Moving Beyond THE COVID CLASSROOM: A STUDY OF HOW MOBILE TECHNOLOGY IS USED FOR FIELDDATA GATHERING AND A CHANGING PEDAGOGICAL FRAMEWORK

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INTRODUCTION

The COVID lockdown period is fast becoming a distant memory, but while we were experiencing how to cope with teaching outside the physical classroom and indeed furthering our own research did present a way of adapting and discovering new processes. These new processes led to working remotely within our own individual bubbles and discovering how to cope with this new world.
Using a research project of documenting the phenomenon of beach cusps this paper will consider how mobile technology is used in the field for gathering data and how the findings can be incorporated into the teaching curriculum which can lead to new artistic artworks created from these findings.
The artistic pieces created from the field data using mobile technology can be expressed within the artistic community by giving credibility to the technology and can give further dialogue to the connection of place and the changing methods within the tertiary education sector.

FIELD RESEARCH

Beach cusps can be described as strange water formations along the shoreline that are made of various types of stones and sediment that are washed up along the shoreline. Not all beaches have them and they do not necessarily repeat in the same place, as it all depends on the formation of the sediments in the tides along with the wavelength and the angle between the intersecting wave trains.[1] As the waves hit the shoreline beach cusps are formed making what is called the horns and the embayment as they are displaced on the beach. The horns are coarser material than the embayment thus creating the phenomenon of beach cusps. Examples can be seen in Figure 1.
The documenting of the research project ‘beach cusps’ was over a period of two summer seasons and saw the formulation of filmed footage, postproduction workflow, editing and creative process. The origins of this research project lie off the coast of New Zealand with observing and documenting the formations of beach cusps. As an educator artist and film maker I wanted to observe the footage through an artistic lens. How the beach cusps were formed and how the journey could be documented and artistically transformed into artist poetic works piece.[2]

Figure 1. Example showing the formation of the horns and embayment of beach cusps taken from the drone footage.

In gathering research for this paper examples of beach cusps were limited to still photography or technical illustrations[3] showing their formation with a few examples of filmed footage shown on social media platforms such as YouTube. A limited amount of footage can be found on social media sites such as, *Cusps Formation* https://www.youtube.com/watch?v=bJ9AUMGTKaI and *Beach cusps on Agate beach, Haida Gwaii* https://www.youtube.com/watch?v=FJfZw5YDreg. The photographic and filmed examples I noted were either taken from shoreline of clifftop, which did not give a clear representation of the beach cusps. Understanding how they are formed and showing the topography of the beach is limited at these angles. It is worth noting that that New Zealand beach cusps are quite rare and where they do form there are no cliffs to observe them from. This process of documenting the cusps either from the beach or from a position such as clifftops is limiting in the amount of elevation or angle to correctly observe the beach cusps.

Process

Now that we are living in a somewhat normal post COVID environment, we have however adapted and changed our lives to a new form a COVID process within our research and teaching habits by becoming more remote and more reliable on technology. In doing so this paper will examine the processes used in a research project that started during the pandemic period and concluded beyond the pandemic and how we adapted in the ways we think and document our research.

This paper will focus on the processes of an alternative method for documenting beach cusps using mobile technology such as drones and timelapse photography with a view of expressing these findings through artistic moving image examples such as short films. Moreover, it can be seen as an artistic research inquiry and can be established as a method of gathering information to formulate visual poetic art pieces. Klein argues that this form of 'artistic research inquiry' is subject to the researcher's perspective and he suggests that 'art' is a way of perception, and thus the artistic research becomes a process and reflection, in doing so a creative practice takes place "at the level of artistic experience itself".[4]

Through a series of site gathering data and experiments using mobile recording equipment such as drones, waterproof cameras and audio recording equipment, this paper will show how data gathered from these site visits and experiments in the field can aid in the making of visual poetic reflections in the form of short poem films and how they can be delivered into a new pedagogical framework.

METHODOLOGY

Entering this new method of gathering data was an unknown field of where to start and indeed what the final results would yield. Through this research of data gathering, recording, and processing either in the field or later back in my studio, I use the methodology of heuristic inquiry. Described by Moustakas as, "internal search through which one discovers the nature and meaning of experience and develops methods and procedures for further investigation and analysis".[5] Through this process of investigation and experimentation can be a process of trial and error and working through to find the solution. Moustakas refers to this as, "internal search through which one discovers the nature and meaning of experience and develops methods and procedures for further investigation and analysis" Sela-Smith notes a heuristic inquiry "requires that the participant-as-researcher focus on the feeling dimension of personal experience to discover meanings embedded therein".[6]

The process of refinement in the experiments or the art pieces becomes what [7] describes as 'move testing' as experimentation and a sense of 'what works' and 'what doesn't' occurs through a process of reflecting 'on and in action'. Thus, a heuristic inquiry involves a process of discovery through trial and error and the ability to critically 'feel' one's way forward using intuition and insight.[8] Within this process I am "the insider".[9] Therefore, what I experience and create bears the signature and voice of my personal interpretation.[10] As Sela-Smith notes, heuristic inquiry "requires that the participant as-researcher focus on the feeling dimension of personal experience to discover meanings embedded therein". An example of the working process can be seen in Figure 2.

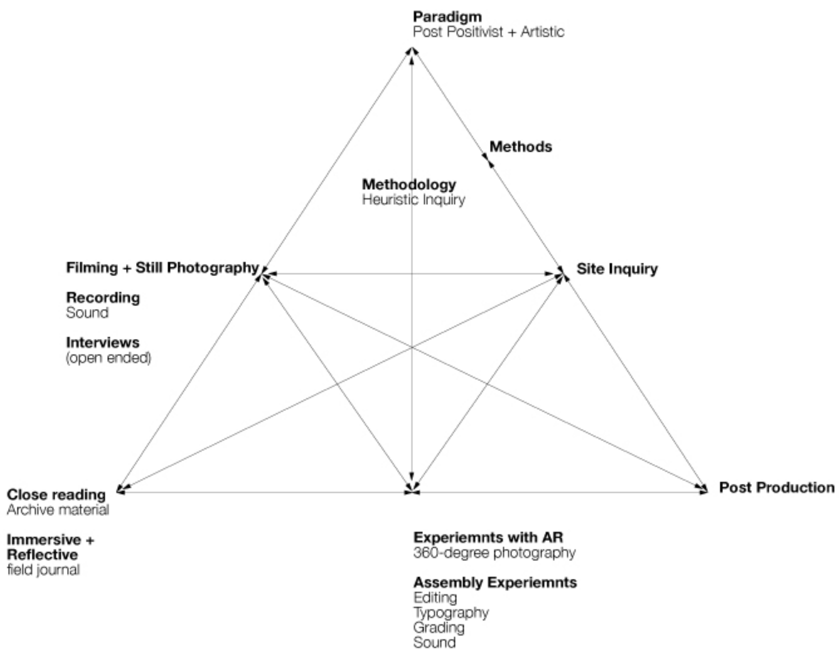

Figure 2. Information demonstrating relationships between paradigms, methodology and methods.

METHODS

The methods used for researching and documenting in the field is restricted to the amount of equipment that I can physically take due to transporting and carrying the equipment in hard to reach and secluded locations. There are five methods that I adopt within the documenting and creative process, and although they are discussed individually, they do form a correlation and speak with each other. Moreover, these can be categorised into two groups, *Field Work Methods,* and *Studio-Based Methods.* Although these are categorised separately, they are still connected with a discourse of ideas and do reflect on each other, Figure 2.

The Location and Field Equipment

In documenting the beach cusps relied on being at the beach location for several hours at a time (between 6-8 hours) so that enough data could be gathered. This was also dependent on the incoming and outgoing tides. A secluded beach location with no people around was of upmost importance especially when filming time-lapse and using the drone for filming. In researching a beach that was devoid of people and produced beach cusps was going to be a challenge. However, being a keen sea kayaker, I did know of a location that was indeed secluded and showed promise of beach cusps formations. The location I chose is only accessible from the sea which meant that there would be no people on the beach. It was approximately 1.5 hour's paddle to reach the beach, so the equipment had to condense into one small waterproof bag that would fit inside the kayak. On my field trips to the beach consisted of 2x drones, spare batteries, drone controller, 3x GoPro cameras, Zoom sound recorder, mini tripod, iPhone 13pro and DJI iPhone stabilizer. The collection of equipment was small and light, easily transportable but equally not compromising in the quality of the filmed footage. An example of the mobile equipment can be seen in Figure 3.

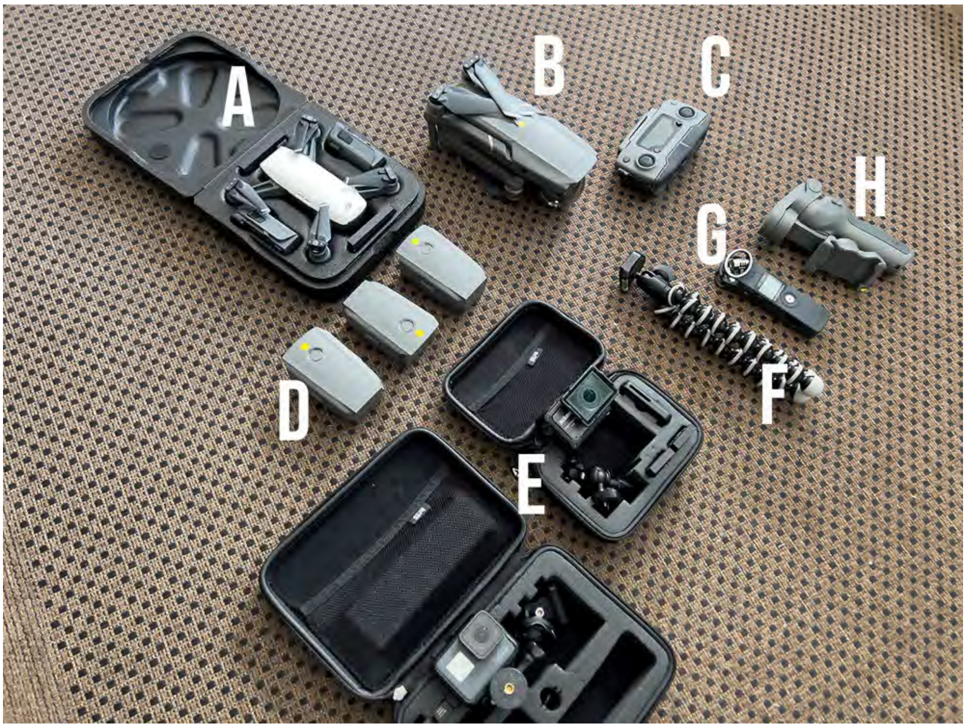

Figure 3. A collection of mobile equipment that is used in the field comprising of (A) DJI Spark drone, (B) DJI Mavic Pro 2 drone, (C) drone controller, (D) drone spare batteries, (E) GoPro cameras, (F) mini tripod, (G) Zoom sound recorder, (H) DJI iPhone stabilizer.

GoPro Cameras for Timelapse Footage

One of the greatest benefits of using GoPro cameras is their small size, robustness, and versatility to capture high quality filmed footage housed within a waterproof body. They are capable of filming in 4k for large format displays such as movie cinemas also have the capability for recording in timelapse mode. In the field experiments I used both moving image (normal filming mode) and timelapse footage (single shot frames and timed delayed periods and pieced together) for capturing data for analysis.

The first experiments were using the GoPro cameras set at different points along the beach to capture the horns and embayment of the beach cusps to determine the size of the cusps and how they were breaking on the shore. The cameras were also positioned at different heights to track the deposits of stones and sediment as it is washed up onto the shoreline. An example of the placements of the cameras can be seen in Figure 4. GoPro camera #1 was positioned on an aluminium pole 500mm above the ground and at right angles to the shoreline. The aluminium poles where specifically made for this field trip and had a diameter of 10mm. It had to be thin enough as to not cause movement to the cameras as the waves came in and hit the pole, but also substantial enough to support the cameras and be able to take a ¼ inch thread enabling it to be mounted to the tripod mount.

With the incoming tide the height of the camera would be at a water level of between 200mm and rising to 100mm from the bottom of the camera as the tide came in. It was setup to take 1 timelapse photograph at intervals of 10seconds over a period of 4-hours (240 frames). Played back at normal speed of 24 frames per second gave a 10seconds piece of filmed footage. This may appear a short-filmed piece, but it did show a significant about of sediment deposits and movements of stones and shells.

GoPro camera #2 was positioned on an aluminium pole at a higher hight of 1200mm from the ground and at a 45-degree angle to the incoming tide. A similar setup to GoPro #1 was setup to take 1 timelapse photograph at intervals of 10seconds over a period of 4-hours (240 frames). Played back at 24fps gave a 10seconds piece of filmed footage similar to the other cameras. GoPro camera #3 was positioned on a mini tripod at a height of 150mm and pointing directly at the incoming tide and was away from the water's edge. This camera was setup to take real-time footage over a period of 1-hour. The footage from cameras 1 and 2 were useful in data analysis and understanding sediment movement, whereas the findings from the footage from camera 3 didn't contribute to the research.

The timelapse footage showed some interesting features of the movement of the stones and sediment as the waves deposited the stones and sediment on the beach. Shown through the footage played back at normal speed (24fps), an interesting account of the stones and sediment being deposited on the beach with further rhythmic motions of the waves retreating them back. This shows a constant movement of deposit of sediment and stones in a forward and backward motion. Examples can be seen in Figure 4.

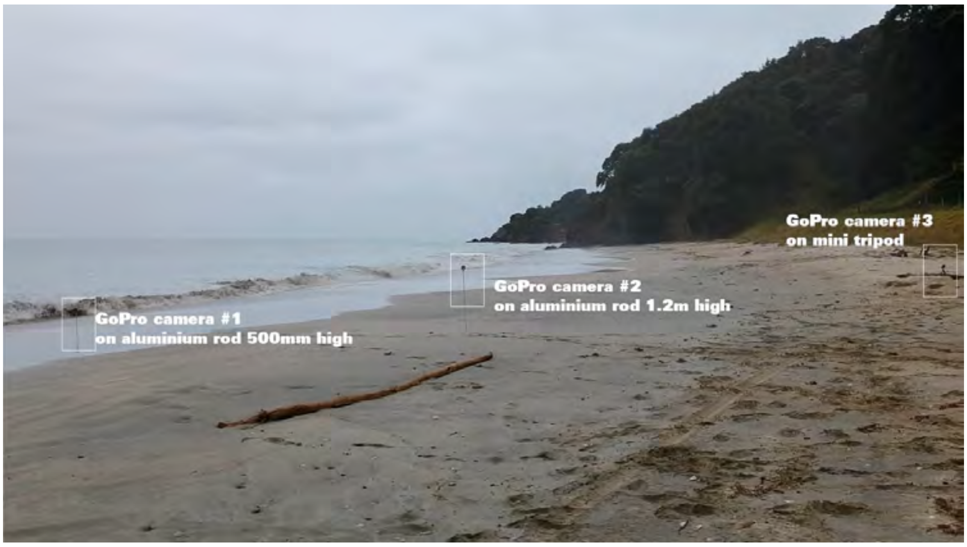

Figure 4. Diagram showing the positioning of the GoPro cameras.

Drone Filming

Using the drone for capturing film footage at the beach location took on the form of several experiments to establish what was going to give the best results. Phase 1 saw various initial experiments using drones flying at low altitude along the beach parallel to waves at about 5m off the ground panning slowly left to right. These experiments were initially to capture the movement of the waves and to record the size and movements of the waves. Further experiments were taken flying at a higher altitude of between 50m—100m at a speed of 5 kilometres per hour to establish where the beach cusps were forming. After these initial experiments where completed they were examined, and further drone filming could be established based on the findings. Viewing the recorded drone footage on site using a mobile tablet such as he Apple iPad pro was very useful as alterations to the drone's position, altitude and angle can be adjusted for alternative flights. Metadata retrieved form the flights shows the flightpath, altitude, compass direction, wind speed, drone speed, camera angles, camera aperture and film speed which is useful for analysing ongoing site visits and future drone fights.

After these initial drone flights phase 2 of the drone flying and filming could be established. The drone was positioned in a static flying mode directly above the beach with the camera pointing downwards. The drone was at hight of 250m and was left in this position to record the waves for 20minutes. Further experiments took place at higher altitudes of 400m with camera the angle adjusted to incorporate the entire beach, Figure 1. By the nature of drone technology and inbuilt camera movement stabilizers, meant that the drone could sustain its fixed position with while filming with no unwanted movements or disturbance to the filmed footage. This gave excellent smooth filmed footage results. The drone used in the filming was a *DJI Mavic Pro 2* and has the capability of filming at a high resolution of 4k and has a Hasselblad 1-inch photographic sensor giving a very high image quality. This technology has proven to have been beneficial when displayed on large projections especially in galleries and public spaces. Examples can be seen in Figure 5.

Figure 5. Image showing the artistic poem film 'Where Art Meets Science: An Artistic and poetic response to a scientific study of energy patterns and beach cusps' being played on a large-scale projection approximately 10m x 5m within the university campus. The piece can be viewed at the following link https://www.youtube.com/watch?v=dS_IjPIwfg4

Mobile Phone Filming

As well as using high-end filming equipment such as the drones and GoPro cameras, I also use an Apple iPhone 13pro mobile phone. I mainly use this for recording visual notes in the form of still and moving image for references so I can refer to these later. However, due to its high technical ability it also comes in useful for high-end recording as it has the capability of filming at 4k at 120fps and when attached to a hand-held gimbal such as the DJI Omos it becomes a very professional and versatile setup. The iPhone is also used as the viewing screen attached to the controller for the drones and can also play back the recorded footage making it a versatile setup in the field.

Environment Sound Recordings

When using a drone, timelapse recordings and photographic still footage, by the nature of its technology it doesn't record any sound. So, when I am in the studio making the creative works, especially when they are moving image files, they can become soleless with the loss of any sound. Therefore, I like to add sounds and atmos to this footage. Atmos refers to sounds that can be defined as indescribable such as the hum or noise in the background to evoke an emotional response to the footage. In preparation to this when I am on site, I use a high-end digital sound recorder (Zoom) mounted on a tripod in the field to record the sounds from the environment. These atmos sounds together with other recorded sounds of the environment such the waves and wind can be added to the recorded footage when creating the poem films. These recorded sounds are valuable for supporting a sense of dwelling and indwelling in the poetic work. For instance, these could be the sounds of the waves lapping against the shore, the wind in the trees, the sound of sand blowing in the wind, insects flying by. These sounds are layered on top of each other and have different volume output levels creating a palimpsest of sounds. This method of overlapping sounds is not to over emphasize, but to achieve a poetic subtleness of the sounds.[11] I also create and edit instrumental sounds bites that will harmonise with the natural sounds. These can be in the form of subtle rhythmic baselines that have a sympathetic connection to the visual elements.

Field Journal, a Poetic and Factual Account

As I launch the kayak into the sea and set off around the coastline on my journey to the beach gives me time to think about how the day will unfold.

When I first access the beach, I take time to survey the surroundings and think about the day and what it has install. At this stage I take notes, sketch and record sounds and take photographs on my iPhone for inclusion into my field journal. I familiarize myself with the area around and I walk along the beach feeling the sand between my toes, the sound of the sea breaking on the shore, distant birds singing and the soft sound of the wind. I close my eyes and feel the sun on my face, I become part of the beach and the surrounding nature as I connect with the place. While I am there, I take the time to immerse myself with the surroundings and my thinking and feelings of the place are not always explicit, I try and become the 'indweller'.[12]

I make notes of my feelings so that when I am back in my studio, I can recall how I felt. Gregory Bateson once suggested that, "the mental world – the mind – the world of information processing – is not limited by the skin".[13] This also helps me process my thinking in a reflective manner and to the creation on the artistic pieces "to become immersed in the world and potentials of the image".[14] I first start to record elements of the area, but not as data gathering but as emotional reflections. These can take the form of photographs and quick filmed footage taken on the iPhone. I take note of the where I am standing to ascertain possible camera and drone placements etc. These are useful for data analysis and future replication of the site for further visits. My thinking develops a clearer understanding of what I will do as I make these connections and dwell inside the data and the footage I take. I also take a viewing tablet (Apple iPad Pro) to view the recorded data while I am at the location. I also use the tablet for quick film editing and some colour manipulation. These ideas of field work examination I document and use in the progression of my teaching methods and curriculum development. Showing the secluded beach off the New Zealand coast, Figure 6.

Figure 6. The secluded beach that was used for the research project of mapping beach cusps.

Example of Artistic Works

In the poem film *Waves,* it uses typography as the image and the spoken word. It has been created in a digital environment from the emotional feelings and experiences from the field trips and subsequent filmed footage. As the poem film plays the wording breaks into particle images as electrical energy dissipating like the waves on the beach.

With the words fading in and out through a spectrum of spatio-temporal typography it reads '*Waves of energy ripples through time, then fading to nothing'*. It speaks to us as waves of energy that move through space and time with such energy comes from nowhere and moves to nowhere. As it changes inside an infinite void, it establishes meaning then dissolves poetically, speaking with the beauty of a silent voice, through an atmosphere of electrical sound.

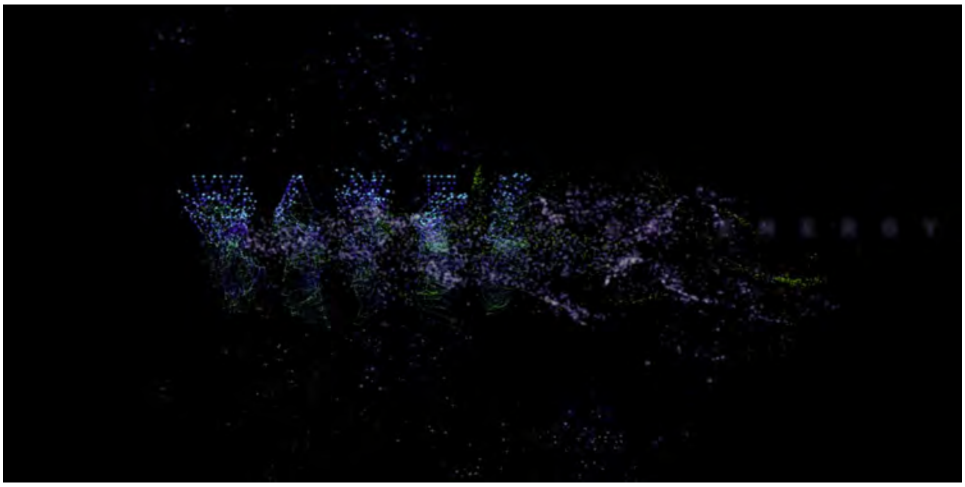

Figure 7. Image showing the artistic poem film 'Waves: A poem film'. Waves has been selected in the international film festivals Serbest International Film Festival 2023 and Aotearoa Poetry Film Festival 2023. The piece can be viewed at the following link https://vimeo.com/590837344?share=copy

CONCLUSION

The onset of COVID19 meant that other planned field trips for field data gathering was very limited due to COVID lockdown periods. However, in the lockdown periods I was able to assess the filmed data and commence the postproduction artistic responses with other field trip visits when able to.

In documenting the process of researching into the phenomenon of beach cusps this paper sets out to show how mobile technology can aid in the findings on research field trips, how the findings can improve the way we teach within the educational communication/graphic design studio model.

Thus, learning can be seen as an engagement with the environment and the surrounds we are absorbed in and can exist within a community outside of formal institutes. What we understand and produce from these experiences help to guide us on a lifelong experience in learning and how these can be passed on to our students. It also gives thought to how these methods, can be incorporated in the curriculum of the graphic design classroom. While they each have their own set of values, I am cognizant of its original intension of documenting beach cusps using mobile technology and how both artist and educator can gain value from the findings. The findings from this research project and the use of mobile technology have seen the development of graphic design curriculum and delivery of taught papers and programmes. This has also seen the rise in the expectations of how students can have access to technology and how it is used and how it can improve on the creative thinking process and how they approach a design problem.

NOTES

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