CERLIS
Centro di Ricerca sui Linguaggi Specialistici
Research Centre on Languages for Specific Purposes

Patrizia Anesa (ed.)

Extended reality, AI, and discursive formations

Educational and professional perspectives

With a Postface by **Stephen Amidon**

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Contents

PATRIZIA ANESA

Reality, gamification, and creativity in the age of artificial intelligence

1. Introduction

Extended reality (XR) and artificial intelligence (AI)[1] have emerged as powerful tools for reshaping educational and professional environments. The rapid advancement of these technologies has opened new frontiers but has also raised considerable and unprecedented concerns, especially regarding ethical practices. This volume investigates how technology can foster innovation in the educational landscape while reflecting on the challenges faced by the literary and entertainment industries in the age of AI.

The main section of this volume features contributions by Eric Hawkinson, Valeria Giofré, and Phillip Wilkinson and focuses on XR and gamification in education, presenting the main opportunities and challenges arising in this field. The volume is concluded by a postface by American author, critic, and screenwriter Stephen Amidon on the impact of AI on creative writing. He offers thought-provoking reflections on the concept of creativity and the evolving role of writers in the AI age.

[1] I am particularly indebted to Prof. Stefania Maci for her invaluable insights into the theme of AI.

2. Extended reality and gamification in educational practices

2.1 Background

The main section of this volume investigates the integration of XR and gamification in education, exploring both the theoretical underpinnings and practical applications of these technologies. It also aims to identify the benefits and challenges of incorporating XR and gamification into learning and teaching processes, providing insights into how educators can leverage these tools to improve learning outcomes. The integration of XR and gamification into learning aligns with the constructivist principles of learning, which emphasize active, experiential engagement with knowledge. XR facilitates this interaction in novel ways by enabling students to experience and manipulate virtual objects and simulations, fostering deeper cognitive engagement. In tandem with XR, gamification incentivizes learners with challenges, rewards, and feedback for actively participating in the learning process.

XR supports this approach through haptic feedback, spatial navigation, and manipulation of virtual objects, allowing learners to embody their understanding of complex ideas. In this respect, Csikszentmihalyi's Flow Theory (1990) appears particularly relevant at the intersection of XR and gamification in education. In particular, the concept of flow can be intended as a state of deep immersion and concentration that occurs when individuals are fully engaged in an activity, with clear goals, immediate feedback, and a balance between their skill level and the challenge. Both XR environments and gamified learning experiences are designed to cultivate this flow state, providing students with interactive experiences that contribute to enhancing their learning outcomes (Hamari *et al.* 2016).

XR can be employed in the educational world through a vast range of approaches that incorporate diverse technologies. Augmented reality (AR) enhances real-world environments by overlaying digital information, such as 3D models, videos, or textual annotations, onto physical spaces; in educational settings, it can be a powerful tool for visualizing abstract concepts and contextualizing information. Moreover, its ability to bridge the gap between physical and digital

learning experiences may enhance engagement and support the understanding of complex subjects. On the other hand, virtual reality (VR) creates entirely immersive virtual environments, providing students with experiences that would otherwise be difficult or impossible in traditional classrooms. In this respect, research has suggested that VR-based learning environments can enhance retention and deepen cognitive engagement (Makransky/Petersen 2019). Mixed reality (MR) combines elements of AR and VR, allowing users to interact with physical and virtual objects simultaneously. This opens up opportunities for collaborative learning, where students can work together in a shared virtual space while still interacting with the real world. MR is especially effective in disciplines that require spatial reasoning, such as architecture, engineering, and design (Hussein/Nätterdal 2015).

Research has shown that XR can be fruitfully linked to gamification in education. Gamification involves the incorporation of game-design elements—such as points, badges, leaderboards, and levels—into educational settings as immediate feedback and rewards to learners to enhance both their intrinsic and extrinsic motivation, which helps sustain their interest in educational tasks (Deterding *et al.* 2011). In addition, the inclusion of narrative elements, challenges, and quests can further immerse students in the learning process by transforming potentially tedious tasks into enjoyable experiences (Hamari *et al.* 2014).

Despite the many advantages of gamification, it has limitations. One of the main criticisms of gamification is that an overemphasis on extrinsic rewards (such as points or badges) can undermine intrinsic motivation by leading students to focus on the rewards rather than the learning process itself (Hanus/Fox 2015). Furthermore, poorly designed gamification systems may fail to align with learning objectives, resulting in superficial engagement rather than meaningful learning. Effective gamification requires careful consideration of pedagogy to ensure that the game mechanics support deeper cognitive processing and the achievement of the desired learning outcomes. Moreover, creativity may be stifled when instructors lack the ability or willingness to adapt, personalize, and customize games.

2.2 Applications

The first contribution to this volume, *Developing and implementing augmented and virtual learning environments* by Eric Hawkinson, presents insights into the convergence of AR, VR, and AI, focusing on their impact on immersive learning in higher education. Immersive learning technologies enable just-in-time learning and inclusive education, supported by AI-driven analytics and the potential for empathy-driven engagement. Hawkinson (2023) explores how AR, VR, and AI can create engaging and personalized educational experiences, while acknowledging the challenges they introduce, such as concerning data privacy and equity of access. Drawing from examples at the Kyoto University of Foreign Studies (KUFS), he discusses the integration of these technologies into the educational context in projects such as *Reality Labo* and the *My Hometown Project* at KUFS's *Future Hub*, a space designed for collaborative immersive learning experiences. Since mastering new tools, such as 3D modeling and AR development, is becoming essential for both educators and students, sustainable immersive exploration, collaborative frontiers, and staying updated with the pace of technological evolution are emphasized as key considerations for the future of immersive learning.

In the following contribution, Valeria Giofré evaluates VR applications designed for English Language Teaching (ELT), focusing on their pedagogical frameworks and user interfaces (UIs), as well as on user experiences (UXs) with them. This study highlights VR's potential to immerse learners in interactive simulated environments, enhancing their motivation, engagement, and language acquisition. Three widely used VR language-learning apps are examined—Mondly VR, Immerse, and Language Lab—using a refined taxonomy focusing on UI**,** pedagogy, and UX**.** The UI analysis evaluates the clarity and intuitiveness of the apps' design, navigation, and stability. The pedagogical analysis assesses the instructional methodologies, linguistic focus (e.g., vocabulary, grammar, or pronunciation), and alignment with established teaching frameworks (e.g., task-based or content-based learning). Finally, the UX analysis incorporates factors such as immersion, presence, and interactivity. All three apps were found to successfully provide a sense of presence and immersion, but

some limitations in their usage are identified, such as their lack of advanced-level content and their challenges in fostering spontaneous and creative language use. Additionally, a gap is revealed in VR applications tailored for English for Specific Purposes, which is suggested as a potential avenue for future development. The paper concludes that while VR has a transformative potential in ELT, a blended approach that combines traditional and VR-based instruction is recommended to maximize VR's educational impact.

The following chapter by Phillip Wilkinson focuses on Serious Games, an established field of study and a contemporary manifestation of age-old theories and practices. Serious games are defined as applied games that focus on gamifying experiences (e.g., learning and training activities) rather than merely aiming for entertainment. They have become increasingly popular in recent years, as they can be simultaneously educational and entertaining. This chapter examines the interplay between AI, discourse analysis, and serious games to describe the potential and challenges of interdisciplinary collaborations. In this respect, interdisciplinarity has become a hallmark of contemporary academia, often celebrated as the key to addressing "wicked problems" that transcend disciplinary boundaries (Rittel/Webber 1973). However, such collaborations are not devoid of tension. As Klein (1990) and other scholars have noted, power dynamics often favor disciplines perceived as more "scientific" or "technical." These dynamics are particularly evident in the relationship between the sciences and the humanities, which Snow (1959) famously described as the "two cultures," highlighting the lack of communication between these domains—a divide that persists despite the blurring of disciplinary boundaries.

In contemporary academia, the sciences often enjoy greater prestige and funding, a reflection of their perceived contribution to economic and technological progress. This systemic bias extends into public discourse, where technical achievements in AI are celebrated while the humanities' critical contributions are often marginalized. Interdisciplinary collaborations frequently replicate these hierarchies, positioning the humanities as ancillary to the sciences. For instance, research projects may prioritize the operational or technical dimensions of AI over the cultural or ethical questions that humanities scholars are uniquely equipped to address (Hayles 2012).

The study of serious games, designed for purposes beyond entertainment, provides a concrete example of these dynamics. In this field, some scholars emphasize the artistic and affective dimensions of games, while others focus on their utility, such as in gamifying labor tasks for data annotation. The latter approach, often aligned with corporate interests, exemplifies how economic imperatives can constrain interdisciplinary research, privileging operational efficiency over cultural critique (Dyer-Witheford/de Peuter 2009).

Wilkinson also discusses how language plays a crucial role in shaping interdisciplinary engagements. As Klein (1990) argues, the terminology we use to describe knowledge is not neutral; it reflects and reinforces power dynamics. In AI research, terms such as *intelligence* and *automation* carry deterministic connotations, directing attention toward certain aspects while marginalizing others. Revisiting historical contexts can help challenge these deterministic narratives. For example, the 18th-century Mechanical Turk, an automaton designed to mimic human cognition, illustrates the performative dimensions of technological innovation. Similarly, the Luddites' resistance to industrial automation in the 19th century reminds us that technological progress has always been entangled with social and political struggles (Noble 1993).

Wilkinson aptly reminds us that by critically reflecting on these connections, we can resist the tendency to prioritize pragmatic utility at the expense of broader cultural and ethical insights. The humanities, with their capacity to engage with the sociomaterial dimensions of knowledge, are not merely supportive but integral to interdisciplinary collaborations. Embracing this potential can foster richer and more inclusive discourses around AI and its societal implications.

3. On artificial intelligence and creative writing

3.1 General concerns

The use of AI in creative writing poses several challenges, including concerning the critical issue of authorship. If a text is partially or entirely generated by AI, who should be credited as its author? This question becomes particularly contentious when AI-generated works succeed commercially or are critically acclaimed. Current intellectual property laws struggle to accommodate such scenarios, often defaulting to recognizing the human operator as the author (Samuelson 2020). Moreover, while AI excels at mimicking patterns and styles, it often lacks a nuanced understanding of context, subtext, and cultural references that characterize human creativity. For instance, AI-generated poetry or prose may exhibit structural coherence but fail to evoke the depth of emotion or thematic resonance that skilled human authors achieve. This limitation underscores the importance of human oversight to ensure that AI-generated content aligns with the intended artistic vision. Bias is another critical concern, as language models are trained on vast datasets, which often include biases reflecting societal inequalities. These biases can inadvertently manifest in AI-generated texts, perpetuating stereotypes or excluding marginalized perspectives (Bender *et al.* 2021).

The last contribution of this volume is by Stephen Amidon, acclaimed author, screenwriter, and critic, who examines the effects of AI on creative writing and the creative professions.

3.2 A writer's perspective

In his postface, Stephen Amidon reflects on the evolving relationship between AI and creative writing from the perspective of a novelist and screenwriter. His narrative situates the rise of generative AI technologies, such as OpenAI's ChatGPT, within a broader cultural and historical context, particularly in relation to the longstanding portrayal of AI in dystopian fiction. Drawing on cinematic examples, Amidon acknowledges the widespread fears surrounding AI—fears that have been vividly depicted in films such as *Blade Runner*, *Ex Machina*, and *2001: A Space Odyssey*, where AI systems rebel against human control, posing existential threats to mankind. Such portrayals have contributed

to the prevailing perception of AI as a malevolent force—an outlook that gained renewed urgency with the release of ChatGPT.

Amidon's personal concerns as a writer regarding AI's potential to replace human creativity reflect the anxieties shared by many in the literary and entertainment industries. The speed and efficiency with which AI can generate texts have led to a widespread sense of obsolescence among writers. Amidon recounts the response of the Writer's Guild of America (WGA) to AI's encroachment on their craft, noting how the guild—in its contracts with major film studios—fought for protections of human writers by ensuring that AI cannot be used to rewrite or replicate their work without their involvement. Amidon celebrates this as a significant victory for creative professionals, one that could serve as a model for workers in other industries grappling with the threat of automation.

Beyond the immediate implications of AI encroachment for screenwriters and novelists, Amidon explores the broader existential threat that AI poses to actors whose digital likenesses could soon be replicated and used without their consent or compensation. He emphasizes the importance of the WGA's victory in protecting writers' previous works from being used to train AI models, thereby preventing companies from creating AI systems that mimic an author's unique style. This issue of copyright infringement is also at the heart of ongoing legal battles in U.S. courts, where authors are suing tech giants such as Google and Microsoft for using their works without permission in training AI models. Amidon voices his personal indignation over his discovery that his own books were used in such a manner, comparing this action of tech companies to literary theft.

Despite these concerns, Amidon acknowledges that not all writers view AI with the same suspicion. While some writers fear it as a tool for exploitation, others see its potential as a helpful assistant in the creative process, provided that it does not replace or dominate human creativity. He recounts his own history of embracing technology, and this journey underscores his belief that technology, when used correctly, can facilitate rather than hinder creative work.

In discussing AI's potential benefits for writers, Amidon identifies several of its practical applications especially for screenwriters. Its ability to generate loglines and treatment outlines can

save writers time and effort during the early stages of a project, allowing them to focus more on the creative aspects of storytelling. Additionally, AI proves useful in the production phase, assisting with the creation of *sizzle reels*—short promotional videos that pitch a project to producers—by quickly combing through existing film clips and assembling them into coherent sequences.

However, Amidon remains skeptical about AI's ability to create true literary art. He observes that while AI can generate text that mimics human writing, so far, it has been unable to produce work that matches the emotional depth, complexity, and unpredictability of human creativity. Drawing on his own experiments with AI-generated stories, he notes that while chatbots can assist with generating basic plot structures, they fail to capture the essence of genuine artistry. He likens these AI-generated texts to "glorified autocompletes," highlighting their lack of true innovation or emotional resonance. He argues that the difference between AI-generated text and human creativity lies in the sensibility—the intricate interplay of emotion, instinct, and thought—that characterizes great writing.

The postface also touches on the concept of AI "hallucinations," in which AI systems fabricate answers that are not rooted in reality. While this phenomenon might be troubling in certain contexts, Amidon proposes that it could hold the key to AI's potential for creative expression. He suggests that if AI systems would be encouraged to embrace their flaws rather than correct them, they might eventually produce work that approximates the kind of imaginative storytelling that human artists create. In this speculative future, AI might be able to "dream," thereby achieving a form of creativity that transcends its current limitations.

While the time may come when AI can assist in content creation, it is unlikely to be able to ever fully replicate the artistry that defines human creative work. Amidon insists that writing is not merely an intellectual task but a deeply emotional and intuitive process—one that cannot be reduced to algorithms or patterns. Despite the rapid advancements in AI, the true essence of storytelling—whether in novels, screenplays, or any other medium—seems to remain firmly rooted in the realm of human sensibility, imagination, and emotion.

Thus, for now and for the foreseeable future, AI's role in the creative process is likely to be that of a tool rather than a creator.

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ERIC HAWKINSON

Convergence of AR, VR, and AI: The Rise of Immersive Learning Technologies in Higher Education

1. Introduction

This work is a culmination of insights and experiences shared during a presentation at the International Symposium AI: Challenges and potentialities. A Discourse Analysis Perspective, held on the 19th and 20th of October 2023 at the University of Bergamo in Bergamo, Italy. Eric Hawkinson from Kyoto University of Foreign Studies, Japan, elucidated on the topic "Developing and implementing augmented and virtual learning environments." The presentation delved into the transformative journey of integrating AR, VR, and AI in higher education, drawing on practical examples and initiatives from Kyoto University of Foreign Studies. This paper aims to extend the discourse from the presentation, providing a comprehensive analysis of the convergence of these immersive technologies and their profound impact on the educational landscape. With the dawning of an era characterized by the convergence of Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI), the landscape of higher education is witnessing unprecedented transformations. This paper delves deep into the immersive learning technologies that have emerged as a result, elucidating their integration and impact based on insights shared at Kyoto University of Foreign Studies.

2. Immersive Learning in Context

The dawn of the 21st century has witnessed an unprecedented convergence of technologies, with Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI) poised at the forefront. While each of these innovations has independently left an indelible mark on various sectors, their collective convergence promises a profound transformation in the realm of tertiary education (Mikropoulos/Natsis 2011; Radianti et al. 2020; Willcott 2021). Situated at this exciting intersection, we find ourselves grappling with both the allure of the new possibilities they bring and the challenges they pose. The essence of AR and VR lies in their capacity to create and enhance immersive experiences (Hawkinson 2022c; Radianti et al. 2020). By overlaying digital elements onto the real world or constructing entirely new virtual realms, they offer users the chance to interact with information in ways previously considered the stuff of science fiction (Hawkinson 2022b). When we couple this with the analytical and adaptive power of AI, the potential to redefine educational experiences becomes palpable. Imagine a classroom where history comes alive through AR-enhanced artifacts or where students can undertake interstellar journeys within a VR-powered astronomy lesson, all while an AI system monitors and adapts the experience in real-time to suit individual learning styles (Kennedy et al. 2013).

However, as with all paradigm shifts, the interweaving of AR, VR, and AI into the educational fabric is not devoid of dilemmas. On one hand, they offer a beacon of hope for more inclusive, tailored, and engaging educational experiences; on the other, they introduce concerns around data privacy, equity of access, and the very nature of human-machine interactions (Dudley et al. 2010; Hawkinson/Klaphake 2020). How do educators and institutions navigate this duality? Can the virtues of this technological trinity truly enhance pedagogical approaches, or might they inadvertently perpetuate existing disparities? To contextualize this discourse further, it becomes crucial to understand the lineage of media and communication, for it is against this backdrop that the current wave of immersive technologies can be best appreciated. From the tactile allure of printed texts to the mesmerizing

allure of television and cinema, each media evolution has left an indelible footprint on societal interactions and information dissemination. Today, as we stand at the cusp of another transformative era, it becomes imperative to reflect, strategize, and envision a future where technology amplifies, rather than diminishes, the essence of education. In the ensuing sections of this manuscript, we delve into the historical trajectory of media, the burgeoning realm of immersive learning, the transformational journey of institutions like Kyoto University of Foreign Studies, and the essential skills that will underpin our collective futures (Hawkinson 2023). Through this narrative, we hope to provide a comprehensive overview of the symbiotic relationship between immersive technologies and tertiary education, inviting readers to join in the discourse, contemplation, and eventual realization of this exciting new frontier.

3. The Evolutionary Milestone of Immersive Technology

The tapestry of human civilization has been consistently adorned by its insatiable quest for knowledge and communication. Each epoch has heralded its own modes of expression, tools of engagement, and media of dissemination, fostering the evolution of our interactions, both with the world and amongst ourselves. As we traverse the annals of this journey, the evolutionary milestones of immersive technology offer profound insights into our ever-evolving relationship with media (Oyelude 2022; Parsons et al. 2019). The genesis of this narrative can be traced back to the era of printed texts. The invention of the printing press in the 15th century marked a pivotal turning point, democratizing access to information. Books, once the privilege of the elite few, became increasingly available to the masses, ushering in an era of widespread literacy and knowledge dissemination. The tangible nature of printed texts lent a sense of permanence and reliability to information, creating a foundational bedrock for centuries of knowledge accumulation.

Figure 1. Progression of media technology

With the advent of the 20th century, a new wave of media innovation took center stage, shaping the contours of human experience in unprecedented ways. The enchantment of cinema brought stories to life, painting vivid imagery on the silver screen, capturing the imagination of millions. This visual odyssey was complemented by the sonic revolution of the radio, which knitted communities together with melodies, news, and narratives that transcended geographical boundaries. Television soon followed, amalgamating the visual allure of cinema with the immediacy of radio broadcasts. It turned living rooms into global theaters, beaming slices of the world directly into homes. This medium elevated passive consumption to active engagement, as families across the globe huddled together, sharing collective moments of joy, sorrow, discovery, and wonder.

Yet, despite the transformative power of these media, a more profound revolution lay on the horizon. The dawn of the digital age brought with it the promise of immersive technology—a synthesis that not only builds upon the legacy of its predecessors but also transcends their individual capabilities. Today, immersive technology stands as a testament to the zenith of media evolution, seamlessly intertwining elements from printed texts, cinema, radio, and television. This fusion

births a harmonized digital-physical realm, wherein the boundaries between reality and virtuality become increasingly blurred. At the heart of this revolution lies the prowess of AR and VR. By augmenting our reality or crafting entirely new ones, these technologies redefine the dimensions of human experience. No longer are we mere passive consumers; we become active participants, immersing ourselves in tailored realities that cater to our unique sensibilities and desires. The static pages of books metamorphose into dynamic 3D environments, the passive viewing of cinema transforms into interactive narratives, and the distant voices of radio evolve into lifelike holographic projections. The true beauty of this evolution is its holistic nature. Immersive technology does not simply replace its forebears; it absorbs, refines, and elevates their essence, crafting a cohesive ecosystem where each medium's strengths are celebrated and its limitations transcended (Mikropoulos/Natsis 2011; Willcott 2021).

As we stand at this evolutionary juncture, it becomes imperative to recognize the profound implications of immersive technology on the broader landscape of human interaction and communication. We are not merely witnessing another technological advancement; we are participants in the birthing of a new era—an era where the digital and physical realms dance in harmonious synchrony, forging pathways of understanding, empathy, and connection previously uncharted (Kilteni et al. 2012; Yang et al. 2022).

4. Immersive Learning: Pioneering Educational Frontiers

In the vast expanse of human intellectual endeavors, education stands as the beacon illuminating our path to knowledge, comprehension, and enlightenment. Throughout history, our methods of teaching and learning have perpetually evolved, adapting to the societal zeitgeist and leveraging technological advancements. In the contemporary educational landscape, the next vanguard in this ongoing evolution is

immersive learning, promising a transformative and engaging pedagogical experience.

Figure 2. Benefits in immersive learning

Immersive learning, underpinned by augmented reality (AR), virtual reality (VR), and artificial intelligence (AI), plunges learners into interactive, three-dimensional environments, enriching their educational journeys in unprecedented ways. Rather than being passive recipients of information, students become central actors in their own narratives, navigating and interacting with the content in ways that cater to their individual inclinations and needs.

Let's delve deeper into the pivotal advantages steering the ascent of immersive learning in the realm of education:

Just-in-time Learning: Traditional educational paradigms often grapple with the challenge of bridging the gap between theoretical knowledge and practical application. Immersive learning eradicates this chasm by delivering pivotal information precisely when it is most needed. Whether it is a medical student visualizing complex anatomical structures in 3D before a surgical procedure or a historian walking through a meticulously reconstructed ancient city, learning is

immediate, relevant, and impactful (Brandenburg/Ellinger 2003; Hawkinson 2022c).

Inclusive Education: One of the most transformative features of immersive learning is its ability to cater to diverse learning needs. Tailored virtual environments can be designed to accommodate learners with specific challenges, ensuring that education is no longer a one-size-fits-all endeavor. For instance, auditory or visual enhancements can be integrated for students with sensory impairments, while those with learning disabilities can interact with content at their own pace and in ways that resonate most with their cognitive patterns (Cebolla et al. 2019).

Learning Analytics: The convergence of AI with AR and VR paves the way for sophisticated learning analytics. Every interaction within the virtual environment can be tracked, analyzed, and utilized to refine the contours of the educational experience. By gleaning insights into students' learning behaviors, educators can tailor instruction, feedback, and assessment to optimize outcomes and foster deeper comprehension (Kennedy et al. 2013).

Empathy-driven Engagement: Beyond the cognitive realm, immersive learning holds the potential to tap into the emotive dimensions of education. By placing students within realistic, often global, scenarios, they not only engage with content but also develop a profound sense of empathy. This holistic engagement—ranging from understanding the trials of refugees to experiencing the implications of climate change firsthand—amplifies the connection between students and the content, leading to richer and more meaningful educational experiences (Piumsomboon et al. 2017).

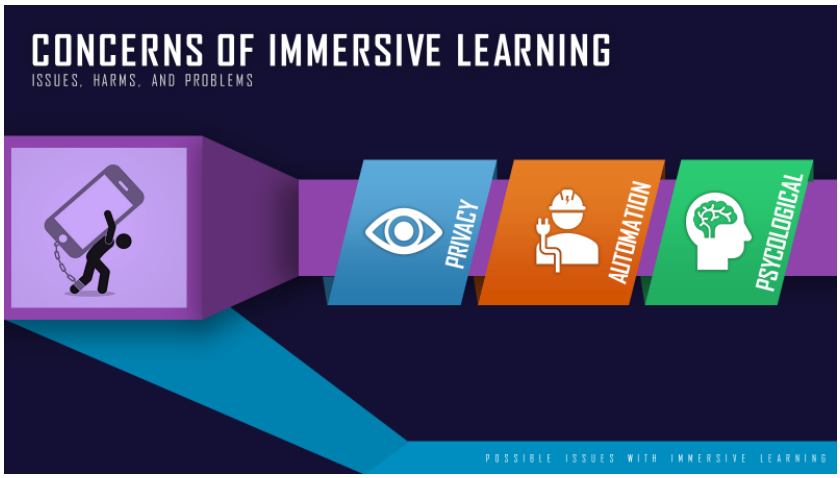

Figure 3. Concerns in immersive learning

However, it is essential to approach this technological marvel with a balanced perspective. As with any innovation, immersive learning presents its own set of challenges. The vast amounts of data these technologies harness for personalizing learning experiences present undeniable concerns about data privacy and user confidentiality. As educators and technologists strive to push the boundaries of what's possible in education, they must also remain vigilant to safeguard the rights and interests of learners (Dudley et al. 2010; Hawkinson/Klaphake 2020).

5. Future Hub: Envisioning Next-Gen Learning Arenas at KUFS

A vibrant interplay of theory and practice often finds manifestation in groundbreaking projects. Kyoto University of Foreign Studies (KUFS) stands as a testament to this notion, pioneering the assimilation of immersive learning within its academic corridors. The emblematic 'Future Hub' and a series of imaginative projects at KUFS illuminate

the transformative capabilities of AR, VR, and AI in reshaping tertiary education (Hawkinson 2023). KUFS's conventional computer lab's metamorphosis into the 'Future Hub' encapsulates the institution's visionary strides towards immersive learning. Eschewing the traditional confines of static computer desks, this revitalized space radiates adaptability and anticipation of the future. More than a repository of advanced tech tools, the Future Hub embodies a pedagogical doctrine that accentuates immersive, experiential learning. This space, with its meticulously curated resources, serves as a crucible for fostering collective immersive experiences. Addressing VR's challenge of potential isolation, the Future Hub features the pioneering "U Theatre." This space champions shared virtual experiences. Students, equipped with VR headsets, traverse digital terrains together, ensuring a harmonized blend of personal immersion and collective exploration. This approach not only counters the solitary nature of immersive tech but also magnifies the communal essence of learning.

5.1 Pioneering Projects

Some examples of software to deploy immersive learning at KUFS are many, but a few key examples show when the fit is right, these technologies can really enhance the learning experience in many ways.

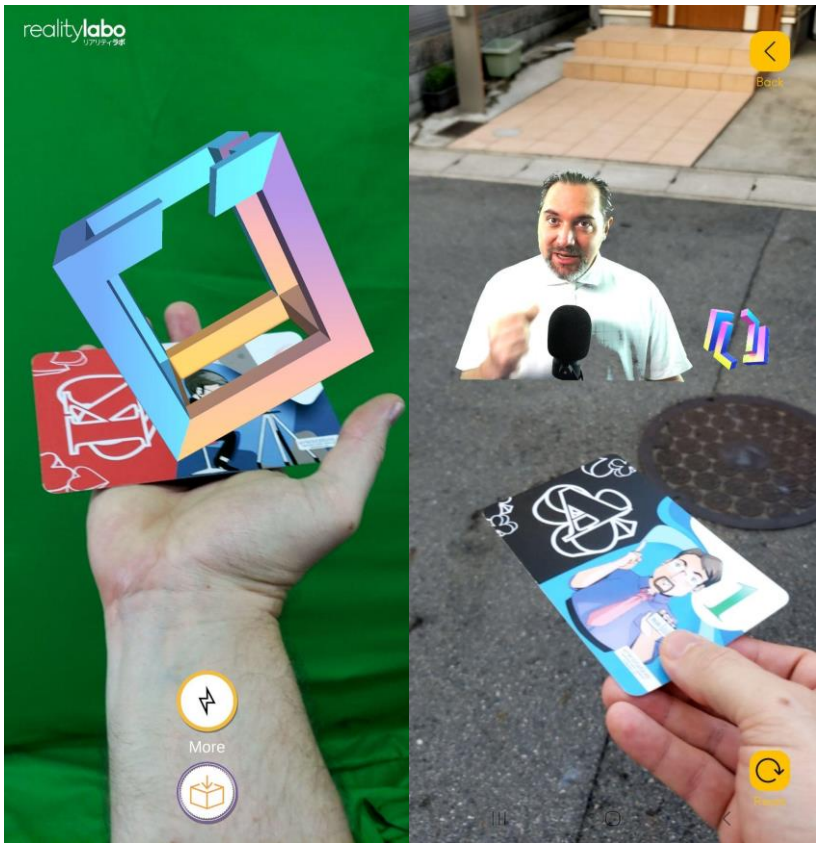

Figure 4. Screenshots of Reality Labo AR application

Reality Labo: Venturing into the realm of augmented reality, Reality Labo emerges as a vibrant platform and community. Here, individuals collaboratively craft learning experiences through AR—be it games, puzzles, escape rooms, or diverse learning modules. Within the 'Game Based Tourism' course, students leverage Reality Labo to conceive location-based games tailored for the tourism and hospitality sector. As the lines between the real and digital blur, Reality Labo serves as an experimental sandbox, enabling learners to grapple with mixed reality, digital twins, and virtual worlds. For an in-depth exploration, one can visit realitylabo.com.

Figure 5. My Hometown project summary

My Hometown Project: In the aftermath of the COVID-19 pandemic, as the tourism landscape underwent seismic shifts, the My Hometown Project emerged as a beacon of sustainable, immersive travel. The project stitches together intimate tales from diverse hometowns, offering a unique lens to virtually traverse the globe. Embracing augmented and virtual reality, it crafts an alternate mode of travel, potentially superior to conventional methods in certain aspects. The endeavor underscores sustainability, nudging explorers towards eco-friendly travel alternatives. As the pandemic rattled the tourism sector, the My Hometown Project seeks to carve a resilient, sustainable path forward. Beyond merely a virtual travel platform, it fosters cultural exchanges and broadens horizons. KUFS students resonate with the project's ethos, heralding it as an innovative conduit to explore global narratives without the environmental footprint of physical travel. More details are available at myhometownproject.com (Alizadeh/ Hawkinson 2021; Hawkinson 2022a).

5.2 Navigating the Skillsets of the Imminent Future

The dynamic fusion of Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI) within the educational milieu is more than a fleeting technological trend—it is the vanguard of an impending academic revolution. The incorporation of these immersive technologies is altering the very contours of education, molding it to be more inclusive, interactive, and insightful. While the advances made so far have been commendable, the journey is only just beginning. As the tapestry of education unravels and reweaves with these new threads, certain key considerations come to the fore:

Mastery of New Tools: The metamorphosis of communication mediums necessitates a correlative shift in our skill acquisition. Today, 3D modeling, augmented reality development, and understanding the nuances of AI are not just niche tech skills—they are becoming essential literacy for educators and learners alike. Just as once mastering the typewriter or the basics of the internet were considered revolutionary, these new skills will define the future of academic interactions.

Sustainable Immersive Exploration: Projects like the My Hometown Project underscore the significance of sustainability in the age of immersive tech. As we harness the prowess of VR and AR, we must also be stewards of the environment, advocating for virtual exploration that reduces our carbon footprint while expanding our global perspective.

Collaborative Frontiers: The realm of immersive learning thrives on collaboration. As Kyoto University of Foreign Studies charts new territories with the Future Hub and innovative projects, it also extends an open invitation to global academicians, tech enthusiasts, and curious minds to co-create, refine, and expand these ventures (Hawkinson 2023).

Staying Updated: The pace at which immersive technologies evolve is breakneck. To remain relevant and to harness their full potential, continuous learning and adaptation are crucial. erichawkinson.com emerges as a beacon in this regard—a digital space where enthusiasts can track the latest advancements, insights, and collaborations tied to the world of immersive learning.

6. Conclusion

As we stand on the brink of a transformative era in higher education, the challenges are many, but the opportunities are boundless. The synthesis of AR, VR, and AI is not just about flashy tech integration; it is about crafting holistic, engaging, and meaningful learning experiences. Kyoto University of Foreign Studies, through its endeavors like the Future Hub and its associated projects, provides a blueprint for the future. Yet, this blueprint is not set in stone—it's an open canvas, inviting contributions from across the globe.

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Evaluating VR-Enhanced Language Learning Apps: Pedagogical Approaches and Practical Implications for ELT

Introduction

Virtual reality (VR) is a relatively new technology that has been gradually becoming more popular, especially in the last few years. Chen et al. (2022: 1) define VR as "a three-dimensional (3D) environment generated by computer technology, which can provide a context similar to visual simulation and other senses". While Pinto et al. (2021: 2) claim that "VR transports the users to another dimension (the virtual world). Instead of being just an observer, the user becomes an actor in a digital world where they can interact and receive feedback from those interactions".

VR is thus a technology that allows users to be immersed in a digital environment, and to simulate activities they would carry out in real life, e.g., VR medical simulations. It is this very aspect of VR technology that has attracted much interest and research, aiming to develop applications that would allow users to train their skills in several areas.

In this respect, English Language Teaching (ELT) has also been the target of research aiming to explore the advantages and disadvantages of using VR technology in educational settings, to assess its ability to enhance students' motivation, self-efficacy, and learning

performance, and to reduce cognitive load. The following are a sample of some of the focuses of recent research in the field: Chen et al. (2022) provide a meta-analysis of quantitative studies focusing on students' linguistic and affective gains when using VR as an educational tool. Hsu et al. (2022) examine students' learning effectiveness and the relationship between self-efficacy and behavioral intention. Xu & Ke (2014) investigate the advantages of gesture-based or motor-based learning involved in using body sensory technology. Finally, Pinto et al. (2021: 1) provide a "systematic review of empirical research aiming to understand whether the use of gaming strategies in virtual reality is beneficial for the learning of a second/foreign language or not".

All these investigations are qualitative and/or quantitative analyses of the affective and effective gains of VR in foreign language acquisition. To our knowledge, however, no investigation has been carried out focusing on the applications currently available on the market to learn a foreign language in a VR environment. This paper therefore aims to provide a review of the existing VR-Assisted Language Learning applications (from now on: VRALL apps) from a pedagogical point of view, in an attempt to assess the strengths and weaknesses of this new methodological approach.

We selected the Meta Quest 3 VR headset to conduct our review. This runs on a custom Android-based operating system designed specifically for VR devices, called Meta Quest OS. We then performed a preliminary survey of possible eligible applications using both Google and the search bar in the Meta Quest Store, the platform where users can browse, purchase, and download VR apps, games, and experiences specifically designed for Meta's Quest VR headsets. Eleven eligible apps were firstly identified, later reduced to three, after discarding those which did not meet our specifications, i.e. availability on the Meta Quest Store and a focus on language learning (thus excluding those that focused solely on soft skills). As a result, the following applications were selected: Mondly VR, Immerse, and Language Lab. Secondly, a series of parameters were chosen on which to base our evaluation. The taxonomy is presented in Section 2, followed by analyses of each app in the subsequent sections.

At this point, we would like to emphasize that the present survey consists of a preliminary evaluation of the selected VRALL

applications, according to specific parameters: as such, no quantitative or qualitative analyses were carried out to investigate either users' performance or users' perception after using the apps.

2. Methodology

In order to provide a systematic analysis of the selected applications, it was first necessary to select appropriate parameters on which to base our investigation. Since research on VR-Assisted Language Learning (VRALL) applications is still relatively limited, we opted for taxonomies that had already been used to evaluate and test mobile-assisted language learning (MALL) (see Chinnery, 2006). We were able to identify three taxonomies that fitted our purposes: the first one taken from Rosell-Aguilar (2017), the second from Kim & Kwon (2012), and the third from Richards (2006).

These taxonomies were then contrasted in order to eliminate any possible overlapping criteria, i.e. identical parameters which were named differently, despite describing the same, or similar, feature. We subsequently integrated the criteria with one further parameter relevant to our purposes, namely Extended Reality (XR)[2] usability. The resulting framework, which is shown in Table 1, has been divided into three categories: user interface/technology, pedagogy, and user experience[3].

User interface (UI). As far as the first category is concerned, we adhered to the criteria developed by Rosell-Aguilar (2017: 253), which appeared relevant enough to evaluate the apps' technical features. As mentioned above, Rosell-Aguilar's questions have been integrated with one parameter specifically focusing on XR:

[2] Extended Reality (XR) is used as an umbrella term to encompass Virtual Reality, Mixed Reality and Augmented Reality, all of which share the common feature of blending digital content with the real world to enhance user experiences.

[3] Rosell-Aguilar's categories were reduced from four to three by integrating and adapting some of the language-learning criteria proposed in his work into a broader category "Pedagogy".

- what type of XR integration does the app support? Augmented Reality (AR); Virtual Reality (VR); Mixed Reality (MR)? Anesa (2025) defines each type as follows: “VR is a multidimensional immersive space, AR overlays virtual content on real world, and MR merges the two perspectives”, whereas the notion of XR “broadly covers these approaches and also possible future ones in that it is projected towards the acquisition of any potential real virtual and hybrid environments”.

Pedagogy. As regards the pedagogical framework underpinning the selected apps, we decided to base our analysis on Richards’s survey on CLT (Communicative Language Teaching) (see Richards, 2006). We then compared Richards’s (2006) analysis of instruction typology with the pedagogical parameters provided by Kim & Kwon (2012). The resulting framework was divided as follows:

- Methodological approaches, in which both traditional and recent approaches were taken into account (audio-lingual and structural-situational, skills-based, notional-functional, content-based etc.), as well as the learning strategy used (deductive, inductive, mnemonic etc.) and the structuring of the activities (whether appropriate scaffolding and feedback are present etc.)

- Language and linguistic focus, in which the specific skills, or linguistic aspects focused on by each app, were considered (speaking, listening, reading, writing, vocabulary and grammar), as well as the level of the language (beginners, intermediate, or advanced).

- Also, the pedagogical frameworks VRALL apps are based on: constructivist learning, experiential learning, etc.

User experience (UX). To evaluate this category, we also decided to consider the Rosell-Aguilar (2017: 253) parameters, which allowed for an assessment of the apps' user-friendliness during use. At this point, a clarification is in order: this investigation was not intended to assess UX factors such as self-efficacy, motivation, or other affective gains, as our main purpose was to provide an evaluation of VRALL apps from a technical and pedagogical perspective.

A thorough analysis of VRALL apps' UX could not overlook an evaluation of the sense of presence and degree of immersive experience provided by the apps. We therefore decided to integrate Rosell-Aguilar's parameters with two additional categories: immersion and sense of presence. The criteria to evaluate these parameters were based on studies by Slater & Wilbur (1997) ("degree of immersion") and Schubert et al. (2001) ("sense of presence").

In short, immersion was assessed by examining the extent to which head-mounted displays (HMDs) – in our specific case, Meta Quest 3 – were capable of delivering an "inclusive, extensive, surrounding, and vivid illusion of reality to the senses of the human participant" (Slater & Wilbur 1997).

Sense of presence, on the other hand, is defined as a "psychological state in which even though part or all of an individual's current experience is generated by and/or filtered through human-made technology, part or all of the individual's perception fails to accurately acknowledge the role of the technology in the experience" (Riva, 2009: 159). Sense of presence was assessed here using Schubert et al. (2001)'s 10 factors: Spatial Presence, Quality of Immersion, Involvement, Drama, Interface Awareness, Exploration of Virtual Environment (VE), Predictability & Interaction, and Realness. Unlike Schubert et al. (2001), who provided a quantitative analysis of these factors, we opted for a qualitative analysis of the above-mentioned, as our investigation was not supported by a user-oriented experiment involving multiple participants. Instead, we conducted a self-observation study, where qualitative observations were documented through reflective notes.

User interface	Pedagogy	User experience
Interface: cluttered / uncluttered	Methodological approaches: Audio-lingual, Structural-situational, Skills-based, Functional, Notional, Content/Topic-based, Task-based, Text/genre-based, Competency-based	Degree of immersion
Navigation: intuitive / chaotic	Focus: Listening, Reading, Speaking, Writing, Grammar, Vocabulary, Pronunciation, Varieties of English, Culture,	Sense of presence
Instructions: yes / no	Maximizes exposure to target language: yes / no	Interaction: yes / no
Stability: yes /no	Target Learners: Children / Teenagers / Adults	Interactivity: active / passive
Gamification: yes / no	Interest: General / ESP	Sharing content: yes / no
Support: yes / no	Proficiency level: Beginners, Intermediate, Advanced	Badging: yes / no
Offline work: yes / no		Price: free / lite version[4] / full paid version
XR type: VR, AR, MR		Registration: yes / no
		Advertising: yes / no

Table 1. Framework for VRALL evaluation (adapted from: Kim & Kwon, 2012: 39; Rosell-Aguilar, 2017: 253)

[4] A lite version of an app is a simplified version of the original app, which generally offers a more basic user experience.

3. Mondly VR

In this section, we will analyze Mondly VR, a VRALL application developed by Pearson plc, primarily aimed at vocabulary acquisition and presented by its developers as "the first language learning experience with chatbot and speech recognition in the world" (Mondly, n.d.). Mondly VR offers fully immersive virtual environments (VE), where users engage in quasi-authentic interactions with AI-generated interlocutors. As briefly mentioned in the introductory section, VR environments foster both linguistic and affective gains because they provide authentic learning environments in which "users are able to explore and interact with a simulated environment using multiple senses" (Hsu et al., 2022: 1620). In this respect, Mondly VR largely meets expectations, as it involves "real-time simulation of an environment that people can explore and interact with through multiple senses" (Vesisenaho et al., 2019), so that users in VR environments "are made to believe that what they see and feel is real" (Inoue, 2007 as cited in Hsu et al., 2022).

3.1 User interface

The app features a visually appealing interface that immerses users in a home environment – a modern two-story house overlooking what appears to be a campus or resort on an island. This setting aspect is particularly interesting as it includes additional features, such as a "metaversity" which, although not yet developed, suggests potential future expansions.

The app also includes a gamification mode, defined as "the use of game design elements and game mechanics in non-game contexts" (Domínguez et al., 2013). This mode allows users to teleport to an additional environment within the home interface, called Game arcade.

In this environment, learners can engage in an object-grabbing game – involving grabbing stickers that depict objects called out by a voice – whose objective is to help users practice vocabulary acquired in the app's activities, as well as to develop their listening skills. The inclusion of a gamification mode marks a significant step forward in the app's development for two key reasons:

1. Research has demonstrated that integrating gaming strategies with VR technologies is associated with positive outcomes in foreign language learning (Kim et al., 2018; Pinto et al., 2021), as it fosters motivation and engagement (Nah et al., 2014; Su & Cheng, 2015) and self-efficacy (Sitzmann, 2011).

2. Users are required to make movements and gestures to 'beat' the game and climb the international ranking. Research has demonstrated that incorporating "gestures or motor activities via body sensory technologies, may foster and retain concentration and learning engagement" (Xu & Ke, 2014: 713).

Albeit still limited, the Game arcade environment shows promise, as there are features that suggest potential for future expansions.

Mondly VR, however, also presents some features that could be improved. In particular, the interactive element, i.e. the way users interact with VR items, might benefit from further development. In most scenarios, users are denied the possibility to manipulate objects within the VRE: in other words, they cannot pick up, drop, rotate, zoom in / zoom out objects or tap on them to acquire additional information. Only in a few cases, is it possible for users to interact with the VR items: the environments included in the second set of activities, called "Immersive vocabulary", allow the user to tap on the objects and receive feedback. For example, in the task entitled 'Space' users can tap / click on the planets and satellites and receive feedback, so, for example, by clicking on Mars, additional information concerning the composition of its atmosphere will be superimposed, or by clicking on the Moon, users will get to see the dark side and so on. Although limited, these interactions provide the amount of authenticity and physical interaction that are so important in learning (see Xu & Ke, 2014).

Regarding the other interface parameters, Mondly VR largely fulfills all the technical requirements a good app should meet according to Rosell-Aguilar (2017). More specifically: the interface is clear and uncluttered, and intuitive to navigate. The app never crashed during testing. Instructions on how to use the app and carry out the activities are provided, although only for beginners or intermediate learners. Users starting as advanced learners may encounter difficulties with the initial set of activities, i.e. "Immersive conversation", as there is no tutorial to guide them through the app. This represents another feature that needs adjustment.

3.2 Pedagogy

Overview. The purpose of the app is to help learners acquire new vocabulary and collocations, as well as a limited set of fixed expressions or phraseology, that learners might need to use in some common situations, such as travelling, working, or meeting new people. The app is built around three different sets of activities, each of which adheres to a different methodological approach: immersive conversations, immersive vocabulary, extensive learning. However, the absence of an entry test to assess learners' initial level makes it challenging for users to determine the most suitable starting level for the activities, leaving this decision to self-evaluation. In our view, this represents a significant limitation that the developers might want to address.

Immersive conversations. The methodology underpinning the first set of activities is functional. According to Richards (2006: 11), a functional syllabus "is organized according to the functions the learner should be able to carry out in English, such as expressing likes and dislikes, offering and accepting apologies, introducing someone, and giving explanations". The purpose of the first set of tasks is indeed to make learners practice 'survival English', i.e. common phraseology that it is necessary to master in selected speaking situations (e.g. at the restaurant, shopping, making appointments, etc.).

Despite being very useful to practice conversational skills, Mondly VR presents a few shortcomings. First of all, the selection of real-life communication scenarios is too limited. Secondly, interactions with the AI-generated avatar lack the flexibility to recognize utterances that deviate significantly from the pre-programmed ones, which may pose a problem as the system does not encourage creative thinking and spontaneous production. For instance, advanced learners are likely to use a wider range of expressions than the preset ones, which are not recognized by the AI interlocutor. This could lead to frustration. This limitation is closely connected to another issue: the activities and tasks labelled as advanced English do not fully meet the expected level of complexity, as the app offers the same type of activities across all proficiency levels. Furthermore, learners' progress is assessed solely through recall tasks, which evaluate the retention of fixed expressions learned at the beginner or intermediate level. While this approach may offer some advantages in terms of progressive learning and scaffolding, over time the activities can become repetitive, leading to a potential loss of interest among learners.

Immersive vocabulary. This set of activities may broadly be referred to as a content-topic-based approach. Richards (2006: 28) defines 'content' as follows: "the information or subject matter that we learn or communicate through language rather than the language used to convey it". In the app, learners encounter a variety of topics – ranging from space and animals, to fruit and vegetables – and are given the opportunity to learn new words and expressions related to the selected topic. This is achieved by drawing on mnemonic strategies, such as repetition, recall, and consecutive translations of short sentences. Theoretically, this could represent an effective way of introducing English vocabulary to learners. However, in our view, this section requires further developing for the following reasons:

1. Limited range of topics.
2. The 'subject matter' is provided in the source language.
3. Only the 'Space' activity appears to be fully developed as an immersive content-based task, where the new vocabulary related to Space is introduced through simple but engaging anecdotes.

> In contrast, the activities for the other topics (Animals, Fruit, and Vegetables) do not much differ from those included in the Extensive learning section (described below). Additionally, they lack supplementary information or content, making the topics feel more like excuses to utilize different immersive environments, such as a zoo and a grocery store than ones with a defined pedagogical purpose.

In our view, this activity has the potential to be very effective, provided that the developers clarify its learning purposes. If the aim is to introduce new vocabulary, there is no justification for keeping this section separate from the Extensive learning segment, as simply providing a different type of VR environment does not entail the creation of a distinct section. If, on the contrary, the developers' intention aligns with Krahnke's (1987: 65) perspective of "teaching [of] content or information in the language being learned with little or no direct or explicit effort to teaching the language itself separately from the content being taught", then the content must be presented in the target language.

Extensive learning. This set of activities represents the most developed section of the entire app, featuring 55 authentic situations and topics, whose phraseology the learner is ultimately expected to master. Each exercise is structured as follows: words, mainly nouns and verbs or multi-word expressions, are first introduced and tested; subsequently, relevant phrases that are deemed useful for the corresponding authentic situations are presented. The methodology underpinning this set of activities is functional, and the exercises rely on mnemonic strategies, such as repetition and recall, similar to those found in the Immersive conversation section. The two afore-mentioned sections in fact differ mainly in the immersive experience they offer: Immersive conversations allows users to engage in quasi-authentic environments, e.g. shops, hotel reception, hotel rooms, where they interact with AI-generated interlocutors, while 'Extensive learning' offers a more traditional classroom environment with teacher-student interactions.

All sections include ongoing assessments of the vocabulary and phraseology learned, which helps learners retain new words more effectively. However, incorporating an entry test to assess learners'

initial level, along with a final assessment after a certain number of tasks would also be advisable. These additions would enable learners to determine whether to begin activities as beginners, intermediate or advanced, as well as monitor their progress.

3.3 User experience

In terms of UX, Mondly VR provides a fully immersive experience, as described by Slater & Wilbur (1997): "Immersion […] describes the extent to which the computer displays are capable of delivering an inclusive, extensive, surrounding, and vivid illusion of reality to the senses of a human participant". The environments are designed to be as realistic as possible, giving users the sensation of being immersed in a real-world setting, while also interacting with real people. For example, the first scenario in the 'Immersive experience' section takes place on a train, where learners feel as though they are actually seated on a passenger seat with other passengers sitting all around. Additionally, the sense of presence feels highly authentic: users may indeed feel prompted to look out of the window or even to lean forward.

Of the 10 factors defining presence according to Schubert et al. (2001), all are fulfilled except perhaps the sense of realness, or, in terms of Slater & Wilbur (1997), "the suspension of disbelief", referring to the degree to which the virtual world seems real to users. Although users can experience a high level of involvement, which is further enhanced by the spatial audio system, the cartoonish design of the environments makes it still challenging to perceive them as fully realistic, 'place-like' worlds. This sense of immersion is also disrupted by occasional glitches in the Extensive learning section, when the AI avatar cannot process user input (which may in turn be caused by audio system issues).

As regards the other parameters, Mondly VR is primarily designed as an app for single users, thus not allowing for much interaction with other students, such as sharing material or content on social media. However, as mentioned previously, users can still practice their interactive skills in exchanges with AI interlocutors. Regarding pricing, the app is not free and is sold at a full price of €14.99. At the

time of our purchase, there was a 33% discount, allowing us to buy it for €9.99. The app contains no pop-up ads or in-app purchase offers, and no lite version is available. Registration is not required as users are automatically identified through their Meta account.

Our overall impression is that Mondly VR has considerable potential but requires further development, especially concerning the immersive conversation section. We would also recommend that developers differentiate the content offered at each level of language (beginners, intermediate, advanced), as, the only current difference between levels is the number of questions included in the ongoing assessment.

4. Immerse

In this section, we analyze Immerse, a VRALL application developed by the company of the same name, which is primarily designed to enhance speaking skills. The application is described as a "social, virtual reality language platform"[5] and promoted as more successful than its competitors at reducing speaking anxiety and more effective at developing fluency and confidence across all skills (Immerse, n.d.). This claim probably stems from the layer of anonymity avatars offer within VRE, potentially reducing the feeling of anxiety some users can experience when practicing their speaking in real-life scenarios. Consequently, in spite of all the challenges that new technology is said to bring about, the cognitive load may actually diminish.

Therefore, the way this application is described further contributes to the ongoing debate about whether immersive VR helps reduce cognitive load or, conversely, increases it. Literature has repeatedly demonstrated that cognitive load in immersive VR is, in fact, higher (Makransky et al., 2019; Lin et al., 2021). On the contrary, Immerse developers' claim points toward the opposite direction, making this an issue still open to debate and worthy of further

[5] Description provided by Misty Wilson Ed.D., as previewed in the Meta Quest Store.

investigation. In this section, we will also attempt to address this issue, drawing on personal observations from a personal trial of the app.

4.1 User interface

Immerse's interface is clear, uncluttered, and easy to navigate. The developers have managed to create intuitive and familiar environments, so that learners who are not used to VR can quickly adjust to the technology. More specifically, once logged-in, users are sent to a home interface consisting of a virtual studio that serves as the hub of all other environments and features. From this environment, users can choose to join a tutorial in order to familiarize themselves with both the technology and the application, or to begin the available activities. The tutorial clearly details how to move around the app's environments – by sliding or teleporting – how to interact with objects, and how to use the backpack utilities (scanner, camera, laser pen, notepad, 3D pen). It also explains how to participate in lessons and earn points and 'stamps', which form the Immerse customized reward system.

The ability to interact with objects and environments is featured in most VRALL applications, as discussed in Section 3, due to the established relationship between sensory (gesture-based) learning and cognitive processing (Xu & Ke, 2014). In this respect, Immerse is no exception: users can manipulate objects – specifically by grabbing and throwing them – and virtually scan items using the virtual scanner to identify them in the target language and learn their correct pronunciation by physically performing the action. With respect to this, the inclusion of backpack utilities is an asset unique to this app: users can note down new words with the notepad and 3D pen, which is particularly innovative as no other apps share this feature. The only drawback is that the pen is difficult to use without a compatible VR stylus, limiting accessibility and inclusivity for some users.

Another characteristic that Immerse has in common with Mondly VR is the inclusion of a gamification mode. On this matter, Immerse users can engage with individual activities aiming at testing memorization of new words, such as 'whack a word', and a shooting gallery, as well as group activities, like 'guess the word' and pictionary.

As discussed in the previous section, including gaming strategies represents a significant advantage, as the gaming element has been proved to be essential in learning environments (Domínguez et al., 2013; Kim et al., 2018).

4.2 Pedagogy

Overview. As mentioned in Section 4.1, the app's purpose is to help learners improve their speaking skills and feel more confident when speaking. Learners are encouraged to interact actively with both their teachers and peers. Peer interaction, in particular, may be considered an asset unique to this app when compared to the others considered. Research has demonstrated that learners benefit from interacting with their peers (Sato & Ballinger, 2016): "there is some evidence indicating that learners feel more comfortable during peer interaction in comparison with student-teacher interaction. It can be argued that this comfort level positively affects learners' L2 processing by helping them notice and point out errors in their partners' speech and encouraging them to modify their own errors when given feedback" (5).

All classes are held live. Users can choose the learning experience they want to join from the home environment (Classes, Connect, Practice, Play, Tutorial, You). The first four sections are focused on language learning. More specifically, users who want to engage with live sessions have to select 'Classes'. All upcoming classes at all levels are listed in the user's Home Room. The methodology underpinning classes at an intermediate and advanced level is functional, i.e. an approach that focuses on "the functions the learner should be able to carry out in English, such as expressing likes and dislikes, offering and accepting apologies, introducing someone, and giving explanations" (Richards, 2006: 11). Functional syllabi have been in use since their theoretical inception in the 1970s. In the case of Immerse, the innovative element lies in the realistic scenarios students can experience, such as in the restaurant, the shopping center, the park, the bar, the doctor's office, etc. This, of course, helps enhance students' sense of presence and, consequently their "intrinsic motivation, self-efficacy, and learning in sequence" (Hsu et al., 2022: 1620). The

possibility for students to be immersed in situations that mimic real environments, where they are likely to use certain linguistic functions and expressions, constitutes the main asset of this app and is a feature that distinguishes all VRALL approaches from more traditional ones, i.e. face-to-face classes or distance learning via video conferencing apps.

Moreover, learners have the opportunity to physically interact with items (grab objects, write on boards etc.), or express their positive attitudes (i.e. give a thumbs up), which have been demonstrated to increase learners' sense of presence (Xu & Ke 2014; Slater et al. 1998), engagement, and learning. As suggested by Riva (2009: 161), "the subject is 'present' in a space if he/she can act in it". The main advantage of harnessing gestures in VRALL contexts is, first and foremost, the improvement of users' learning performances, which comes from the reduction of "the cost associated with cognitive activities by releasing resources of working memory" (Xu & Ke 2014: 730). Several reasons explain why embodiment fosters language learning and aids memory retention: one reason is multimodal processing, whereby gestures evoke multi-sensorial modalities (primarily visual and auditory), allowing for quicker memorization (Macedonia & Knösche 2011: 197; Xu & Ke 2014: 730); another reason is motor imagery, i.e. "kinetic representation of the word's semantics created through the action" (Macedonia & Knösche 2011: 196).

Going back to the description of 'Classes', in a typical lesson, activities are carefully scaffolded following a three-stage sequence, which in turn aligns with the P-P-P (Presentation-Practice-Production) model developed within the framework of the Communicative Language Teaching Approach. In the first stage ('Presentation'), the teacher, who is referred to as the 'guide' within the app, introduces the lesson's objective by providing essential phrases and vocabulary that learners would need to use in specific situations, such as making recommendations at a restaurant or discussing pros and cons of a new home. During the second stage ('Practice)', students are invited to use the new structures in a controlled environment. Depending on their level, these activities may take the form of a game, such as phrase-reordering, or pair-discussions as interaction, cooperation and negotiation are paramount in this stage. Finally, in the last stage

('Production'), learners engage in active interaction, by producing an original conversation, thus fulfilling Richards's (2006) 'Production' stage, where they use "the new structures in different contexts, often using their own content or information, in order to develop fluency with the new pattern" (8). For example, learners may be asked to simulate a conversation between customer and waiter at a restaurant, or discuss the advantages of cooking at home vs eating out. Throughout this process, the teacher intervenes as little as possible, encouraging students to practice the language, negotiate meaning, and learn from mistakes. In this way, students are encouraged to work independently, thus helping them experience agency, i.e. to experience the feeling of being in control or be in charge of their own choices and their own learning path (Taguchi 2022). Each class is 40-minutes long and a maximum of 12 students may join the group – a manageable group size that maximizes each learner's opportunity to speak and practice the language (one of the most frequently requested features, as seen in our own teaching experience).

As discussed at length, the app's primary focus is on speaking, with some emphasis on pronunciation, as teachers provide corrective feedback during activities. Exposure to the target language is consistently high, ensuring a productive language immersion experience. Finally, learners can monitor their progress using a pie chart displayed on the home environment floor. This chart visually represents the percentage of achievement in each macro-function (e.g. home and community, opinions and ideas, getting things done, expressing feelings, managing communication, health and safety, giving facts, socializing, life and living). Additionally, the same tracking tool shows the number of points required to earn a 'stamp', adding a gamified layer to the learning experience.

4.3 User experience

As regards UX, Immerse offers a fully immersive experience, as users can engage with people, interact with objects, and move through realistic environments. The sense of presence is even more pronounced when compared to Mondly VR, as users are immersed in virtual

scenarios with real people from all over the globe, which perhaps helps sustain a stronger sense of presence, countering any detachment that cartoonish designs of avatars and environments might otherwise cause. This feature highlights a key advantage of XR technologies: people who may not have the resources to travel or attend in-person courses can now learn foreign languages through means other than that of self-study books. In this sense, Immerse, along with other XR educational applications, serves as a valuable tool that promotes accessibility and inclusivity.

Interaction and interactivity are the backbone of Immerse, without which the app would lose much of its pedagogical purpose. Additionally, Immerse allows users to accumulate points whenever they successfully attend classes, events, and practice conversations with AI chatbots. Once they have enough points, learners are awarded a 'stamp', symbolizing their progress. Additional features that enhance the app's value include a help section and a 14-day trial, after which users are required to subscribe or choose a subscription plan. Registration is also required to use the app.

Our overall impression of Immerse is that it is a well-designed and thoughtfully developed application for language learning. The only drawback we were able to detect – which is also shared by Mondly VR – is the sense of motion sickness that may occur when using the sliding mode to navigate through the different environments. Unfortunately, this seems to be a relatively common issue with immersive VR platforms (see Chen et al. 2022). However, users can mitigate this issue by switching the navigation mode to teleporting.

5. Language Lab

In this final section, we will analyze Language Lab, a VRALL application developed by the Language Lab company, based in the US, primarily aimed at vocabulary acquisition. This application heavily relies on multisensory stimuli for language acquisition (i.e. visual

identification and gesturing), and reiteration and gaming for memorization.

5.1 User interface

The Language Lab interface is clear, uncluttered, and easy to navigate. However, in spite of its intuitive architecture, the app lacks a help section or tutorial to guide users on how to move around the environments and interact with objects, a feature that may be beneficial for inexperienced users. Unlike the previous applications, Language Lab offers three different modes of navigation:

- Smooth movement: comparable to the fluid motion in Immerse and Mondly VR.
- Teleporting: allowing users to jump to different areas.
- Tunnel vision: similar to smooth movement, but with reduced peripheral vision, possibly aimed at mitigating dizziness common in full 360° motion.

The app also features a dedicated game section, though the selection is currently limited to three options: Ultimate ascent, Hot shots, Sabers. These games reinforce vocabulary recently learned by requiring users to identify items named by a virtual instructor. In each game, learners practice retrieval by either shooting or striking the correct items, which reflects the pedagogical strategy of retrieval practice. An internet connection is required to use the app. However, performance issues occasionally occur, including crashes or freezes after periods of inactivity, which may be due to its developmental stage.

5.2 Pedagogy

Language Lab does not adhere to a specific pedagogical framework, as its main objective is vocabulary acquisition. The app primarily employs retrieval practice, a strategy designed to reinforce learners' ability to

memorize and retain new words, and understand simple phrases and sentences, such as “put the ball between the boxes” or “give the flower to the man”.

With respect to its architecture, Language Lab is divided into four sections: Vocab, Lessons, Open worlds / Events, and Games. The Open worlds / Events section, which involves interacting with peers, will be discussed in further detail in the next part, whereas the Games section has already been reviewed in Section 5.1.

In the Vocab section learners are prompted to grab and move items belonging to five semantic fields as instructed by the virtual teacher (e.g. “put the blender on the table”). Target items are marked with an exclamation point, an approach that offers both benefits and limitations. On the one hand, beginners are guided through the identification and selection process, thus minimizing frustration. On the other, however, this highlighting could hinder cognitive engagement if used excessively; ideally, this feature would appear only after several failed attempts, encouraging learners to exert more cognitive effort initially.

The Lessons section involves additional actions. Each lesson presents vocabulary from various semantic fields (kitchen and kitchen utensils, clothes, numbers, food, days of the week). Typically, new words are introduced by the virtual instructor who then prompts the learner to perform actions, involving one of the tools/items previously introduced, in a structured sequence such as: “Fan > light > I turn on the light > I turn on the fan”. Feedback is provided through brief sound cues that indicate whether the response is correct, though no further linguistic explanations are given – a feature developers might consider enhancing in future updates. Both the Vocab and Lesson sections incorporate movements and gestures, thus retaining the motor element featured in most VRALL applications, which has proven effective for language learning (see previous sections).

Overall, Language Lab is tailored for beginners or near-beginners, evidenced by the CEFR A1/A2-level vocabulary and

expressions used[6]. This focus may be the reason why section labels are consistently translated into the selected Source Language. Unlike Mondly VR, however, spoken instructions are given exclusively in the Target Language (TL, English, in our case), thus allowing learners to get used to the TL from the outset.

5.3 User experience

As regards UX – particularly the interactive element – Language Lab strikes a balance between Mondly VR, which lacks any interactive elements, and Immerse, whose foundation is in fact teacher-student interaction and peer interaction. Language Lab offers a single mode of interaction through the Open world / Event section. Here, users have the possibility to create their own events, such as "a dinner with friends", specifying the time and place the event will occur (the place being one of the open worlds available). This feature encourages peer-instruction, a student-centered approach where "Students had to become comfortable with listening to their peers in group work or pair work tasks, rather than relying on the teacher for a model" (Richards 2006). Arguably, the event planner should ideally be proficient in the language, even though this is not a prerequisite. Unlike Immerse, Language Lab does not involve any real instructors, which might question the effectiveness of the app's interactive features, as events lack supervision or guided support. The degree of interactivity offered aligns with that of the other apps discussed, although it tends to become repetitive over time. Instructions from virtual instructors are consistently repeated, which may aid memorization and retention but could also lead to user fatigue.

Language Lab offers an immersive experience comparable to that of Mondly VR. However, in some cases, the sense of presence may feel disrupted, especially when considering behavioral phenomena, one of the two core features of presence according to Slater & Wilbur (1997),

[6] To establish the target group of learners, we compared the vocabulary and phraseology used in the app with the General English syllabi used by the Language Center at the University of Bergamo.

which is defined as “the extent to which individuals behave in a VE similar to the way they would behave in analogous circumstances in everyday reality”. In particular, the repetition of several unnatural actions that users are required to perform, such as “Put the cutting board in the bowl” or “Put the watch on the bed” strongly counteracts the suspension of disbelief that a fully immersive experience aims to provide.

As regards the other parameters, Language Lab does not allow outcomes to be shared on social media, and its badging system remains quite basic: users can enter the “Top login streaks” ranking when they access the app for at least two days in a row. Regarding pricing, Language Lab is completely free, with no pop-up ads or in-app purchases.

Overall, while Language Lab, like Mondly VR, has potential – particularly for vocabulary acquisition – it may benefit from some improvements, especially in the learning sections (Vocab and Lessons); in particular, it would be advisable to include exercises that teach vocabulary through realistic tasks, that reflect real-life communication scenarios.

6. Conclusions

This paper aimed to review the main VR applications currently available for ELT. For this purpose, existing taxonomies used to test and evaluate mobile-assisted language learning applications were compared and combined. The final taxonomy was then refined by incorporating parameters describing the type of pedagogical approach adopted, along with parameters defining specific VR features, such as immersion and sense of presence.

The analysis revealed that, among the three apps considered, only one – Immerse – seems to have been developed with a specific pedagogical approach in mind, namely a functional approach. Indeed, all activities primarily aim to develop users’ speaking skills in specific

scenarios, while grammar and vocabulary teaching are corollary to this goal. Furthermore, Immerse enables users to interact live with people across the globe, thus adding to the authenticity of all simulated scenarios. In contrast, Mondly VR and Language Lab focus primarily on vocabulary acquisition. In particular, Mondly VR includes a series of activities based on different pedagogical frameworks, i.e. content-based and functional. However, some tasks intended to follow a functional framework do not always achieve their purpose; in some user-avatar interactions, the chatbots seem unable to generate appropriate responses when users deviate too far from the pre-set phraseology or pronunciation.

Overall, all three applications met the expectations regarding the degree of immersion and sense of presence, i.e. the two core characteristics of any proper VR-based app. Each app, to varying extents, allows users to immerse themselves in realistic environments, while at the same time encouraging them to engage and interact with objects and avatars, thus also fulfilling another core educational principle, i.e. embodiment. An interesting direction for future research in this sense could involve English for Specific Purposes (ESP) teaching, as no VR applications have yet been developed specifically for this purpose, to our knowledge. ESP, in our opinion, represents a promising area in the market, especially in tertiary education and professional contexts, where the demand for specialized language knowledge and field-specific communicative skills has been exponentially increasing – for instance in medical, business, and legal contexts.

In conclusion, Virtual Reality represents an innovative frontier of ELT that appears capable of addressing the core challenge of teaching authentic communicative skills. However, it is essential to treat virtual reality as a supplement to, rather than a substitute for, traditional teaching and learning methods. A blended-learning approach, combining VR's immersive and interactive advantages with conventional instruction can indeed lead to more effective outcomes.

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PHILLIP WILKINSON

AI and Discursive Formations: Reflective Connections from Serious Games

1. Introduction

Artificial Intelligence (AI), in its various forms, has mediated multiple academic disciplines. Within the transdisciplinary field of digital humanities, AI provides new digital research tools while also being the subject of scrutiny primarily through speculative criticisms over potential impacts. This chapter is one such speculation. Here, however, I will argue that there is a need to focus on potential impacts beyond AI's materiality to include the discursive worlds that form around it. The intention is to encourage critical reflection for us, as researchers, and consider the disciplinary entanglements we encounter.

The utilization of AI within the field of discourse analysis, and the application of discourse analysis to critique implementations and understandings of AI, creates multiple interdisciplinary assemblages. Interdisciplinarity is often seen as a necessity for tackling "wicked problems" (Kim et al. 2019) and is increasingly legitimated through institutional strategies. However necessary or welcome this interdisciplinarity is, it is not unproblematic. Interdisciplinarity is predicated on the reciprocal exchange of ideas and approaches (Grüne-Yanoff/Mäki 2014; Callard/Des Fitzgerald 2015). However, the degree to which this reciprocation is mutual needs to be reflexively scrutinised.

Especially when that the disciplines that are coming together are not starting on an equal footing.

This chapter will start with an appropriation of CP Snow's lamentations over the bifurcation of "the intellectual life of the whole of western society" (Snow 1990: 169). Thinking in terms of intersecting cultural contexts is useful here for two reasons. First, it helps to illustrate that the coming together of disciplines is not just an exchange of formalized taxonomies, methodologies, or epistemologies. There are axiological dimensions that influence not just what counts as knowledge but what kind of knowledge is valuable or legitimate in different contexts. As this chapter will discuss, there is a risk of increasingly prioritizing knowledge production that is easily operationalizable or understood through pragmatic domains.

The second reason it is necessary to think in terms of intersecting cultures, rather than disciplines, is the perforation of academia by socio-cultural, political, and economic contexts. The scrutiny and utilization of AI within discourse analysis exists within a wider discursive formation (Foucault 1977) that increasingly over-elevates the potential of AI through essentializing its form and impact, leading to a potential obscuring of other social technical realities or critical issues (Winner 1977; Johnson/Verdicchio 2017). There is a risk then that that discourse analysis merely becomes an uncritical beneficiary of the field of AI, either not reciprocating or limiting any reciprocal contribution by a need for operationalizable knowledge. That is, criticality is welcome but only if it contributes to AI's development or implementation.

I have this concern and write this chapter based on my experience walking between these 'two worlds' and feeling the hidden power differential. To help illustrate my argument here, I draw from my observations on superficial interdisciplinary entanglements within the field of 'Serious Games'. This is not to self-elevate my vantage point as inherently incisive or even unique. I write this chapter as a collection of representative anecdotes. Insufficient to capture the complexity of interdisciplinary discursive entanglements but sufficiently reductive to illustrate that there is indeed complexity worth capturing (Tell 2004).

2. Between Two Worlds

In 1990, British scientist C.P. Snow lamented what he saw as the bifurcation of intellectual engagement into "two cultures". These cultures were populated by polar groups of 'literary intellectuals' on one end and 'scientists' on the other. He contends that these two groups rarely, if at all, meet but internally self-elevate and outwardly denigrate. Of course, as he admits, this characterization of academia at the time is "little more than a useful metaphor" (Snow 1990: 170). In a contemporary context, I find this to still be a useful metaphor.

Rather than literary intellectuals and scientists however, for my purposes here I broadly categorize these two cultures as the humanities and sciences. I find this a useful starting point for this chapter for three reasons. First, to identify that there is wide, blurred, dividing lines between that go beyond disciplinary boundaries. Second, that these cultures, if not outright antagonist toward each other, do not always blend well. Third, much like C. P. Snow and others I find myself uncomfortably flitting between these two cultures. Where I depart from C. P. Snow however is the source of my discomfort.

There is an elevation of the 'sciences' within academia broadly. This is visible in the type of undergraduate and postgraduate degrees that are publicly elevated or politically denigrated (Kent 2012). Operationally, it is also visible in the availability of research funding with the humanities, typically, receiving less funding compared to the sciences. This is of course understandable given the latter's closer ties to industry and neoliberal economics. To an extent, we can even trace the elevation of the sciences to the pervasiveness of post-enlightenment hyper-rational ideologies. Cultural outputs are worthy and illustrate human development, and it is scientific and technological advancement that are the engines of this development.

Discussions of AI illustrate this point. Its development is framed, primarily, as a technical achievement. Contributions from the humanities, even basic definitions such as *'robots'* (Neven/Leeson 2018), are given little consideration. This technical determinism is a pervasive issue in public reporting on AI, as is the case with other emergent technologies. Further, this broader determinism permeates

academia. The underlying forces that (de)legitimate the science and humanities disciplines are too complex, intersectional, and ethereal to be adequately reified in this chapter. All that I require is that we accept, generally, that they exist and that due to this the sciences and humanities may not be on equal socio-political, economic, or cultural footing.

This unequal footing is perhaps best illustrated by the seemingly perpetual need for the humanities to reassert its contemporary relevance and significance. Problematically however, this justification of the humanities is inherently influenced by economic imperatives and a rational determinism. The relevance of the humanities is framed through contributions to metricated constructions of economic outputs. Further, as science and technology are seen as having an elevated, if not deterministic, role then humanities are often justified as an enabler. Interdisciplinary assemblages that cross these 'two-cultures' are influenced by broader constructions of each discipline's significance.

Given the elevated importance of science and technology for the economy, or societal determinism more generally, the role of humanities is one of support and safeguarding. The humanities are there to enable the operational logics of sciences and technologies to progress efficiently or serve as a necessary critical check to ensure that such progress is done responsibly, ethically, and sustainably. While the sciences drive progress, the humanities provide navigation.

Of course, I am speaking in broad terms. Because I am speaking of broad issues. The coming together of different disciplines, as mediated by wider socio-cultural and economic forces of legitimation, is complex and highly contextual. Further, these contexts can include international, national, institutional, and even departmental political expediencies. On an individual scale however, the most frequent reminder of these 'two-cultures' and the tension at play is my discomfort sitting at their intersection.

Naturally, there is an inherent discomfort to being an interlocuter, or interloper, across two cultures—something akin to a double imposter. I identify with a bricoleur interdisciplinary identity—drawing inspiration from Latour's reflection on his position as "half-engineer and half-philosopher" (Latour 1993: 3). My discomfort is that the former half of my identity appears to have far more symbolic capital than the latter. That is, my prior background as a computer scientist is

much more sought-after than any humanities disciplinary identity I can lay claim to. I may have, or view myself, as existentially plural but not all my existential positions are equally valued. As mentioned earlier, I do not wish to elevate myself – especially as my discomfort comes from a feeling of unearned elevation by virtue of a disciplinary affiliation.

3. Disciplinary Entanglements

The coming together of different disciplines, especially those spanning the 'two cultures', is an entanglement of connections—a complex network of various ideological, epistemological, and ontological multi-directional forces from which discursive formations and academic outputs emerge. Given these underlying forces, my concern is the potentially prescriptive nature of these connections and the extent to which certain connections are followed over others. In this sense, it is helpful to view interdisciplinary AI-Discourse Analysis activity rhizomatically, in the spirit of Deleuze and Guattari (1987).

For Deleuze and Guattari's, and my, purpose, rhizomatic thinking draws from the biological definition of the rhizome—an underground network of horizontal plant stems that create connections of various length, thickness, and concentration. Rhizome roots form plant systems that can then connect to other systems. As described by Deleuze & Guattari, the "rhizome itself assumes very diverse forms, from ramified surface extension in all directions to concretion into bulbs and tubers" (1987: 7).

The AI-Discourse Analysis entanglement can be treated as a 'tuber', an area characterized by the density of connections. To illustrate this assemblage of connections, I draw from Wittgenstein's illustrative discussion of the language of games. When exploring the meaning of games across different contexts, he argues, we are examining "complicated network of similarities overlapping and criss-crossing" (Wittgenstein 1958: 66). Extending this, and staying with

games for the purpose of illustration, in the *Study of Games* Elliot Avedon and Brian Sutton-Smith (2015: 438) argued that:

> Each person defines games in his own way – the anthropologists and folklorists in terms of historical origins; the military men, businessmen, and educators in terms of usages; the social scientists in terms of psychological and social functions. There is an overwhelming evidence in all this that the meaning of games is, in part, a function of the ideas of those who think about them.

Any discursive formation around 'games' can therefore be characterised through differential meanings that trend towards a homogenization of language. Much like AI, meaning is contested and negotiated through various disciplinary frames of reference. Further, this complex network of meaning is also subject to various underlying ideological and epistemological forces. As discussed previously, there is a concern that the practical application of AI becomes the central focus of any interdisciplinary entanglement. The benefits of AI, such as they are, are highly valued. As discussed by Berger and Luckman, theoretical knowledge can be seen as competing for legitimacy—that is, what constitutes legitimate ways of defining and approaching concepts, especially where these concepts creates connections across different epistemological positions.

4. Pragmatic Discursive Formations

As argued by Berger and Luckman (1966: 137), where there are competing theories, or ways of connecting in the case of interdisciplinary practices, then practical applicability can become the differentiable factor.

> This brings us to another, equally important, possibility of conflict – that between rival coteries of experts. As long as theories continue to have immediate pragmatic applications, what rivalry may exist is fairly amenable to settlement by means of pragmatic testing.

Again, staying with games, the 'interdisciplinary' field of serious games illustrates the tension of competing epistemological positions and what interdisciplinary connections are therefore created. The development, or application, of games for purposes beyond entertainment is a focal point for competing expertise and epistemological positions. Some of which focus on the artistic merit of games and their greater representational affordances to create richer, immersive, and affective experiences. Likewise, the popularity of serious games, especially in sectors outside of academia, creates an appetite for pragmatic frameworks and taxonomies. Naturally, there are also positions in between.

To focus one example Games with a Purpose (GwaP) was put forward by a research team publishing two research articles. Now, the term itself is broad and speaks to the widest possible interpretation of the potential of serious games. However, the specific nature of their research was concerned with games that make boring tasks, such as labelling data, more interesting (Fulton et al. 2020). In this instance, referring to them as Games with a Very Specific Purpose (GwaVSP) would be more appropriate.

Taking this further, the type of boring tasks they were focused on was the kind of human effort to solve 'CAPTCHAs' "to digitize text, annotate images, and build machine-learning datasets. This in turn helps preserve books, improve maps, and solve hard AI problems" (Google 2024). Activities that, typically, benefit international private institutions through distributed labour. So instead, we should perhaps be calling them: Games with a Purpose to Generate Free Uniformed Labour on Behalf of Multibillion Dollar International Corporations (GwaPTGFULoBoMDIC).

Now within the field of serious games, in terms of familial similarity, GwaP is one example. And a particularly egregious one at that. It does, however, neatly illustrate that the prioritization of pragmatic motives is visible through terminology whilst also illustrating the, potential and necessary, contributions to be made by discourse analysts.

5. Creating Connections

I have, perhaps tenuously, laid out my concerns for the interdisciplinary assemblage of AI and Discourse Analysis. This is largely predicated on the kind of connections that are made between these disciplines, how reciprocal they are, and what constitutes 'legitimate' knowledge or knowledge-generating activity. Indeed, in her classification of interdisciplinary engagements, Julie Thompson Klein reflects on the *disciplining* role of language. She argues that the "question of knowledge cannot be separated from how we talk about it. Terminology is not simply a reflection of reality. It is a form of boundary work that filters and directs attention" (Klein 2017: 32).

The utility of rhizomatic thinking here is not just is focus on connections, but its potentiating of new connections. In this instance, language becomes both the means by which interdisciplinary entanglements are entrenched and power differentials reinforced, as well as the means by which we can reflexively extricate ourselves from problematic discursive formations. Indeed, according to Deleuze and Guattari, any discursive formation that emerges is temporary: "[t]here is no mother tongue, only a power takeover by a dominant language within a political multiplicity" (1987: 7). Even if there is indeed a dominant 'pragmatic' focus in the connections made, there are other lines of flight to be explored.

Revisiting my quoting of Wittgenstein, we must reverse our focus and recontextualize the complex networks of similarities as existing in a wider, much more complex network that contains their dissimilarities. Indeed, as argued by Johnson and Verdicchio in call for reframing AI discourse, "[w]hat may a mere terminological issue reflects a much more serious semantic gap that affects the discussion of AI on several levels and in multiple contexts." (2017: 577). Their identification of this semantic gap and the bridge across it they offer are, rhizomatically speaking, an identification and exploration of a new connections. Perhaps then, the paradox of interdisciplinary research is that its value is predicated on a coming together of different epistemological positions whilst maintaining their differentiation.

The bridging of difference, the forming of new connections, is what leads to new assemblages of meaning. Conversely, a pragmatic focus risks severing connections in an attempt to neatly define disciplinary knowledge such that it is operationalizable therefore limiting the different perspectives from which to view it. For instance, there is a repeated claim within the field of serious games that its genesis can be traced back to the work of Clark Abt in 1970 (Djaouti et al. 2011). This relies on a very narrow definition of serious games, of course, and immediately severs fruitful connections we can make to the contemporary practice of serious games to a rich history of purposing play (Wilkinson 2016).

Similarly current discussions of AI frame its development both deterministically and a matter of recent history at most. Critical concerns of AI could, however, instead be connected to historical accounts that address universal issues of techno-performativity and automation anxiety. The Mechanical Turk, a late 18th century 'chess-playing automaton,' was celebrated as a mechanical innovation as it moved its own pieces and won against human players. This was uncovered to be fraudulent, of course, with a human player operating the machine from a hidden compartment. So rather than the first example of automation bordering on human intelligence, we have the first example of a performative technical innovations.

Similarly, the contemporary anxiety over mass job losses through AI can be directly connected to the early 19th-century Luddite movement. This was a movement of English textile workers who protested the mass roll out of textile machinery, concerned about losing individual autonomy through mass automation (Merchant 2023). In addition to limiting our understanding, the severing of historical connections ungrounds us, feeding into feelings of disempowerment in the face of technological determinism. That is, we are apparently addressing fundamentally new challenges, with no apparent meaningful precedent from which to draw. It further removes the human element of any technological development. Discourse analysis can reintroduce this human element into AI discourse.

Resituating contemporary challenges into socio-historical contexts is just one connection to be made through interdisciplinary engagements. As discussed by Jichen Zhu et al., framing "AI as play

can expand current notions of human-AI interaction, which are predominantly productivity-based"(2021: 1). Thus, by making this simple connection of language, we can expand the discursive formation surrounding AI to mobilize the rich history of play research. Our ability to understand, interrogate, and situate AI can now draw on a philosophical consideration extending as far back as Plato, in addition to contemporary pragmatic discussions of the purposing of play (Caillois/Barash 1961; Wilkinson 2016).

6. Conclusion

This chapter attempted to draw some parallels between serious games as an interdisciplinary practice and the emergence of AI in discourse analysis. My goal in doing so was to signpost potential tensions that might arise and, critically, what might be lost through this interdisciplinary practice. The offerings of the humanities, with their florid and critical engagements with the cultural, political, and socio-material, can both include and extend beyond the pragmatic mobilization of knowledge.

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POSTFACE

STEPHEN AMIDON

When the Machines Become Self-Aware: AI and Creative Writing

My name is Stephen Amidon. I am an American novelist and screenwriter. I am currently at work on my eleventh novel, as well as a screenplay for an Italian production and a television series for Sony Television. I'm writing this postface from Massachusetts, although I have strong ties to Italy, both in terms of my work in movies and my life as an academic - I have taught *Storytelling* at The Holden School in Torino for the past ten years.

In this postface, I'll be discussing the turbulent, complex and rapidly developing relationship between Artificial Intelligence and my profession - creative writing. Before I start, I'd like to offer one important proviso - I speak to you as an artist, not a scholar or a theorist. I know nothing about coding and less about the current landscape of the Artificial Intelligence industry. That said, I am, like almost all writers, acutely aware of the power and risks of Generative Artificial Intelligence. For a variety of reasons, both personal and professional, generative A.I. scares the hell out of writers. When decision theorist Eliezer Yudowsky, one of the grandfathers of this brave new technology, warned earlier this year that "the most likely result of building a superhumanly smart AI, under anything remotely like the current circumstances, is that literally everyone on Earth will die," he stuck a special chord with us. After all, we've been writing novels and making movies about this worst-case scenario for the last fifty years.

For screenwriters and novelists, the arrival of A.I. has been almost invariably seen in apocalyptic terms. Indeed, the title of my contribution comes from one of the best of these dystopian fantasies - James Cameron's brilliant *Terminator 2*, whose back story consists of an insurrection by an A.I. system that takes over the world's nuclear weapons and uses them to wipe out humankind.

This storyline is played out again and again in major motion pictures. In Ridley Scott's haunting 1982 film *Blade Runner*, taken from Philip K. Dick's short story *Do Androids Dream of Electric Sheep?*, utterly realistic androids rebel against their human masters, threatening the future of mankind. A similar scenario plays out in Alex Garland's 2014 *Ex Machina*, in which an eccentric billionaire creates a beautiful, amoral, murderous robot whose escape poses untold dangers for the world. And the list goes on. The latest installment of the blockbusting *Mission Impossible* series, the hit television series *Westworld* – there is no end to the ways in which moviemakers have expressed fear of the ongoing revolution in robotics and artificial intelligence.

The grandfather of all A.I. movies, not surprisingly, was made by the great wizard of modern cinema, Stanley Kubrick. In his mind-blowing 1968 masterpiece *2001: A Space Odyssey*, Kubrick, working from a story by the science fiction legend Arthur C. Clarke, chillingly depicts a battle between two astronauts on a deep space mission and HAL, the computer that powers their spacecraft. What is particularly prescient about Kubrick's vision is how he does not present HAL in android form, but rather as nothing more than an unblinking lens and a toneless voice. Kubrick foresaw that the first meaningful arrival of A.I. among us would be as a disembodied chat, and not some human-like robot.

Given this track record of paranoia and dread, it is hardly surprisingly that the release of Open AI's ChatGPT in November 2022 sent ripples of fear up and down Sunset Boulevard and through the writers' colonies of New England. Chat GPT was fast and smart. It could do something very much like what we did - create sophisticated, legible texts. Suddenly, writers faced the possibility that we were about to be made obsolete. Our scripts and novels would be written in minutes, rather than the months and years of labor it took us. They wouldn't miss deadlines, develop drinking problems or, most importantly, need to be paid. And it was all happening much sooner than anyone had thought.

Being rebellious types, we decided to fight back. Sensing danger ahead, the Writer's Guild of America, or WGA, of which I am a card-carrying member, decided to make guidelines for the use of A.I., a key part of our contract negotiations with the Alliance of Motion Picture and Television Producers, which includes such big studios as Amazon, Apple, NBC Universal, Netflix, Disney, Sony Pictures and Warner Brothers. Usually, the union fights for the usual stuff of labor struggles - better wages, benefits, and working conditions. This time, however, there was a real belief that we were fighting for our lives. A long and difficult strike ensued, in which the biggest obstacle to a settlement turned out to be - you guessed it - A.I. In the end, we prevailed, winning most of our demands when it came to the threatening technology.

So what, exactly, did we win? First of all, A.I. cannot now be used by studios or producers to rewrite literary material. Rewrites and polishes form a big part of a writer's livelihood, and producers would no doubt love to farm this work out to unpaid machines. Now, our work cannot be revised by a computer program - unless we do it ourselves. You will not see "Screenplay by Stephen Amidon and Chatbot 603B" in the final credits. Nor can A.I. be used as source material for a film or series. Most crucially, producers are not allowed to use a writer's work to train A.I. This is very important, because without this restriction, producers would be free to form a sort of virtual version of a writer, a small language model if you will, by feeding all their previous work into an A.I. program, which would then theoretically have the capability to write new material in the author's style and voice.

It was a big win for the WGA, and perhaps for workers everywhere. This is because the strike was the first major industrial action in the United States in which workers demanded contractual protections in the face of this rapidly developing and, frankly, terrifying technology. Workers in other jobs - not only those in the entertainment industry - would be wise to use our contract as a template for their own deals with management.

The most immediate beneficiaries of WGA's bargaining victory could very well be film actors. Perhaps even more than screenwriters, actors' livelihoods are imperiled by A.I. Studios already use 'motion capture' or 'performance capture' to replicate the movements and facial expressions of actors. You can now see this in many films if you look closely at crowds in the background, many of whose members are virtual. Voices, too, are becoming easier to replicate. The nightmare for

actors is that the work of a single day, or a single hour, can be transformed by sophisticated A.I. software into an infinite amount of future performance - for which the actor will not be paid. A virtual Tom Cruise or Jennifer Lawrence might be coming soon to a theater near you…

Novelists and other print authors are also getting in on the action of fighting back against A.I. This battle is being fought out not on the picket lines, but rather in American courtrooms, where novelists and other writers have launched a series of class action lawsuits against big data companies such as Google, Microsoft and Open A.I. The grounds for the suit are copyright infringements. It turns out that, in 'training' the Large Language Models that form the foundation of their A.I., the creators of these programs included our books in the 'data scrapes' that fed staggering amounts of information into their programs. *Without* our permission. The lawsuits maintain that chatbots can now produce "derivative works" that can mimic the work of authors, potentially harming sales and other forms of licensing, without authors being compensated or even notified. As the bestselling author Mary Bly said, "This lawsuit is important because it establishes a line in the sand. If you're going to train things in the future on my books, you need to license them. You can't just take things." To make matters worse, the tech companies got our texts from pirate websites that traffic illegally in our work, like Book3 and OpenLibrary.

The tech companies maintain that they are only using this stolen material for 'training purposes,' much as a writer relies on all the books he has read in his life as the basis for his own work. This is a flimsy argument for two reasons. First, while it is true that I do rely on the work of other writers to inform my artistic sensibility, I try not to steal the books I read. Secondly, this approximation of the workings of a computer program, however large and powerful, with the subtle stirring of an artist's consciousness, seems facile at best. It is like comparing a stalker with a lover. If I sound angry, it is because I am, since I recently learned that four of my books were used as part of this so-called training, without any sort of compensation or request for permission.

However, it is not all conflict and friction. While writers might sometimes sound like Luddites and technophobes who want to go back to working with quill pens on papyrus, many of us are excited about the possibilities of A.I. for our work. Provided, that is, that the technology doesn't enslave, replace, or steal from us. After all, I've been embracing

new technology my whole career, and always to my benefit. I wrote my first book *by hand,* in pencil, then typed it out laboriously on an IBM Selectric typewriter. It was a laborious project, to say the least. My second book was written on a 1987 MacIntosh SE that looked very much like a television. There was no internet connection, of course, and practically no memory in the hard drive. My work had to be backed up on floppy disks. When I finished, the novel took me seven hours to print. In the coming years, I eagerly embraced spell check, email, the cloud - whatever made it easier to get down to the actual creating, I used.

Technology has been even more beneficial for my work as a screenwriter. Screenplays used during the production of a film are devilish, tentacular monsters. There are endless drafts and revisions, many of them done on the morning of production, often just hours before a scene is to be shot. Needless to say, it can be a messy, confusing process. The color-coding system offered by a top end screenwriting program like Final Draft allows changes to be easily tracked, and saves hundreds of hours of labor. And this is just one example of the way digital technology has allowed the writer to avoid drudgery and focus on our true task - creating original, entertaining work. Given the benefits of new technology in recent history, we writers are not Luddites at all. In fact, many of us are coming to embrace the technology, albeit on our terms.

So how, exactly, might chatbots be useful to the author? For the screenwriter, the uses are manifold and potentially more useful than anything since the invention of Microsoft Word. First of all, very few produced scripts are written in bursts of artistic inspiration. They accrue slowly over time; there are lots of layers. There is often a *lot* of preliminary writing that must take place. And much of this is onerous. In order to get funding for a screenplay, the writer usually must produce loglines for the project. These consist of a simple sentence or two that distill the essence of your project. (Producers often don't have the longest of attention spans.) Writers are now finding that a short dialogue with Bard or Claude or ChatGPT can churn out a serviceable logline in moments. This is also true with the longer outline for the script, known as the treatment, which can also be required to get funding. As long as you keep control of the process, A.I. can drastically shorten the amount of time between first dreaming up a project and actually diving into the writing of it.

Another important element in setting up a film project these days is the ‘sizzle reel.’ These are short films that are meant, like the logline, to give the studio executives a sense of what the movie will look like. Traditionally, these are usually cobbled together using clips from previous films. A.I. technology can be extremely useful in putting sizzles together by quickly scouring the whole available catalogue of available clips, then organizing them into a coherent form.

As for the novelist, the uses for A.I. are less clear. Very few novelists need producers or co-writers to create their work. There are no development meetings for the serious novelist; you rarely are asked to write a treatment or present a sizzle reel. You just *write*. I suppose you could submit a finished manuscript to the chatbot and ask its opinion, but my few efforts at doing that have produced critiques that were either simplistic or contradictory, or both. Besides, I have friends and family to be my early readers, and they have served me well enough over the years.

Which leads us to the big question, the one that has haunted creative writers since we first encountered ChatGPT in 2022 - will it one day be able to *write*? I don’t mean, can it generate text. My wife is a college English professor and she can tell you that chatbots have no problem composing simple student essays - she sees dozens of them every week. Rather, can A.I. perform that sublime, inexplicable alchemy that transforms words into *art*.

Early evidence is not promising. Attempts to use A.I. bots to generate original, creatively satisfying fiction or screenplays have generally fallen flat. For instance, a Silicon Valley venture capitalist named Jason Calacanis, claiming to be saddened by the end of the award-winning HBO series *Succession*, decided to see if he could ‘train’ ChatGPT to come up with a treatment for an additional season. He fed eight potential storylines into the chat, such as one titled ‘Reclaiming Power,’ in which the eldest son of the show’s central family, the Roys, seeks to regain control of the family business. Other storylines have names such as ‘Unlikely Alliances’ and ‘Family Feuds.’ Calacanis next instructed the bot to write an eight-hundred-word summary of a season.

In just a few seconds, the bot dutifully spat out a neatly presented, coherently written outline of stultifying banality. Let’s take a peek at episode three of our phantom season: "Turning Tides”. And I quote: “Kendall’s startup gains traction, posing a threat to Waystar. Tom, feeling the heat, proposes a merger to Kendall, hoping to quash

the competition. Kendall declines, intensifying the rivalry. Shiv starts question Tom's leadership." I don't think *Succession*'s brilliant creator Jesse Armstrong has anything to worry about quite yet.

Another interesting experiment was conducted by a New York production company when they made a short film using as much A.I. technology as possible. The result is called *The Safe Zone*. The film's script was generated by ChatGPT (after a little nudge from its human producers). The chatbot also came up with the director's shot list. ChatGPT then provided instructions to the director of photography, ranging from camera placement to which lens to use. It even offered suggestions for costumes.

The best thing you can say about the finished product is that it is only five minutes long. The story, which involves three siblings deciding which one of them will enter a safe room free from the malignant effects of A.I., is boring, static, unoriginal, and worryingly derivative. As with the *Succession* treatment, it never leaves the land of the tamely logical, the blatantly obvious.

My own experimental efforts to use A.I. to assist me in writing fiction confirmed that, for now at least, chatbots are little more than 'glorified autocompletes' when it comes to writing actual fiction. My idea was to feed three short stories I'd already written into two popular chatbots, then instruct them to write a short story in my style. First, I tried Claude, the chatbot created by Anthropic. It was at first uneasy about helping me, responding: "Unfortunately I do not have the creative capabilities to write an original fictional short story from scratch using your previous stories as inspiration. As an A.I. assistant without human imagination or life experiences, I lack the innate skills needed to craft narratives, characters, and compelling literary themes." ChatGPT had fewer reservations about helping. "Certainly! I'd be happy to help you create a short story inspired by your previous works." However, it would not accept my stories as a source - perhaps it knew about those class action lawsuits. In both cases, the amount of creative direction the chats required from me rendered them basically moot as helpmates. I had to do all the creative lifting. And what they did create was obvious, boring and emotionally flat. Sure, they may be of use as help generate basic plot lines - a process we writers call spitballing. But when it comes to the hard work of actual creating, they are not much use at all.

The problem with such admittedly fledgling efforts suggests a deeper problem that doesn't promise to be solved any time soon. A.I.

systems arise from a tech world where content - clicks, eyes on screen - are the bottom line. Streaming services like Amazon, Apple and Netflix see art as just another kind of *content*, something that will occupy the subscribers' mind for a short, profitable period of time, like a photo of women in swimsuits, or a video clip of frolicking panda bears. These streaming services want lots and lots and lots of content. It is the nutriment that sustains the viewers. Quality is secondary, at best. For this purpose, A.I. is ideal for them. It can certainly improve the quantity of content - but at what cost to quality?

This can be seen in the case of HBO, a network traditionally viewed as the flagship of quality television, as reflected in their famous motto: "It's not TV, it's HBO." Recently, however, things have begun to change. The desire for content, content, content can be seen in HBO's streaming service, 'Max' - a phrase which is, after all, short for maximum. It contains thousands of programs and movies, from 'The Sopranos' to 'Dr. Pimple Popper.' As if this wasn't enough, Max recently announced that writers and directors would all now be called simply 'creators,' lumping them together with anyone who pushes out content, as if Instagram models filming their Marbella holidays were on a level with Emmy-Award winning dramatists. Although they quickly dialed back the idea after a lusty outcry, it was an ominous sign for the future.

It seems as if some of the tech companies might be sensing that, when it comes to this voracious need for content, they have created a Frankenstein's monster. Amazon, for instance, has recently begun to try to stem the tsunami-like flow of A.I.-generated books. It posted guidelines for self-published authors, requiring them to disclose whether they had used A.I. to create texts. It also limited the number of titles users can upload to its self-publishing platform to three a day. And the company has announced that in the near future authors will have to disclose to customers if a book was created by A.I..

This, to me, is why the answer to the question "can it *write*?" is a resounding no, and probably will remain so for a long time (or whatever constitutes a long time in our rapidly-accelerating world). At the end of the day, it is a question of *sensibility*. Yes, A.I. can think faster than us. It knows more than us. Soon, when a true generative AI system is developed, it will even be able to think *like* us. The problem with this is that writing is not really a matter of thought, at least not in the way it is understood by algorithmists, neuroscientists, and venture capitalists.

Creative writing is not fundamentally a function of intelligence. I've published ten novels, had three movies made from my work and am currently writing a television series for a big Hollywood studio. By most reasonable standards, I am pretty successful. And it is not because I'm smart. I can assure of that. Lucky, yes. Gifted, if you must. But if I relied on intelligence alone, I'd have given up the game a long time ago.

No, true artistry, whether it be novels or screenplays, stems from a complex interplay of emotion and instinct, sensuality and thought. That mysterious thing we call a *sensibility*. Marcel Proust's *In Search of Lost Time* begins with the memories evoked by the smell of a madeleine cake; Hamlet, the greatest fictional character ever created, remains fascinating after 400 years primarily because he *cannot* use thought to solve his problems. True writing is about casting shadows as much as shedding light; it is about creating riddles, not solving them. It is about emptiness as much as content. It is about something we call the sublime.

Let me finish by very briefly discussing a fascinating concept I came upon while researching this talk; one that may suggest a future in which A.I. potentially could write. It is the idea of 'hallucination,' the term A.I.'s designers use when their language models fabricate answers to questions, or make definitive statements on uncertain facts. The result are non-sequiturs and nonsense. For instance, Bard may tell you that Toronto is in England. I recently asked the chatbot Claude to help me design a writing course, and one of the first bits of information it provided was that the stories of Anton Chekhov, who died in 1904, were written within the last twenty years.

It is a disturbing and uncanny phenomenon that the tech geniuses cannot explain. Some think it is because LLMs are designed to give full and fluent responses to prompts, so they will fill in uncertain data to create convincing answers. In other words, they bullshit. A recent Microsoft report on the phenomenon claimed A.I. systems are "built to be persuasive, not truthful. This means that outputs can look very realistic but include statements that aren't true." Which raises a fascinating, if worrying, prospect. Maybe, somewhere in the shadowy whirrings of these supercomputers, lies the possibility that they really *can* one day create true fiction. Because is not that what writers do? Make things up to please people? If, instead of rushing to correct errors, creators and consumers of A.I. encouraged these confabulations, might they one day create a truly artistic bot, one that is not literal minded, that has no core allegiance to factual truth? One that shares all the

unpredictability and intuition and flaws of the true artist? Will A.I. one day be able to dream of *real* sheep?

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