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A Second Life for Educators: A Hybrid Extended Reality Education Between Zuckerberg's Vision and Educational Researchers' Imaginary

Mandi Li
Media and Information, Department of Humanities
University of Amsterdam
Amsterdam, the Netherlands
mandy.li@student.uva.nl
0000-0002-2500-2251

***Abstract*—While Extended Reality (XR) education is a contested future that consists of diverse discourses, Meta's monopoly of XR technology leads to the misconception that Mark Zuckerberg's vision will be the only future of Metaverse education. To address this discursive power imbalance, this paper draws on the Sociology of Knowledge Approach to Discourse to analyze the interests and significance behind different discourses on XR education. In particular, through an exhaustive comparison between Zuckerberg's vision for Metaverse education and educational researchers' imaginary of XR education, I identify that the primary difference between these discourses is the extent of users' digital autonomy. This difference unveils the two parties' grasping motivations: whereas Zuckerberg uses his utopian vision to cover Meta's recent economic crisis and to secure Meta's power in the future education market, educational researchers employ their decentralized imaginary to maximize their degree of freedom to create in the future learning environment. Lastly, I argue that the two radical dreams should learn from one another about digital governance. Thus, a hybrid XR education is proposed.**

Keywords—extended reality, education, metaverse, discourse, future imaginaries

I. Introduction

A. The Education of the Future

'Soon we'll be able to experience stunning lifelike simulations in virtual reality indistinguishable from our physical world. We'll be walking and actively interacting in the Metaverse, not slavishly staring at the flat screens' [1]. This is a breathless description of the Metaverse, a possible digital world based on Extended Reality (XR) technology. This description suggests that XR has the potential to become a better educational environment, ushering in a revolution that not only transforms our mode of learning but also our mode of thinking.

Despite many articles that imagine an XR education, a large amount of them are based on speculative opinions rather than solid evidence. Additionally, a discursive approach that analyzes the power dynamics behind contested XR discourses has been little employed. A sociological perspective in particular is scarce in the discourses of the Metaverse replete with technological jargon.

To fill the aforementioned academic gaps, this paper asks: how does Mark Zuckerberg's vision for Metaverse education compare to the educational researchers' imaginary of XR education? And what should they learn from one another about governing digital space? These questions are important as imaginary discourses shape the material development of emergent technology. Moreover, as the governance of digital space politically impacts public rights, 'the question of who owns and controls digital infrastructures' becomes crucial [2]. And an analysis of diverse discourses about digital governance is the first step to 'assert our collective democratic power against the private rule of economic elites' [2].

Through pursuing the sociology of knowledge approach to discourse (SKAD), I argue that Zuckerberg's centralized educational Metaverse vision, which depicts students as passive users to strengthen Meta's control in the future Metaverse market, should be moderated by educational researchers' autonomous XR imaginary, which empowers users through an unlimited degree of freedom to create, to construct a new learning environment. That is to say, the two radical dreams should learn from one another by focusing on protecting students' biometric data, separating the control of data, and helping students critically develop virtual identities.

II. Theoretical Framework

Extended Reality (XR) is an umbrella term that encompasses 'VR (virtual reality), AR (augmented reality), and MR (mixed reality)' [3]. While VR utilizes 360-degree images to generate 'a new reality' in which avatars act from a third-person perspective, AR 'superimposes virtual objects on real space from a first-person perspective' [3]. And MR is an integrated device that combines VR and AR [3]. More succinctly, XR is the technical requisite of the three media objects analyzed in this paper: the Metaverse (XR), Second Life (VR), and OpenSim (VR).

Because XR is an emergent notion, this paper will conceptualize it as contested futures rather than a technology in and of itself. Brown argues that 'the future of science and technology is actively created in the present through contested claims and counterclaims over its potential' [4]. Thus, I will analyze XR as uncertain, multiple, and contested discourses. More specifically, I will compare Zuckerberg's Metaverse vision and educational researchers' XR imaginary for clues of things to come.

On the one hand, a vision refers to the imagination of a particular individual [5]. It is crucial to examine Zuckerberg's Metaverse vision through a critical lens, and existing research provides valuable insights. For example, Haupt [6] explored

Zuckerberg's discursive consistency of creating 'a better world.' More importantly, Haupt [6] discovered four motivations behind Zuckerberg's techno-utopian Facebook vision: to strengthen Facebook's legitimacy in the future power structure; to resolve the public relations crisis by shifting public attention to a better future; to stimulate technological developments; to 'provide users and business partners with a sense of meaning.' This paper finds that these motivations continue to exist in Zuckerberg's Metaverse discourse. Moving Haupt's research into a Metaverse context, the following analysis aims to critically investigate the incentives behind Zuckerberg's Metaverse vision in the framework of platform capitalism.

Pasquale classifies platform capitalism into two narratives: neoliberal optimism and progressive counternarratives [7]. Neoliberal optimists argue that platform economy 'promotes economic growth' by advancing market competition and labour conditions [7]. Conversely, progressive counternarratives suggest that platform economy's monopoly hinders economic growth [7]. This paper will employ the counternarrative approach [7] to critique Zuckerberg's neoliberal narrative of Metaverse education.

Moreover, platform capitalism raises deep concerns about data centralization. For example, Egliston warns us of Meta's illicit data extractivism, which involves 'tracking and monitoring users' social activity, creating a vast lake of data to automate exchanges between advertisers and Facebook' [8]. Additionally, Harari has discussed the risk of data dictatorship: the centralization of biometric data will afford 'corporations and government agencies to know [citizens], manipulate [them], and make decisions on [their] behalf'[9]. This paper will use these concerns as academic evidence to conduct a risk analysis on Metaverse education.

On the other hand, sociotechnical imaginary refers to how a large collective makes sense of a future's black-boxed notion. Jasanoff frames sociotechnical imaginaries as 'collectively held, institutionally stabilized, and publicly performed visions of desirable futures attainable through science and technology' [10]. Based on this definition, I find that educational researchers' sociotechnical imaginaries associated with XR education tend to constitute a coherent collective, even though they come from different educational disciplines. In particular, researchers from art, computer science, and medical education coherently imagine users to have an unlimited degree of freedom to create in the XR environment.

Finally, Lessig [11] defines the freedom to create as 'free speech and the copyright doctrine of fair use.' In the socio-technological discourse, the freedom to create refers to users' 'strong desires to experiment, to play with the possibilities' of an imminent technology [5]. Built on these frameworks, this paper defines freedom to create as the imaginary that XR will free users from the regulations of traditional institutions and infrastructural limitations of technology companies.

III. Methodology

This paper draws from the sociology of knowledge approach to discourse (SKAD), which analyzes discourse as 'performative statement practices that constitute reality orders and produce power effects' [12]. Grounded in Foucault's book *The Archaeology of Knowledge* [13], SKAD highlights the 'material and concrete' nature of discourse, which is embodied by tangible traces such as 'speech, text, discussion, and visual image' [12]. General practices of this method include reconstructing the processes of how discourses construct subjective reality and analyzing 'the social effects of these processes' [12].

This focus on the materiality of discourses is supported by Berger and Luckmann in their book *The Social Construction of Reality* [14]. Berger and Luckmann argue that linguistic agents, especially languages and discourses, construct 'a shared social reality' [12]. Foucault also discusses the 'realness' of discourses as opposed to merely the symbolic representations of physical objects [12]. Foucault further defines discourses as 'battlefields, as power struggles around the legitimate definition of phenomena' [12]. Based on this power-knowledge conjunction, I will analyze the power dynamics behind contested discourses about the Metaverse.

In particular, I will first analyze the video 'The Metaverse and How We'll Build It Together' [15] through the lens of platform capitalism [7]. Next, I will use Hilgartner's concept of 'freedom to create' [5] to examine how researchers in art education [16], computer science education [17], and medical education [18] imagine a different XR education. These discourses are important as they represent the voice of a less powerful social group. Finally, by combining the two radical dreams, I will discuss the possibility of a hybrid XR education.

However, the SKAD method has two limitations. First, less powerful groups are underrepresented. In particular, students, who will be essential stakeholders of the XR education and yet are less organized in the XR discourses, are not covered in this study. Second, the hermeneutic analysis in this paper lacks the technicality that forms the material foundation of the Metaverse.

IV. Results

Combining literary and technological studies, this paper defines the Metaverse as a possible digital world based on Extended Reality technology that allows people to engage and live in digital identities. The term 'Metaverse' was first coined by Neil Stevenson in his science fiction novel *Snow Crash* in 1992. In the novel, the Metaverse is 'a world where virtual and reality interact and create values through various social activities,' and the protagonist accesses the Metaverse by wearing headsets, which helps him escape the dystopian reality [19]. Nevertheless, with the development of VR and AR technologies, computer science provides additional insights into the definition. For instance, Park and Kim focused on 'the applications and technologies that can give social meaning' in a Metaverse environment [3]. More specifically, the Metaverse is a virtual world based on the material infrastructures of 'Extended Reality and avatars' [3].

A. The Centralized Metaverse Education Vision

Having gained 7.3 million views on YouTube and being ranked as the first search result by Google videos (search query: 'Metaverse'), the video 'The Metaverse and How We'll Build It Together' uploaded by Meta [15] becomes the hegemonic narrative of Metaverse education. In this video

Mark Zuckerberg says: 'With apps like Osso VR you can learn new techniques and surgery firsthand, practicing until you get it right.' This description frames Meta as a neutral third party. However, deeper motivations are rarely addressed, even as it impels further asymmetries of power.

Indeed, although Zuckerberg frames Meta's products as free education tools, he evades the fact that how Meta designs its products strengthens its private control over the education market. It has further fostered a ruthless belief that every technology should be controlled by corporations with little user creativity and individuality. This hidden centralization is in line with Muldoon's finding that although digital platforms advertise themselves as public infrastructures, they are actually 'controlled by a narrow oligarchic elite' [2]. Thus, we should ask: who will benefit the most from this dominant narrative, and why has this discourse of centralization persisted? In the following sub-sections, I characterize the centralization of Zuckerberg's Metaverse education vision by two components: platform capitalism and data dictatorship.

1. Platform Capitalism

Zuckerberg's vision can be classified as a neoliberal narrative of platform capitalism, which extols corporations for improving consumers' standard of living. However, a counternarrative reveals a darker side of the story: the risks of centralization and monopoly [7]. In this sub-section, I argue that Zuckerberg intentionally implies centralization in his vision to mitigate Meta's recent economic crisis and to secure Meta's power in the future education market.

First, to better understand the context of the Metaverse video, we need to understand Meta's financial position. Meta is facing its biggest financial crisis ever. According to Meta's 2021 fourth-quarter financial report, the company's net profit fell 8% compared to the previous quarter; the number of daily active users was the same as in the third quarter [20]. This slow user growth and declining profits made Meta's stock plummet 26 percent [21]. To hide these crises, Zuckerberg shifts the public attention to a better world, a 'not too distant but nevertheless indeterminate future where all the problems of the present would dissolve' [6]. This futurity gives its stock buyers and users a sense of purpose, persuading them that the company's long-term profits will exceed its short-term loss. In other words, Zuckerberg uses the centralized Metaverse vision as a public relations strategy to cover its economic loss.

Furthermore, the centralized vision helps Meta strengthen its power in the future education market. Meta's major competitors Amazon, Apple, Netflix, and Google all have found their own niche markets. Xu illustrates that 'Google has artificial intelligence; Amazon focuses on cloud computing; Apple has consumer hardware; Netflix owns content traffic' [22]. These areas have a clear growth path in future education [22]. In comparison, as the user growth of Facebook remains stagnant, Meta would need to find a new growth point as soon as possible. Therefore, it is logical to extrapolate that Meta wants to leverage the Metaverse as a unique weapon to outshine its competitors. In particular, groundbreaking technologies such as XR have great potentials to monopolize the traditional education market, of which the development has been stagnant for decades. Meta's monopolistic ambition substantiates Pasquale's concern for 'a full privatization of [public] governance' [7]. And an alarming consequence of this privatization is data dictatorship.

2. Data Dictatorship

Zuckerberg's vision is an unrealistic utopia. This means that Zuckerberg ignores not only potential crimes that might be committed by users, but also by Meta itself. In fact, one of the biggest risks may be Meta's illicit data extractivism. Indeed, a repeating pattern in the video is that Zuckerberg evades the issue of data extraction and instead focuses on a vague notion of privacy. In particular, while briefly mentioning that the Metaverse is 'designed for safety, privacy and inclusion [15],' Zuckerberg is overall vague on how Meta will use students' data in the Metaverse. In fact, Facebook has a track record of being opaque on the issue of privacy. For instance, Facebook's 'clickwrap agreement, a mechanism for quickly moving users into consumption... is vague in specifying data uses' [8]. This lack of transparency will exacerbate technological corporations' data surveillance in the Metaverse. To illustrate, VR infrastructures such as Oculus enable Meta to shift its focus from psychological data tracking to biometric data tracking, which might lead to an unprecedented digital dictatorship. As the user agreement of Oculus Quest, a VR headset developed by Meta, exemplifies: 'we collect data about your physical attributes and measurements, such as your estimated hand size when you enable Hand Tracking' [23]. In this statement, Zuckerberg and his company describe users not as free, creative individuals, but as collective data points.

In education, biometric surveillance like this one can go wrong in two ways. First, as Facebook '[generated] revenue through data or surveillance-centred business models,' Meta may sell users' biometric data to a third party to 'further empower Facebook's advertising arm' [8]. In fact, this data trade will be in the best interests of Meta because more data means more precise target customers and more training materials for machine learning. However, we must remain lucid on its potential to reduce complex humans into monetized data points. The risks of such reductionism were already demonstrated by the Cambridge Analytica Scandal. During the 2016 US presidential election, Facebook and Cambridge Analytica shaped voters' decisions by analyzing their digital traces. As a result, the fundamental principle of democracy, which assumes citizens have free will to choose their leaders, was shattered by data surveillance.

Second, we should be wary of the risk that the biometric data collected by Meta might be leaked to political dictators. Indeed, Harari suggests that the centralization of biometric data would allow autocrats to 'hack the deepest secrets of life, and then use this knowledge not just to make choices for us or manipulate us, but to re-engineer organic life' [9]. Similarly, if students' biometric data were leaked to authoritarian governments, dictators would manipulate students' thoughts. This manipulation through biometric data in the Metaverse will be much more daunting than the control of psychological data on the Internet. This is because biometric data can monitor and understand human feelings better than humans themselves can, given that human feelings are merely biochemical fluctuations [9]. Therefore, such biometric data

will allow dictators to monitor and manipulate citizens by reading their minds.

Nevertheless, we should not outright deny the value of Zuckerberg's utopian vision as imagining is not the same as obtaining. History is overwhelmed by hyperbolic fantasies. For example, the ideal city-state proposed by Plato in *The Republic* was never fully realized. However, this utopian political structure has been motivating many nations to strive for a more egalitarian society. Therefore, the meaning of Zuckerberg's utopianism is not to succeed in achieving it; rather, the meaning is to allow us to choose a different future.

B. The Decentralized XR Education Imaginary?

If Zuckerberg's vision exacerbates the existing unequal power relation, the decentralized XR imaginary might provide insights into what is missing from this utopian future. In this section, I will analyze the imaginaries of educational researchers in art education, computer science education, and medical education. All of these sources come from peer-reviewed journals, which are approved by the majority of experts in their respective disciplines.

To begin with, in contrast to Zuckerberg's centralized Metaverse education, educational researchers imagine users' creativity to be free from corporate controls. Research in art education suggests that *Second Life*, a 3D online virtual world, can be a potential learning environment, in which students will autonomously learn artistic creativity by creating avatars [16]. Moreover, Liao [16] considers Second life as 'a medium, a graphics-tool and a context for generating art.' This suggests that students are imagined to be at the top of the power hierarchy, and technology companies are merely invisible mediums that materialize students' creativity. Similarly, researchers in engineering education imagine universities as unfettered creators. For instance, Crespo [17] suggests that by using 3D free tools such as OpenSim, institutions will be able to provide students with customized learning content. Two layers of freedom are implied in this research: teachers' freedom of constructing individualized courses and students' freedom of choosing their tailored courses. In both cases, VR education is imagined to be free from any traditional regulations, granting users full autonomy.

Nevertheless, this absolute autonomy also leads to scepticism or concerns about the XR learning environment. For example, Liao [16] critiques that avatars in *Second Life* reflect 'the Western canon of beauty,' deepening social stereotypes. Thus, it is crucial for educators to help students critically form their virtual identities and avatar aesthetics [16]. Additionally, Kye [18] argues that the Metaverse can lead to 'identity confusion, escape from reality, and maladaptation to the real world for students whose identity has not been established.' Kye [18] also warns users against privacy infringements and various crimes caused by the 'anonymity of the Metaverse.' These critiques, a backlash against algorithmic discrimination and data surveillance on the Internet, contradict Zuckerberg's utopianism.

However, users' absolute freedom to create is implausible for two reasons. First, historically, new technologies are often accompanied by regulations as boundless freedom is correlated with high crime rates and a higher propensity for violence. For instance, at the early stage of the Internet, cyberlibertarians imagined the Internet as an uncharted space free from any traditional institutions' regulations. A nice case in point is John Perry Barlow's *A Declaration of the Independence of Cyberspace*, which asserts that offline laws cannot regulate online activities. Nonetheless, as the number of cybercrimes skyrocketed, institutions made new laws to regulate the Internet. Likewise, time will empower traditional institutions to limit users' absolute freedom in the XR learning environment. In other words, educators might fulfill their libertarian fantasy at the early development of XR technology, but the state and corporations will intervene once more problems are exposed.

Second, users' freedom to create is restricted by corporate infrastructures. Hilgartner [5] suggests that 'innovators do not create from nothing' and users' freedom to create is limited by 'excessive corporate control of intellectual property and overregulation of risk by the state.' That is to say, even if users can choose freely from the menu of creativity, the menu itself is designed and managed by corporations. For example, it would be impossible for a botanic student to learn the smell of the damask rose in the Metaverse because the current XR devices do not afford the olfactory perception.

In short, I found that while educational researchers coherently imagine users to have an unlimited degree of freedom to create in the Metaverse, they coherently harbour critiques and dystopian fears about XR technology. However, this absolute freedom is unlikely to be realized for two reasons: one, it ignores the pattern of history; two, users' freedom is limited by corporate infrastructures.

V. Discussion

A. The Hybrid XR Education

The analysis above suggests the impracticality of the two radical dreams. On the one hand, as Zuckerberg's utopian vision is a product of Meta's economic interests, it lacks a critical perspective on the potential risks of XR technology. On the other hand, because educational researchers' imaginary was created solely for users' interests, it is short of historical viewpoints and the capitalist reality. However, rather than outright rejecting the two radical dreams, I argue that they should learn from one another about digital governance in three ways. These three laws make up the third possible future that I propose: the hybrid XR education.

1. Legislate Against Illicit Uses of Biometric Data

VR and AR require biometric data 'relating to the physical, physiological or behavioural characteristics' of a student to achieve an immersive effect [8]. And yet, the Results section shows that this biometric data might be misused by malicious third parties unless there are effective public regulations of the private sector. Thus, the authority should make strict laws restricting corporations' ability to commercialize students' biometric data.

Lessons for regulating personal data could be learned from many traditional professions. For instance, lawyers know lots of private information about their clients, but lawyers cannot sell the information to a third party. Likewise, doctors are not allowed to disclose patients' information to others. It is worth

noting that a common thread running through these professionals is that they declare no conflicts of interest. In contrast, the current official guidelines that regulate private companies (e.g., Facebook's cookies) were made by the staff of those companies who had tremendous conflicts of interest. In fact, the reality of the current private sector is that technological corporations leverage the art of language to write guidelines that maximize profits but minimize users' rights. To prevent this situation from occurring in the Metaverse, guidelines concerning XR education should be free of conflicts of interest, demanding that companies can only extract students' biometric data to help them, not to manipulate them.

2. Separation of Power

Before implementing democracy, it took two world wars for the West to realize the problematic totalitarianism brought about by Fascism and Communism. In the 21st century, we should move beyond building democracy in the offline world to establishing democracy in the virtual world.

A monopoly of users' biometric data can result in digital totalitarianism that manipulates not only users' behaviours, but also their thoughts [9]. This dystopian totalitarianism, however, can be avoided by anti-trust laws that are legislated against one party controlling all the data in the XR education. In other words, the management of data in the Metaverse should be separated among courts, governments, corporations, and users. Moreover, we should prevent one-way surveillance in the Metaverse. Put simply, whenever the surveillance of users increases, the surveillance of governments and corporations should also increase.

3. Help Students Develop Critical Thinking on Virtual Identities

XR education will afford students more freedom compared to traditional education. In particular, students will have the freedom to construct disparate virtual identities embodied by avatars. For students who are in the process of forming their identities, contradictory virtual identities might cause 'identity confusion and maladaptation to the real world' [18]. Therefore, educators can develop syllabuses to help students explore the relationship between virtual identities and real identities, forming a framework for critical thinking. For example, philosophy teachers can adapt ontological theories to the Metaverse context by guiding students to explore three questions: Where did I come from in the offline world? Who or what am I in the Metaverse? Where are my avatars going after my physical body dies?

Additionally, given the increasingly important role of social media in political activism (e.g., Black Lives Matter; MeToo movement), the Metaverse has the potential to be the next virtual space that helps activists mobilize political or social movements. Educators thus can move XR education beyond the world of academia and teach students to engage with real-world issues by using the tool of XR technology

VI. Conclusion

Through investigating the latent interests lurking behind Zuckerberg's vision for Metaverse education and educational researchers' imaginary of XR education, this research contributes to the understanding of the Metaverse as contested discourses. By writing this article I want to highlight two points: one, discourses are material and imaginary discourses in particular shape the material development of emergent technologies; two, it is indispensable for a society to deconstruct dominant narratives as we cannot afford to combat (digital) totalitarianism.

My central argument is that the main divergence between Zuckerberg's vision and educational researchers' imaginary is the degree of user autonomy. On the one hand, Zuckerberg imagines a centralized Metaverse education, which is characterized by platform capitalism and data extractivism, to strengthen Meta's monopolistic status. On the other hand, while remaining vigilant about the potential crimes in XR education, educational researchers empower users with unlimited autonomy. Finally, by moderating the two radical futures, I argued for a hybrid XR education that is based on three laws: (1) Legislate against illicit uses of biometric data; (2) separate the control of data; (3) design a curriculum that helps students critically develop their virtual identities.

Lastly, future research could extend the concept of the Metaverse as contested futures and further critically deconstruct the hegemonic narratives concerning XR education. Researchers are also encouraged to propose different Metaverse futures that can minimize potential crimes such as illegal data extraction.

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Conflict of Interest

The author reports there are no competing interests to declare.

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