

Integration between Art and Science (An Art Appreciation of Nyawa Light Exhibition)

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Abstract

This study aspires to inform that collaborative artwork between art and science plays a crucial role to bridge the gap between art and science field. This research is to meet the objective such as study the contextual analysis based on the selected artwork from Nyawa's light exhibition at the same time analyze the formalistic artwork and also interpret the aesthetical content of the selected artwork from Nyawa's light exhibition. In the present paper, the research method is described by qualitative study through two different methods which are through interviews with three different artists from three different categories and also through close observation. The findings were that collaborative artwork between art and science exposed the idea of understanding between both fields. Regarding the statement the research create a communication platform through artistic visualization on a scientific theory that leads to new media exploration based on new ideology and invention.

Keywords - Keywords: Art; science; light; nyawa exhibition

1. Introduction

Art and science experiments into a new level of aesthetics that can draw statements that sound like self-fulfilling prophecies. The Collaboration between the two fields leads to a new invention, a way of finding what when missing from both fields, there is little acknowledgment of the fact that contemporary artists use a wide range of media which demands many different mental processes. The collaboration between art and science also lead to the invention of media exploration that creates an installation, performance, live art, sound art, digital art, internet art, film, and video, and so on. The function of all art may be reduced to universal principles if it is regarded in terms of survival and emotion selection, the view of the evolution of science, media, and technology.

There is certainly, a predominant trend in contemporary practice that can include the idea of art and science collaboration that lead towards conceptual art, which relies on intellectual association making and on a play with words and the medium itself as a message to the society. Intuitively, artists understand how a sensuous receptiveness to the world using the aesthetical value towards their art-making. Concerning the statement, when art and science collaborate a new way of exploration occurs, and this leads to a new knowledge invention that can lead to the achievement of the industrial revolution 4. Collaboration between science people with artist or designer such as 3D animator, Sculptor, Illustrator, and graphic designer.

According to San Ede (2010), in which artists and scientists need each other, to build advanced communication skills so that the public reaches a better understanding of both fields. It is also a form of advanced explanation about science through the art method. In this proposal, the solution is to create awareness of integration between art courses and science.

In Malaysia, with the idea of this, both fields working together can benefit science students yet also given a broader career path towards art students. Science people seek for artistic sense, truly use art as a tool for scientific discovery, it requires people to recognize the collaboration between art and science. (Wilson, 2002). Other than that, improving the illustration skill and as a graphic designer, illustrator and sculptor will reach the value of critical thinking. Whereby the designer implement their skills either in art form and also scientific form. The budding interest of museums in areas such as art and science. Its close alliance with scientific and related disciplines makes it easy to dismiss as part of those worlds. Visual access is not necessarily straightforward for example, some works can only be seen through microscopes or via other special instruments. Paradoxically, the art world is somewhat ambivalent, simultaneously promoting experimentation or iconoclasm and the preservation of historical standards. (Wilson, 2002).

Contrary to the claims of some in the science community, the public is better to be exposed to the contemporary science that can stimulate art's flexible, intuitive and visceral response to the world. As reported by Ede (2010), Science is bedeviled by market forces and it would be no bad thing if the artist were to engage with those scientists who are themselves extremely concerned about ethical issues. This idea of art and science collaboration may lead to a construction of the human mind, phenomenologically and linguistically. The issue either the public is aware of it or not, viewed in accordance with the prevailing values and beliefs of particular times and places. As an anthropologist, Steven Mithen traces the way in which the human mind has evolved in an ongoing active engagement with the natural environment, developing technical, natural history, social and linguistic intelligence which continually interact, questioning, imagining, and suggesting new constructs to explain and predict structure and behavior. (Ede, 2010).

2. Problem Statement

In the Malaysian context, there is a barrier between Art & Science programs. Academically in the universities syllabus, the field between art and science will go through a different path and different career. It was claimed that presumably there are indications that a long period of tension between the two areas is closing with what passes for dialogue but is just a litany. (Richardson, 1971).

In the context of technology and the digital era, the knowledge towards science and invasion is part of important. It is very crucial to highlight the idea of integration between these two fields. What makes the role of inter disciplinarians crucial is our ability to coordinate vastly different fields, and to be the link between them, in other that specific goals may be achieved for communicating with the public through the collaboration between art and also science. This specialty is more focused on the understanding of the artwork itself.

According to Camilia F. Matuk in The Journal of Bio-communication from her thesis study related to art and science, stated that 'The idea of Art and Science molded by client's needs and tastes and directed by the requirements of practical purpose in which at heart most artist will dabble in science while scientists secreting art studios' in which this statement it explained about switching roles between artist and also a scientist in order to reach a certain understanding towards both fields. Both art and science are like the fundamentals of any invention and future.

This research will focus on the idea of collaboration of art and science in which to convey the life complexity of the problem, while also making it accessible. Science is usually thought of as the attempt to understand natural phenomena using the scientific method. While art is the creation of beauty, the achievement of realism, or the visual exploration of symbols. Art and science, the twin engines of creativity in any dynamic culture, are commonly thought of as being as different as day and night. This is a critical error.

According to Wilson (2002), in forging new art for the twenty-first century, it was claimed that they have tackled projects that might normally be categorized as science, ranging in focus in various departments such as astronomy to zoology. Art seems to have been a medium of communication that linked the natural and metaphysical worlds. The major problem when it comes to scientific language, it needs specific understanding of its theory.

According to Ede (2010), art manifests intentional communication to others, like language it attributes meaning to a visual image that is not associated with its referent. The major problem in the art and science field is that there are barriers between these two fields, where the expertise like scientists speak different languages between artists. Language is created with the intention of communication. (Wilson, 2002). Language operates outside the confines of the here and now space and time that bring the meanings of symbols can be variable between individuals and cultures or may carry multiple meanings. Relate to the language barrier between art and science can be a bridge with the idea of collaboration between both fields. Art then appears to have played an important role in communication.

In which art basically as the medium of the message was intended to communicate meaning at an intense level. This research intensely links it with another crucial phenomenon in which occurred during the same critical period. The huge gap of understanding between art and science can be linked through communication as the base to understand the different perspectives from different backgrounds of the field. (Lewens, 2015).

Art and science collaboration knowledge definitely will cover the basic understanding of scientific theory such as the sense of vitality or energy, flashes of light, luminescent color in a form of simplification pattern that created by the artist in which easy for the society to understand the theory through the visualization of the artist.

3. Research Aim

To bridge the gap of understanding between art and science field through analysis from selected artwork based on: Nyawa's light exhibition.

3.1 Research Objectives

- To analyse the formalistic aspect of the selected artwork from Nyawa's light exhibition.
- To study the contextual analysis of the selected artwork from Nyawa's light exhibition.
- To interpret the aesthetical content of the selected artwork from Nyawa's light exhibition.

3.2 Research Questions

- What are the formalistic aspect of the selected artwork from Nyawa's light exhibition?
- What are the contextual analysis of the selected artwork from Nyawa's light exhibition?
- What are the meaning of aesthetical content of the selected artwork from Nyawa's light exhibition?

4. Significant Of Study

The idea of collaboration is actually to benefits society with a better future and also lifestyle. Although Art cannot directly communicate science or change minds, the art fields will create space for conversation around the difficult issues. In another way, art can be inspired by science. Based on this statement both collaborations between art and science can lead to the invention of new digital media exploration and new technologies development. Based on this statement, in a way art will create a response to science. Based on Strosberg statement in his book title 'Art & Science', in this research proposal, it is a platform where artist examines problems from different angles and engage within a different way from scientist, There is a great deal to be gained for a scientist as well that can engage with artist. The sensations between art and science will always remain the people to question their connection for the people to achieve beyond miracle future. It stimulates and letting them conjure up uniquely. Usually, scientists will not understand when it comes to contemporary art, an increasing number of artists are beginning to understand science and there are many examples of excellent works which have been inspired by the scientific process. If art is about anything, it is a reflection of human

experience in complexity and it emanates from an inventive individual in which communicate about the scientific process itself.

5. Literature Review

In the Malaysian context, the idea of collaboration in two fields between art and science is still a huge barrier. Academically in the school syllabus, the field between art and science will go through a different path and different career. It is very crucial to highlight the idea of marriage between these two fields. Back during history, the idea of art and science was merely like the most ideal couple. Leonardo Da Vinci himself was an artist and also a scientist, which involved in both fields of art and science. Art and science are like the fundamentals of any invention and future. This research on the collaboration of art and science is to convey the life complexity of the problem, while also making it accessible.

According to Camilia Matuk in her article title Master of All trades, Doctor of none stated that creative fields that thrive have similar hierarchies of qualified participants in which some direct production, some guide the creative idea, and some commission product. But in most of these professions, there are then those deemed experts in the science field where they analyze and judge how best to produce something. Indeed in this statement, the artist and scientist do need each other in order to reach a high level of critical thinking in so many ways. The idea of collaboration definitely will benefit society with a better future and also lifestyle. Although Art cannot directly communicate science or change minds, the art fields will create space for conversation around the difficult issues. (Stangos, 2003).

In another way, art can be inspired by science. Based on this statement, in a way art will create a response to science. Rather, what makes our role as interdisciplinary crucial is our ability to coordinate vastly different fields, and to be the link between them so that specific goals may be achieved for communicating with the public. This specialty is less focused on leading based on the separate field but it is a platform where the society can refer to both of the collaboration between art and science.

Collaboration between art and science definitely will bring new knowledge towards future education. For example, the subject of science which is astronomy can blend in with artistic photography. According to Ede (2005), in astronomy, the application of photography to the production of permanent records of celestial phenomena, the improvement in astronomical instruments, and the wonderful discoveries of the galactic environment. We can merely see the chemistry between art photography and astronomical project both collaborations can bring out a phenomenal discovery just like national geography discoveries.

Art lines like sculpture and painting comprise a science, adorned with many disciplines and various branches of the learning process. It is the greatest invention of them all, it is made with a certain level of meditation, during which it is composed according to rational considerations. Strongly influenced by 'The Ten on Architecture' by Vitruvius, being the only surviving artistic treatise from antiquity. (Ede, 2005). The question about one's role is keeping this research questioning why do art and science have developed into such different beasts in the last couple of centuries. Through this research, it is a platform to bring back the collaboration between art and science just like Leonardo Da Vinci's era. Through the marriage between art and science, will benefit society in so many ways. Other than bringing up new knowledge for the future it will also help the society in terms career-wise and create a new field for the community to work in between art and science. There is a huge potential and indeed demand for the attempt to bridge the division between different ways of making sense of the world. There are certain qualities to each art and science which are difficult to translate and often end up in shallowness and masquerade with little contribution be it poetry or knowledge. It is a very difficult task, from the artist's perspective, to make something that both succeeds on the more intuitive cultural layers of what we value about art and the ones that are usually associated with science.

6. Research Methodology

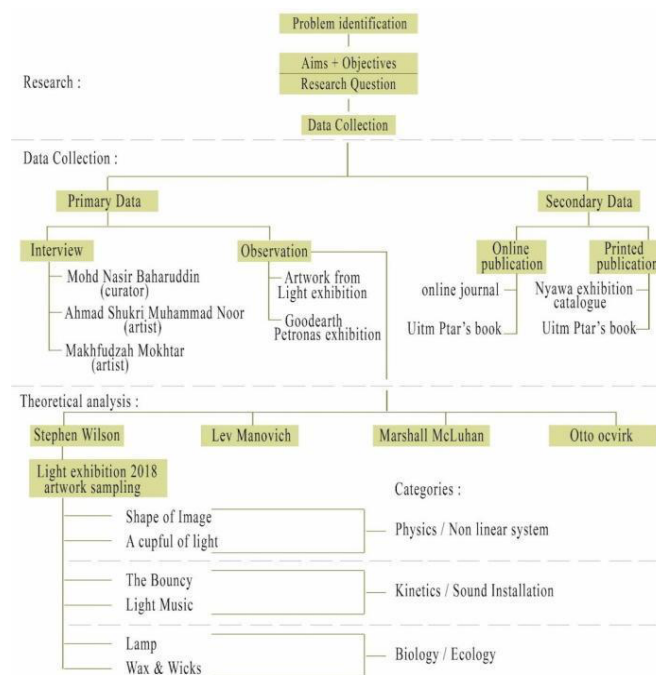


Figure 1. Research Methodology

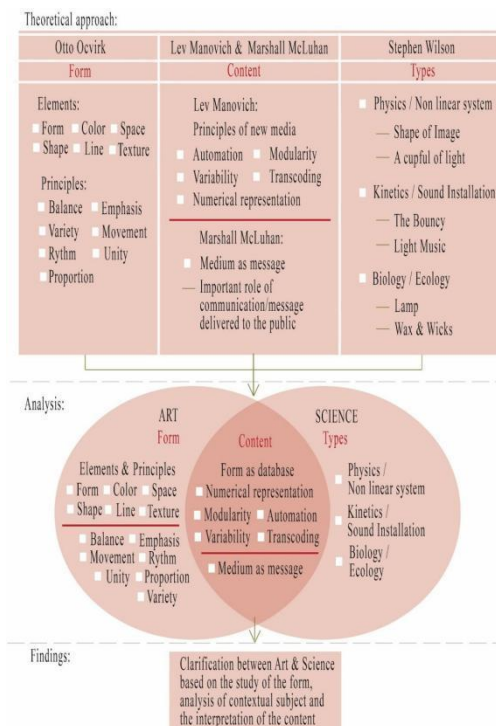


Figure 2. Theoretical Approach, Analysis, Findings

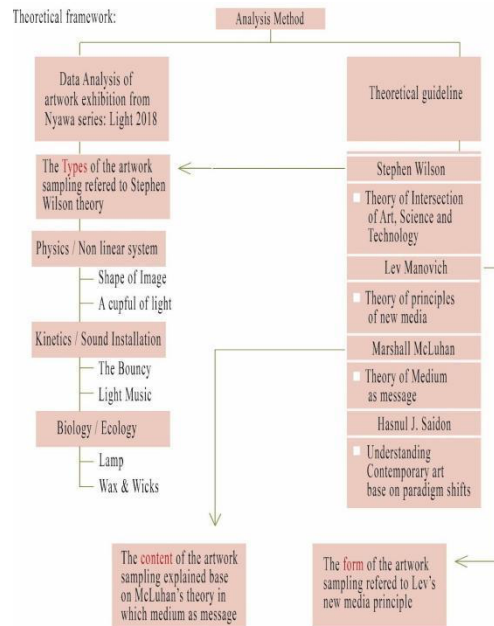


Figure 3. Theoretical Framework

7. Data Analysis




	<p>Artwork Title : A Cupful of Light</p> <p>Artist : Makhfudzah Mokhtar, Taiwo Ambali, Zamili Mohamed Sathzura Saidin, Siti Noradhliha Mohamad Tukijan and Mumtaz Mokhtar</p> <p>Material/ Medium : Plastic cup, Water, Light emitting diodes (LEDs)</p>
	<p>Artwork Title : Shape of Image</p> <p>Artist : Maryam M Isa, Nasir Zakaria and Fadi Imad Osman</p> <p>Material/ Medium : Computer, Light emitting diodes (LEDs) matrix display and minicomputer on a chip</p>
	<p>Artwork Title : Light Music</p> <p>Artist : Ahmad Shukri Muhammad Noor, Zuraidah Zan, Syamsuri Yaakob and Azizi Mohd. Ali</p> <p>Material/ Medium : Speaker, Light emitting diodes (LEDs) cube, laser pointer.</p>
	<p>Artwork Title : The Bouncy Beam</p> <p>Artist : Mariatulqabtiyah Abdul Razak and Ruqayyah Ainul Bashirah</p> <p>Material/ Medium : fluorescent lamp</p>
	<p>Artwork Title : L.A.M.P</p> <p>Artist : Nor Asmara Tasrip, Nur Fadhliah Khairil Mokhtar, Ummi Kalthum Hanapi, Md. Eaqub Ali, Cheah Yoke Kqueen, Suhaimi Mustafa and Mohd Nasir Mohd Desa</p> <p>Material/ Medium : Loop mediated isothermal amplification</p>
	<p>Artwork Title : Wax and Wicks</p> <p>Artist : Faridah Hanum Ibrahim, Mohd Nasir Baharuddin and Norhidayah Mad Halid</p> <p>Material/ Medium : wax, glass and natural branches as wicks</p>

Figure 3. (a) A Cupful of Light; (b) Shape of Image; (c) Light Music;

Nyawa series exhibition: Light 2017, basically presented 20 artwork that related to light, in which the Serdang Gallery in University Putra Malaysia (UPM), now promoting another level of an exhibition where the forms of expression extend or engage with electrical and technological in the context of light. Based on all the six artwork sampling, each two of the artwork represent one category.

All the sampling from the six artwork is selected based on three different categories which are Physic and Nonlinear system, Kinetics and Sound Installation, and Biology and Ecology. Three of the artwork sampling used light-emitting diodes (LEDs) as their main material. 'A cupful of light', 'light music' and 'shape of image' are the three artworks that composed the light using LEDs. There was 20 artwork presented at the Nyawa series: Light 2017 exhibition, 6 artwork that selected from all the 20 artwork presented at the particular event. Each two of the 6 selected artwork is categorized into 3 different categories. Detail explanation of the selected artwork discuss in chapter 5 where all the material and philosophical meaning and detail interpretation.

This chapter primarily explains the analysis process where the researcher collected based on the close observation and interview with selected artists. Out of 20 artwork display at the Nyawa exhibition series: Light 2017, 6 selected artwork, that analyzed by the researcher according to 3 different categories. The basic idea about the selected artwork was analyzed by the researcher by listing the types of material that used in the selected artwork and the concept of the artwork. Practically, this chapter presents all the databases collected by the researcher from the particular Nyawa exhibition series: Light 2017. All the list of artwork in the exhibition was arranged in a table content as data collection, which proves, that practice can be referred at the appendices section. The detailed information about the artwork is all presented in the Light 2017 catalog book provided by the Gallery Serdang in University Putra Malaysia. It can be summarised in this chapter that, the artwork in the particular exhibition provides the other expertise to involve with the art-making in which develop a new invention that create opportunity for the society to see differently.

At the same time, this collaboration between art and science helps the scientist and engineering to understand the aesthetical value in the artwork. By constructing an innovation give space for the invention of new technology and encourage the involvement of more collaboration among researchers to interact and participate in the discourse. The Nyawa exhibition series: Light 2017 has paved a new development of a new paradigm in educating the society about the idea of collaboration between a different field that can lead to the experience of digital development and the invention of technology, at the same time a new way to reach a better understanding and is a form of the learning process. All the elaboration of the interviewee's answer the detailed information about the particular artwork. Which explains the material used in the artwork and the relation on science theory each one of the artwork. It also includes instances where the interviewee supported the idea between art and science collaboration, as the first interviewee highlight the idea of bridging the gap between different kinds of field.

The second interviewee stated that collaborative artwork between art and science can lead to a communication platform where each field understands the difficulties of language between two different fields. Whereas, the third interviewee focuses on the artistic visualization towards the scientific theory. All the three interviewees that participate in the interview session, are represented as one of the artists from the selected artwork sampling. All of the three interviewees explained in detail the idea and concept of the artwork.

8. Findings

In this chapter basically, interpret in detail all the artwork sampling. Detail elaboration on the idea of the artwork in terms of the contextual elements and the aesthetical content of the artwork in which relate with both art and science ideas. There is much contemporary science that can stimulate art's flexible, intuitive and visceral response to the world. The discussion explains the concerns of new artistic and scientific explanations through the supported theory as the researcher used as a guideline. The finding in this chapter leads to the discovery of philosophical differences that apply in the art and science artwork, in which it explains the mystery between art and science ideas. Collaboration artwork between these two fields, art, and science that actually on one hand is the view that there is an implicit reality that can be explored. As art is part and parcel of culture, it is crucial to be wary of where value and judgments come from.

This particular chapter is a platform where art and science are the new knowledge that leads to a new invention and the active involvement with new media and technologies that can lead to new creation and achieve the evolutionary theory. The collaborative idea on art and science elaborately connected in various perspectives

such as, nature, technology, and the exploration of different media that can expose the artist towards contemporary art. In the past, science aspired toward a dream of total predictability. Contemporary scientists now accept that some systems are nonlinear. Slight perturbations can have profound effects on the systems, which makes them hard to predict. Some theorists see nonlinear system areas of concern as a radical challenge to traditional physical science, while others see it as fine-tuning. In this particular category, artist elaborate the body of speculation fascinating because it seems to open a new perspective of communication between art and science.

A cupful of light is an artwork collaborate between six different artists to produce this artwork using programmable lighting. This artwork is a cup filled with water arrange in a rack, in which the light eventually disperse from one cup to another based on the arrangement in form of a movement of light. When the light travels from air to water in the cup, light refraction takes place in which as result, the visual impairment can be seen through the objects that radically change position as the audience view the objects from a different point of view of the cup. Different types of color from the light-emitting diodes (LEDs) are placed in the cup to demonstrate that light consists of different wavelengths, which are identified as different colors. A cupful of light primarily describes the use of programmable lighting in water-filled cups. As refer to this statement, it explained the theory of how the light travels from air to water, align with this process, light refraction occurs.

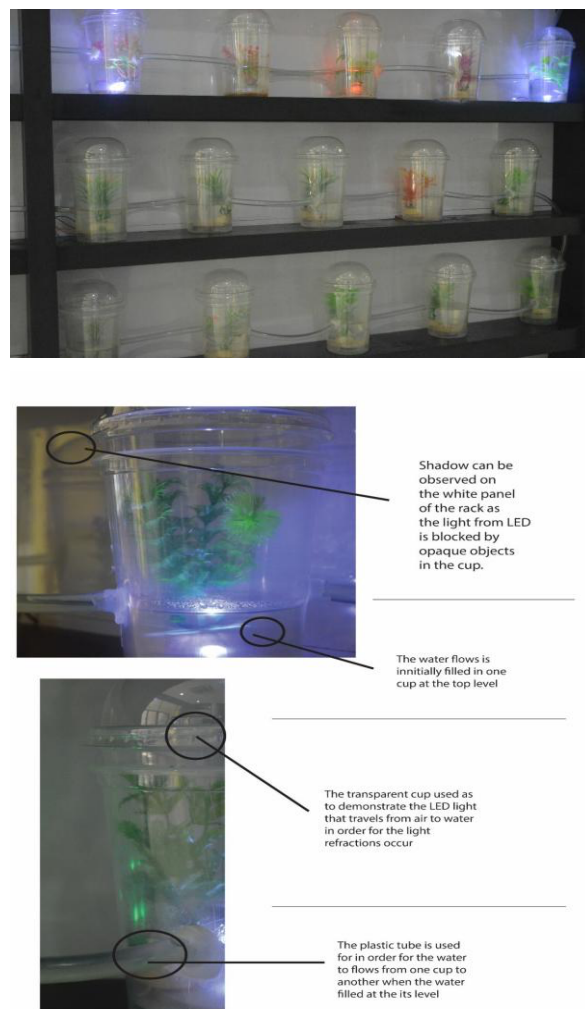


Figure 4. A Cupful of Light

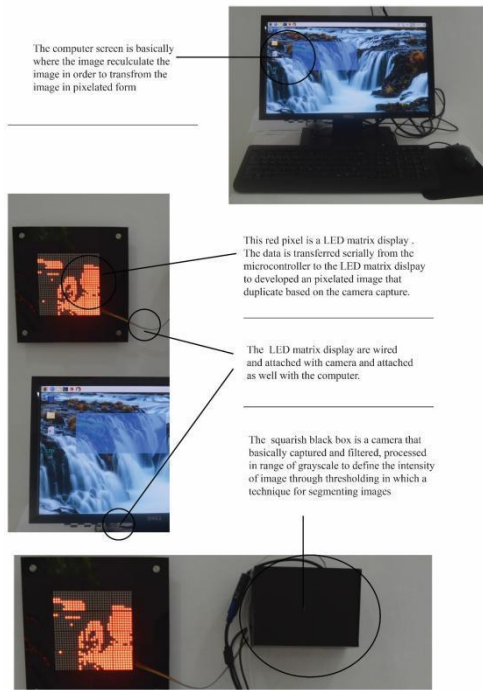


Fig. 3. Shape of Image

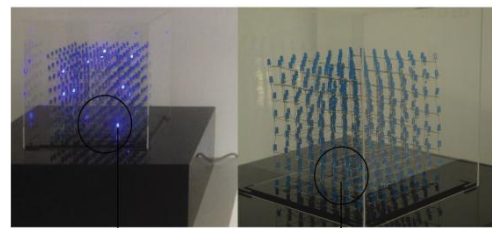


Fig. 4. Light Music

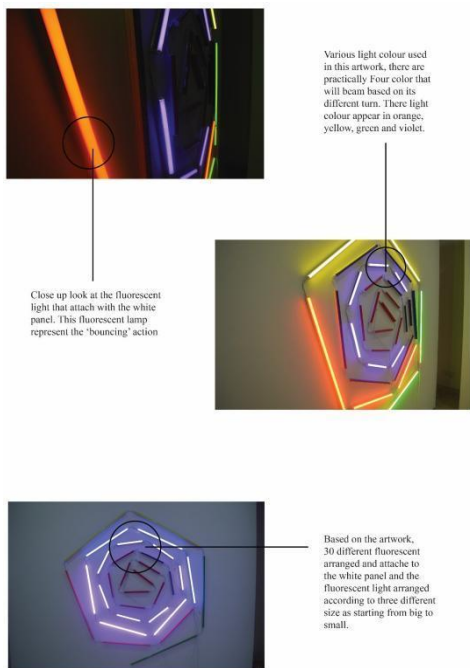


Fig. 5. The Bouncy Beam; (e)

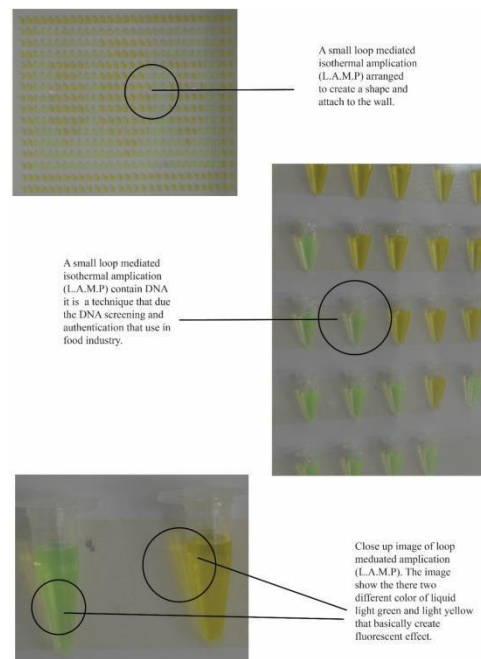


Fig. 6. L.A.M.P; (f) Wax and Wicks

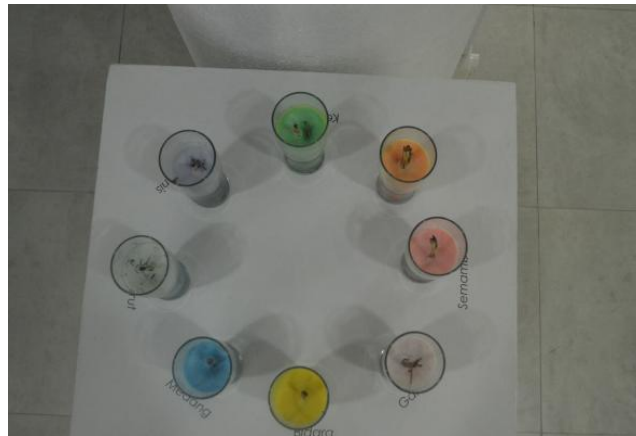


Fig. 7. Wax and Wicks

Light can differ in a broader context, where light is the most important part of a human's daily life. This research basically, highlights the perspective of science and art in the specific concept of light. Bridging the gap between art and science through the understanding of the critical thought of science in art primarily will give society a new perspective.

In this research, the theme of the exhibition which is light practically can be related to the Islamic context. In the Al-Quran, in the light verse 35 (surah An-Nuur), explain the light. Allah is the light of the heavens and earth where the human indeed requires light as guidance in every single life. God creates the sun source of light that enlightens the earth and human life. Light is mysterious yet beautiful and full of crucial criteria.

In today's world, where the expansion of technologies relates to digital devices. The fourth industrial revolution, which related with the idea of light in scientific understanding where the phenomena of light design in this research related with the extension of digital and electronic light. In terms of a design concept, the basic understanding of the art craft can be highlight regarding the Malay design principle, according to the basic Zakaria Ali theory and principle. Six principles by Zakaria Ali which is fine principles, usefulness, unity, symbolic, contrast, and meaningful. All the principles used in the discussion of the selected artwork.

The understanding of light in the context of art, science, and Islamic meaning is used as a communication platform to bridge the different languages between the art and science fields. All the related ideas on various theories, precisely elaborate in terms of the material and subject matter of the selected artwork.

The concept of scientific theory elaborately explains in the idea of visualization of the art and elements principle and together with the scientific theory as the core in this art and science collaboration. Philosophically emerge with the Islamic context where light is the most crucial thing in human's life as the light symbolize the guidance in life at the same time enlighten human's life.

9. Conclusion

It can be concluded that the collaboration between art and science is a new form of appreciation and communication platform in which scientists scanning technologies that possess beauty in which sufficient unto itself. Meanwhile, the artist communicates the science language in form of a creative way in delivering the message to the viewer. The artist played an important role in encoded the messages from the scientist. Intellectually, the concept of art and science collaborative artwork, give society a greater understanding of the natural world that were never equipped to view.

The sense of value and critical thinking towards certain content can be expanded beyond level as the expansion of the digital and technologies also taking over. Art and science can lead to the invention of new media and technologies as for the unique collaboration can primarily expose the aesthetical of the intrinsic meaning from

the particular creation. The potential for new catastrophes lurk and super-intelligent machine and invention might occur with the idea and concept of collaboration between art and science.

10. Recommendation

The art and science collaboration is recommended to maintain and make it practical in the local context. Especially through the education line where local universities should encourage future collaborative ideas between various fields. This would help the student to be exposed to the understanding of different languages from different fields. This research concept on integration between art and science will lead to further investigation.

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