Industrial Revolution 4.0 and Its Influence on Visual Arts Education

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ABSTRACT

This article presents the challenges Industrial Revolution 4.0 (IR 4.0) pose to visual art educators, specifically, and the impacts of IR 4.0 on visual arts education, generally. The industrial sector has experienced countless changes through the first three phases of industrial revolutions. The impacts of the IR 4.0, however, are unlike any of its previous predecessors. The IR 4.0 marks significant influence on every facet of life, going beyond industrial sector to all other industries and agencies as well as defining the way people go about their everyday lives. Sparked by smart technology, as explained by Schwab (2017), the burst of IR 4.0 was generated by the invention of supercomputers, smart robots, driverless vehicles, genetics transformation, virtual reality, augmented reality and neuro-technology. The field of visual arts education is also, directly and indirectly, continuously shaped by these technological advancements. Hence, the article details each phase of industrial revolutions and illustrates how the IR 4.0's surgence is different; the manner it revolutionizes and affects visual arts education; as well as the positive and negative effects that it has on the field.

Keywords: *Industrial revolution, visual arts education, teacher education in visual arts education*

1. INTRODUCTION

Industrial Revolution 4.0 (IR 4.0) is a widely debated issue among academics around the world. Presently it is an important change that shapes future education. IR 4.0 places smart technology as a core and calls for pedagogical approaches and curriculum to be reviewed. At the heart of IR 4.0 are skills and digital literacy [15],[16,[19]. For universities, providing a digital ecosystem is considered a step in the right direction in meeting the needs of the current generation. For visual arts educators, the IR 4.0 presents its unique challenges. Responding to this, Lewis [13] suggests that teachers need to learn and adapt to new skills, accept new approaches and address the ongoing social changes.

The IR 4.0 desires individuals who are ready to learn to accept and adapt to changes in line with the ever-evolving and dynamic information technology. Education is an important element, in which to remain relevant, educators must be able to profess digital literacy and willingly prepare to gain new experience and broad knowledge in various fields [2]. The IR 4.0 brings pedagogical transformation in the classroom [22]. Art educators need to be more flexible as their role is not only as a source of knowledge but also as a facilitator in the learning process.

Components of the IR 4.0 also include the continuously changing access to information through social media. Delacruz [7] found that digital social media plays an important role in shaping contemporary thinking in art education. Prospect in social media can be use by students and art educators to share and enhance understanding the development of the visual arts around the world as technology allows us to reach to anyone in any parts of the world quickly and effectively.

2. INDUSTRIAL REVOLUTION

Historically Industrial Revolution is a process of changing the pace of production in the manufacturing industry. This change is due to the advancement of production technology which is from the usage of the old and traditional technologies to the use of the latest technologies [9].

The industry change through technological innovations that involve the usage of technological machines resulting in mass production of goods by using machines as a commercial and trade purpose. This situation has directly transformed the economic landscape from agriculture to industrialization and made it a source of income for the people's economy. The Industrial Revolution improves the standard of living in a world where job opportunities are created and encourage economic development to achieve.

2.1. Industrial Revolution 1.0 (IR 1.0)

This revolution which occurred in the 19th century was triggered by the introduction of electricity. One of the industries which was greatly affected was the metal industry through the utilization of electric-powered machinery. This led to the emergence of mass production of metal, oil and early communication and transportation technology emerged such as telephones and light bulbs.

Huge number of schools of design were established during the second industrial revolution to fulfil the needs of the industries. Nevertheless, there were countless complaints from fine art educators in the 19th century who felt that the training centres fell short in providing quality education and in producing efficient designers. McMullen [14] and Stankiewicz [20] indicated that the insufficiency of training in product design as one of the main causes of the issue.

2.2. Industrial Revolution 3.0 (IR 3.0)

As social creatures, people constantly experience absolute IR 3.0 began in the 20th century with the introduction of computing technology, automation and electronics. Industrial production in this era was more rampant with the development of software and computer programming, particularly in robotics, to assist product manufacturing. The introduction of 3D software, for example, had cut the production time exponentially, leading to more cost-efficient production [4].

The spur of computing technology had also shaped the curriculum of design schools. Many art institutions opted to offer computer program and software design courses to accommodate the needs of manufacturers who placed high demand for skilled employees in the areas.

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2.4. Industrial Revolution 3.0 (IR 3.0)

Industrial Revolution 4.0 (IR 4.0) created bigger waves than the first three industrial revolutions. In comparison to the first, second and third industrial revolutions which only affected industries; the fourth industrial revolution goes beyond industries and affects every facet of life. Spurred by the Internet which then supported by smart technology, IR 4.0 enables the amalgamation of humans and computers establishing a social network among humans, robots and machines that are able to communicate with each other [18, 19].

3. THE EFFECT OF INDUSTRIAL REVOLUTION (IR) 4.0 ON VISUAL ARTS EDUCATION

The term Industrial Revolution 4.0 first emerged as Industry 4.0 and was first made public by the German federal government. Similar to the previous revolutions, IR 4.0 through smart technology affects many aspects of human lives. Innovations such as portable computers, social networks, and big data create many opportunities in building a conducive learning ecosystem.

The concepts of learning are adapting flexibility with more open and ubiquitous. This includes the idea of learning can be done anytime and anywhere. An ecosystem that supports digital literacy is salient especially in linking education with the working sector. As an educator, I am an advocate in using a variety of teaching and learning techniques. Thus, in this paper, I would discuss my views on the Industrial Revolution and its implication on visual arts education.

3.1. Artwork Quality and Art Products

Evaluation of artwork often involves aspects of detailed observation, complexity, and fine work as well as the quality of its production. Hand-made art products are time-consuming to produce; however, the advancement of technology and computer software has eased the process and increased the production lines.

The increase in its economic value, however, is not without its downside. Massive art productions have compromised their quality to a certain extent. The introduction of computer and online platforms have replaced the need for physical interactions between artists and objects [21]. Even in art education, art production is no longer a process of artistic exploration based on the thoughtful thinking process.

3.2. Art Form and Production

Observation techniques is a form of practice in art production. It is often employed in drawing classes in which learners record their observation data based on what they have observed. This process is significant in shaping their perceptions and understanding of art forms in addition to sharpening their memorization skills [17].

Internet and its worldwide web present faster and easier options for art educators to access an abundance of images [5]. However, this practice limits learners' explorative

minds as it distorts them from exploring and observing their surroundings and environment.

3.3. Aesthetic Experience and Virtual Museum

Museums and art galleries are effective mediums for aesthetic and visual art education [11],[12]. Many museums have integrated the use of technology as part of visitors' visiting experience [3],[8]. The number of museums offering digital media has increased exponentially with several museums venturing into virtual reality.

Virtual reality is a form of digital entity which depicts museum characteristics through non-physical means, hence, presenting rich aesthetical elements. IR 4.0 increases public accessibility to museums as exhibits and objects can be observed virtually without requiring physical presence. Museum management must take this opportunity in integrating web-based technology as a long-term strategy in ensuring that museums continue to stay relevant.

3.4. Intellectual property and Art Products

Laws concerning intellectual property are a pivotal element in supporting technological advancement resulting from IR 4.0 [1]. The ease in accessing art-based products has led to widespread issues concerning copyright and patent. Undeniably Internet has created a global platform for art marketing and promotions as well as student's exploration of techniques and style.

Hence, educators should be well-informed and sensitive to issues about copyright when students were asked to download resources from the Internet. Students often copy and imitate styles and techniques by artists in other countries and apply these in their artworks, this could lead to copyright issues.

3.5. Art Learning and Pedagogy Through YouTube

Digital media offers visual excitements through text manipulations, images, sounds, animations and videos [23]. In comparison to traditional artwork which requires aesthetic understanding, digital media is highly valued among young users due to its straightforwardness in conveying information and messages. Besides, the traditional form of visual arts no longer able to fulfill people's aesthetic needs.

The YouTube platform has garnered increased attention over the years. From the perspective of arts education, the tendency to learn visual art and art production techniques through YouTube videos may well be the reason for teachers becoming redundant and obsolete. Learners find the videos to be far more entertaining than traditional classrooms. This phenomenon can be observed through the high number of video uploads on YouTube by Youtubers who have no formal artistic training.

3.6. Coordination Training and Fine Motor Skills

Traditional art productions require the ability to develop their fine motor coordinator which demands simultaneous use of hands and their sights (eye). The use of pencil or brush in carrying out visual art activities, for example, helps in strengthening the muscles, enhancing fine motor control and improving eye coordination. The impacts of technology on art production have long been a debating topic among scholars in art education.

Many agree that technology has brought about significant improvements in the field [10]. Touch-based technology promoted as being highly interactive is not able to provide for the development of fine motor skills particularly in coordinating the hands, fingers, and thumbs. Agolla [2] believed that exposure to digital literacy improves the adaptation skills of young children. Nevertheless, art educators must provide familiarity with activities requiring fine motor skills regardless of how menial they might appear. Hand movement cantered tasks such as writing, cutting, using cutlery, buttoning up and unbuttoning the shirt, knocking and tying up shoelaces are crucial in the development of children's fine motor skills.

4. CONCLUSION

The article focuses on issues and challenges which surround art education in light of Industrial Revolution 4.0 and the advancement of technology sparked by the revolution. Unlike other industrial revolutions in the past which placed significant influence and changes only on industrial sectors; IR 4.0 affects every facet of life. Hence, its effects are unlike any other we have ever experienced. It is interesting to ponder whether have we successfully controlled the technology or is the technology controlling us? The most prevalent challenge to art educators in the face of 21st century is the ability to adapt to various, unexpected and immediate changes - to mention a few: the need for digital literacy on the part of the educators; the changing pedagogy; and the different ways and multitude students approach their learning. Nevertheless, art educators should view these changes constructively and as means for continuous professional improvement efforts. Art educators must also equip themselves knowledge-wise and acquire emotional stability to effectively abreast with future challenges.

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