The Role of Metaverse in Developing Soft Skills Among ESL Learners

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ABSTRACT: Metaverse world revolution will occupy its place among other technology tools during the coming decades. Therefore, education has become one of the most important areas that try to reap the benefit from Metaverse. The purpose of this article is to review the literature in order to clarify the concept of "Metaverse", its origins, and the modern approach to its use in education. This article finds that Metaverse plays a crucial role in developing soft skills that ESL learners need; such as communication skills, creativity, innovation, and critical thinking.

KEYWORDS: Metaverse, soft skills, ESL, Artificial Intelligence, communication skills, creativity, innovation, and critical thinking.

1. INTRODUCTION

The fourth industrial revolution constituted the real start of the fourth generation of globalization, as it imposed many new changes that were placed before the governments of countries, great challenges to deal with and compete in creativity and innovation in order to control global markets (Al-Haddad, 2021).

Since the beginning of 2022, a lot of controversy and skepticism have emerged about the world of metaphysics and its goals. Some believe it is an inescapable world of augmented reality and mixed reality. While others think it is the real breakthrough and a historical moment in the world of extended reality, as it is the world approaching to the second life that many people have expected for years (Othman ،2022).

This digital world mostly attracts students and helps them to be more creative and practice a new language with a wide community (Schroeder, 2021). Metaverse also provides valuable resources for both ESL teachers and learners. Such digital world helps students to be full when practicing English freely outside the classroom (Alshammari, 2022). Further, students with high confidence can continue in the Metaverse world and benefit from it even if they fall into failed experiments (Hirsh-Pasek et al., 2022). Therefore, it should be considered by English program designers and developers.

But what is Metaverse and how did it appear? Here it is necessary to learn about artificial intelligence and its role in the emergence of the Metaverse world. Many companies concerned with technology have become devoting all their capabilities to take advantage of artificial intelligence techniques in developing high-speed computers that work through artificial intelligence to enter the Metaverse world (Osman, 2022).

2. THE EMERGENCE OF ARTIFICIAL INTELLIGENCE

Philosophy theories and theories of perception and learning worked 2000 years to produce artificial intelligence. Likewise, the mathematics, and computing sciences that adopted theories of logic worked 400 years in guiding artificial intelligence. Psychology and the discovery of human capabilities and the way the brain works also had a role in feeding this new world of technology. The science of linguistics and the efforts exerted in revealing the structures and meanings of language and the development of computer science and its applications also had a role in the emergence of artificial intelligence (Khawald, 2019).

The philosophical roots of artificial intelligence go back to the Greek philosophers Socrates Aristole, Plato and to the French Francis Bacon and Bertrand Russell, who had the idea of Logical Positivism. In addition, the roots of artificial intelligence go back to some sciences, such as mathematics, through three fields: "logic, probability theory, and algebra." (Khawald, 2019).

According to Khawald (2019), the time periods that artificial intelligence has gone through can be divided into three stages:

First: It began immediately after the end of World War II at the hands of the scientist Shannon in 1950, when he began designing a game of chess. This stage ended with the two worlds, Vision Baum and Feldman in 1963, as it was represented in the development of research methods in spatial representation and led to the development of computational modeling models based on three factors:
1. Representing the primitive state of the subject in question (like a chess board when starting to play).

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2. Choosing the conditions for realizing reaching the end (beating the opponent).

Second: It is called the poetic stage, and it extended from the mid-sixties AD to the mid-seventies. Where frames were placed to represent information by Minsky's world. This was followed by the system that the world and Negrad made to understand English sentences such as conversations and texts. It was followed by what Anonston and Brown did at the Massachusetts Institute of Technology. Where they built list of words from some languages and made formal and symbolic treatment.

Third: It is called the modern stage, which began in the mid-seventies. At this stage, a large part of human intelligence moved to computer programs. As this period is considered the golden age for the flourishing of this science. The nucleus of artificial intelligence technologies was formed and crystallized to include symbolic modeling, menu processing mechanisms, and various programming techniques that interacted with many branches of science.

2.1. Three main types of Artificial Intelligence "AI":

１. Narrow AI or weak AI: It is the simplest type, as AI is programmed to perform certain tasks and functions within a specific environment. An example is the robot "Deep Blue", which beat the world chess champion Garry Kasparov.

２. Strong or general artificial intelligence: It has an advanced ability to gather and analyze information. The process of accumulating experiences contributes to independent and self-decision making, an example of which is driverless cars.

３. Superior artificial intelligence: They are models that are still under experiment, seeking to simulate humans, and here we can distinguish between two basic patterns, the first: it tries to understand human thoughts and emotions that affect human behavior, and it has a limited ability to interact socially, and the second is a model of the mind theory. These models can express their internal state and predict the feelings and attitudes of others and are able to interact with them, and it is expected that they will be the next generation of super-intelligent machines.

2.2. The concept of Artificial Intelligence:

The definition that Khawald (2019) provided of artificial intelligence is a group of efforts to develop computerized information systems in a way that they can act and think in a manner similar to humans, these systems can learn natural languages, accomplish actual tasks in integrated coordination, or use cognitive images and forms to rationalize behavior, and at the same time, you can store the accumulated human experiences and knowledge and use them in the decision-making process.

The most important characteristic of artificial intelligence is the creation of smart machines that behave as humans. Its most important areas include:

• Natural Language Processing

• Robotics

• Understanding

• Neural Network

• Expert Systems

Hence, the Meta company launched the design of the so-called high-speed computers. As the company announced in January 2022 on social media that it will develop this type of super-fast computer that works with artificial intelligence. The company's goal in launching this type of computer was to "run the next generation of artificial intelligence algorithms." According to Othman (2022), the company has completed the first stages of its preparation.

The company promises that it will be able to train AI systems with more than a trillion parameters on data sets as large as an exabyte — or a thousand petabytes. This new technology of ultra-fast computers based on artificial intelligence is expected to grow by 9.5% from 2021 to 2026 (Sarkar, 2022).

The Meta promises to provide a number of unprecedented uses for its supercomputer, from ultra-fast gaming to seamless, instantaneous translation of large amounts of text, images, and videos at the same time. As this technology enables the gathering of a group of people speaking different languages at one time and enables them to communicate smoothly through simultaneous translation. These computers also provide scanning of large data of photos and videos in search of harmful content to stop it or to identify a single face in a large crowd of people to serve investigations. The most important thing this modern technology provides is a serious start in developing the next generation of artificial intelligence models, as it will operate the Metaverse, and will be a basis upon which future Metaverse technologies can rely (Othman, 2022).

3. METAVERSE CONCEPT

Collens (2008) reports that the term Metaverse was coined by Neal Stephenson in his 1992 science fiction novel Snow Crash. Where users from anywhere in the world can integrate into the virtual three-dimensional environment with its various components, whether for the purpose of commerce or entertainment, as in his novel.

The first word "meta" means beyond and "Verse" refers to the universe or the outer world. Technology companies use the word to describe what comes behind the Internet, meaning beyond the world or the other world (Ribeiro, 2021). The word "Verse" is derived from the word Universe. Further, Metaverse also named "mirror world", or "spacial internet", "AR cloud", "Second Life- SL" (Mystakidis, 2022) and (Ribeiro, 2021). Shin and Kim (2022) believe that the best definition of Metaverse is "a 3D virtual space,

in which numerous people can inhabit, migrate, and make use of as a virtually physical environment". They explained Metaverse is the future of the Internet. It is a mixture of fantasy and real life that has created a third world (Hirsh-Pasek et al., 2022). It is also defined as a continuous digital world that reflects our world, as it has become more diverse, creative, and allows us to do anything we can do in the real world (Strickler, 2021).

Although the term "Metaverse" has been around for 30 years, since the publication of the science fiction novel Snow Crash by Neal Stephenson, it became more popular in 2021. When Facebook turned to Meta, with promises from CEO Mark Zuckerberg and it was followed immediately by Microsoft announcement that it will launch Mesh, an immersive platform that allows participants to be present, interact and share from anywhere - on any device - through mixed reality applications. In the Meta launch video, Zuckerberg said: "our overarching goal across all of these initiatives is to help bring the Metaverse to life" (Schroeder, 2021). Knox said that the term Metaverse can be described as a combination of virtual world technologies and massively multiplayers online games, which in turn has attracted education technology researchers recently (2022). Max Moeller said that Metaverse is a digital landscape that participants can use to build their own virtual environments. It is also a space for users around the world to communicate in a more human way than other ways (2022). Thus, starting from May 2021, the virtual world and Metaverse have become the subject of widespread controversy in modern research and applications to a greater extent than before. (Shin & Kim, 2022)

In his article published in October 2021, Schroeder said that 3D social spaces like CyberTown long predate the existence of Metaverse. Virtual worlds emerged as early as the 1970s that included multi-user dungeons. And she was the inspiration for many of the predictions we see about metaphysics today (Schroeder, 2021).

Further, people have become real estate agents in the digital land; They've been selling virtual items in the digital world "Second Life," for nearly two decades. Surprisingly, schools and companies have opened their own campuses in this virtual world (Schroeder, 2021).

People can also navigate virtual galleries, examine, and purchase digital paintings and original artworks. In March 2021, a marketer sold a purely digital artwork by Beeple for $69 million in cryptocurrency. "The auction, the artwork, and the currency were all virtual, but the transaction was very real" (Strickler, April 2021).

3.2. The emergence of metaphysics in education

The emergence of the Metaverse in education has been accompanied by a continuous development that lasted two decades, as Schroeder explained in her article published in March 2022. However, this development was slow and gradual, and this was due to two reasons, the first because of the slow adoption of the Metaverse concept, and the other because of the technological challenges that hindered its development in some environments that attempted to test it. Virtual games that early versions of the Metaverse were designed and refined in education. Schroeder mentions examples of creating Metaverse in education such as those found in "Second Life, Minecraft, Roblox" and many other virtual platforms that have emerged since 2000 (Schroeder, 2022).

Although the Metaverse has not been completed in a way that can be completely relied upon as another world, it is transforming and expanding every day in different ways. The most prominent example of this development was the shift to distance learning during the Corona pandemic period, as it prepared a 24-hour site through which synchronous, asynchronous, and interactive 3D video presented in virtual reality and even augmented reality modes to connect the "real" world with space and provided what serves the educational process (Schroeder, 2021).

Thus, education has become one of the most important areas that benefit from Metaverse. According to Shin and Kim (2021), visiting museums has become more accessible to everyone, in a completely similar way to reality. For example, the "Google Art Project" provided a lot of knowledge about cyberspace and expanded the inclusion of educational electronic museums.

Also, regarding simulation through the virtual world; the world of metaphysics has benefited many fields of knowledge such as medicine. It provided evidence and models that answered many questions and overcame doubts and fears through training in a world similar to reality. Many economic studies have shown that virtual world technology in the global healthcare market is expected to reach $4.15 billion by 2025 compared to $1.42 billion in 2021; This confirms, according to (Hirsh-Pasek et al., 2022), that the Metaverse world revolution will occupy its place among other technology tools during the coming decades (Osman, 2022).

Strickler directs Media Entrepreneurship and Innovation at the Institute for Creative Media Industries at Georgia State University; Where students build Metaverse environments, as she believes the world is heading to this Second Life. Students and artists show creativity and earn a lot of money using Metaverse. The institute established an agency to preserve the rights and intellectual property of works in the Metaverse world, called NFT "Non-fungible token" (Strickler, April 2021). The NFT is a registered certificate of ownership that all browsers can see, as it is very similar to those contracts that a person gets when he or she buys a house in the real world. It indicates that a person owns a file or product on the Internet. So that it was produced on the Internet for the purpose of serving Internet surfers, but this property does not prevent others from entering and enjoying the owner's page. So that Tehranian explained that the purpose of publishing products on the Internet is attracting users, which increases the value of these products and thus benefits the owner (Strickler, 2021) and (Tehranian, 2021). Providing such certificates in a digital environment helps learners from all over the world to trust this technology and be more creative and share their thoughts freely.

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Also, the so-called digital fashion appeared and became available for all users. Students in fashion fields and designers use Metaverse to share their designs and allow users to experience dressing digital outfits that are unique. As the way to change costumes is one of the things that users are most fond of in the virtual world. Many of them began to buy clothes from the virtual world in order to publish pictures of them wearing unordinary outfits on their social media pages, and then sell them later. Vrbanic in her research "hype beast culture" found that some people owning a store in Decentraland, which is a platform in the Metaverse for selling digital fashion designs. Also, another store called Demat which is verified in the NFT platform, is well known in selling a lot of costumes as soon as they are released on the site (Vrbanic, 2021), and (Nevius, 2020). This new creative way can attract ESL learners from all over the world to develop and use such designs.

Among the most important skills provided by the Metaverse world to learners, is that the so-called soft skills that the learner can master in the educational Metaverse world, and they include communication skills, creativity, and innovation (Shin & Kim, 2021). Soft Skills that ESL learners acquire in the Metaverse world:

Communication and Collaboration

Communication and interaction with native and nonnative people are one of the most important skills that a learner can acquire in the Metaverse world. Playing in groups contributes to the development of this skill, in addition to the skill of self-reliance, accepting loss and reconciling with oneself. As a result of this communication, players involved in the Metaverse world develop two types of skills resulting from communication, which are teamwork and socialization. An example of a teamwork application is Overcooked, which is a game that requires a few players to cooperate with each other. It requires cooperation between the players to pass the mission and achieve the objective. It depends on language communication between them and understanding of instructions. It was observed during the completion of the stages of the game that this collaborative atmosphere prompted foreign students to try to speak English in order to achieve better communication and complete teamwork. Regarding socialization, many companies have developed many applications that simulate reality to make friends with virtual people in the virtual world. An example of this is WoW, which developed this technology to satisfy its users. It helps users to lead people who share same interests. Further, it was noticed that users used profile pictures reflect their personalities to attract other users and build social communication with the largest number of players and make friendships through Metaverse. ESL learners will be able to practice listening, speaking, reading, and writing to communicate since using English has become one of the basics of our daily lives. And it goes without saying language skill grows and develops with human growth through communicating with others (Hirsh-Pasek, 2022). Collaboration is one of the most important social skills for humans, which must be experienced during the learning process, as it contributes to build social relationships, understanding points of view, recognizing their differences, and accepting others (Hirsh-Pasek, 2022).

Innovation and Creativity.

One of the most important skills offered by the Metaverse is innovation and creativity. Metaverse is the right place for players who are looking for excellence, creating new, and unprecedented ways and solutions. A good example of this is the world of Minecraft's Crafting, which gives artists and architects a chance to think creatively. The most important thing that students can come up with in this creative atmosphere is exploration and resourcefulness. Metaverse gives the freedom to explore and investigate what is around in a world full of new and modern information without fear or hesitation. An example of this is the three-dimensional puzzles presented by Myst in Metaverse, which helps players to not limit themselves to what is available within the application, but rather go beyond that and use new resources. For example, players in Myst use codes they get from the Internet that allow them to use other tools within the game (Shin & Kim, 2022). It is important to know that all electronic games use English language and are based on a set of rules that the player must be aware of and work to overcome by tricks that he chooses for himself. For example, "Minecraft" provides three modes: the creativity method, the adventure method, and the survival method. Each method has its own rules that must be learned to pass the stages of the game. Survival mode requires the player to gather materials and beware of dangers and threats that appear when night falls (Shin & Kim, 2022).

Critical Thinking

The ability to criticize and analyze the information received is one of the most important skills that the ESL learner will acquire in the virtual world. Traditional sources of content such as reading, writing, math, science, and social studies must work in conjunction with application, implementation, and continuous learning to support student learning. When the student masters the skill of communication and cooperation, then he or she can master and understand the content and move on to higher skills (Hirsh-Pasek, 2022).

Metaverse in ESL classroom

Due to the fact that the Metaverse world provides a typical environment in terms of merging real life with a virtual life similar to reality, and because it provides a fertile environment for conducting educational experiments, a group of Japanese educators and researchers used the Metaverse world to conduct their studies on a group of university students in both Japan and the United States of America in order to study student behavior on Virtual world while applying the problem-based learning method. So, the researchers bought an island in the Metaverse. On this island, researchers designed virtual classrooms and buildings. Two buildings were built and placed next to each other. The students were asked to answer the following question, "What will homes look like in the near future in a time of global warming?" The researchers collected answers from students, including a description of what a

typical modern home would look like as environmentally friendly, and work on designing the house using the tools available in the virtual world. The students interacted and communicated with each other and designed environmentally friendly model homes in the virtual world. Which has proven effective in helping students solve problems and teamwork with students from all over the world. (Barry et al, 2010). An example of the trend of companies adopting this new world in education is what happened with the Roblox company, as Roblox announced "a commitment of $ 10 million in grants dedicated to developing a group of classes in middle and high schools and college." As they reported in the Wall Street Journal, "One company-funded game will teach robotics, another will focus on space exploration, and a third will help students explore careers and concepts in computer science, engineering, and biomedical sciences." (Schroeder, 2021). This should be considered by English program designers and developers. This digital world mostly attracts students and helps them to be more creative and practice new language with a widen community.

Metaverse provides valuable resources for both ESL teachers and learners (Moeller, Mar 19, 2022).

First: Students and teachers can meet in a digital world using their digital tools at any time and from anywhere around the world. As students wishing to learn about other countries history can join classes designed by a teacher who travels around the world and brings them closer to different civilizations through learning classes on Metaverse.

Second: Metaverse provides three-dimensional images for learners that they can examine and increase their knowledge about different situations that are not easily accessible, such as volcanoes. By exploring the virtual world, they can increase their educational experience and add a lot to their knowledge.

Third, the Metaverse provides teachers with a fertile environment to design their lessons and enhance student learning using experiential teaching as opposed to relying entirely on textbooks.

Fourth: this world enables students to live in the past and learn about ancient lives under the supervision of their teachers.

Educational applications need Metaverse (Hirsh-Pasek et al, 2022)

The general atmosphere of education in ESL classes must be full of activity and vitality. Learners learn best in positive, complex rather than simple environments. Applications must encourage integration rather than distraction and rely on sounds that help in integration with digital tools while playing and reading. Application must be associated with meaningful tasks related to reality to support learners. As students learn better when he or she connects what they learn with their previous experiences. Applications must contribute to enhance social interaction inside or outside the digital world. Based on his experience as an English language teacher, Ribeiro notes the need to provide the latest developments that can be accessed and made it available in learning environments. He believes that this contributes to the students' linguistic growth and enables them to face the challenges of an ever-competitive world outside the classroom environment (Ribeiro, 2021).

In the near future, according to Schroeder, "the augmented and virtual reality market will grow to more than eight times its current size over the next five years, making it the fastest growing category among emerging devices, which includes wearables and smart home devices" (2022). It is about integrating Metaverse technology into education. The human mind sets off to innovate without limits, producing innovative ideas that will one day make things part of science fiction a tangible reality (Khawald, 2019, p. 142).

Hirsh-Pasek et al. (2022) believe that soon Metaverses will be as ubiquitous as "TikTok, Instagram and Facebook" and as a result, we must also advance in how we educate children and prepare teachers to meet these new opportunities. From his point of view, when education lags with these digital developments, companies tend to adopt technology instead of teachers, which is an economic educational opportunity.

They elaborated, "Today as the metaverse infrastructure is still under construction, researchers, educators, policymakers, and digital designers have a chance to lead the way rather than get caught in the undertow. To leverage the potential of the metaverse as a 3D, global, interconnected, immersive, and real-time online space, we need new ways to connect the physical world with augmented and virtual reality (VR) experiences" (Hirsh-Pasek et al, 2022).

The most important proposals in Hirsh-Pasek et al.'s article to provide best practices for better education in the Metaverse world are (2022):

1. A series of principles drawn from how and what students learn in the Metaverse should be proposed to guide the design of new educational technology.

2. Those creating educational products for the Metaverse must join forces and partner with educators and scientists to ensure that students experience real human social interaction as they navigate virtual spaces.

According to Rehm, Goel, & Crespi, "the world of metaphysics should not be viewed as an end in itself, but rather as a means of transformation towards cyber-physical development on various levels" (2015, p. 3). As Metaverse is going to be part of education, the question is "whether as designers, policymakers, educators, and parents, we can mold intentional and appropriate opportunities that are truly educational within this new and exciting context" (Hirsh-Pasek et al, 2022).

4. CONCLUSION

Metaverse in education is expected soon to become a platform for learning systems that take advantage of the continuous platform and suite of highly immersive connectivity capabilities and features to drive better learning outcomes. The ability to engage in

physical tasks, iterate, and immerse themselves in virtual, augmented environments will add a depth dimension to physical or virtual classrooms away from traditional textbooks, illustrations, and videos (Schroeder, 2021).

With the NFT protection system the accreditation system becomes more democratic. Education becomes more equitable and open. Teachers can benefit from what they offer in the virtual world. Teachers can have their own brand and their own classes. It also creates environments for ESL students of their own, enabling them to manage and control their pages and achieve material gains, which motivates them to learn, spread knowledge and exchange experiences. It worthily mentions important skills that ESL learners can master when integrated into the Metaverse such as communication, collaboration, innovation, creativity, and critical thinking, However, more qualitative and quantitative research is needed in ESL classrooms to prove with evidence the effectiveness of Metaverse use on students English skills and needed soft skills.

Conflicts of Interest: "The authors declare no conflict of interest."

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REFERENCES

1) Alshammari, M. (2022). The effect of online learning in developing English speaking skill. Journal of Educational Psychological Sciences, 6 (8), 149-157.
2) Barry, D. M., Kanematsu, H., & Fukumura, Y. (2010). Problem Based Learning in Metaverse. Online S   ubmission. https://www.semanticscholar.org/paper/Problem-Based-Learning-in-Metaverse.-Barry-Kanematsu/fa925a6da030d8925c191c260b7d2ada856e05c1
3) Collins, C. (2008). Looking to the future: Higher education in the Metaverse. Educause Review, 43(5), 51-63.
4) Hirsh-Pasek, K, Zosh, J,. Hadani, H,. Golinkoff, R,. Donohue, C,& Wartella, E. (14 Feb 2022). A whole new world: Education meets the metaverse. https://www.brookings.edu/research/a-whole-new-world-education-meets-the-metaverse/
5) Knox, J. The Metaverse, or the Serious Business of Tech Frontiers. Postdigit Sci Educ 4, 207–215 (2022). https://doi.org/10.1007/s42438-022-00300-9
6) Mikroyannidis, A., Third, A., & Domingue, J. (2019). Decentralising online education using blockchain technology. https://www.semanticscholar.org/paper/Decentralising-online-education-using-blockchain-Mikroyannidis-Third/6459ab2190ef04368b1a0ab34e2cdb2fb1f9e5b1
7) Moeller, M. (Mar 19, 2022). Metaverse for education: How virtual reality can help schools and colleges. Retrifed from https://cointelegraph.com/explained/metaverse-for-education-how-virtual-reality-can-help-schools-and-colleges
8) Mystakidis S. (2022). Metaverse. Encyclopedia. 2(1):486-497. https://doi.org/10.3390/encyclopedia2010031
9) Pfeiffer, A., Denk, N., Serada, A., & Dingli, A. (2022, March). DIGITAL IDENTITIES, NFTS AND AI IN THE EDUCATION SECTOR: SHOWCASING A DEMONSTRATOR. In Proceedings of INTED2022 Conference (Vol. 7, p. 8th).
10) Rehm, S. V., Goel, L., & Crespi, M. (2015). The metaverse as mediator between technology, trends, and the digital transformation of society and business. Journal For Virtual Worlds Research, 8(2).
11) Ribeiro, R. (15 Nov 2021). 'Metaverse' and the educational potential: is it so far away?. Cambridge University Press. https://www.cambridge.org/elt/blog/2021/11/15/metaverse-educational-potential/
12) Sarkar, A. (4 Feb 2022). Supercomputers, AI and the metaverse: here's what you need toknow.https://www.weforum.org/agenda/2022/02/supercomputers-ai-and-the-metaverse-here-s-what-you- need-to-know/
13) Schrader, R. (2021, December 23). How NFTs Influence Society: A Look at Scarcity Mindset, Generational Gaps in Education, and the Impact on the Environment. https://doi.org/10.35542/osf.io/2qyfv
14) Schroeder, R. (21 October 2021). Is the Metaverse Finally Emerging?.https://www.insidehighered.com/digital-learning/blogs/online-trending-now/metaverse-finally-   emerging
15) Schroeder, R. (1 December 2021). Tech Trends in Higher Ed: Metaverse, NFT and DAO. https://www.insidehighered.com/digital-learning/blogs/online-trending-now/tech-trends-higher-ed-metaverse-nft-and-dao
16) Shin, E., & Kim, J. H. (2022). The Metaverse and Video Games: Merging Media to Improve Soft Skills   Training. Journal of Internet Computing and Services, 23(1), 69-79.   https://doi.org/10.7472/JKSII.2022.23.1.69
17) Strickler, E. (2021, April). NFTs, the metaverse and the future of digital art. [Video] TED Conference.https://www.ted.com/talks/elizabeth_strickler_nfts_the_metaverse_and_the_future_of_digital_art?subtitle
18) Tehranian, K. (2021, August). NFTHow NFTs are building the internet of the future. [Video] TED Conference.https://www.ted.com/talks/kayvon_tehranian_how_nfts_are_building_the_internet_of_the_future

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19) Vrbanic, G. (2021, December). The new reality of fashion is digital. [Video] TED Conference. https://www.ted.com/talks/gala_marija_vrbanic_the_new_reality_of_fashion_is_digital

20) المراجع العربية

21) الحداد؛ محرم، محمد محمد. (٢٠٢١) .الثورة الصناعية الرابعة (الذكاء الاصطناعي – التحول الرقمي) تحديات وفرص الاستحواذ على القوة الرقمية الجديدة.

22) أبو خوالد، بكر. (٢٠١٩) .تطبيقات الذكاء الاصطناعي كتوجه حديث لتعزيز تنافسية منظمات الاعمال. المركز العربي الديموقراطي للدراسات الاستراتيجية للدراسات والاقتصاد والسياسية. برلين-المانيا.

23) عثمان، محمد. (٢١ فبراير ٢٠٢٢) .الحاسبات الفائقة الذكاء الاصطناعي، والميتافيرس إلى ما تحتاج معرفته. مشتق من https://fihm.ai/supercomputers-ai-and-the-metaverse-heres-what-you-need-to-know/