

Question 5: Choose a theme, movement or selection of artists or designers that relate to your practice or interests and construct a 2500-word essay. Critically assess primary themes, key writers and relevant practitioners.

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Ceramics is one of the most ancient crafts, the oldest known ceramic artifact is dated as early as 28,000 BCE, when humans discovered clay could be sourced from the ground and formed into solid objects. Handcraft has been the primary method of forming ceramics for thousands of years, used to create tiles, tableware, art objects and more. Hand building was the only technique, made by the most skilled artisans. Pottery was either monochrome or decorated with simple painted shapes and often fired at low temperatures, some only dried by sun. After World War II, ceramics were used to enhance many technological fields, such as medical, energy automotive and space exploration (The American Ceramic Society, 2022). A tremendous transformation has occurred within ceramic craft. Today, pottery is moulded by a combination of handwork and technology, incorporating different techniques or even industrial manufacturing (Lleó, N. 2020). In this digital age, technologies such as CAM, CAD and 3D printing play a significant role in the evolution of ceramic craftsmanship. The digital age can be great for speeding up processes, simplifying batch production and guaranteeing uniformity, yet one must question whether this mass production and industrialization will inadvertently diminish craftsmanship and prompt depersonalisation in the products created. In this essay I will explore the mutation of ceramics and the impacts of technological advancements on the tradition's art. I will investigate the impact of technology in ceramic production and conclude whether it has a positive or negative effect on the industry.

To understand the evolution of ceramics, it is necessary to investigate the historical and cultural significance of handcraft prior to the integration of technology. Throughout history, various cultures have used hand-built ceramics for both functional and decorative purposes. Each society has developed its own traditions and procedures, from the classical amphorae of ancient Greece to the complex pottery of Native American societies. (Lovell, 2023) This age-old technique includes moulding and shaping clay with manual tools, yielding work with an organic feel. The significance of handcraft is shown by a study in the Journal of Literature and Art Studies, Issue 6 vol.11, 2015. The purpose of the study was to examine how a handicrafts programme affects pupils in the context of art education, with a focus on how it affects both cultural and economic growth. To summarise the study, a test was set for 45 participants, consisting of students from the faculty of education. It asked questions on a range of works such as ceramics, calligraphy, weaving, sculpting, embroidery and more. After two weeks, the students were given a handicraft programme which required them to learn the value of handcraft in terms of economics and method of production. After repeating the first test, the data showed there was a significant difference between the students test scores pre- and post-program. This shows the impact of the handicraft programme on pupils, thereby endorsing handcraft is important to enhance academic performance and product understanding (Mahgoub and

Alsoud, 2015). Three main hand-building techniques used with ceramics are coil building, pinch pot technique and slab construction. Generally, coil building consists of artists joining ropes of clay on top of one another to build the walls of a vessel (MacKinnon, 2020). The pinch pot technique is an intuitive method where artists manipulate clay with only their hands, pinching and pulling it to the shape desired. Slab construction relies on clay being rolled out into flat slabs and then formed together to make various objects. These are some of the historical methods, dating back to pre-historic times; this is the base that we can compare current ceramics to.

To understand the significance of handcraft in consumerism, we must consider the “handmade effect.” Positive contagion can help us understand that consumers find hand crafted products more appealing. According to the research of Fuchs, Schreier and Van Osselaer (2015), ‘love’ plays a role in consumer behaviours regarding handcraft as these products are considered to carry the artisan’s “essence” in the form of love and passion in the process of production in a way that machine-made products cannot. Products have increasingly been manufactured by machines since the industrial revolution, with human labour generally limited to repetitive acts in which everyone is involved in only one or a few steps in the production process. Several authors have emphasised the drawbacks of the transition away from handmade, artisanal production since the mechanisation of production during the Industrial Revolution. Karl Marx (2007), for example, criticised the alienation inherent in the mode of production in which human producers and machines engaged in an endless repetition of the same actions that constitute only a single step in a multistep production process and provide little intrinsic satisfaction. This mode of production contrasts sharply with a process in which one artisan controls and executes the entire production of a product. Artisans often devote years to mastering their craft and invest some of themselves in their process and their products, deriving intrinsic satisfaction from the manufacturing process.

Due to ceramic innovation and industrialisation, artists can now make much more intricate designs using CAM (computer-aided manufacturing) and CAD (computer aided design). For example, in the past, ceramic colour was limited to a small amount of variation in glazes and colouring oxides making pieces look earthy and dull. Today there is a large range of glazes, stains, colourants, and inks to improve art and bring vibrancy to ceramic pieces. In recent years, we’ve had digital printing to broaden and create more precise designs. Digital printing reduces production time, cuts costs and boosts efficiency in the artist’s process (Lleó, 2019). Traditional ceramic forming processes in industries rely primarily on moulds, resulting in limited design flexibility. Therefore, embracing digital techniques like 3D printing, is a reasonable response to these challenges. 3D printing is a collection of advanced manufacturing technologies used to create physical parts in a discrete point-by-point, line-by-line, or layer-by-layer additive manner from 3D CAD models that have been digitally sliced into 2D cross sections (Chen et al., 2019). Ceramic 3D printing has been around for a long time, from desktops to industrial systems, and it is becoming more popular by the day. Binder jetting, stereolithography, material extrusion, and nanoparticle jetting are the major 3D printing technologies. Binder jetting is when binding agents are selectively sprayed using an inkjet printer to combine powder particles layer by layer. The advantages of using this method in ceramic printing are its high speed, the absence of supports, and the feasibility of complex geometries. The disadvantages of low compressions include high porosity and low strength, as well as difficulties in getting the best precision and surface polish. For complicated shapes, cleaning powder after printing can be difficult. Material extrusion, like FDM, entails pushing clay or paste through a nozzle layer by layer. This approach is low-cost and ideal for desktop applications. However, when compared to other approaches, the results may be lacking in resolution, layer height, and mechanical performance. Nanoparticle jetting uses material jetting for metal and ceramic printing. Two sets of photocurable inks are used in this process, with the build material being a liquid dispersion of ceramic

nanoparticles in a binding component. During printing, droplets deposit multiple material particles, resulting in dense components with optimal performance and low sintering shrinkages. Nanoparticle jetting provides superior resolution, precision, and manufacturability, making it a significant improvement in the area. Stereolithography is gaining traction with the discovery of resins incorporating ceramic suspensions. The resin acts as a binding agent in this procedure and burns out during the sintering phase. The benefits include high surface finishes, low cost in desktop forms, and the potential for ceramic-polymeric composites. However, disadvantages include a limited material range, sensitivity to deformation and shrinkage during sintering, and user-friendliness issues as compared to ordinary resins (Auerbach, 2021). This serves to exemplify the profound transformation over the course of the ceramic evolution.

Having gained insight into the integration of technology within the realm of ceramic craftsmanship, we can now delve into its impact on traditional handcraft and contemplate the future trajectory of ceramics. From the above research, we can assume that there are several factors contributing to the challenges faced by handicraftsman in juxtaposition to technologically produced work. As briefly explained, handcrafted ceramics are a lot more time consuming and less efficient, especially in comparison to mass produced products. With CAM and CAD technologies, objects can be manufactured at a much quicker rate, allowing for precision in the creation of multiple pieces. This includes the planning phase as CAD software allows creators to manipulate designs promptly, whereas in handcraft there would typically need to be a drafts person to completely redraw their plans (James, 2019). Also, technological processes provide a much higher level of uniformity which is another huge advantage in consideration to consumerism. Handcraft requires not only time but also a lot more labour, resulting in a higher production cost compared to industrial products. Technological methods are generally more scalable, making them more suitable for both small- and large-scale production. Handcrafted ceramics may face limitations in scaling up production while maintaining the same level of quality. Referring to the previous craft methods where artists were limited to certain design abilities, technological innovation adds design flexibility. Digital printing adds opportunities for intricate designs that handcraft may not be able to create or at least repeat. The wider range of design flexibility draws a larger range of consumers, along with the ability to quickly adapt to trends and unique artworks. In addition to this, the market is heavily influenced by current trends; therefore, having a faster creative process allows the artist to closely align to prevailing preferences. We can also consider the process of learning the craft when it comes to comparing efficiency, handcraft is a skill honed over years of experience, while technology continues to advance there is less of a need for extensive skill only adaption.

While these are some of the advantages of technology in ceramic crafts, it's imperative to look at its disadvantages. As previously highlighted, handcrafted ceramics entail significantly more labour, contributing to higher production costs. Expanding on this, the use of CAD software can also be extremely costly as it consumes a large amount of computer processing power which requires high – quality computing power that can be expensive. CAM also requires advanced manufacturing devices that are also costly (James, 2019). Furthermore, the dynamic nature of CAD software, which is constantly evolving, introduces complexity, particularly for first-time users or novice artists. Training in CAM/CAD technologies adds extra cost, although some may argue that this upfront investment can potentially yield long-term benefits, justifying the expenses. Maintenance is a critical aspect of any ceramic tool, and CAD/CAM systems require regular upkeep to prevent costly downtime, which, if not managed, could have adverse effects on schedules and business operations for artisans.

We must also consider the benefits of handcraft in the digital age, as the traditional method can provide employment opportunities for skilled artisans. Personally, I think that the skills for

handcrafting ceramics should be valued and should not be lost due to the integration of technology. There is also a greater appeal to handmade ceramics, referring to the previously mentioned research of Fuchs, Schreier and Van Osselaer (2015), this personal touch is what consumers may appreciate along with the artistic value. Some consumers are willing to pay premium prices for handcrafted ceramics due to the nature of the process. However, especially with the current cost of living complications, it may be likely for a higher number of consumers to opt for the mass produced and cheapest option when purchasing objects such as ceramic tableware. Although there are reports on customer preferences, I believe these preferences rely heavily on the current economic state and availability of products. Therefore, research of small samples on customer preferences for digitally produced or handcrafted goods is unreliable unless done in recent years with a large sample of people from different areas of the world. My reason for this opinion is that reports from years ago before certain technological advancements would be unbelievable due to preferences changing to current advances. There would also have been a drastic change in preferences during COVID-19 when people would not be going out to stores to purchase things and a large portion of people were picking up handcrafting as a hobby. There was a boom during lockdown for artists selling online as they had a lot of time to dedicate to their hobby, which would have swayed consumer preferences. Also, with the current cost of living, a large amount of people are budgeting and don't have the money to spend on higher quality handcraft when they can get something half the price with no consideration for artistic value. As for the future of CAM/CAD processes, reports by SmarTech Analysis state that 3D printing is evolving into a standard in several industries and maturing into a serial part production, with 2025 estimated as a pivotal moment in this transformative journey (James, 2019). However, it is not clear through research whether this digital age will completely wipe out handcraft as these processes still need assistance and artists still value their craft.

To conclude on the research attained, my personal opinions on the debate of whether technology is benefiting or limiting ceramics, I believe that although technology is incredible for its capabilities to create intricate pieces in minimal time with minimal effort from the artisan, it massively diminishes the skill and true art of handcraft. Handcrafted ceramic pieces are to be valued in a digital world. Each item is unique, with its own character. The respect for handmade ceramics extends to their defects and imperfections, which add to their beauty and authenticity. Furthermore, because the clay surface preserves the distinctive markings of the artisan's hand, these works frequently give a tactile sensation that mass-produced objects lack. "Ceramics is about tactility, beauty, and subjectivity—and conveying things I can never talk about," says Christina Tufiño, a ceramicist focused on handcraft, at NADA New York (Lesser, 2017). This quote stood out to me as I find that technology could never achieve the same essence as a handcrafted piece. There are a load of ceramicists that are aware of the capabilities of adapting to technological processes but chose to stick to their handcraft due to the passion in the process and the satisfaction derived from being able to turn a lump of clay into something extraordinary. In terms of what is beneficial on an economic level, CAD/CAM processes may be a more efficient way to bring in money from selling uniform products, the costs of setting them up alone heavily outweigh the tools used in hand building. From a consumer perspective, I believe that in current times people may opt for the cheapest option which happens to often be the industrialised ceramic. Therefore, it is clear that technology does greatly benefit the ceramic industry in terms of process and production pricing, however, will inadvertently diminish the artistic touch meaning we should still appreciate handcraft in a digital age.

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