

The Advantage and Disadvantages of Manual and Digital Drawing in Today's Institutions

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Abstract. This paper situates the increased application of digital means instead of manual drawings. This traditional ability is moving toward the digital age and is largely replaced by online delivery knowledge for most of the art, design and science subjects. Exception has been placed for practical and/or studio-based science subjects. It also provides examples of well-known designers and creative artists and architects harvesting an understanding of these two means of cognitive recorded expressions. First, it offers an analysis that covers the definition of “drawing” -manually or digitally- and the meaning of “visual thinking representation”; second, it investigates and compares the most common advantages and disadvantages of the digital tools (software) contribution to visual drawing. And finally, an emphasis of reflection is placed, if the ability to represent visual images manually or digitally is necessary in today's academic institutions, discussing future possible implications for students born-digital or paperless technology.

Keywords: Manual Drawing, Digital Drawing, sketching-scribbles, Working drawing, education.

1 Introduction

Many common people believe that the ability to draw is a gifted capacity given by God where there is an intrinsic talent hidden in the artist's soul or mind which make them able to express and communicate in ways not understood by others. There is a heated discussion amongst artists, designers, practitioners and cognitive psychologists if this cognitive ability is called “talent or skill”. This awareness is shared amongst other factual science and art disciplines such as music, dance, performance, or being able to complete complex calculations without any prior background knowledge. The human ability to perceive, select and organize information has become critically vital and important. Manual or digital drawing is a corporeal ability by using a pencil over a paper or a beam of light over a screen, what matters is to understand how this information is transferred and which assets are achieved of the intended goal [1]. This ability to draw something out of an abstract idea, to observe the nature around us and reproduce it in a manner of a drawing is to be able to translate these three spatial dimensions of form, shape, space, texture and colours into a bi-dimensional surface. This observed illusion of reality is either objective or subjective; seeing is produced by the cognitive mind and it is communicated through the artist's eyes. The ability to graphically represent images manually or digitally through drawing is fundamental in the development of knowledge. In the “*Elements of Drawing*” 1857, art critic John Ruskin[2], describes drawing as a means to clearly and usefully set down to record things that cannot be described in words,

either to assist one's own memory or to convey distinct ideas to other people[3]. Training students to see, absorb, elaborate, and understand the three-dimensional spatial visual elements is a primary concern for art and design practitioners at all stages of education. Manual line drawing or recording with touch screen technology does provide similar reliability to paper. However, drawing slightly differs from both platforms; manual and digital drawing may reach similar outcomes in consistency and reliability; but it remains to be confirmed whether digital means increase the accuracy and precision compared to manual drawing which may trigger in us our sense of beauty. Depending too much on these new digital technologies such as graphic tool, cut and paste, CAD (computer aided design) may diminish students' sense of observation to present visual images of their surroundings. The reason for these shortcomings is that these digital tools contain a number of algorithm calculations ready-made to be applied, without much analysis and effort from the user compared to the human experience of translating the visual surroundings. As such, paper has many useful properties, compared to any digital tool-table/stylus. It is lightweight, easy to transport and manufacture. Despite these advantages, paper remains secondary in value and precision compared to any digital tool-table/stylus [4], where digital drawings can be re-sized, images can be adjusted, images can be collaged or re-composed.

2 Problem Statement

In the art and design field, making manual or digital drawings is a fundamental discipline related to the creative process. Giorgio Vasari [5], a Renaissance artist and considered the father of the History of Art once said: "Drawing... is the necessary beginning of everything [in arts], and not having it, one has nothing"; This is an important learning process and step forward that is taken within the field of art training. Fine art artists and designers in all fields, painters, sculptures, print-makers, illustrators, so on and so forth; need to be able either to draw what they see through the sense of sight (eyes) or conceive new ideas in their minds and translate it into new systems of expression by using forms, shapes, space, colour and texture, something that mesmerizes people's minds and is regarded as creativity. The time is approaching where the ability to draw manually or digitally may not be necessary at the educational level, or it may be replaced for the introduction of more digital technologies. However, this ability to convey our surrounding in the form of a drawing will always be necessary for artists, designers or any creative person. The mind reacts in the same way either using paper or any digital screen-stylus with this ability the artist and designers move simultaneously as conscious reflection working out in two level of priorities; first, the artist/designer may work the contours, form, shape, colour or texture of any give object; second, or it may be developed according to their own desire of importance, this event happens naturally mostly before any form of work has started. In the current education scenario, the ability to draw manually has been slowly replaced by more digital outcomes. Drawing is a hidden language which takes effort to master its hidden meanings, obviously replacing it for newer, more convenient digital technologies may bring some advantages but also it develops some disadvantages differing according to the specific way each tool is used. Artists and designers must know that each tool brings along some type of limitation, the artists goal is to maximize the potential of the medium to the best of their abilities. This medium used in a natural or digital drawing behaves in different manner, no medium is the same and these bring immeasurable possibilities for an artist or designer to explore. This raises two main questions; first, does it matter what kind of tools (Manual or digital) an artist uses in the

process of creating a work of art; and secondly, in this existing field of work, can the introduction of digital technologies replace the visual thinking process of creation, practical approach and elaboration of drawing by artist or designers.

3 Objective

This paper's objective is to debate the advantages and disadvantages of the ability to represent visual images through manual or digital drawing and its relevant practices such sketches, idea generation, and working drawings in today's academic institutions. The outcomes generated by this study may impact and provide positive information in the field of the arts, raising awareness amongst teachers, students, institutions and art practitioners.

4 Methodology

The present study addresses an empirical method of reflective reasoning touching on observation with regard to the ability to represent visual images through manual or digital drawings to be used at academic level. In the field of applied arts and design, manual or digital drawing is defined as the linear realization of visual objects, concepts, emotion or fantasies; this mark making evolves from simple scribbles to more complex or accurate visual ideas. Its simplicity allows conclusions to be communicated in an effective means.

5 Discussion

The term "Drawing" used in this paper is generic and nonverbal (visual), manual or digital and comprises of basic sketch, tracing, scribbles and other familiar or similar activities. Merriam-Webster Dictionary classify - "drawing" - *the art or technique of producing or representing and object-images or outlining a figure, plan, or sketch by means of lines or mark making on a surface* [6].

For most people or anyone not connected to any art academic circle, the term "Drawing" has been understood much more with a sense of artistic connotation. Drawing is a cognitive skill-based activity that works on colour identification, perception, motor abilities, spatial awareness and sequencing, this like any other activity such as dance, singing or performing art, is a skill that can be cultivated and learned through an intensive daily practice. Frank R. Wilson, states that the hand is as primordial as the brain in the lives of the human, and due to this essential condition humans learn, produce and survive. Angeline Trachana also agreed, affirming that handling different materials/mediums/tools to draw helps in development and an intensifies tactile perception completing this knowledge through the sense of sight [7]. The activity of drawing may not be regarded only to represent the reality around us in an accurate manner, perhaps a "photograph", would achieve a better outcome. A point to add in the study of drawing is that there are two extreme points to understand the term drawing [8]; first, as the representation of the form, directly related to an abstract idea of the object "outline", and second, as the object "mass" related to the visual picture generated in the viewers' retina. Mass and form in art are two different things, which may bring challenges in the process of doing a drawing.

Some artists may do exercises capturing the form of an object, some other may also capture the mass of the object. Let's highlight those Eastern minds which are not as obsessed with the accuracy for the depiction through drawing as the Western minds are [8]. This depiction may be the primary rendition of objects in the visible world. It is fundamentally important for any student of courses such as art and design to be trained purely on the activity of "observation", alongside with the use of other elements of art and design "line, dot, plane, volume" as tools for rendition of the shape, mass and form, referring to a 2Dimensional surface or 3Dimensional form alike. For the Western world the ability to draw alike is part of the artists' skilled execution learned in the institution or it perhaps may convert in a personal conventional style. Study drawings executed by an artist sometimes contains idiosyncratic notations made up on the spot, these notations are to remind the artist of such important things to remember, correct or change [9]. Refer to Plate 1 below.

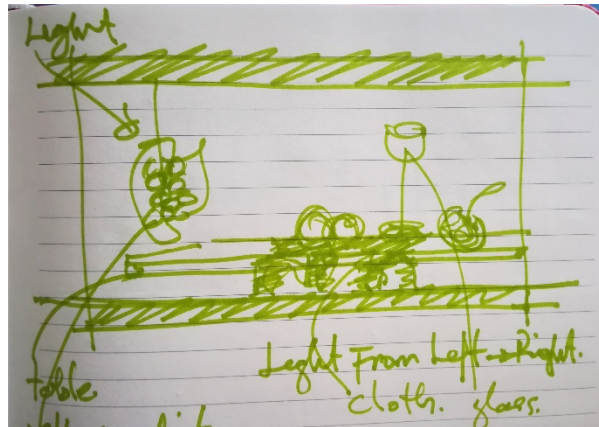


Plate 1. Ernesto Pujazon. Sketch idea generation for still-life drawing composition, 2020. Green maker pen on cartridge paper. 12cm x 8cm.

A well-trained eye for the appreciation of the form is what every student should set himself to acquire with all the might of which he/she is capable [8]. However, to gain control over this skilled activity is a way of communication between the producer and the viewer and it begins with training. Any creative activity such as drawing, painting, sculpting, or printmaking requires concentration, dedication and patience; these activities are a constant journey of discovery. People who do not or cannot draw believe that they must draw from memory to be an accomplished artist. This statement is certainly subject to debate. It was Leonardo da Vinci, another great artist, who recorded every day experience observed in his sketchbook and it was Michelangelo who presented some preliminary working drawings as a gift to his friend Tommaso de' Cavalieri and Victoria Colonna, this action supported to elevate this discipline "Drawing" from a preparatory medium like working drawing into a more serious independent artistic genre [10]. Undoubtedly, some people can do any kind of drawing that is because they have been practicing it for a long period of time, fine arts schools promote intensive practice of classical academic drawing which is an ideal representation of reality a state of existence expressed by the artist, where accurate proportion, shading, value, composition, strict rules of construction and visualization are applied. Acquiring this knowledge emancipates the artist's talent where every stroke or line becomes alive

effortlessly, and this allows the artist to master complex or dynamic visual compositions which are a fundamental part of any artwork. Refer to Plate 2 below.



Plate 2. Ernesto Pujazon, Still-life drawing, 2021. Metal stylus over coated watercolour paper. 22cm x 22cm.

Drawing is a learned activity, for instance following the contour of certain font-typo styles, for example the letter ‘a’ several times; by doing so the student will learn to draw it without needing to see it again. The visual information that the font-typo letter provides is stored in our visual memory to be drawn anytime it is required. Learning to see is like learning to write them or graphically draw them out. Learning to draw a likeness is to gain control of this ability to observe the world around us. Every drawn object is conceptualized in the mind and composed as a set of major and minor selected forms from the artist’s mind. This creates an “alphabet of shapes, forms and mass” and overlaid on a gestural structure, where the minor forms are never allowed to dominate the major gestural structure otherwise the overall form and gestural unity is destroyed. This availability to draw is free and a transcendent silent language which is older than words. A comparison between the human eye and a camera lens device, is that the camera as a tool only “guises” at the subject-object, it isn’t by any means able to “see” it. The ability to “see” is a human activity and this visual perception [11] interprets the surrounding environment using the light visible spectrum reflected on objects. This dynamic make sense of our surroundings and is fundamentally a cognitive activity involving different senses of our self. The camera a technological gadget would not have the ability to discern what to remove or not from a subject such a still life. Alan Lee points out that “the act of observational drawing creates an intimacy with the object, almost as if it had been picked apart, piece by piece and fed through the brain to re-appear on the page”, refer to Plate 3 below. One major difference between a hand drawing from a camera device is that the hand drawing does not appear instantly, as in a photograph. Drawing is an act of mental elaboration, therefore, any drawing takes time to be prepared and accomplished.



Plate 3. Alan Leen, “Fangor”, Character Design from the Lord of the Ring Sketchbook. Pencil on paper

Drawing subjects are disappearing from universities, colleges, and high school curriculums or they may also have been replaced by other much easier image-generating technologies in line with current trends.

Education systems are judged by how much students acquire and develop knowledge during their time in the system [12] The Malaysian Education Blueprint 2013-2025, introduced by the government encourages modules under the STEM program (Science, Technology, Engineering Mathematics) in order for the country to achieve the status of developed nation facing new challenges [12]. STEM education by definition means: “pedagogical applications, based design and engineering technology for teaching content and practice in science and mathematics education with the content and practice of educational technology and engineering simultaneously” [13]. This step is to increase interest in STEM. The development of arts studies in the early years continuing through the upper years is not a priority within the STEM programme. STEM subjects are science-oriented modules to develop the country’s science and research strength to cope with the next generation’s challenges. In the Malaysian education landscape, post-secondary school, in subjects such as Art and Design, universities and colleges may offer skill discipline modules such as fundamental drawing or basic drawing during the first year of foundation studies. This means that students taking Art and Design career would be introduced to these core modules during the learning process of the first semester of the academic year. Rarely will students continue with it in the second semester. The reason is that many of these basic modules are replaced largely by other three-dimensional modelling software and other digital technology modules.

By doing so, the argument stands, those students have not built up a necessary and profound understanding of these subjects and may fall under the direct impression that computer generated drawings are much easier to accomplish than using any traditional or manual methods such as pencil and paper. Using an I-Pad-Pro device or XP-PEN monitor with electronic stylus pen and sketch-colour rendering software to develop a series of sketches and working drawings for future paintings brings some quick visual rewards. It is also more forgiving, and nothing is permanent when there is an -undo- button. This wonderful gadget-tool holds-up many kinds of intangible virtual mediums such as a large range of digital pencils, coloured pencils, watercolours, poster-colours, oils, soft and oil-pastel as well as different brush sizes and tips to mention some. Basically, the stylus pens respond to the pressure on the surface of the screen but what makes a difference is the non-linear process, where the artist may arrange the development of the drawing and painting into several different layers that can be edited and improved separately later. Drawing digitally is not easier or harder than using traditional paper, it is just different. Refer to Plate 4 & Plate 5 below.

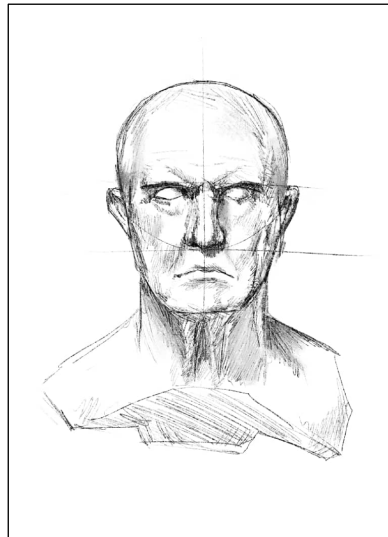


Plate 4. Digital line drawing with digital stylus on screen 2019

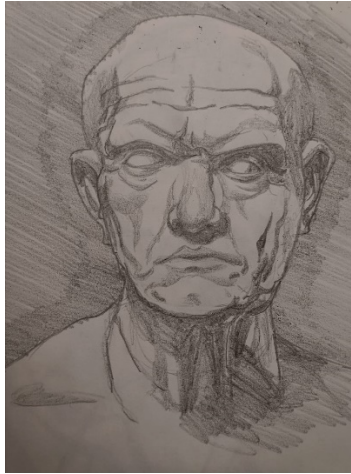


Plate 5. Manual drawing, pencil on A4 size paper,2019.

Normally in a digital drawing the artist may correct it several time creating clean and neat lines which is not similar to a drawing using pencil on paper. Besides, an element of advantage for digital technologies is that artists and designers may add on more images or visuals from the online free domain readymade photo library to increase the impact on the picture making which they have at their disposal. They can also use several digital tools, adding on a virtual colour pallet with hundreds of colours and shade combinations and customized brushes and a variety of 2dimensional and 3dimensional effects. Losing the feeling of the pencil, brush, stick or any other materials over a surface may be the greatest challenge any artist or designer might face. Some practitioners believe that they find it difficult and also struggling not being able to feel the texture and the smell of the materials used in their works, the aroma of each material such as turpentine, thinner and ink or the mixture of them is very particular to how they react against the chosen surface. For the accomplished artist, it is very important to be able to see and feel it. Another issue to highlight here is first, corrections the artist makes during the drawing or painting development; using any digital medium for drawing the artist and designer may use the button to “undo” or delete any unwanted mistake to their likeness, it allows them to go back to the original drawing; second, using any traditional materials such as pencil and watercolour challenges the artist’s ability and skills to work around non comfortable zones, where simple accidents may happened like loose strokes, water marks, blending mediums, that may or may not enhance the visual outcome of the artwork. An artist using traditional mediums may counter on the unpredictability of how the painting medium interacts with another similar medium. This interaction may create a rich visual texture which is not achievable using digital technology. Digital technology may rely on already printed patterns or image replicas to be mixed up with other cut and paste digital methods. This mostly creates soul-less outcomes. Refer to Plate 6 & Plate 7 below.



Plate 6. Fruit's still-life, pencil colour on paper , 2019.



Plate 7. Fruit's still-life, digital pencil colour on screen, 2019.

Traditional materials behave very differently from digital mediums, both may reach certain degrees of positive outcomes. Using ready-made pictures, the artist may infringe on another artist's copyrights, therefore, the outcome may not be considered as original work. Any original artwork produced with non-digital technologies possess an aura that cannot be replicated by any digital tools [14] There is a lot of complicated things that an artist can do using cut/paste software and other digital platforms; however, at the end of the day, digital tools also face some major disadvantages, maybe on the artwork resolution, printed process, type of surface selection, and furthermore, the exposition to UV light which may deteriorate the artwork easily. Before the modern graphite pencil was invented by Nicholas-Jaques Conte in 1795, artists used many different techniques for rendering, sketching and drawing. Renaissance masters used a sanguine stick which was a mix of red Ochre, red oxide, or iron oxide as well as another material called, "silver point" over coated paper, used by accomplished artists such as Durer, Leonardo, Michelangelo, Raphael, Hans Holbein, Jan Van Eyck and others. This technique is not possible to replicate by a digital tool. The silver point drawing [15], is a technique using a metal rod such a silver, gold, bronze, copper or lead inserted on a pencil stylus. This technique was used to make marks on a special coated paper. The mark made cannot be erased or corrected and gradually tarnishes in time to other colours such as green, bluish, and brownish. The principles for rendering and shading are the same if an artist uses any pencil. This medium behaves like a pencil.

Alan Lee, (b.1947), a book illustrator and lead concept artist for Peter Jackson's, (b. 1961) "Lord of the Rings" films said:

"To draw a tree, is to pay such close attention to every aspect of a tree, is an act of reverence not only toward the tree, and toward the earth itself, but also our human connection to it. This is one of the magical things about drawing—it gives us almost visionary moments of connectedness".

It is the purest form of expression which requires virtually no equipment, and yet can provide the greatest transcendence in the hands of a true master or could become a simple tool of communication in the hands of others. Depending on the nature of an artist or designer, it does not matter what tool (traditional or digital), is used to express this inner manifestation in the form of a creation, a simple basic graphite pencil will do a positive job as well as any digital tool. However, a pencil in the artist's hand will function differently to a digital tool in the same hand. Digital tools produce line drawings with lack of personal embodiment, as a result, there is no differentiation of a line drawing done by an artist, or a line drawing done by a student. Yet, this critical medium of communication (the ability to draw manually) as an art form is draining out from the universities, colleges, and schools and is being seen nowadays as an old-fashioned affection in a world fully of three-dimension modelling and surfacing software, drag-and-drop (cut-and-paste) graphics which are much faster to use. There are a few quick things that the artist can do using digital tools such as instantly erase without leaving any trace or marks, cut and paste any part of the drawing to be used or reproduced again, changing colour scheme from the unlimited colour pallet that the software would be offering, working different mediums simultaneously such as watercolour, pencil, acrylics or airbrush together without the need to wait for these mediums to dry. This is a fantastic time saver for an artist or a designer; however, more traditional tools for drawing allow the artist to trace its development and the different stages that the drawing has taken to be made and to become a unique artwork. Using digital technology an artist or a designer can reproduce any drawing in full or produce several copies at any time. Learning this activity of drawing is not optional if one desires to be an artist, a designer, an architect, an engineer, or any creative individual engaged with the external physical surrounding. Another example of an accomplished creative designer and film maker is Ridley Scott (b. 1937), the Director of influential movies such as (Blade-Runner, 1982), (Alien, 1979), (Alien Covenant, 2017), (Prometheus, 2012), he is an amazing graphic artist, who attended the Royal College of Art in London and he created most of the storyboards for the movies himself, because he could visualize the entire story in his mind before it was filmed. This is the quickest way to communicate his ideas to the cameraman and team of designers.



Plate 8. Alan Lee. Lord of the Rings creative process. Pencil on paper.

Drawing is the genesis for creative expression of all visual arts and design practices [16] It teaches us to see and is one of the most dominant creative acts to undertake. Not everyone can learn to draw brilliantly, but everyone can learn to see through the study of drawing. In the creative arts, designers aiming for professional growth, cool career prospects and interesting and challenging projects, would need drawing skills (manually or digitally), understand visual representation, and have strong knowledge of academic drawing theories which are vital conditions of communication to possess.

Finally, in some other circles of the design practice, for example at the management level, it would not be necessary to have highly developed level of drawing skills, as in the field of art and design. There are a variety of tools and hundreds of stocks with graphic assets like icons, illustrations and photo shop software enabling anyone to create interface. In this case, what the creative designer needs is a profound command of aesthetic principles to balance the lack of drawing skills against these design principles. Nevertheless, for those, either artists or designers, striving for originality and uniqueness, high-quality of skills is basically grounded on strong knowledge where academic drawing and painting skills are needed.

6 Conclusion

Based on the discussion presented, digital drawing may offer a deceptive sense of quick gratification. The process of drawing is about constantly assessing, reassessing-artist and designers may always question themselves-; have I got this right, should I move or change this? Whereas in CAD software, one moves from a hard line to a completed visual very quickly. One does not go through that process of gradually building up information.

Among the advantages of digital media are:

- it's faster than traditional mediums, such as watercolour, because there is no need to prepare the paper, colours, water, paintbrushes, tissue, which all are combined under a simple software ready to use.
- it's more forgiving than traditional mediums, once one-makes a mistake, it can easily be erased or undone and one can restart.
- it can be duplicated with precision and work each sketch with different colour palette.
- it provides endless possibilities as each software has different sets of tools and functions; therefore, a digital artist may have an advantage over a traditional artist.

Among the disadvantages are:

- there is no original copy or original design that can be considered genuine, as it can be reproduced as much as anyone may want.
- there is no tangible (touch), physical copy as original. It may violate the copyright for mass production.
- while producing a digital painting there no sense of touch or smell that can be felt. Digital art takes away these feelings during the creative process, it is what some artists may have called, "soulless art".

Architects and engineers have experienced that the creative process is not intuitive when the delicate and intimate relationship between brain, eye and hand is mediated by computer tool. The current digital revolution has inspired realms of psychological research, much of which sees drawing as an innate human activity- as vital to learning, thinking and

communicating as it is to artistic expression. Wayne Thiebaud says: the study of academic drawing presents us with a source of primary information, and this is the reason it has been around for so long and will continue to be [16]. In this argument presented, organizations such as universities, colleges and schools should promote the need for more artistic visual literacy in all fields or areas of studies as diverse as medicine or dentistry, because by doing so, students are able to construct meaning from the images, understand components of this visual analysis, improve their writing proficiency, thus encouraging them to evaluate, understand, and think upon of the cultural context, aesthetically, intellectually. Arts and the ability to make drawings should be as integral as part of the timetable equally important to any science subjects. Sir Ken Robinson (1950-2020), insisted that creativity can be taught not through direct instruction, but by giving students opportunities, inspiration, encouragement and mentoring.

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