*the learning that is intrinsically motivated and reflects when the individual wants to, not because they have to*" (p. 324), and many settings outside the traditional classroom-based education could encourage such learning. Despite the fact that these types of learning have always existed in human behaviour, the shift in societal perception of education is relatively recent, as evidenced by Hilton (1981) addressing the need for recognising the importance of non-school sources as valuable information and Clifford's (1981) belief that education should enable flexibility, adaptability, and survival skills in a volatile world. The growth of the Internet, through which people can readily obtain information they are actively seeking, was also a further factor fostering free-choice education (Dierking & Falk, 1998). Free-choice learning is an integral part of the human experience. According to Falk et al. (2011), as long as the motivation derives from gaining information, enhancing comprehension, or satisfying curiosity, even modern-day activities such as watching news, browsing the Internet, reading books and magazines, and visiting museums can be considered components of free-choice learning.

One of the main discussions in free-choice learning is that learning outcomes can be more than just knowledge-based. Differs from the early theory that learning was divided into cognitive, affective, and psychomotor domains (McCroskey, 1982), the concept of free-choice learning believes that learning is more diverse and interconnected with other complexity (Damasio, 1994; Falk et al., 2011). For example, according to Falk & Dierking (2002), they identified at least eight types of learning in a study conducted in Virginia Museum of Fine Art, namely knowledge, interests, skills, values, museum literacy, social learning, creativity, and awareness, The finding demonstrates that visitors are able to generate far more complex learning through their own agenda. As a result, it is essential to acknowledge the multiple learning outcomes when designing an environment to facilitate free-choice learning. Allowing and being open to a broader range of learning outcomes, as opposed to presuming what visitors will learn, could help educational institutions employ methods for capturing more accurate evidence of their visitors' actual learning processes, which are typically subtle and complex.

Nevertheless, free-choice learning is also constrained by the nature and behaviour of the learner or the environment (Heimlich & Falk, 2009). First, the learners themselves can be biassed, and their experiences or characteristics may not always facilitate their learning outcomes. Such variables as the learner's background, dispositions, length of time spent at the venue, and motivation for their visit can influence the learning orientation. The second constraint is caused by the educators or the learning venues themselves. Such as immunisation and apathy of the educator toward the exhibits, forgetting how influential the collections can be for visitors; unpleasant weather conditions; and incoherent interpretation. All of the above could cause inconsistent learning experiences. The third realm is the interaction that occurs in learning environments. It could be the interactions between visitors, educators, or exhibits, as the dynamic can have dramatic effects on the learning experience or cohesiveness towards the conveyed messages. The inherent nature of visitors or sites presents inevitable obstacles. Nonetheless, as Heimlich & Falk (2009) noted: "*the more difficult questions remain... how can we ensure that the (free-choice) learning that does occur is as effective as possible?*" (p. 21)

With the characteristic and constraints that free-choice learning bearing, Falk et al. (2011) also asserted that educational institutions must adapt specific practices in order to establish and collect meaningful evidence for the free-choice learning outcomes. (1) *Allowing individuals to form their full learning agenda.* Due to the fact that learning should not be predetermined, it is critical to understand the prior knowledge and experience that visitors may possess. By encouraging their visitors to express what is foremost in their minds during their visit, museums can gain a better grasp of how visitors approach and connect with the exhibit. (2) *It takes time.* Not all learning occurs

immediately following a visit. Given that learning is a complex process that can take weeks, months, or even years, it is necessary to extend the timeframe for learning assessment and data collection among visitors. (3) *It should be natural*. There is a difference between experimental and natural conditions. It is crucial to provide a comfortable environment for visitors during the collection of their data on learning outcomes, as this can bring the data as close as possible to the visitors' actual experience. (4) *Validity over reliability*. In terms of research, educators also strike a balance between validity and reliability, as both are essential elements. However, free-choice learning carries with it the connotation that the outcome may not always be consistent. As a result of the inherent nature of allowing visitors to create their own learning agenda, the reliability of research on free-choice learning can be less stressed over validity.

The connection and applicability of free-choice learning to environmental education is also a prominent topic of discussion. For example, as Ballantyne & Parker (2005) mentioned that the desired outcomes of the informal educational settings, such as free-choice learning, may include “*encouraging curiosity and exploration, changing attitudes, evoking feelings, developing a sense of personal, cultural and community identity, and making decisions about moral and ethical issues.*” (p. 2) They are fairly congruent with the goals of environmental education, whereas free-choice learning offers larger opportunities for developing environmental sustainability awareness and behaviour than is often accessible in formal education settings. To determine whether an environmental venue contains the notion of free-choice learning, Heimlich & Falk (2009) mentioned that an exhibit must include a desired message, generate wayside displays, illustrate the viewer in a manner of pedagogical instruction, and then encourage the occurrences of viewers' learning outcomes. Consequently, venues such as parks, nature centres, zoos, natural history museums, botanical gardens, conservatories, and, of course, aquariums can be associated with the concept of free-choice learning.

The implementation of free-choice learning in various educational settings, such as museum learning or environmental tourism settings, has been extensively studied. Such as demonstrated by Bamberger & Tal's (2007) study of student groups' learning performance in a nature history museum has proven that, the museum environment “*allows a variety of learning opportunities without directing the students*” (p. 76), elicits greater and more profound engagement than traditional classroom-based learning. Van Winkle & Bueddefeld (2021) also examined the learning efficacy via the framework of free-choice learning in agritourism and its visitors. They discovered that agritourism enables the visitors in terms of the breadth and depth of their free-choice learning at different levels, and that deeper and more complex forms of learning are possible when intentionally linking agritourism experiences to agricultural literacy goals. While putting

the scope on zoology, Heim & Holt (2021) noted that free-choice learning had facilitated the identification of the various goals produced by the learner's prior to the learning experience, and that those who have developed goals aligned with their intrinsic interests have a greater chance of remaining engaged in their interests in later stage.

Free-choice learning has demonstrated its versatility and applicability in numerous contexts. Aquariums should be an ideal setting for practising the concept of self-directed learning. As many aspects of education in aquariums resemble free-choice learning, perhaps aquarium educators and staff members should be aware that such a notion could add greater value to their visitors' learning agenda. Moreover, aquariums should begin to value the diverse learning outcomes that arise from their environment, which are not limited to marine knowledge. Oftentimes, aquarium education can also produce feelings, commitments, values, and actions; therefore, aquariums have a primary responsibility to begin documenting and recognising these outcomes in order to create an optimal education for society.

5.2 Edutainment

When examining the aquarium's role as an entertainer, it is easy to recognise the significance of aquariums in providing substantial entertainment elements to the tourism industry. While requiring a re-evaluation of the meaning and application of future education in places such as aquariums, we should not overlook the aquarium's entertainer position. Similar narratives have been expressed by aquariums throughout interviews, with many of them stating that entertainment is essential to the financial sustainability of aquariums as it is the primary means of attracting tourists' willingness to pay a visit. Moreover, entertainment also has the potential to help aquariums better communicate their educational messages to visitors, making it a crucial enabler for aquariums to implement effective education programmes. Perhaps there is no better example than edutainment, in this case, that connects this link between entertainment and education and greatly contributes to a discussion of the changing roles of aquariums.

The concept of edutainment involves the integration of education and entertainment, in other words the delivery of educational material in an enjoyable manner (Yum, 2022). It was also defined as the promotion of interesting learning through engagement and communication, exploration by fostering an awareness of learning (Shulman & Bowen,

2002). Similar to the concept of ‘learn through play’, academics believe that the foundation of edutainment is also ‘playing’ and allowing a dynamic and active behaviour that facilitates learning (Rapeepisarn et al., 2006), with the main differences being that the presence of technological facilitator, commercial concept, and visual material are almost always presented in edutainment. Throughout its earlier history, the term ‘multimedia’ was frequently associated with edutainment, such as television, computers, music, and games, that educator used those multimedia to convey the embedding lessons and instruct their audiences (Colace et al., 2006), thus creating an amusing yet educative approach. As Aksakal (2015) commented: “*Edutainment approach provides students with having a good time and experiencing the way of creating, using information resources and teaching methods. Students’ enthusiasm and excitement can be increased in order to teach them information and subjects which are difficult to learn.*” (p.1238)

Aksakal (2015) also identified the following characteristics of edutainment through analysis of various edutainment literatures:

- Educating difficult-to-learn topics and information to students by combining education and entertainment and boosting their excitement and motivation.
- Using the game-like element grabbing students’ focus.
- Ensuring that students comprehend or assimilate what they learn.
- Teaching how individuals use their own knowledge in learning.
- Enabling the learners to have a good time while creating and experiencing.

While the majority of educators may agree that edutainment is an excellent method for increasing the learning process and optimising the outcomes, certain of its characteristics continue to generate controversy. Rapeepisarn (2006) noted that, when the learners ‘play’, the actual experiences can overshadow the learning outcome because the learner is directed to focus on the gameplay and obeying the rules, yet it is never assured that particular learning will occur. Resnick (2004) also mentioned that edutainment carries the idea that education is the bitter medication and entertainment is the sugar-coating, thus implying the false reward/suffer relationship that learners must endure in order to receive the ‘fun part’. Okan (2003) expands on the same argument, emphasising the importance of understanding and clarifying whether learners’ motivations are intrinsic or extrinsic when engaging in edutainment. “*Intrinsic motivation is defined as a tendency to engage*

in activities for their own sake, just for the pleasure derived in performing them or for the satisfaction of curiosity, while extrinsic motivations include compliance, recognition, and grades and rewards, which are unrelated to the act of learning.” (Okan, 2003, p. 259)

Despite the fact that the vast majority of the edutainment literature focuses over its application in the classroom when adding multimedia to create the ‘fun part’, experts have begun to study the feasibility of applying the edutainment framework to the tourism industry. For instance, Balloffet et al. (2014) explored the risks and opportunities for museums when adapting the edutainment framework that was used in theme parks, stating that “*edutainment refers to the tendency of cultural institutions to incorporate elements of entertainment and interactivity in order to attract new audiences.*” (p. 5) Yet, it carries the risk of over-commoditising cultural aspects, resulting in the so-called ‘Disneyfication’ phenomenon. When examining the efficacy of edutainment in zoology, Spooner et al. (2019) revealed that programmes such as live animal shows and family theatre can “*effectively deliver animal information and raise awareness of conservation efforts within a leisure setting*” (p. 1), as individuals were able to respond more accurately to animal and conservation-related facts following their experiences. On the other hand, Hertzman et al. (2008) investigated so-called ‘edutainment heritage tourist attractions’ (EHTAs), a hybrid form of attraction that employs multimedia technology to convey the heritages’ cultural value. The research into visitor experiences revealed that EHTAs can evoke a wide variety of emotional responses and intellectual engagement, making them a significant source of historical information in heritage tourism.

Edutainment design could also be effectively implemented in public spaces, such as aquariums, as these designs enable people to obtain information according to their interests and unique user identities, thereby fostering a strong learning environment. Istanbul Aquarium can be viewed as an example of adapting edutainment as it was designed in accordance with the edutainment business model in 2011 (Yum, 2022). The business model that Istanbul Aquarium adapted emphasised spatial interaction and communication with originality. While sometimes physical contact with the animal is not possible, the aquarium attempts to compensate with other means, such as interactive kiosks. While maintaining the high quality of visitor experiences and educational value, the Istanbul Aquarium also ensures a reliable business strategy, as edutainment design has

demonstrated the ability to produce multiple values on marketing, communication, and social awareness, thereby making them valuable assets. Technology such as a 3D virtual habitat, interactive consoles that stimulate deepwater fish, and the projection of underwater imagery have all enhanced the dynamic experience and educational outcomes for the visitors. Reflecting on the Istanbul Aquarium project, Yum (2022) commented that: *“The most important quality of edutainment is related to knowledge construction through entertainment. Apart from educative goals, the approach offers practicality on marketing, communication and security with its updateable, renewable and customizable nature.”* (p. 226)

In accordance with the literature, the concept of edutainment appears to have great potential when properly integrated with aquariums in order to create meaningful and transformative education while allowing visitors to indulge themselves. Certainly, the nature of edutainment has some limitations and concerns compared to traditional classroom-based learning, but the benefits it can offer have been demonstrated to be worthy of recognition. Perhaps the best example of putting the notion of edutainment into practise is in a setting like an aquarium, where individuals often gain knowledge through an enjoyable experience. As entertainment has become an inseparable component of aquariums whose survival is fundamentally dependent on it, implementing approaches that closely align with edutainment may enable more meaningful programmes. It would also assist aquariums in better integrating educational messages while providing visitors with an entertaining experience. This integration could ultimately contribute to the sustained success and social significance of aquariums.

5.3 Posthumanism

When aquariums provided their narratives regarding their interaction with ethics, it was noticeable that many aquariums actively engage with ethics and recognise the need to use ethics as an instrument for their continued development. Some aquariums have even elaborated, from an ethical standpoint, a vision of a future without aquariums. The author was surprised that a number of aquariums were prepared to align themselves closely with ethics while placing animal stakeholders at the forefront of their operations. The author subsequently identified that these narratives exhibited characteristics of posthumanism, a

novel concept involving more-than-human approaches to thinking.

Given that contemporary aquariums are rife with a multitude of moral and ethics issues that are receiving a considerable amount of attention, there is a need to employ a conceptual underpinning from a distinct perspective in order to address topics involving these intricate ethics. The relationship between aquariums and their animal residents, as well as the use of animals in commercial entertainment, has sparked a serious discussion among scholars regarding animal captivity, animal welfare, and animal cruelty (Minteer & Collins, 2013). In order to more cohesively address such issues, we may need to employ 'more-than-human' ways of thinking and examine the situation from a different point of view, or so-called posthumanism. However, as humans, are we even capable of achieving a 'more-than-human' way of thinking? Are we willing to give up the very identity that enables us the chance to engage in critical thinking, like the one we are addressing? The answer, if there is one, may not be simple and may require much more philosophical approaches to uncover. This is the question the author posed to himself prior to the beginning of this chapter. Even though the journey of searching for the truthful perspectives could be endless, he still intended to investigate this potentially contradictory topic to the humanity nature of tourism study.

Hassan (1977) in the book of *Prometheus as Performer: Toward a Posthumanist Culture* stated: "*posthumanism may also hint at a potential in our culture, hint at a tendency struggling to become more than a trend ... We need to understand that five hundred years of humanism may be coming to an end, as humanism transforms itself into something that we must helplessly call posthumanism.*" (p. 843) Hassan's outlook on posthumanism may be pessimistic, but his prophecy has demonstrated that the world has begun to witness the commencement of posthumanism. The term itself had made its way into modern critical discourse in a number of humanity studies, but one could argue that the emergence of posthumanism was prompted by the similar discourse of 'antihumanism', in which a departure from the legacy of humanism was declared as it was seemed problematic and often male-centred and Eurocentric (Braidotti, 2013). On the contrary, posthumanism simply indicated the impossibility of detaching from humanism because everything surrounding us has been unconsciously choreographed by humanism (Badmington, 2000), and "*to oppose humanism by claiming to have left it behind is to overlook the very way*

the opposition is articulated.” (p. 9) As a result, posthumanism was not intended to be solely opposed to or reject humanism, but rather to refuse to take humanism for granted and embrace the thought that confronts such a thematic, and to “*sexualised, racialised and naturalised differences, far from being the categorical boundary-keepers of the subject of Humanism.*” (Braidotti, 2013, p. 4) As stated by Wolfe (2009): “*there are many values and aspirations to admire in humanism - but rather [posthumanism is]to show how those aspirations are undercut by the philosophical and ethical frameworks used to conceptualize them.*” (p. xvi)

To place the perspective into the broadest interpretation, posthumanism is a philosophical term for an individual or entity that lives beyond the human consciousness. It also opposes the notion that, because humans are rational, they are the sole arbiters of the fate of the world and its non-human residents. Is it therefore safe to assert that posthumanism has not completely abandoned humanism? Wolfe’s (2009) interpretation of posthumanism, which is quite intriguing, would argue that posthumanism appeared both before and after humanism. Before in the sense that the embodiment and involvement of the co-evolution of human animal technicity and archival mechanism (language and culture) came before ‘the human’ was given the name, and after in the context that the new theoretical paradigm was named once the historical moment of decentring human was reached. As stated by Wolfe (2009): “*a new mode of thought that comes after the cultural repressions and fantasies, the philosophical protocols and evasions, of humanism as a historically specific phenomenon.*” (p. xvi) Moreover, posthumanism can be viewed as a fairly political term, given that its concept revolves around the critique of anthropocentrism and articulates ecological consciousness with an emphasis on minorities (Braidotti, 2013), addressing social constructivist issues such as feminism, anti-colonialism, and environmentalism. Minorities as actors, such as women, non-Westerners, and animals, who were typically disregarded by humanism approaches, became a greater focus of discussion in posthumanism.

Another remark that appears in posthumanism is the rejection of human exceptionalism and the ontological and ethical distinction between humans and non-humans (Wolfe, 2008; Wennemann, 2016). This is not intended to equate humans and non-humans, but rather to acknowledge that the current conceptual instrument of humans/non-humans has reached

its limits and is far too blunt to facilitate meaningful examination. Even in biology and ethnology research, posthumanism has gradually gained acceptance, demonstrating that animals are capable of human-like consciousness, such as making decisions or engaging in meaningful activities (Cohen, 2019). As a result, posthumanism recognises both human and non-human subjectivity, as well as the complexity and multidimensionality of animals, such as “*cognitive, emotional, social, political and cultural complexity*” to emerge (Cohen, 2019, p. 419). Using posthumanism approaches as the theoretical foundation would enable the establishment of contact with animals and the engagement of more meaningful emotions, such as empathy and intimacy, in order to take animal as a congruent subject into the discussion more cohesively.

With its political and ethics connotation, posthumanism is not merely a philosophical approach; it may also be viewed as a new ethical paradigm for tourism. Cohen (2019) noted that the paradigmatic shift that posthumanism engenders can have significant implications for the human-animal relationship in tourism. It can end the mechanically object-like treatment of animal actors and recognise them as subjects on par with humans, which may have significant repercussions for tourism involving animal/human interaction, such as zoos and aquariums. In Guia’s (2020) conceptualization of the theoretical grounding of justice tourism, for instance, he identifies posthumanism as an emerging ethical regime that has the potential to become an effective mechanism for justice tourism due to its “*political responsibility in relation to the vulnerable and disempowered, whether these are human or non-human beings.*” (p. 8) Fennell (2022) also examined the choice between animatronic and natural encounters among university students using the framework of posthumanism. The research used the intervention of a posthumanist video about marine mammal captivity in aquariums and then tested whether students would choose the same between swimming with a real dolphin or a robotic one before and after the intervention. With the posthumanist intervention, a broader ethical horizon was enabled, and the collision of posthumanism and traditional animal ethics was believed to pave the way for a future filled with new dynamic constellations of knowledge, according to the study’s findings (Fennell, 2022).

Moreover, posthumanism may not always appear to suggest the rejection of venues like zoos and aquariums, despite their tendency to use animals as displayed objects. Cohen (2019) noted that posthumanism also supported the interaction between humans and animals, as opposed to their complete separation. As long as this interaction is not harmful to the animal actors, it could be advantageous for both parties in terms of the possible occurrence of significant learning. For instance, by examining the volunteer in an aquarium working in animal husbandry with a posthumanist position (which, by her definition, includes not only animals' welfare but also political notions such as feminism), Lloro-Bidart (2017) discovered that the human-animal interaction contributes to a growing dialogue in environmental education and sets the tone for other political ecologies of education. The so-called 'network of learners', which consists of staff, visitors, and animals, all contribute to the development of a strong and complex emotional bond, which subsequently enables the consideration of how animals become a part of communities and networks.

When it comes to the ethical discourse of the very existence of aquariums, it appears very appropriate and logical to draw up the concept of posthumanism. Adopting posthumanism to aquarium research might prove a tremendous achievement in terms of re-evaluating the current human-animal relationship, given that it encourages human actors to detach from their exceptionalism and introduces a mutual level for the minorities (Braidotti, 2013). Incorporating posthumanism into aquarium studies also has the potential to evoke broader and more impactful critical thought that can address discourses from a broad range of viewpoints (Fennell, 2013; Lloro-Bidart, 2017). When attempting to reconceptualise the role of aquariums and examine the complex ethical issues intertwined within, it can be beneficial to utilise the framework of posthumanism, which pushes us to start wondering critical questions about why and perhaps how we better employ animals for human enjoyment.

In conclusion, the examination of ethics in the context of aquariums revealed widespread engagement with and recognition of the significance of ethics. Some aquariums even contemplated a future without aquariums from an ethical standpoint. The narratives provided by aquarium staff exhibited posthumanist characteristics, challenging traditional human-centric perspectives and embracing a more inclusive mode of thought. The

adoption of posthumanism in aquarium research affords the chance to reevaluate the human-animal relationship and resolve ethical concerns from a variety of perspectives. Posthumanism not only criticises anthropocentrism, but also recognises the complexity and subjectivity of non-human beings, paving the way for greater engagement with and contemplation of animals as congruent subjects.

In addition, posthumanism provides an ethical framework for tourism that promotes justice and political accountability towards both human and nonhuman entities. It does not inherently reject the existence of venues such as zoos and aquariums, but it promotes interactions between humans and animals that are responsible and beneficial. By incorporating posthumanism into aquariums, critical concerns can be raised and a broader understanding of ethical issues surrounding human-animal relationships can be fostered, leading to a more thoughtful and compassionate view of aquariums' role in society.

Chapter 6 Conclusion

In contemporary society, diverse perspectives shape our understanding of various institutions, including aquariums. These institutions, viewed through different lenses, manifest their narratives and establish their identities. Aquariums can be educational, imparting vital marine and environmental education to those who visit them; Aquariums can be entertaining, attracting tourists and generating economic benefits for host destinations; Aquariums can be conservative, safeguarding the well-being of animal residents and promoting environmental awareness. However, the existence and operation of aquariums raises significant concerns and questions. Are aquariums fulfilling their educational mission effectively? Is aquarium education effective enough? Do their entertainment offerings lack substance and exploit their animal inhabitants? Moreover, ethical considerations arise in relation to aquariums. These issues, which are key to the study's focus, urge the author to consider the future of aquariums and the changes they may endure.

Before diving into the complexities of these queries, a moment of reflection is required. Can all these complexities be addressed adequately? Aquariums have been the subject of extensive examination and analysis by academicians, who have presented arguments both for and against their existence. They have also provided evidence of the influence aquariums have on visitors' mindsets and behaviours. However, there is a notable dearth of research that examines the perspectives of aquarium staff members in order to obtain insights from within the aquarium itself. To truly comprehend the future of aquariums, it is essential to embark on the task of hearing the aquariums' own voices. By exploring their narratives, a deeper understanding of the dynamics between aquariums and societal perceptions can be achieved. In addition, these narratives provide valuable insights into the current approaches and mentalities adopted by aquariums, allowing for a more comprehensive understanding of their current state. Intriguing findings emerged from the interview. These narratives, collected directly from aquariums, provide not only valuable contributions to the studies, but also a rare glimpse into perspectives that are not readily observed. The carefully selected set of questions allowed the author to explore different aspects of aquarium operation, capturing information on how aquariums approach education, entertainment, and ethics.

Through these narratives, numerous significant themes regarding education, entertainment and ethics were identified. To start with, aquariums perceive education within their facilities as a non-formal instrument that goes beyond traditional classroom learning. However, the effectiveness of aquarium education must be measured rigorously to ensure that it fulfils the expectations of both educators and students. Also evident was the significance of entertainment in aquariums. It functions as an amplifier for increasing visitation, generating revenue, and improving the efficacy of educational messages. However, the entertainment aspect frequently raises ethical concerns as it becomes a subject of question. Finally, aquariums, in general, demonstrated a willingness to engage in ethical discussions and acknowledged the need to address ethical considerations within their institutions when questioned, despite some of the discussion could even suggest a world without their very existence. In the end, these ideas contributed to the formation of conclusive theories that reflect the perspectives and agendas of the aquariums themselves, thereby providing a potential vision for future aquariums.

Based on the data collected through interviews, the author has identified several theories that can shape the future of aquariums. These theories include Free-choice learning, Edutainment, and Posthumanism. To provide a summary of their applicability, embracing the concept of free-choice learning can assist aquariums in designing cohesive educational programs that cater to the diverse learning needs and objectives of their visitors. By adopting edutainment, aquariums can offer meaningful entertainment experiences that effectively convey educational messages, while also increasing visitor interest and engagement. Lastly, incorporating posthumanism enables aquariums to address ethical concerns not as sensitive topics, but as opportunities for continual self-evaluation and alignment with contemporary ethical and sustainability considerations.

These notions are rooted in the narratives expressed by aquariums during the interviews. The author believes that if aquariums are willing to embrace these concepts in their operations, it could better equip them to navigate the complex challenges posed by contemporary society regarding their existence. By leveraging free-choice learning, edutainment, and posthumanism, aquariums can enhance their educational impact, create more engaging experiences, and proactively address ethical considerations. This proactive approach aligns aquariums with evolving societal expectations and positions

them as dynamic institutions capable of addressing contemporary issues.

6.1 Suggestions

With all of the aforementioned themes observed in aquariums' narratives and theories, a central concept for the future of aquariums emerged. The authors would like to suggest the following future operational approaches for aquariums to implement:

Free-choice Learning

- Develop a clear positioning of what distinguishes the aquarium learning outcomes from typical classroom learning.
- Recognise that whether the visitors are on a school-based tour or just normal visitors, their visit will be educational in either case.
- Communicate actively with visitors at the outset of their visit to identify their intended learning objectives.
- Allow learners to create their own learning agenda. Developing programmes and workshops that cater to diverse learning styles, paces and interests.
- Allow multiple learning outcomes to emerge among the learners. Offering visitors the flexibility to choose topics and engage in learning.
- Recognise and encourage elements such as sentiments, inspiration or creative thinking as part of the learning outcomes.
- Use measurements to systematically track and document learning outcomes, such as a post-visitation questionnaire via email or an invitation of revisiting.

Edutainment

- When creating entertainment programmes, always make sure an intended educational message is portrayed within, and the visitors are engaged and receptive to the educational content.
- Reassessment of all present entertainment programmes in use. If little or no educational messages are identified, alteration or abolition may be required.
- Integrate technology, such as multimedia, augmented reality or virtual reality, to enhance educational experiences and provide immersive learning opportunities.
- Collaborate with local educational institutions to develop curriculum-aligned programmes that extend learning beyond the aquarium visit and reinforce

concepts taught in the classroom.

- Implement interactive assessments and evaluation methods that allow educators to gauge students' comprehension and assimilation of the educational content. Such as quizzes, interactive games, or reflective exercises that encourage learners to apply their knowledge.
- Train and support educators in excellent instructional tactics and practices that encourage material comprehension, application, and enjoyment. Such as professional development opportunities, ongoing feedback, and collaboration among educators to share best practices and enhance the overall learning experience.

Posthumanism

- Continuously post ethical discussions internally. Encourage employees to engage in ethically-based brainstorming, debate, or reevaluation.
- Include more-than-human stakeholders in the decision-making process of aquariums at all times. Ensure that their agency is represented.
- Create a dedicated board of ethics.
- Externally engage in ethical discussions and transparency, such as enabling platforms for communication. Actively seeking ways to improve and align with contemporary ethical standards.
- Ensure the relevancy and efficacy of the aquarium's programmes and exhibits by continuously evaluating and modifying them based on visitor feedback, emerging research, and shifting societal expectations.

6.2 Limitations & Future Researches

As a novice researcher, the author has found the process of conducting this study to be highly enriching. It provided an opportunity to closely examine the actual approaches employed by aquariums in real-world contexts. However, the study does have several limitations arising from factors such as time constraints, available resources, and the chosen methodology. The following section aims to acknowledge these limitations and further propose future studies, which could guide future researchers interested in exploring similar topics towards a more comprehensive understanding of their approaches.

1. **Samples:** Due to the qualitative nature, it was determined early on that the sample size would not have a significant impact. However, it should be emphasised that certain global regions were underrepresented among participants. Primarily owing to data gathering constraints, such as language barriers and a lack of participation incentives. As a result, the data gap persists in areas such as the Middle East, Latin America, and Southeast Asia. Future research should employ a more consistent and rigorous sampling procedure, ensuring that aquariums from each of the world's regions are represented. Thus, enabling potential research question of: *“To what extent does geopolitics and cultural context influence the operation strategies of aquariums?”*
2. **Conservation Role of Aquariums:** During data gathering, it became obvious that many aquariums see themselves as playing an important conservation role in modern society. They stated their present conservation approaches, which typically include scientific projects, endemic species protection, and habitat rehabilitation, among other things. However, because of the author's tourism background, the incorporation of this conservation role into the creation of the theories provided in this study was complicated by a poor understanding of scientific theories in areas such as biology, environmental engineering, and geology. Future collaborative studies including scientific professionals may be required to resolve the multidisciplinary nature of aquarium research. Asking research question such as: *“How could implementing effective conservation projects influence societal perception of aquarium operation?”*
3. **Biased Perspectives:** To answer the research question, the primary source of data was the narratives of aquarium employees. Nonetheless, it is critical to realise the possible bias in this method. As staff members come from many backgrounds, their narratives may not fully represent or reflect the institution's broader perspectives and values. Furthermore, to have a thorough understanding of the functions aquariums play in society, all stakeholders' perspectives must be considered. As a result, it is advised that future research study the perspectives of stakeholders from multiple parties in order to develop results that reflect the intricacies of our reality more precisely. A suggested research question can be: *“Towards Impactful Aquariums: How can aquariums better align with societal needs while taking stakeholder perspectives into account?”*

Reference

- Adelman, L. M., Falk, J. H., & James, S. (2000). Impact of National Aquarium in Baltimore on Visitors' Conservation Attitudes, Behavior, and Knowledge. *Curator: The Museum Journal*, 43(1), 33–61. <https://doi.org/10.1111/j.2151-6952.2000.tb01158.x>
- Adelsberger, H., & Eicher, H. (2008). The Koralm-Line as a Part of Wider European Railway Connections – Integrated in the Baltic-Adriatic-Axis. *Geomechanics and Tunneling*, 1(4), 250–255. <https://doi.org/10.1002/geot.200800029>
- Aksakal, N. (2015). Theoretical View to The Approach of The Edutainment. *Procedia - Social and Behavioral Sciences*, 186, 1232–1239. <https://doi.org/10.1016/j.sbspro.2015.04.081>
- Akvarij-terarij Maribor. (2023). *About The Aquarium-Terrarium of Maribor*. Akvarij-Terarij v Mariboru. Retrieved 15 May 2023 from <http://www.akvarij-terarij.si/index-en.html>
- AMMPA. (2023). *Our Members | AMMPA*. Alliance of Marine Mammal Parks & Aquariums. Retrieved 15 May 2023 from <https://www.ammpa.org/about/our-members>
- AZA. (2022). *Zoo and Aquarium Statistics | AZA*. Association of Zoos and Aquariums. Retrieved 15 May 2023 from <https://www.aza.org/zoo-and-aquarium-statistics>
- Badmington, N. (2000). *Posthumanism*. Bloomsbury Publishing.
- Ballantyne, R. (2004). Young Students' Conceptions of the Marine Environment and Their Role in the Development of Aquaria Exhibits. *GeoJournal*, 60(2), 159–163. <https://doi.org/10.1023/B:GEJO.0000033579.19277.ff>
- Ballantyne, R., & Packer, J. (2005). Promoting environmentally sustainable attitudes and behaviour through free-choice learning experiences: What is the state of the game? *Environ Educ Res*, 11. <https://doi.org/10.1080/13504620500081145>
- Balloffet, P., François H., C., & Lagier, J. (2014). From Museum to Amusement Park: The Opportunities and Risks of Edutainment. *International Journal of Arts Management*, 16.
- Bamberger, Y., & Tal, T. (2007). Learning in a personal context: Levels of choice in a free choice learning environment in science and natural history museums. *Science Education*, 91(1), 75–95. <https://doi.org/10.1002/sce.20174>
- Betzniech, J. H. (1865). The sea in the glass house| Das Meer im Glashaue. *Die Gartenlaube*, 25, 388–391.
- Biasetti, P., Florio, D., Gili, C., & de Mori, B. (2020). The Ethical Assessment of Touch Pools in Aquariums by Means of the Ethical Matrix. *Journal of Agricultural and Environmental Ethics*, 33(2), 337–353. <https://doi.org/10.1007/s10806-020-09823-2>
- Braidotti, R. (2013). Posthuman Humanities. *European Educational Research Journal*, 12(1), 1–19. <https://doi.org/10.2304/eej.2013.12.1.1>
- Braun, R. (2011). The Lobby as a Living Room: What Interior Design Innovations and Products do Luxury Hotels Implement to Attract Guests to their Lobby? *Modul University Bee*.
- Brown, S. (2007). A critique of generic learning outcomes. *Journal of Learning Design*, 2(2), 22–30. <https://doi.org/10.5204/jld.v2i2.37>
- Brunner, B. (2012). *The Ocean at Home: An Illustrated History of the Aquarium*. Reaktion Books.
- Cater, C. (2010). Any closer and you'd be lunch! Interspecies interactions as nature tourism at marine aquaria. *Journal of Ecotourism*, 9(2), 133–148. <https://doi.org/10.1080/14724040903125039>
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Sage Publications.
- Clifford, G. (1981). The past is prologue. In *The Future of Education: Policy Issues and Challenges* (pp. 127–135). CA: Sage.
- Cohen, E. (2019). Posthumanism and tourism. *Tourism Review*, 74(3), 416–427. <https://doi.org/10.1108/TR-06-2018-0089>
- Colace, F., De Santo, M., Pietrosanto, A., & Troiano, A. (2006). *Work in Progress: Bayesian Networks for Edutainment*. 13–14. <https://doi.org/10.1109/FIE.2006.322573>
- Daengbuppha, J., Hemmington, N., & Wilkes, K. (2006). Using grounded theory to model visitor experiences at heritage sites: Methodological and practical issues. *Qualitative Market Research: An International Journal*, 9(4), 367–388. <https://doi.org/10.1108/13522750610689096>
- Damasio, A. (1994). Descartes' Error: Emotion, Rationality and the Human Brain. *New York: Putnam*, 352.
- Davis, T. C., & Strandvad, S. M. (2020). Aquarium Mermaids: Multiskilled Entrepreneurs in the Creative Economy. *TDR/The Drama Review*, 64(1), 119–144.

https://doi.org/10.1162/dram_a_00899

- Delve, Ho, L., & Limpaccher, A. (2021, September 17). *The Practical Guide to Grounded Theory*. Delve Tool.Com. Retrieved 23 March 2023 from <https://delvetool.com/groundedtheory>
- Dennett, A. S. (1997). *Weird and Wonderful: The Dime Museum in America*. NYU Press. shorturl.at/jwENV
- Dierking, L., & Falk, J. (1998). Understanding Free-Choice Learning: A Review of the Research and its Application to Museum Web Sites. *Museums and the Web*. Retrieved 15 February 2023 from https://www.archimuse.com/mw98/papers/dierking/dierking_paper.html
- Dobson, J. (2011). Towards a Utilitarian Ethic for Marine Wildlife Tourism. *Tourism in Marine Environments*, 7(3), 213–222. <https://doi.org/10.3727/154427311X13195453162976>
- Dohn, N. B. (2011). Situational interest of high school students who visit an aquarium. *Science Education*, 95(2), 337–357. <https://doi.org/10.1002/sc.20425>
- Edge, K. (2014). *Inventing the aquarium: A short history*. Horniman Museum and Gardens. <https://www.horniman.ac.uk/story/inventing-the-aquarium-a-short-history/>
- Falk, J. H., & Adelman, L. M. (2003). Investigating the impact of prior knowledge and interest on aquarium visitor learning. *Journal of Research in Science Teaching*, 40(2), 163–176. <https://doi.org/10.1002/tea.10070>
- Falk, J. H., Dierking, L., & Adams, M. (2011). Living in a Learning Society: Museums and Free-choice Learning. In *A Companion to Museum Studies* (pp. 323–338). John Wiley & Sons.
- Falk, J. H., & Dierking, L. D. (2002). *Lessons Without Limit: How Free-choice Learning is Transforming Education*. Rowman Altamira.
- Falk, J. H., Heimlich, J., & Bronnenkant, K. (2008). Using Identity-Related Visit Motivations as a Tool for Understanding Adult Zoo and Aquarium Visitors' Meaning-Making. *Curator: The Museum Journal*, 51(1), 55–79. <https://doi.org/10.1111/j.2151-6952.2008.tb00294.x>
- Fennell, D. A. (2013). Contesting the zoo as a setting for ecotourism, and the design of a first principle. *Journal of Ecotourism*, 12(1), 1–14. <https://doi.org/10.1080/14724049.2012.737796>
- Fennell, D. A. (2022). Animatronic dolphins as the new authentic? Posthuman reflections of 'light' tourism on the move. *Journal of Ecotourism*, 0(0), 1–20. <https://doi.org/10.1080/14724049.2022.2099409>
- Glaser, B. G., & Strauss, A. L. (2017). *Discovery of Grounded Theory: Strategies for Qualitative Research*. Routledge.
- Gosse, P. H. (1853). *A naturalist's rambles on the Devonshire coast*. J. Van Voorst.
- Gosse, P. H. (1856). *The Aquarium: An Unveiling of the Wonders of the Deep Sea*. J. Van Voorst.
- Gray, J. (2017). *Zoo Ethics: The Challenges of Compassionate Conservation*. CSIRO Publishing. <http://ebookcentral.proquest.com/lib/sdub/detail.action?docID=4898665>
- Grimm, D. (2011). Are Dolphins Too Smart for Captivity? *Science*, 332(6029), 526–529. <https://doi.org/10.1126/science.332.6029.526>
- Guia, J. (2020). Conceptualizing justice tourism and the promise of posthumanism. *Journal of Sustainable Tourism*, 29(2–3), 503–520. <https://doi.org/10.1080/09669582.2020.1771347>
- Guinness World Record. (2014, March 31). *China's Hengqin Ocean Kingdom confirmed as world's largest aquarium as attraction sets five world records*. Guinness World Records. Retrieved 07 March 2023 from <https://www.guinnessworldrecords.com/news/2014/3/chinas-hengqin-ocean-kingdom-confirmed-as-worlds-largest-aquarium-as-attraction-sets-five-world-records-56471>
- Haikal, M. (2020). The Aquarium “Unter den Linden”. In *Master Pongo* (Vol. 17, pp. 66–79). Penn State University Press. <https://doi.org/10.1515/9780271086415-007>
- Hassan, I. (1977). Prometheus as Performer: Toward a Posthumanist Culture? *The Georgia Review*, 31(4), 830–850.
- Heim, A. B., & Holt, E. A. (2021). Goal-Setting among Biology Undergraduates during a Free-Choice Learning Experience at a Regional Zoo. *Journal of Zoological and Botanical Gardens*, 2(4), Article 4. <https://doi.org/10.3390/jzbg2040044>
- Heimlich, J. E., & Falk, J. (2009). Free-choice learning and the environment: Background and Theory. In *Free-choice Learning and the Environment* (pp. 11–22). Rowman Altamira.
- Hein, G. (2011). Museum Education. In *A Companion to Museum Studies* (pp. 340–350). John Wiley & Sons.
- Hemdal, J. (2009, December 15). *Aquarium Fish: Mortality Rates of Fishes in Captivity*. Retrieved 24 February 2023 from Reefs.Com. <https://reefs.com/magazine/aquarium->

fish-mortality-rates-of-fishes-in-captivity/

- Hertzman, E., Anderson, D., & Rowley, S. (2008). Edutainment heritage tourist attractions: A portrait of visitors' experiences at Storyeum. *Museum Management and Curatorship*, 23(2), 155–175. <https://doi.org/10.1080/09647770802012227>
- Hilton, W. J. (1981). Lifelong Learning. In *The Future of Education: Policy Issues and Challenges* (pp. 147–157). CA: Sage.
- Holdworth, E. W. H. (1860). *Handbook to the Fish-House in the Gardens of the Zoological Society of London*. Bradbury & Evans.
- Humphreys, H. N. (1857). *Ocean gardens: The history of the marine aquarium*.
- ICOM. (2022). *Museum Definition*. International Council of Museums. Retrieved 14 March from <https://icom.museum/en/resources/standards-guidelines/museum-definition/>
- Jardin d'Acclimatation. (2018). *More Than 160 Years of History | Jardin d'Acclimatation*. Jardin d'Acclimatation. <https://www.jardindacclimatation.fr/en/beyond-150-years>
- Jennings, G., & Junek, O. (2007). Chapter 12 - Grounded Theory: Innovative Methodology or a Critical Turning from Hegemonic Methodological Praxis in Tourism Studies. In I. Ateljevic, A. Pritchard, & N. Morgan (Eds.), *The Critical Turn in Tourism Studies* (pp. 197–210). Elsevier. <https://doi.org/10.1016/B978-0-08-045098-8.50017-9>
- Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing*, 72(12), 2954–2965. <https://doi.org/10.1111/jan.13031>
- Kelsey, E. (1991). Conceptual change and killer whales: Constructing ecological values for animals at the Vancouver Aquarium. *International Journal of Science Education*, 13(5), 551–559. <https://doi.org/10.1080/0950069910130506>
- Kim, J. M., & Snively, G. (2007). Korean teachers' perceptions of aquarium field trips and future recommendations for marine aquarium education. In *CONNECTIONS 2007* (pp. 123–129). University of Victoria.
- Klopfer, L. E., Fortner, R., & Wildman, T. M. (1980). Marine Education: Progress and Promise. *Science Education*, 64(5)(4), 717–723. <https://doi.org/10.1080/00357529.1980.11764651>
- Le Gall, G. (2018). Aquatic dioramas: Théophile Gautier visits the aquarium of the Jardin d'acclimatation | Dioramas aquatiques: Théophile Gautier visite l'aquarium du Jardin d'acclimatation. *Culture & Musées. Muséologie et recherches sur la culture*, 32, Article 32. <https://doi.org/10.4000/culturemusees.2370>
- Lloro-Bidart, T. (2017). A feminist posthumanist political ecology of education for theorizing human-animal relations/relationships. *Environmental Education Research*, 23(1), 111–130. <https://doi.org/10.1080/13504622.2015.1135419>
- Lloro-Bidart, T. (2018). A Feminist Posthumanist Multispecies Ethnography for Educational Studies. *Educational Studies*, 54(3), 253–270. <https://doi.org/10.1080/00131946.2017.1413370>
- Lloro-Bidart, T., & Russell, C. (2017). Learning Science in Aquariums and on Whalewatching Boats: The Hidden Curriculum of the Deployment of Other Animals. In M. P. Mueller, D. J. Tippins, & A. J. Stewart (Eds.), *Animals and Science Education* (Vol. 2, pp. 41–50). Springer International Publishing. https://doi.org/10.1007/978-3-319-56375-6_4
- MarineBio. (2017, May 9). Worldwide Aquariums & Marine Life Centers ~ MarineBio Conservation Society. *MarineBio*. Retrieved 15 May 2023 from <https://www.marinebio.org/creatures/marine-aquariums/>
- Mather, J., & Anderson, R. (2007). Ethics and invertebrates: A cephalopod perspective. *Diseases of Aquatic Organisms*, 75, 119–129. <https://doi.org/10.3354/dao075119>
- Matteucci, X., & Gnoth, J. (2017). Elaborating on grounded theory in tourism research. *Annals of Tourism Research*, 65, 49–59. <https://doi.org/10.1016/j.annals.2017.05.003>
- McCroskey, J. C. (1982). Communication competence and performance: A research and pedagogical perspective. *Communication Education*, 31(1), 1–7. <https://doi.org/10.1080/03634528209384654>
- McIntosh, M. J., & Morse, J. M. (2015). Situating and Constructing Diversity in Semi-Structured Interviews. *Global Qualitative Nursing Research*, 2, 2333393615597674. <https://doi.org/10.1177/2333393615597674>
- Minteer, B. A., & Collins, J. P. (2013). Ecological Ethics in Captivity: Balancing Values and Responsibilities in Zoo and Aquarium Research under Rapid Global Change. *ILAR Journal*, 54(1), 41–51. <https://doi.org/10.1093/ilar/ilt009>
- Nyhart, L. K. (2009). *Modern Nature: The Rise of the Biological Perspective in Germany*. University of Chicago Press.
- Ogle, B. (2016). Value of Guest Interaction in Touch Pools at Public Aquariums. *Universal Journal of Management*, 4, 59–63. <https://doi.org/10.13189/ujm.2016.040202>

- Okan, Z. (2003). Edutainment: Is learning at risk? *British Journal of Educational Technology*, 34(3), 255–264. <https://doi.org/10.1111/1467-8535.00325>
- Ong, C.-E. (2017). 'Cuteifying' spaces and staging marine animals for Chinese middle-class consumption. *Tourism Geographies*, 19(2), 188–207. <https://doi.org/10.1080/14616688.2016.1196237>
- Packer, J., & Ballantyne, R. (2010). The role of zoos and aquariums in education for a sustainable future. *New Directions for Adult and Continuing Education*, 2010(127), 25–34. <https://doi.org/10.1002/ace.378>
- Rapeepisarn, K., Wong, K. W., Fung, C. C., & Depickere, A. (2006). *Similarities and differences between "learn through play" and "edutainment"*.
- Regan, T. (1996). Are Zoos Morally Defensible? In *Ethics on the Ark: Zoos, Animal Welfare, and Wildlife Conservation* (pp. 38–51). Smithsonian Institution.
- Resnick, M. (2004). *Edutainment? No thanks. I prefer playful learning*. Associazione Civita Report on Edutainment.
- Saxon, A. H. (1989). P. T. Barnum and the American Museum. *The Wilson Quarterly* (1976-), 13(4), 130–139.
- Schwan, S., Grajal, A., & Lewalter, D. (2014). Understanding and Engagement in Places of Science Experience: Science Museums, Science Centers, Zoos, and Aquariums. *Educational Psychologist*, 49(2), 70–85. <https://doi.org/10.1080/00461520.2014.917588>
- Shulman, J. L., & Bowen, W. G. (2002). *The Game of Life: College Sports and Educational Values*. Princeton University Press. <http://ebookcentral.proquest.com/lib/sdub/detail.action?docID=740669>
- Smith, M., Warmolts, D., Thoney, D., & Hueter, R. (2004). The Elasmobranch Husbandry Manual: Captive Care of Sharks, Rays and their Relatives Editors. *Special Publication of the Ohio Biological Survey*, 589.
- Sowerby, G. B. (1857). *Popular History of the Aquarium of Marine and Freshwater animals and plants*.
- Spooner, S. L., Jensen, E. A., Tracey, L., & Marshall, A. R. (2019). Evaluating the impacts of theatre-based wildlife and conservation education at the zoo. *Environmental Education Research*, 25(8), 1231–1249. <https://doi.org/10.1080/13504622.2019.1569201>
- Sprung, J. (2002, December 15). *Aquarium Invertebrates: Captive Husbandry Of Goniopora, Spp. With Remarks About The Similar Genus Alveopora*. Reefs.Com. <https://reefs.com/magazine/aquarium-invertebrates-captive-husbandry-of-goniopora-spp-with-remarks-about-the-similar-genus-alveopora/>
- Stott, R. (2003). *Theatres of Glass: The Woman who Brought the Sea to the City*. Short Books.
- Strauss, A., & Corbin, J. M. (1997). *Grounded Theory in Practice*. SAGE.
- UNESCO, W. H. (1998). *Semmering Railway*. UNESCO World Heritage Centre. Retrieved 04 March 2023 from <https://whc.unesco.org/en/list/785/>
- Van Winkle, C., & Bueddefeld, J. (2021). Free-choice learning in agritourism. *World Leisure Journal*, 63(2), 182–200. <https://doi.org/10.1080/16078055.2020.1832025>
- Ventre, J., & Jett, J. (2015). Killer whales, theme parks, and controversy: An exploration of the evidence. In *Animals and Tourism: Understanding Diverse Relationships* (pp. 128–142). Channel View Publications.
- Warner, D. (2015, July 14). *William Stimpson and the Smithsonian's First Aquarium*. Smithsonian Institution Archives. Retrieved 12 April 2023 from <https://reurl.cc/GerVoA>
- Wennemann, D. J. (2016). The Concept of the Posthuman: Chain of Being or Conceptual Saltus? *Journal of Ethics and Emerging Technologies*, 26(2), Article 2. <https://doi.org/10.55613/jeeet.v26i2.57>
- West, H., & Duignan, B. (1999). Utilitarianism | Definition, Philosophy, Examples, Ethics, Philosophers, & Facts | Britannica. In *Britannica*. Retrieved 19 March 2023 from <https://www.britannica.com/topic/utilitarianism-philosophy>
- Wijgerde, T. (2016, February 10). *Victorian pioneers of the marine aquarium*. Reefs.Com. <https://reefs.com/magazine/victorian-pioneers-of-the-marine-aquarium/>
- Wolfe, C. (2008). Flesh and Finitude: Thinking Animals in (Post) Humanist Philosophy. *SubStance*, 37(3), 8–36.
- Wolfe, C. (2009). *What Is Posthumanism?* University of Minnesota Press. <http://ebookcentral.proquest.com/lib/sdub/detail.action?docID=557541>
- Wood, J. G. (1868). *The Fresh and Salt-water Aquarium*. George Routledge and Sons.
- Wursig, B., Perrin, W. F., & Thewissen, J. G. M. 'Hans'. (2009). Intelligence and Cognition. In *Encyclopedia of Marine Mammals* (pp. 616–623). Academic Press.
- Yim, B. (2010). Ocean Park In the Face of Competition from Hong Kong Disneyland. In *Strategic Management for Hospitality and Tourism* (pp. 207–233). Elsevier. <https://doi.org/10.1016/B978-0-7506-6522-3.00011-0>
- Yum, D. M. S. (2022). *Istanbul Aquarium Edutainment Project*. 10(2).

Appendixes

Appendix

Appendix 1 Questions of the semi-structured interviews

Questions	Purposes
Introduction stage	
Q1 How do you think aquariums contribute to society? Which role does aquariums usually play?	Open question/ introducing the main research questions
Q1.1 What is the most prominent role that you have observed in your aquariums? How do these roles apply to your institution?	Follow-up question to specify the applicability to the participants' own aquariums.
Aquarium as Educator	
Q2 Which kind of educational programmes are used?	The current approaches incorporating education within participant's aquarium.
Q3 Why is education important to your aquarium? How is it different from the traditional classroom-based learning?	The aquarium self-identities, perspectives of the education usage (justification, sentiment or reasons)
Q4 How does your aquarium measure the effectiveness of its visitors' education? How can you ensure the knowledge gained can be applied to the visitor's daily life?	Education in aquarium can be 'short-lived' and inefficient (Davis & Strandvad, 2020; Ballantyne & Packer, 2005); understand which specific metrics or feedback mechanisms are used to measure their impact.
Aquariums as Entertainer	
Q5 Why is entertainment important to your aquarium? How does your aquarium benefit from entertainment?	The aquarium self-identities, perspectives of the entertainment usage (justification, sentiment or reasons)
Q6 How do you create and balance meaningful entertainment programmes?	Entertainment factors in aquariums are often facile and devoid of the other messages (Davis & Strandvad, 2020; Ong, 2017)
Aquariums as Exploiter	
Q7.1 Can you describe some of the ethical concerns that have been raised about aquariums in general?	What are the current ethical concerns within participant's aquarium?
Q7.2 How do these concerns apply to your institution? How do you tackle and interact with them?	Follow up question to specify how the aforementioned concerns might occurred to the participants and how do they interact with them?

Q8 Should aquariums address ethical concerns more proactively to the general public	The aquarium self-identities, perspectives of the ethicality; collect narratives regarding the relationship between aquariums and ethics
Close up question	
Q9 How have the societal changed through your experience?	understand aquarium's awareness in public perception changes throughout their experience. Identify how these change in perception might have alter their decision.
Q10 How will your institution change in the foreseeable future? What are the agenda and priorities	learn how aquariums envisioned their futures with the complexity of societal perception intertwined with their operation.