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# Floating on Air

## An Immersive Learning Experience for Meditating with Chronic Pain

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Guided meditation experiences in VR can envelope the viewer in an immersive, safe feeling environment while they listen to the audio guide. This experience targets people in pain learning to meditate by using movement and imagery to act as a metronome to their breath.

The audio track, music and setting guide the viewer as they learn ways to observe their pain in just that moment, during meditation. The goal for this experience is to support novice meditators through the first stages of learning to meditate. The goal is to do itself out of a job, it is successful when its no longer needed.

This experience is being created through creative exploration of rhythm, pace, movement around a space. The design is informed by the many different meditation experiences available but uses an iterative, experimental approach to understand how to assist the niche target audience of novice meditators with chronic pain.

Initial explorations show ways that movement can suggest a calm breathing pace and the way movement within an immersive setting can suggest the adaptive distancing that can support those difficult early stages of paying attention to the long-term pain experience.

This work points to ways that VR can support novice meditators with specific needs such as pain management.

### **Authors Keywords**

Meditation, mindfulness, VR, breath, chronic pain, novice meditators

For people in pain, VR for meditation can lead to not just a measurable reduction in pain intensity (Popert, 2017), but more importantly the pain is less distressing (Aboalsamh, 2011). When people reduce avoidance of painful activities they are able to do more rewarding and satisfying activities (Zetterquist, 2017). And yet, for novice meditators with chronic pain there can be an initial increase in pain intensity (Perlman, 2010).

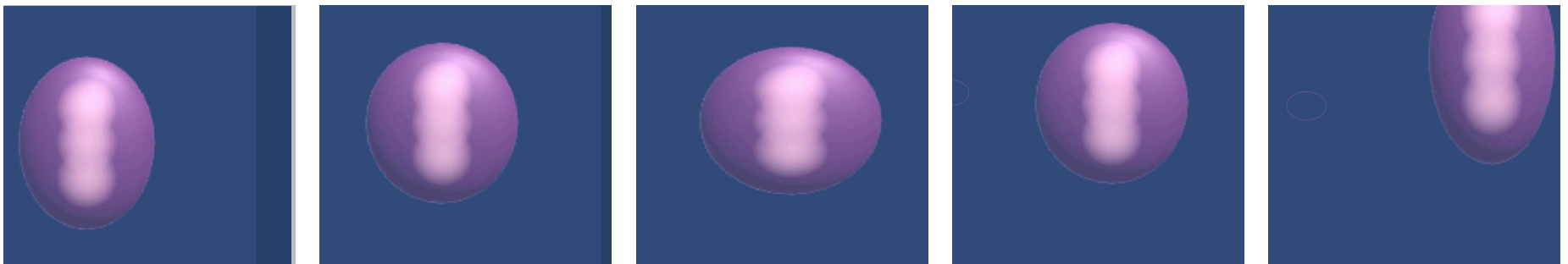
### **Can virtual reality help someone persist in learning meditation even through that initial stage when it's painful and distressing?**

Floating on Air is a VR experience for learners of mindfulness who want to build a better quality of life with chronic pain. For people with a diagnosed chronic pain condition, learning to pay attention to sensations of pain, can be a tough fight against that powerful survival instinct to flee, to remove our selves from causes of pain. Virtual reality can be a useful approach for its unique ability to block out distractions and gain a sense of presence in a calm environment (Navarro-Haro et al, 2017). Through this VR experience, they are guided to gently focus on sensations of pain with open, non-judgemental acceptance; to learn different ways to give up fighting and instead find a new relationship to their pain.

Taking inspiration from stories, photographic effects, animation and nature documentaries, the aesthetic for this experiences is chosen to leave space for the novice meditator, the viewer of the experience, to bring their own perception of their pain experience into the meditation. Placing familiar shapes and movements of sea creatures brings a sense of lightness and rhythmic calm to the setting. The rhythm of movement of these characters is deliberately paced to match a slow, calm breathe. Placing them in the unfamiliar environment of the early morning air, brings a sense of openness to the hitherto unforeseeable, new perspectives on pain; shifting energy from fighting pain to learning to accept it as part and parcel of the human condition.

Floating on Air fits into a known landscape of virtual reality experiences with immersive imagery but interestingly, without attention getting characters, that accompany an audio track of a meditation guide..

This folio documents the explorations to-date, and provides a foundation for the next six weeks to creating a working prototype, viewable on an Oculus Go, that has a simple 360 degree setting designed to accompany a provided audio track of a guided meditation for pain management.



### **A note on terminology**

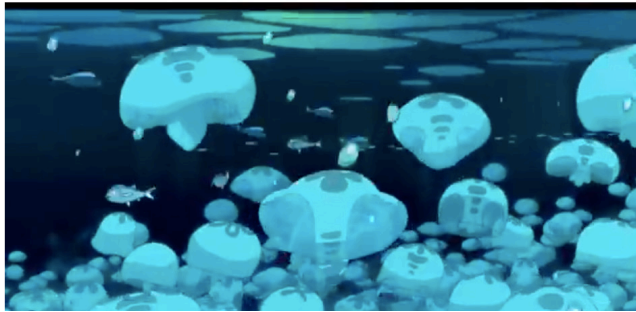
*I will be using the terms meditation and mindfulness interchangeably. These terms have different meanings and research contexts, however, in the setting of pain management I am drawing on the research centred around mindfulness based stress reduction adopted by health providers (Kabat-Zinn, 2011), and the meditative practice of open monitoring or Vipassana (Sanskrit translation) (Zeidan et. al, 2012)*

This moodboard is an expression of my aspiration, acknowledgement of my influences as well as a statement of intent for the work. This has been a guiding light as I navigate the bends and twists through the process of creation.

The inspiration, and aspiration, for the experience is Shaun Tan's story of the familiar, animals we know, in an unfamiliar environment of the skyscrapers and the evening sky.

The other influence, is the calming, rhythmic motion of jellyfish. Their expanding and contracting motion mirrors of the expansion and contraction of our lungs, and our bodies, as we breathe.

There is a fascinating aspect to the way our human vision sees lights in the distance and the way we read a camera's vision of light, when it's focussed and when unfocused. The way we interpret the bokeh effect of unfocused light in the distance, seems to parallel the feeling that the focussed attention in mediation is achieved through taking focus off anything that's not in the present moment.



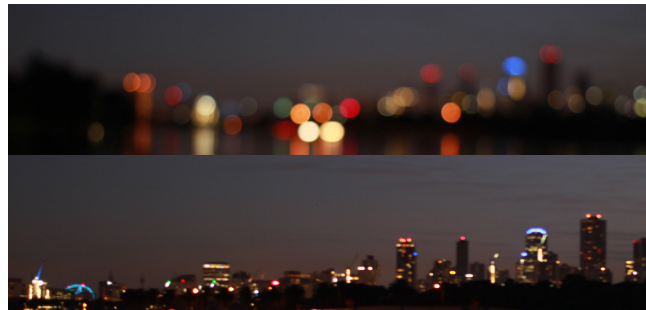
*Ponyo Official Trailer*

The slow rhythm of the jellyfish moving gently away from the viewer in Miyazaki's movie Ponyo inspires a sense of quiet awe. The scene gives a sense of immersion without feeling claustrophobic.



*The Secret Powers of Jellyfish*

Jellyfish are wondrous creatures carrying within them their own lightsource. This short documentary captures the movement and bioluminescence that I find so fascinating.



*City lights reflected in Albert Park Lake*

The distorted, blurred lights introduced by the camera lens stylises the view to emphasise the city lights and blurs the reflections into long vertical lines. I find the top view is more aesthetically pleasing, the loss of detail gives the image a beauty missing from the in-focus shot.



*Shaun Tan's illustration from Tales from the Inner City*

Shaun Tan's tale of catching a moon fish that is swimming above the city buildings is a story of the rewards of patience. My aspiration is to evoke that warm feelings of wonder when the thousands of glowing orbs of roe are released back into the night sky.



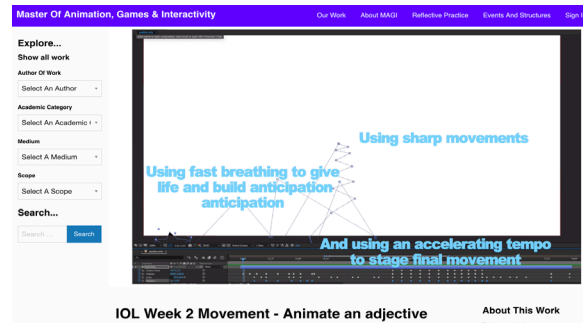
Week 1's exercise to collaboratively design a prototype was a practical application of design thinking. The ideation stage prompted me to think differently about the problem and generate many ideas, rather than moving too quickly into a single, initial solution.

Seeing the problem from my collaborator, Moon's, perspective, shifted my focus onto exploring what are the sights and sounds of comfort and safety. The prototype created by Moon, The Memoreyes, records calming, comforting experiences with the ability to replay them when I need calm and comfort.

This experience will benefit from an iterative, design thinking approach to empathise with the meditator to be able to create something that helps solve problems they may be having when first learning to meditate.

My goal for the end of semester is to create a simple VR experience as a proof of concept. Taking an iterative, agile approach the 360 degree setting with the swan in the foreground is the minimum viable product, each iteration will be suitable for release as a new version of the proof of concept. Each iteration will be changes to this setting with new movements taken through steps to test, review and improve the meditaiton experience.

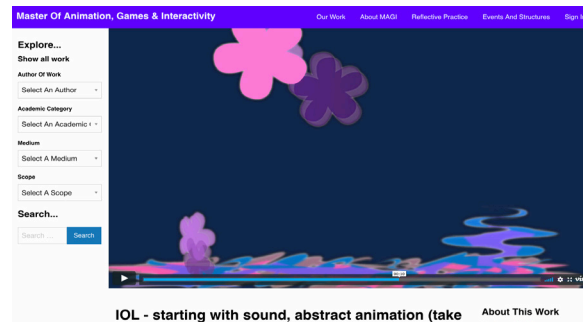
The short in-class briefs have been a study of movement. The endless combinations and permutations of tempo as well as constant, accelerating, decelerating, zero and irregular motion with change (McLaren, 1976) to represent the movements we unconsciously read in the world around us.



The first exercise, to animate an adjective, was an exploration of attention. For me, pain has spiky shape. Sharp, large, quick movements of the spiky star object were effective attention grabbers. The challenge for my intended work is to support the viewer in directing their attention inward, not to bring their attention to movements in the virtual space.



The second exercise, animate a noise, had me stumped. Making something, regardless, taught me to understand ways that movement and sound can interrelate and even amplify the impact of the communicated idea. My frustration in understanding how to tackle this led me to take a second stab at the challenge.



Jon Kabat-Zin, as he teaches meditation, suggests an exercise for learning meditation: being present in the moment as you listen to music and consider the space between the notes (Kabat-Zinn, 2011). I'm not sure that I captured the feeling of rhythmic lightness alongside a sense of menace, but it's given me a step forward from the angular zigzag movement last week, by adapting it into the zigzag float of flowers as they fall. This cylindrical falling shape to the motion will be iterated through adaptations to Blubbo's movement.



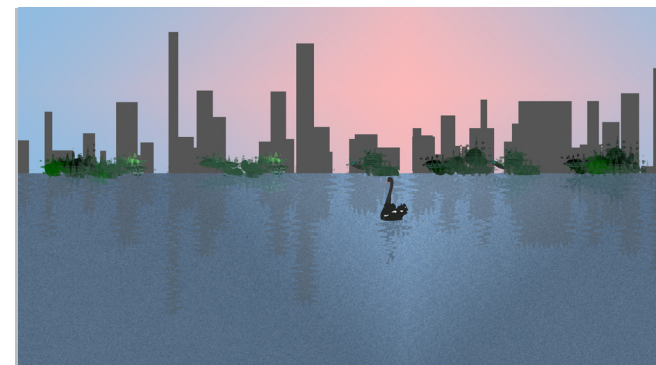
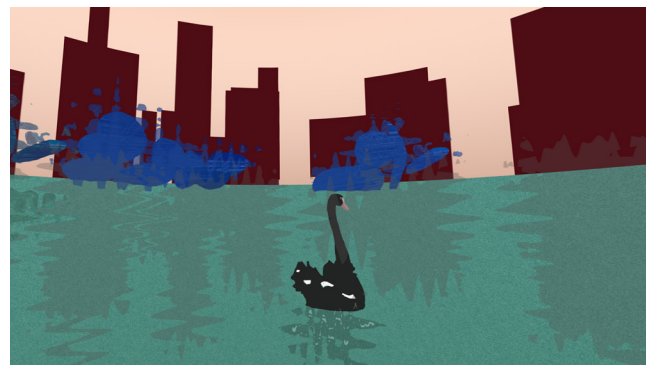
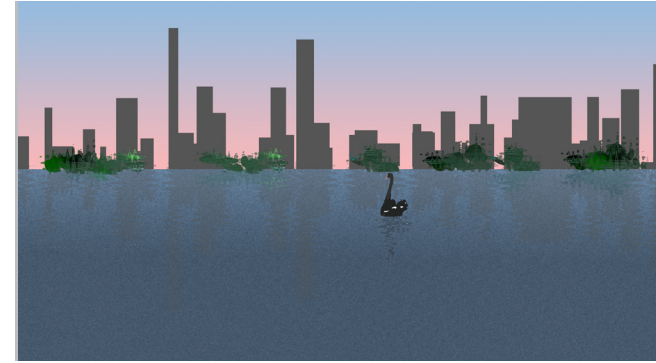
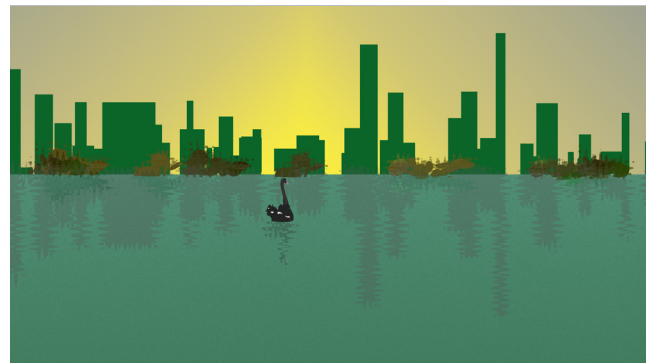
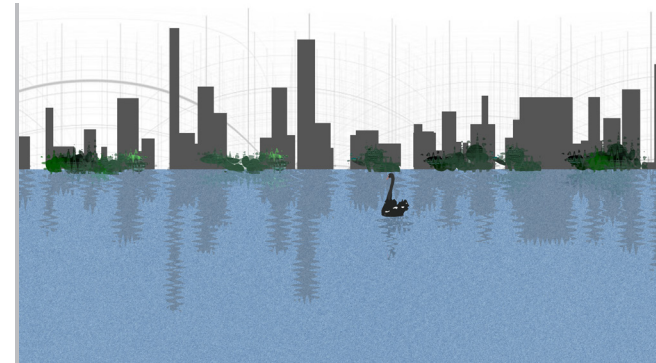
The third exercise, start with a body movement, gave experience with endowing simple objects with agency. The next stage, to play with colour, opened my eyes to the malleability of colour over time and the way colour, rhythm and movement can interact. There are parallels with the changes in the pain experience during meditation: through attention the nature of pain changes, leading to changes in our response to it.

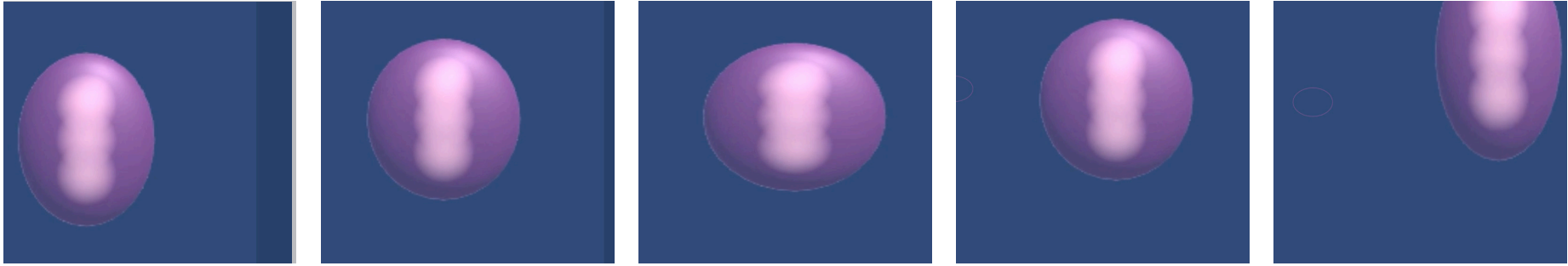
When it comes to ideation, the exercises with colour have helped me generate different possible solutions to the problem of first turning attention to painful sensations.

The design process I need to adopt will make it easy to play with colour for testing, feedback and review.

The exercises have helped me understand how a colour palette might come together. I'm still unsure of the colour palette for the planned VR experience, but I've now got a pathwat to establishing what colours will help communicate the concepts of non-judgemental acceptance of a what is usually percieved (and de-fined!) as a negative, unpleasant sensation.

Working through this process feels like an untethering to photo-realistic representations of characters and settings. This untethering seems balanced by the moodboard as anchor to the goals for the final product.



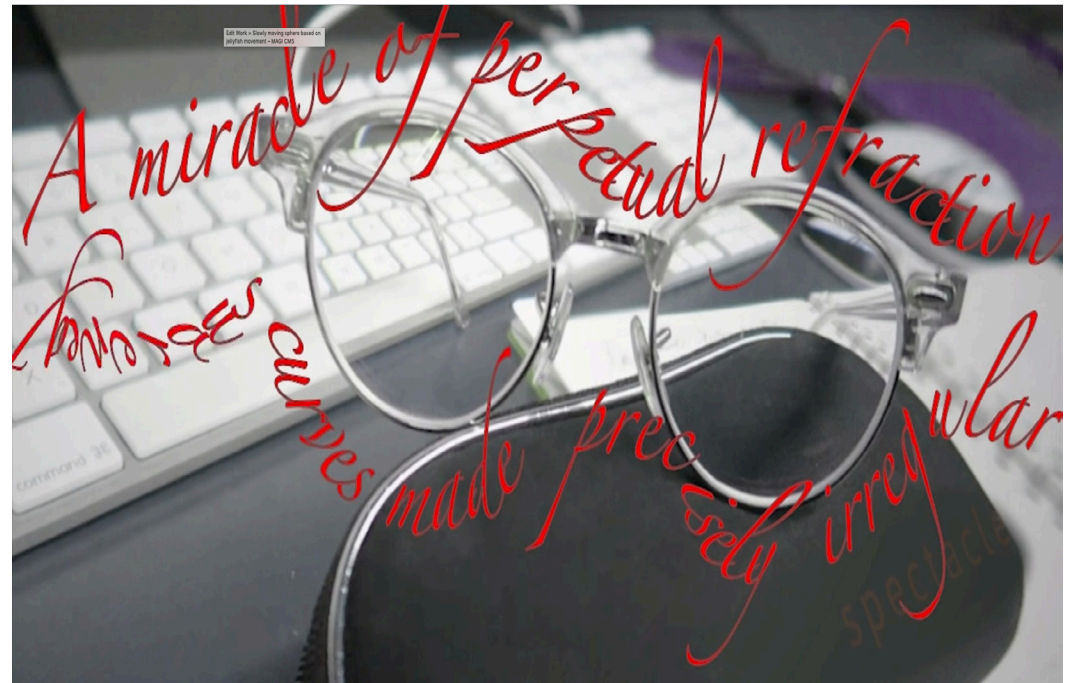


There is a demarcation between the work shown here, for the Illusion of Life MAGI subject, and the work done for the Character Place Simulation MAGI subject. There is an aspect of this delineation that is artificial. As I've experimented with character, I've continued to iterate and with each iteration apply the new learnings on movement from Illusion of Life.

The character above, Blubbo, was first an experiment in embodying a sphere with a sinewave defined movement based on research on jellyfish movement. Blubbo is my first character for the planned VR experience, acting as a visual pacesetter for the ideal slow rhythm.

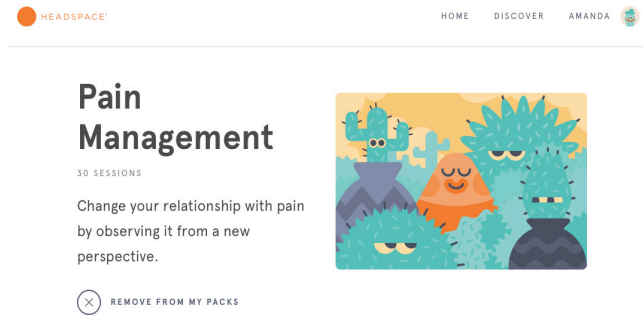
Blubbo was a play with the idea of animation as an act of inspiration, an act of giving an object the breath of life. This was a lesson from Illusion of Life, lecture and reading.

Similarly, the lectures and reading on movement, the thinking on an organic circular movement, and the experiments with different animation tools, informed the curving, spiralling movement of text in the ode to my spectacles. The illuminating examples of interactions between sound and movement (Hodgson 1985, Moore, 2010) and the way that sound can guide an audience's perception (Beauchamp 20015) were my guides and inspiration.



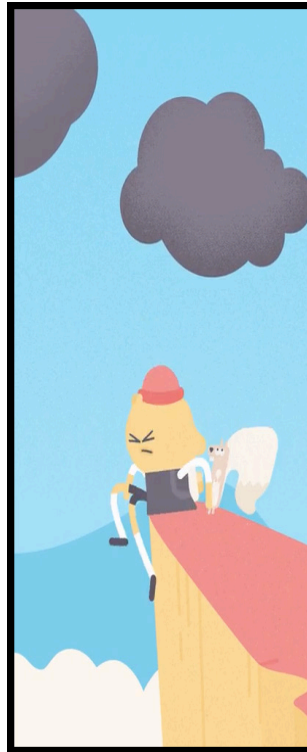
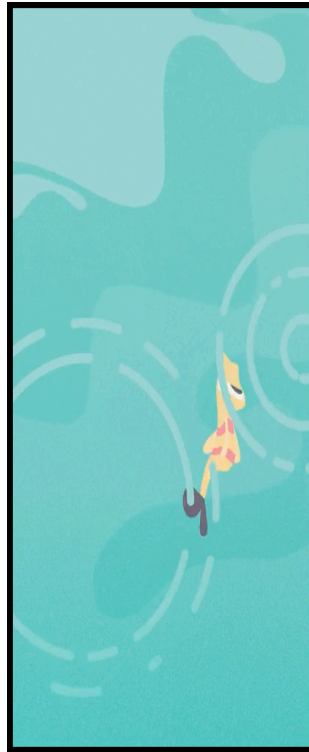
There are many different aids for people learning meditation or mindfulness.

There is the Headspace mobile app, (Headspace 2019) with animated videos explaining the concepts underpinning meditation and a very simple animated timer that appears to breathe during the audio of the meditation guide.



VR experiences can provide a sense of immersion through the setting, a natural looking space, either from 360-degree video in nature (Breach VR 2018), or a 3d modelled space with minimal movement (Cubicle Ninjas 2018) and a meditation guide vocal track.

While not designed for meditation, the VR experience TheBlu (Wevr Inc 2019), showcases how the virtual space around an immobile viewer can be exploited through scale of the characters, movement and design of the setting.





## References

1. Beauchamp, Ra 2017, *Designing sound for animation*, 2nd edition. edn, CRC Press, Taylor & Francis Group, Boca Raton, FL.
2. Breach VR 2017, *FlowVR Meditation for Modern Living*, Oculus Go, FlowVR Iceland.
3. Cubicle Ninjas 2018, *Guided Meditation VR*, HTC Vive, Cubicle Ninjas Glen Ellyn, Illinois.
4. Dam, R & Siang, T 2019, *5 Stages of Design Thinking*, viewed 12 Apr 2019.
5. Headspace Inc 2019, *Headspace*, version , mobile devices, Headspace Inc Santa Monica, California.
6. Hodgson, J 1985, *Trains of Thought*, viewed 13 April 2019, <<https://vimeo.com/259419867>>.
7. Kabat-Zinn, Jon 2011, *Mindfulness, healing & transformation : the pain and the promise of befriending the full catastrophe*, CMI/Premier Education Solutions.
8. McLaren, N & Munro, G 1976, *Animated Motion Parts 1 - 5*, [https://www.nfb.ca/film/animated\\_motion\\_part\\_1/](https://www.nfb.ca/film/animated_motion_part_1/), viewed 12 Apr 2019.
9. Moore, S 2010, *An Eyeful of Sound*, viewed 13 April 2019, <https://vimeo.com/11649675>
10. Navarro-Haro, MV, Lopez-del-Hoyo, Y, Campos, D, Linehan, MM, Hoffman, HG, Garcia-Palacios, A, Modrego-Alarcon, M, Borao, L & Garcia-Campayo, J 2017, 'Meditation experts try Virtual Reality Mindfulness: A pilot study evaluation of the feasibility and acceptability of Virtual Reality to facilitate mindfulness practice in people attending a Mindfulness conference.(Research Article)', *PLoS ONE*, vol. 12, no. 11, p. e0187777.
11. Perlman, DM, Salomons, TV, Davidson, RJ & Lutz, A 2010, *Differential Effects on Pain Intensity and Unpleasantness of Two Meditation Practices* *Emotion*, vol. 10, no. 1, pp. 65-71.
12. Popert, S, Riat, H & Hodges, E 2017, 'P-35 Can virtual reality (vr) guided meditation reduce pain? a feasibility and acceptability study', *BMJ Supportive & Palliative Care*, vol. 7, p. A22.
13. 2009, *Ponyo on the cliff by the sea*, Madman Entertainment distributor, Australia.
14. Tan, Shaun 2018, *Tales from the Inner City*, Hachette Australia, Sydney, N.S.W.
15. Wevr Inc 2019, *TheBlu*, Oculus Go, Wevr Inc Venic, California.
16. Yi, H 2017, 'The Secret Powers of Jellyfish', viewed 12 April 2019, <<https://www.youtube.com/watch?v=-irjnOIjNcs>>.
17. Zeidan, F, Grant, JA, Brown, CA, McHaffie, JG & Coghill, RC 2012, 'Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain', *Neuroscience Letters*, vol. 520, no. 2, pp. 165-173.
18. Zetterqvist, V, Holmström, L, Maathz, P & Wicksell, RK 2017, 'Pain avoidance predicts disability and depressive symptoms three years later in individuals with whiplash complaints', *Acta Anaesthesiologica Scandinavica*, vol. 61, no. 4, pp. 445-455.