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Exploring the Role of Generative AI in Enhancing Language Learning: Opportunities and Challenges

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Abstract: Contemporary advances in generative AI technology have sparked considerable interest regarding its application in language education. This article explores the innovative impact that AI-powered linguistic educational tools may have, such as customized learning journeys, dynamic content, and individualized feedback mechanisms, which collectively have the potential to enhance language acquisition. At the same time, it is important to recognize the constraints associated with such technologies. Concern about maintaining precision and genuineness within AI-crafted language texts is an issue in the literature. There is also caution about AI's current inclination to standardize language expression and to propagate limited cultural narratives, alongside the risks of overreliance on technology which may diminish analytical thought and inventiveness. This article examines the ethical considerations involving generative AI, such as the authenticity of creative work and the ownership of intellectual output. Emphasizing the necessity for clarity and conscientiousness in the application of AI, this conceptual article outlines the opportunities, limitations, and ethical concerns associated with generative AI in language instruction. This article advocates for a well-rounded strategy that leverages the positive aspects of generative AI within language education, while also addressing possible drawbacks and championing an ethical and equitable approach to language learning in the emerging AI-centric digital landscape. A model for forging thinking in this new research and practice space is offered to synthesize many of the possibilities of generative AI in language education.

Keywords: Generative AI, language education, language learning, ethics

1. Introduction

Generative AI is a recent large language model (LLM) system that can receive inputs such as text and images and use these inputs to generate new content in a range of modalities, including text, images, sound, and video [1]. When exploring the implications of generative AI for language learning, it is important to conceptualize this within the technological innovations that have happened in the last 30 years, linked to the beginnings of the Internet in 1994 [2–5]. Educational technologies have developed, alongside the increasing power and capabilities of computers, to support the work of educators and the learning of students and have become integrated into many educational settings. Such technologies are being progressively used to support foreign and second language learning and the work of language teachers in classrooms [6].

The recent dramatic development of generative artificial intelligence (AI) follows this historical trend to technological innovation in education and is one of the more important technological innovations that has emerged, since in applications such as ChatGPT, Bing, Bard, and others there is the potential for significant shifts in how teaching and learning are conducted and language is used creatively [7, 8]. AI systems based on complex language models like GPT-4 can generate text and graphical material that replicates human writing, making them highly useful assets for learning languages. Applications that include generative AI can contribute to the provision of learning feedback, assist in translation, help create learning activities, and construct natural dialogue scenarios for language learning [9–11]. However, a recent empirical case study by Kohnke et al. [12] points to the need for specific and targeted education in using generative AI for instructors (and their students), such as prompt engineering and redesigning learning for the new AI environments.

Part of the attraction of this new technology is the facility of generative AI to adapt learning content and provide targeted digital feedback that can support the work of teachers in language education [13]. Traditional approaches to language learning, while effective in some instances, often adopt a one-size-fits-all approach that is being reconsidered for digital times where the scope of learning resources available to students is much greater [14]. Potentially, AI-based tools can evaluate individual learning patterns, adjust the curriculum accordingly, and provide instant feedback in online and flipped learning environments [15]. This can augment the work of teachers in the learning process and cater to individual learning styles and needs. Furthermore, AI can generate engaging interactive content directed by both the teacher and the student that sustains the interest of learners. One possible application is conceiving generative AI as a virtual tutor that partners with educators in the learning of students. Such tutors might craft language activities, structure writing tasks, provide information, correct grammar, and individualize assessments for each learner, modifying the teaching pace, and even shifting the teaching strategy

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based on real-time student feedback. The adaptive and dynamic potential of generative AI can make language learning more personalized, enjoyable, and relevant to the individual learner.

Studies indicate that AI holds promise in improving language learning results [16]. As it continuously evolves, its effect on language education has come into prominence, prompting enthusiasm in some quarters, but also requiring critical engagement, and caution about how it might be incorporated into language learning programs [16]. Like any technological revolution over the last 40 years, there are affordances from generative AI and new possibilities only just emerging, but there are also challenges that should be understood by both educators and students.

The use of generative AI in language education is likely to have a number of challenges. First, there is some trepidation about the accuracy and authenticity of the texts produced by generative AI. While an AI language model might be accurate in terms of grammar and syntax, the gradations of cultural meaning, including idioms and expressions, characteristic of human languages, might be either missing or distorted [17]. More generally, there are ethical questions about the cultural biases of language data sets on which generative AI is trained. Over-dependence on and deferring to AI-generated content might lead to learning that privileges a standardized version of a language without necessarily embodying the complexities of language and cultural richness. Second, the abilities of language learners for critical thinking and creativity might be diminished if learners become reliant on generative AI bots and accept AI-generated responses without critical questioning. Language education is a human enterprise that should include analytical skills, the ability to think in novel ways and overt control of a language and its context of use.

The ethical dimensions and consequences of using generative AI in language learning need consideration, especially by language educators. With the capacity of AI to generate a range of functional and creative texts, the demarcation between authentic student productivity and AI-assisted outputs may become unclear. This new reality suggests emerging questions about originality, authenticity, and the human basis of learning [18]. One dilemma is whether AI-assisted writing that is submitted as part of a course should receive the same recognition as one composed without the use of generative AI. In terms of affordances, generative AI can offer significant possibilities for language education. However, there are challenges and ethical concerns that need to be engaged with at all levels of education and policy. It is important to find a balance in which there is the leveraging of the learning potential of AI in language education, along with caution, critical awareness, and respect for the essential humanity and cultural basis of language.

In this conceptual article and position paper, the research focus is on the implications of generative AI for language learning, which is an emerging area of research and practice. The ideas discussed above are explored further with the goal of considering how language educators, researchers, and policymakers might conceive generative AI in language learning and classroom practices. These areas of thought revolve around the opportunities, limitations, and ethical concerns that are currently emerging in the research literature, and currently, there is only limited research and published literature, so conceptual clarity is needed in the field. A model to orient thinking in this emerging space is offered as an outcome in the article. This thinking model is not designed to be prescriptive but to provoke new thinking and possibilities in this emergent space of research and practice. Given the growing ubiquity of generative AI in all areas of life, including education and industry, conceptualization of the space is urgently needed so that guidelines, policy, and frameworks might be developed.

2. Theoretical Concept

To understand and conceptualize how language teaching and learning might integrate with generative AI and what are the affordances, challenges, and ethical concerns with the technology, concepts drawn from Borgmann are utilized in this article. Albert Borgmann was a leading philosopher in the field of technology and maintained a critical view of technological innovations through his concept of the "device paradigm". This core notion in his thinking is explicated in his seminal work, technology, and the character of contemporary life [19]. Borgmann argues that contemporary technology, which he considers to be composed of "devices", tends to disengage human from direct and meaningful relations with the world and potentially with culture and language. The idea of the device paradigm captures the notion of how such technologies deliver commodities with considerable efficiency but also disguise the underlying processes of what technology does to human experience, leading to diminishing contact with the environment and with authentic culture and human life [19].

Borgmann's point of view is based on the belief that technology should enhance human life, not detract from it. He suggests that the device paradigm tends to encourage a passive relationship with technology, where convenience and comfort are valued over the quality of engagement with the environments and cultures in which humans live. In his most recent publication, Real American Ethics [20], he extends this notion of device paradigm, arguing for a return to what he calls "focal practices", which are activities that promote community, human engagement, cultural practices, and sustained connection. This, he argues, contrasts with the distancing effect of technologies on how human live their lives, especially in the west but increasingly in other cultural contexts.

Borgmann calls for a reconsideration of the relationship that humans have with technologies, advocating for a more aware and deliberative approach that acknowledges the importance of presence and engagement in the world and in the fabric of daily life [20]. Considering the advent of generative AI, Borgmann's ideas have resonance with emerging understandings of generative AI in two ways. First, as part of applying the notion of the device paradigm, there may be questions about how generative AI shapes human experience and how it distances human from authentic cultural and linguistic life. Arguably, this technology is much more agential, fluid, and interactive and moves beyond mere instrumental commodification that was Borgmann's concern. Second, generative AI may well be part of new focal practices that are convergent in bringing people, the environment, cultures, languages, individual preferences, and communities together with "intelligent" technologies.

While Borgmann's writing pre-dates the development of generative AI, his ideas have significant application to current practices in foreign and second language learning. First, Borgmann's notion of a device paradigm points to recognizing the affordances of the technology for engaging with language as part of digital culture. At the same time, it also points to concerns about generative AI's potential to disconnect learners from genuine cultural and linguistic experiences that are part of authentic language education, and the need for promoting critical engagement with technology in language learning. Second, his advocacy for focal practices suggests the imperative for using generative AI to foster tangible and practical community and meaningful interactions, thus enhancing cultural and linguistic immersion in second language learning environments.

In sum, Borgmann's concepts highlight the need for educators to employ generative AI in language learning to foster deep cultural engagement and authentic communicative experiences over mere linguistic efficiency or instrumental outcomes. Applying Borgmann's principles might guide the development of generative AI tools that prioritize human agency and engagement, enriching the language learning process through deliberate and ethical human-technology integration.

3. Opportunities in AI-Driven Language Learning

In building toward a model for understanding the ways that generative AI might relate to humans and how it might be integrated into language learning, four opportunities for the use of generative AI are discussed. These affordances might be viewed as expansive and speculative areas where generative AI can bring new possibilities to language education in contexts such as second language learning and language for academic purposes.

3.1. Opportunity 1: Personalized learning

Generative AI has emerged as a potential disruptor of taken-for-granted practices because of its capacity to dispense personalized learning experiences for language students. Traditional educational pedagogies and approaches in second language learning may be viewed as static, reflecting the standardization of curricula and the lack of focus on dialogic engagement [14]. These traditional approaches, while structured and predictable, do not necessarily account for the unique learning styles, pace of learning, and preferences of individual students [21]. The result may be a system of second language learning where many learners are left behind or struggle to meet curriculum outcomes.

Potentially, with generative AI, this domain of language learning might be transformed. Unlike static educational approaches and technological tools, generative AI has the capability to adapt in real time, be part of the development of targeted learning materials, and be integral to multimodal forms of content delivery and interactive learning in what might be termed a new set of focal practices [20, 22–24]. For example, generative AI can assist language educators to design a learning path for language students that is individualized. Instead of limiting students to fit into a set curriculum, the curriculum now fits the needs and learning predilections of a student in what might be called a set of adaptive focal practices that have a greater connection with language and culture. This is built on the premise that students learn in different ways and have preferences for how they would like to learn. Indeed, a language learner who favors more visual content might be presented with a range of multimodal materials such as infographics, diagrams, audio-visual materials, pictures, and charts [25]. Similarly, if a student excels in vocabulary but struggles with grammar, the AI-driven bot can adjust its focus, dedicating more resources and exercises toward improving grammatical skills through targeted exercises.

This propensity for customization enables students to be more than passive recipients of information but active and agential participants in their own learning journey, such that it is a device or technology for opening out rather than disguising the process of learning [26]. Indeed, the openness about what technology might provide reflects Borgmann's notion of sustaining a strong connection between person, technology, and culture. This not only heightens levels of engagement but also encourages language retention and optimal ways of learning that reflect culture and context. Moreover, this personalized approach potentially lessens feelings of inadequacy or frustration that may be present with more traditional standardized approaches in language learning. When students experience real-time progress designed to enhance their strengths, it is likely to promote their confidence and increase motivation [27].

Generative AI has potentially opened up a new expansive approach in language education, moving away from only deploying generalized, whole-group teaching approaches to intricate, individualized learning experiences that are more culturally and individually nuanced. Arguably, the future with generative AI is one of customization for every learner, which might lead to a more effective educational experience for second language learners. At the same time, shifting well-established systems of teaching and learning that have long used standardized curricula is not likely to be easy and could prompt resistance to the arrival of generative AI in the language education sector.

3.2. Opportunity 2: Constructing interactive content

As education internationally changes due to technological innovations, one of the possible benefits of generative AI is its ability to produce interactive content under the direction of an educator [25, 28, 29]. This innovation may reshape the disposition of learning, particularly in language education, by transforming teacher-centric and passive learning environments, with more linear types of learning interactions, into dynamic, engaging experiences that are technologically driven. But this is contingent on what Borgmann [19] suggests is the capacity of technology to enrich human life, not undermine it. Beyond a passive relationship with technology, active and critical engagement with technology and learning would appear to be the key.

Conventionally, language learning resources, including textbooks and digital content, have been static and not promoted active and critical engagement. Students would learn information and then attempt to do exercises or quizzes to test their knowledge. Generative AI reshapes this learning paradigm by merging learning with evaluation in a dynamic and individualized manner. For example, when a learner encounters difficulty with certain language text, the AI promptly identifies and addresses the challenge, offering explanations or supplementary materials to facilitate uninterrupted learning experiences. Interactive materials do more than just display data; they engage learners actively, promoting a participatory and collective educational journey [30]. In adapting to learners' responses, generative AI can shift content-based lessons into dialogues that are inherently interactive and thus more engaging. Recent studies indicate that generative AI can cultivate an interactive partnership between technology and learners, advancing the concept of AI as more than a mere instrument [31, 32].

For those learning new languages, the implications are profound. Language inherently demands interaction and thrives on the exchange of ideas. It transcends rote learning of lexicon or syntactic structures; it is fundamentally about engaging in meaningful discourse and articulating thoughts. The capacity of generative AI to emulate these exchanges elevates language training closer to authentic linguistic engagements, such as real conversational contexts and context-specific literacy events [33]. This dynamic material invites learners into a more investigative and participative learning mode. Learners are motivated to experiment with varying grammatical forms, integrate fresh terms, or convey intricate concepts, with the AI providing on-the-spot guidance and corrections. This kind of technologically oriented environment, which promptly rectifies errors, fosters boldness, and creativity—essential elements in second language acquisition [34]. Moreover, deploying generative AI's

capacity for innovation, instructional content can be dynamically designed to invite learner interactions. For example, should a learner demonstrate proficiency in a certain area of language learning, the AI could introduce more sophisticated material or supplementary challenges, moving beyond more linear and standardized approaches.

The development of interactive content through generative AI also has implications for educators and curriculum designers. Instead of producing conventional linear lesson plans, modular, adaptive content can be designed with the aid of generative AI, and quite quickly. This adaptive content can incorporate various resources—videos, quizzes, interactive exercises—that the AI can then select from based on student performance and areas of strength and limitation in language learning. Generative AI's capacity to produce interactive content in collaboration with an educator or designer brings a potential change in the delivery and pedagogical basis of language education. By changing what can be mostly passive engagement with content into active participation, this technology has the potential to foster engagement and engender a holistic and effective learning experience for students.

Exploring Borgmann's views might lead to questions about whether AI-generated content actually enriches language education or if it creates a superficial learning facade, potentially diminishing educators' roles and affecting learners' authentic cultural and linguistic immersion. As such, there is the potential for disengagement from authentic learning experiences. It is clear authenticity and connection as pedagogical goals for educators are imperative.

3.3. Opportunity 3: Alternative approaches to feedback

Feedback has always been an integral part of the educational process in second language learning [35]. Whether it's a teacher marking an assignment, a tutor providing verbal support, or an online platform offering automatic responses, feedback acts as a pivot between present understanding and desired future mastery. However, conventional feedback mechanisms, particularly in language education, come with inherent limitations: they are often static, generalized, and delayed [36]. Generative AI, with its capability to provide instantaneous, adaptive feedback, could significantly alter the modes through which educators offer feedback. Again, generative AI provides new focal practices about feedback that promote stronger connection to the educator and the learning community through the affordance of the technology, which reflects Borgmann's notion that technology should enhance human life.

In traditional classroom settings, students may experience a lag between submitting work and receiving feedback, a wait that could extend for days or even weeks. This gap can disrupt the continuity of learning, a factor critically important in language studies. Often, by the time feedback is provided, students have already engaged with new material, complicating the task of revisiting, and integrating earlier lessons. Moreover, conventional feedback tends to be static, offering a one-time view of a student's performance that does not adapt to their ongoing educational needs. As students advance and their abilities develop, the feedback they once received may no longer be relevant, diminishing its potential to be a powerful tool for learning efficacy.

Generative AI could be a catalyst for a significant transformation in how feedback is provided [15, 22, 37]. In contrast to traditional methods, generative AI, under teacher supervision, can evaluate a student's work in real time, offering immediate feedback alongside the learning process as part of a dynamic learning community. Take, for instance, the challenging task for beginners of constructing and vocalizing sentences in a new language. Generative AI can swiftly pinpoint syntactical inaccuracies and then aid in pronunciation, providing specific and targeted guidance for correcting mispronounced words. This kind of instantaneous feedback ensures errors are addressed as they occur, fostering direct learning and averting the entrenchment of mistakes over time. Generative AI offers a dynamic feedback approach that evolves by assimilating new language input continuously. As it interacts with the student's responses, it adapts its guidance to reflect the learner's current level of understanding of specific curricular topics. For instance, recurring difficulties with a certain language structure could prompt the AI to present more nuanced explanations and targeted practice exercises for that area.

Currently, there is little empirical evidence to corroborate the potential of generative AI in crafting feedback, but the potential is clear. Through generative AI, learners can potentially sidestep the exhaustive search within broad resources for resolving language issues and shorten the delay in receiving assessment feedback to determine their level of understanding. They are instead engaged in an ongoing cycle of learning, applying, receiving direct feedback, and improving, which is likely to bolster retention and proficiency in second language programs at all levels. This responsive feedback model also cultivates student independence, empowering them to direct their learning path and modulating their speed and methods based on continuous feedback.

By transitioning from what is often a static and delayed feedback model to a dynamic and instantaneous one, generative AI tackles a recurrent educational hurdle: providing timely feedback at the point of learning. For language learners, mastering this challenge promises a more effective learning trajectory that is relatively instantaneous and anticipatory. However, a critical evaluation of feedback using generative AI might reveal possible gaps in contextual understanding, potentially reshaping or diminishing the educator's mentorship role, and reducing student autonomy in the language acquisition processes. Feedback is part of an ongoing relational process in learning between instructor and student that could be disrupted through the use of generative AI.

3.4. Opportunity 4: Extending human creativity

Generative AI resides at the confluence of innovation and artistic expression, potentially proffering a future where human creative thought and artistry are enhanced, redefined, and expanded by artificial intelligence [38–40]. This melding is evident in both textual and visual content generation. Traditional writing methods hinge on the author's insights, personal encounters, and creative instincts to produce various textual forms. With the integration of generative AI, writers and designers can harness this technology for producing new concepts, fresh narrative approaches, and a range of viewpoints. AI can introduce different forms of written expression, unearth fresh linguistic constructs, expand initial thoughts, or even create wholly original pieces based on the initial prompts given. This fusion of human ingenuity with generative AI can nurture a more complex and varied sphere of creativity, where human inventiveness is augmented by AI's extensive linguistic and analytical dexterity [41].

Beyond text, generative AI possesses the ability to formulate visual content in reaction to both written and visual stimuli [42, 43]. Instructional designers can input preliminary drafts or ideas into AI, which in turn can generate an assortment of design alternatives, motifs, or color palettes. Such a joint process

expedites the development of designs and paves the way for innovative visual aids that can be adopted by creators in educational settings.

Ultimately, generative AI serves as a co-creative ally in the sphere of language learning, providing new insights and concepts, as well as novel text, translation tools, and visual assets for use by educators, students, and curriculum developers [41]. This synergy of human creative flair with the computational efficiency of AI holds the promise for a broadening of horizons and an enhancement that transcends conventional methods of creating distinctive educational content and learner-generated textual and visual materials [44, 45].

However, there is a tension here between Borgmann's notion of authentic human experiences and connections and the posthuman potential of generative AI for a distinct agency that does not necessarily depend on human input and goes beyond augmentation and automation [46]. Such a tension points to the need for further research on the balance between AI creativity and human agency.

4. Limitations of Using Generative AI

While considering the possibilities of generative AI for language education is significant, it is also important to appreciate and address the fundamental challenges of generative AI, as part of a balanced and critical approach to implementation. Generative AI is being positioned as an indispensable technology in contemporary education internationally, potentially challenging traditional pedagogies and offering personalized, interactive experiences and new creative opportunities for learners [47, 48]. But this rendering of the technology should be tempered by awareness of limitations, some of which might be considered dangers.

4.1. Limitation 1: Considering the issue of accuracy and authenticity

A central issue in AI-mediated language generation is the dual necessity for precision and genuine representation of human ideas and experiences, given the intricate nuances and contextual uses inherent to human languages [37]. Precision, regarding language, pertains to the structural integrity and rule adherence within content. Generative AI has yielded promising outcomes in diverse professional and academic settings, drawing from expansive datasets and intricate algorithms that underpin its capabilities [23]. These AI models can produce text that typically aligns with grammatical norms with a high degree of accuracy. For learners and educators in the field of language, such meticulousness provides an indispensable mechanism for decoding the foundational elements of language and for exacting translations. Nonetheless, language transcends a mere collection of syntactic rules; it is deeply entrenched in and reflective of culture, history, and communal narratives, all of which are dynamic and often site-specific. Herein lies the importance of authenticity. Authenticity captures the subtle expressions, local sayings, dialects, idioms, and cultural understandings that infuse a language with its distinctive quintessence. There are clear lines of authenticity between mere textual comprehension and a deeper, contextualized understanding of the meaning and intent behind phrases [49].

For instance, while a generative AI system might well flawlessly translate an idiom or form of expression literally from one language to another, it might not represent the cultural, historical, or social context behind that idiom. Such gaps of meaning can lead to a surface-level understanding of a language that lack the deeper connections that are pivotal to the functional learning of language for rich communication. The risk, then, is twofold. First, learners might end up with a homogenized, and sanitized version of a language, missing out on its richness and its cultural specificities and sensitivities [50]. Second, there's the potential for miscommunication. Without understanding cultural nuances, learners might use words or phrases appropriately in a grammatical sense, but inappropriately in a cultural context. Addressing these challenges requires a multi-faceted approach. While generative AI can serve as a foundation, human oversight and direction are decisive to maintain authenticity. Collaborative ways of working, where AI-generated content is reviewed and enriched by human linguists or educators, might be a way forward.

As generative AI continues to play a larger role in language education, striking a balance between accuracy and authenticity will be imperative. Only by acknowledging and addressing this challenge can educators realistically harness the potential of AI in the development of holistic language learning approach. Borgmann's [20] notion of the potential distancing effect of technology is apt in this circumstance. In second language learning, generative AI should be used in ways that point to community and culture and avoid disconnection. Applying Borgmann's principles, generative AI could be utilized in group settings to facilitate collaborative learning that is human-centered, bounded by ethical usage limits, and supplemented with diverse cultural and linguistic resources for a holistic educational experience.

4.2. Limitation 2: The issue of normalized language from AI language models

The rapid integration of AI in numerous human and educational domains, including language instruction, has grown notably with the advent of sophisticated generative AI technologies [51, 52]. The capability of such AI to function in multilingual contexts is currently under scrutiny [53]. Accompanying the evolution of this tech are critical issues, among which is the potential for AI to induce a uniformity or cultural bias in linguistic expression, which often can be subtle. Training AI on extensive databases that often skew toward prevalent, Western norms carries the hazard of yielding a language output that neglects the intrinsic pluralism of human language, its variants, and dialects. Language is a vessel for cultural, historical, and personal expression, where each community and individual brings nuances, local expressions, and cultural sayings [54]. Languages are repositories of stories, customs, feelings, and collective memories that defy standardization.

An overreliance on generative AI in language learning could lead to exposure to a sanitized, normative form of language—grammatically correct, perhaps, but devoid of local color and linguistic idiosyncrasies. Consider how the English language transmutes from London to New York to Mumbai, with each locale infusing it with its idioms, vernacular terms, and accents, all steeped in local culture. As AI-driven language tools proliferate, there's a danger that these local inflections may wane, eroding linguistic diversity. It becomes imperative, therefore, that AI companies and their engineers and designers start working with language educators and researchers. It is critical that AI language models include diverse, culturally rich data to faithfully represent language complexity. Yet, generative AI's training models predominantly reflect Western biases at present [55]. These biases could be based on gender, ethnicity, culture, economic status, or language. Language platforms could integrate specialized modules that delve into local dialects and colloquial language, ensuring learners acquire a comprehensive perspective of linguistic variety.

While AI's contributions to language education are potentially vast, a watchful eye must be kept on the possible unintended

standardization of language and the consequent lack of local specificity. Sustaining the multiplicity of languages is vital to maintaining their dynamism, relevance, and profound ties to cultural identities so that, as Borgmann implies, there are sustained cultural and community connections. Guided by Borgmann's theory, generative AI should act as a scaffold in language learning, augmenting human interaction and cultural literacy, not as a replacement for human interactions, ensuring technology supports rather than supplants authentic human skills.

4.3. Limitation 3: Maintaining critical thinking and creativity

A significant issue is the diminishing capacity for critical analysis and inventive thought in students who become too reliant on AI tools [9, 56]. Education's core aim is to nurture curiosity, prompting learners to interrogate, dispute, and invent with language. Critical thinking enables students to dissect data, comprehend foundational principles, and make independent evaluations. Creativity enables students to visualize, map, and articulate novel ideas. These abilities and insights are vital not just academically but for navigating digital culture [57].

Excessive dependence on AI might prompt learners toward a passive stance, rather than being agential and active in their language learning. For example, if generative AI constantly resolves complex queries, rectifies mistakes, or auto-creates text, students may bypass the intensive critical work that is needed to produce work and facilitate deep learning. They may begin to treat AI's output as conclusive, thus curtailing their analytical reasoning and precluding the consideration of diverse solutions or viewpoints. Amid this shift toward generative AI, the importance of human discernment, critical awareness, and active problem-solving needs to be embraced.

Moreover, research suggests that creativity thrives in environments where norms are defied, and risks are taken safely [58]. If AI-created material becomes standard, students might retreat from innovative thinking, assuming outputs from generative AI to be the only creative and productive path. This could inhibit originality and deter learners from pushing creative limits. So, a balanced strategy is best to overcome these issues. Educators might focus on AI's supportive language and learning functions, presenting it as a partner in augmentation, not substitution, of human abilities. Involving students in discussions, ideation sessions, and open projects can foster critical and creative thinking, ensuring these essential skills stay central to second language education and embracing generative AI for its potential to broaden, not constrain, human action. One strategy is for engagement with AI for creative production, followed by a time for reflexivity about the creative process. Although AI has considerable promise for transforming education, cautious utilization is paramount.

5. Ethical Concerns

The integration of generative AI in language education is not without its ethical concerns. In this section, three possible ethical concerns are discussed. These concerns bring another perspective to ideas already covered in this article.

5.1. Concern 1: Authentic authorship

The arrival of generative AI has initiated transformative capabilities in content generation, ushering in a new educational landscape rich with potential yet fraught with complexities. One of these complexities is the increasingly indistinct line between creations by humans and those involving the creative use of AI, particularly within higher education. As AI evolves to proficiently craft distinct literary and visual artifacts, the debate may intensify around the custodianship of intellectual property [59].

The utilization of AI by educators, students, or authors to conceive or enhance content invites a re-examination of conventional concepts of creativity. The core question becomes: To whom does the resultant work belong? Is it the originator who initiated the process or the AI that elaborated upon those beginnings? These considerations extend beyond traditional moral territories, influencing the authenticity and appraisal of academic work and publications. This scenario necessitates a re-evaluation of assessment practices within educational spheres, including language education, especially with regard to the contributions and involvement of AI in the creative process.

As the language educational community incorporates AI into the generative process, it is critical to define and adhere to ethical protocols. Acknowledging the symbiotic relationship between human initiative and AI assistance is crucial for maintaining transparency and safeguarding human authorship amidst the digital transformation. The question remains, however, whether authorship in conjunction with generative AI retains its authenticity [42]. For Borgmann, such authenticity and human connectedness is pivotal to sustaining human values and enhancing human life. In the face of pervasive technologies, such as generative AI it is imperative that the face of humanity is sustained.

5.2. Concern 2: Human creativity and AI in content creation

The interweaving of artificial intelligence with the process of crafting content ignites a complex discussion surrounding the concepts of ownership and originality within education [15]. As teachers, designers, and students begin to utilize AI to aid in the development of content, it becomes increasingly challenging to discern where human creativity ends and artificial creative production begins [4]. Creativity is inherently associated with the human creator, yet the infusion of AI upends this clarity. The resulting work of AI with a human begs the question: Does it belong solely to the student, the teacher, or the designer who initiated the idea? Is it a by-product of AI's processing capabilities, or does it represent a hybrid of the two? This intersection prompts a critical examination of what constitutes ownership of creative works, signaling a pressing need to reassess the meaning of authorship in an era increasingly oriented to AI.

5.3. Concern 3: Integrity through transparent AI use in education

In language instruction, the increasing use of AI technologies requires a commitment to transparency [60]. As educational institutions progressively weave generative AI into their pedagogical practices, the onus is on these institutions to transparently disclose the extent of AI utilization. This initiative aims to cultivate a shared understanding and critical perspective among teachers and learners of AI's role and influence. Nonetheless, implementing such an initiative amidst the swift evolution of this technology may prove challenging.

Furthermore, the establishment of a transparent evaluation system could substantiate the authenticity of work for assessment, effectively differentiating between creativity from students and AI-assisted production [61]. Educational institutions that advocate for such transparency and principled application of AI can preserve scholastic

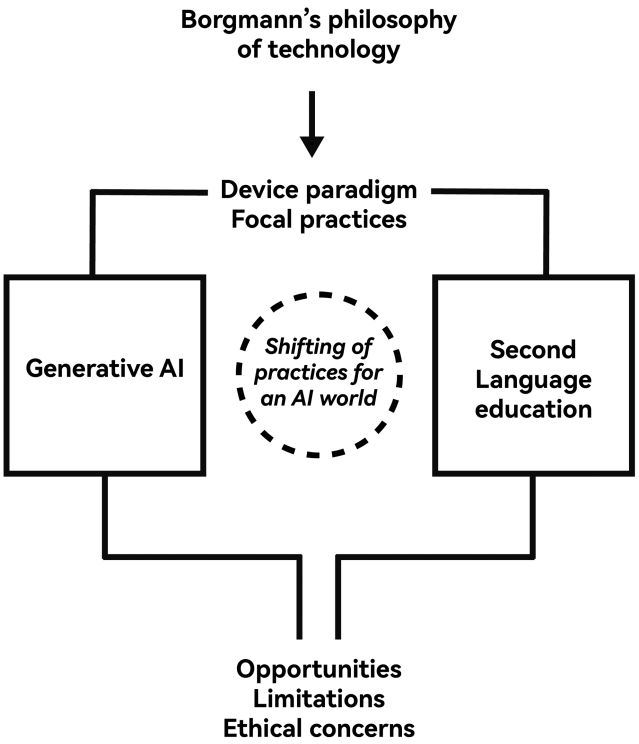
integrity amidst digital transformation [62]. However, delineating the boundary between AI-facilitated and human-crafted work is a complex endeavor, which in some cases, might defy clear-cut distinctions.

6. A Model for Thinking About Generative AI in Language Learning

This section presents a thinking model (Figure 1) based on the concepts introduced in this article, especially those of Albert Borgmann, and the literature examined in consideration of the opportunities, limitations, and ethical concerns presented about generative AI and language education. The model is designed to spark new thinking and consideration of possibilities for research and practice, so it is relevant for researchers, practitioners, and policymakers in the language education space when considering how generative AI might be implemented and used appropriately and ethically in designing curricula and resources. It is also useful for considering the pedagogical practices that exist in classrooms and how generative AI might shift these practices. The model is not designed to offer specificities about research and practice and how it might be applied.

The diagram situates generative AI within the context of Borgmann's philosophy of technology, specifically relating to its application in second language education. It depicts the central role for generative AI as a new disruptive technological paradigm, influencing device-focused practices and offering potential shifts in

Figure 1
A thinking model for generative AI in language learning



educational approaches within language learning that might include shifts in where and how students learn with AI technologies. Borgmann's notions of "device paradigm", or the extent to which there is awareness of how a technological device connects or disconnects people, and "focal practices", those activities and actions that bring people, cultures, and communities together through technologies, are important when thinking about how generative AI might be understood as part of holistic language learning. Using Borgmann's approach, language learning with generative AI should be oriented to bring learners together in community around language and culture and designed to supplement and enhance, not replace, teachers in the learning process.

These components are further expanded to include the opportunities, limitations, and ethical concerns brought about by generative AI, the details of which are considered above. Critical awareness of what AI can do and what issues may emerge from its use are highly important as educators think about implementation. There are also ethical concerns that arise that should be critically examined by educators and researchers, not the least of these being authenticity and integrity. A dotted line encircles the phrase "Shifting of practices for an AI world", suggesting that the integration of generative AI necessitates a re-evaluation of the traditional practices of language education considering this emerging technology. One of these practices might be a movement to a more student-centered and inquiry-based approach to learning where the teacher deploys generative AI for its exploratory and generative capabilities with language but with awareness of the social and cultural setting.

Overall, the diagram schematizes the interplay between the effects that technology has on how humans experience the world, the evolving nature of educational devices and practices, and the specific domain of language education, while also acknowledging the broader societal implications such technological advancements entail.

The entire diagram underscores the importance of understanding AI's capabilities, especially its capacity for novelty, independent content creation, and potential for adaptability, feedback, and interactivity. The diagram points to the need for thoughtful and critical integration into the core practices in language education. It also suggests the importance of AI literacies for educators and their students so that there is due consideration given to how best to use generative AI for excellence in learning outcomes.

7. Conclusion

The proliferation of generative AI is a pivotal shift in the educational landscape and is likely to have a significant effect on second language education. Its potential to customize learning, deliver instant feedback, provide immersive, interactive experiences, and create new and innovative content holds remarkable promise. It could reshape language pedagogy, offering a tailored, engaging, and efficient approach. At the same time, this innovation brings significant complexities. Language's richness lies in its cultural depth and human essence—attributes that AI, despite its prowess in syntax and semantics, struggles to fully encapsulate. There exists the potential peril of diluting language's diverse cultural expressions into a uniformity, a concern that educators, researchers, and linguists must carefully weigh.

The reliance on AI for content generation might also inadvertently eclipse the need for sustained intellectual effort, risking a decline in essential cognitive capacities such as critical reasoning and originality. The immediacy of AI's assistance, though beneficial, might also undercut the rigorous engagement necessary for profound understanding. Ethical dilemmas also loom large. The blending of AI capabilities with student effort complicates the recognition of authentic scholarship, challenging institutions to rethink evaluation paradigms. It underscores the imperative for clear, ethical guidelines,

and data protection. Adopting AI into education does not eclipse foundational pedagogical principles but complements them. A synergistic strategy, positioning AI as an augmentative and partnering technology rather than a replacement, is advisable.

It is in this critical space of engaging with how best to use the potential of the technology for language learning that Borgmann's ideas are important. He questions the extent to which technologies limit and diminish human connection to each other and to the world, which includes culture and language. Educators and policymakers would be well advised to consider this when thinking about how generative AI can be used for language learning, especially in the potential of generative AI to create a diminishing cultural bias that can undermine the recognition of local linguistic and cultural practices. Borgmann also points to focal practices as integrative for connecting humans to each other and the world. It might thus be important to consider the extent to which generative AI can embody such practices. Incorporating Borgmann's ideas, this analysis could also extend to scrutinization of generative AI's prevailing ethical dilemmas—like data privacy breaches, embedded biases, and exacerbating the digital divide—contrasting them with technology's potential to embody authentic human interaction and societal participation.

As generative AI becomes more established in language education, it presents much potentiality; yet it is also fraught with concerns that demand careful, informed consideration. The successful integration of AI will hinge on a balanced appreciation of its capabilities, safeguarding the integrity of learning and cultural richness. The thinking model embodies the concepts developed in this article and seeks to inform this delicate balancing act that is faced by educators and policymakers as the integration of generative AI in language education emerges.

Ethical Statement

This study does not contain any studies with human or animal subjects performed by the author.

Conflicts of Interest

The author declares that he has no conflicts of interest to this work.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

References

[1] Fui-Hoon Nah, F., Zheng, R., Cai, J., Siau, K., & Chen, L. (2023). Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration. *Journal of Information Technology Case and Application Research*, *25*(3), 277–304. https://doi.org/10.1080/15228053.2023.2233814

[2] Boden, M. A. (2018). *Artificial intelligence: A very short introduction*. UK: Oxford University Press.

[3] Bozkurt, A., Karadeniz, A., Baneres, D., Guerrero-Roldán, A. E., & Rodríguez, M. E. (2021). Artificial intelligence and reflections from educational landscape: A review of AI studies in half a century. *Sustainability*, *13*(2), 800. https://doi.org/10.3390/su13020800

[4] Creely, E. (2022). Conceiving creativity and learning in a world of artificial intelligence: A thinking model. In D. Henriksen & P. Mishra (Eds.), *Creative provocations: Speculations on the future of creativity, technology & learning* (pp. 35–50). Springer. https://doi.org/10.1007/978-3-031-14549-0_3

[5] Luckin, R., Holmes, W., Griffiths, M., & Corcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. UK: Pearson Education.

[6] Kruk, M., & Peterson, M. (2020). *New technological applications for foreign and second language learning and teaching*. USA: IGI Global. https://doi.org/10.4018/978-1-7998-2591-3

[7] Trust, T., Whalen, J., & Mouza, C. (2023). Editorial: ChatGPT: Challenges, opportunities, and implications for teacher education. *Contemporary Issues in Technology and Teacher Education*, *23*(1).

[8] Williams, T. (2023). *GPT-4's launch 'another step change' for AI and higher education.* Retrieved from: https://www.timeshighereducation.com/news/gpt-4s-launch-another-step-change-ai-and-higher-education

[9] Bown, O. (2012). Generative and adaptive creativity: A unified approach to creativity in nature, humans and machines. In J. McCormack & M. d'Inverno (Eds.), *Computers and creativity* (pp. 361–381). Springer. https://doi.org/10.1007/978-3-642-31727-9_14

[10] Heaven, W. D. (2020). OpenAI's new language generator GPT-3 is shockingly good—And completely mindless. *MIT Technology Review*, *29*, 1–6. https://www.technologyreview.com/2020/07/20/1005454/openai-machine-learning-language-generator-gpt-3-nlp/

[11] Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *The International Journal of Management Education*, *21*(2), 100790. https://doi.org/10.1016/j.ijme.2023.100790

[12] Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). Exploring generative artificial intelligence preparedness among university language instructors: A case study. *Computers and Education: Artificial Intelligence*, *5*, 100156. https://doi.org/10.1016/j.caeai.2023.100156

[13] Galaczi, E. (2023). *English language education in the era of generative AI: Our perspective*. UK: Cambridge University Press and Assessment.

[14] Zhou, G., & Niu, X. (2015). Approaches to language teaching and learning. *Journal of Language Teaching and Research*, *6*(4), 798–802. https://doi.org/10.17507/jltr.0604.11

[15] Su, J., & Yang, W. (2023). Unlocking the power of ChatGPT: A framework for applying generative AI in education. *ECNU Review of Education*, *6*(3), 355–366. https://doi.org/10.1177/20965311231168423

[16] Liang, J. C., Hwang, G. J., Chen, M. R. A., & Darmawansah, D. (2023). Roles and research foci of artificial intelligence in language education: An integrated bibliographic analysis and systematic review approach. *Interactive Learning Environments*, *31*(7), 4270–4296. https://doi.org/10.1080/10494820.2021.1958348

[17] Pokrivcakova, S. (2019). Preparing teachers for the application of AI-powered technologies in foreign language education. *Journal of Language and Cultural Education*, *7*(3), 135–153. https://doi.org/10.2478/jolace-2019-0025

[18] Craig, C. J. (2022). The AI-copyright challenge: Tech-neutrality, authorship, and the public interest. In R. Abbott (Ed.), *Research handbook on intellectual property and artificial intelligence* (pp. 134–155). Edward Elgar Publishing. https://doi.org/10.4337/9781800881907.00013

[19] Borgmann, A. (1984). *Technology and the character of contemporary life: A philosophical inquiry*. USA: University of Chicago Press.

[20] Borgmann, A. (2006). *Real American ethics: Taking responsibility for our country*. USA: University of Chicago Press.

[21] Renau, M. L. (2016). A review of the traditional and current language teaching methods. *International Journal of Innovation and Research in Educational Sciences*, *3*(2), 82–88.

[22] Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, *7*(1), 52–62. https://doi.org/10.61969/jai.1337500

[23] Brynjolfsson, E., Li, D., & Raymond, L. R. (2023). *Generative AI at work*. (NBER Working Paper No. 31161). National Bureau of Economic Research. Retrieved from: https://library.unimelb.edu.au/recite/referencing-styles/apa7#working-papers

[24] Vandewaetere, M., & Clarebout, G. (2014). Advanced technologies for personalized learning, instruction, and performance. In J. M. Spector, M. D. Merrill, J. Elen & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 425–437). Springer. https://doi.org/10.1007/978-1-4614-3185-5_34

[25] Grassini, S. (2023). Shaping the future of education: Exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences*, *13*(7), 692. https://doi.org/10.3390/educsci13070692

[26] Major, L., Francis, G. A., & Tsapali, M. (2021). The effectiveness of technology-supported personalised learning in low-and middle-income countries: A meta-analysis. *British Journal of Educational Technology*, *52*(5), 1935–1964. https://doi.org/10.1111/bjet.13116

[27] Chen, X., Zou, D., Xie, H., & Cheng, G. (2021). Twenty years of personalized language learning. *Educational Technology & Society*, *24*(1), 205–222.

[28] Bozkurt, A., & Sharma, R. C. (2023). Challenging the status quo and exploring the new boundaries in the age of algorithms: Reimagining the role of generative AI in distance education and online learning. *Asian Journal of Distance Education*, *18*(1), 1–8. https://doi.org/10.5281/zenodo.7755273

[29] Tlili, A., Shehata, B., Adarkwah, M. A., Bozkurt, A., Hickey, D. T., Huang, R., & Agyemang, B. (2023). What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education. *Smart Learning Environments*, *10*(1), 15. https://doi.org/10.1186/s40561-023-00237-x

[30] Kim, J., Lee, H., & Cho, Y. H. (2022). Learning design to support student-AI collaboration: Perspectives of leading teachers for AI in education. *Education and Information Technologies*, *27*(5), 6069–6104. https://doi.org/10.1007/s10639-021-10831-6

[31] Liu, B. (2021). In AI we trust? Effects of agency locus and transparency on uncertainty reduction in human–AI interaction. *Journal of Computer-Mediated Communication*, *26*(6), 384–402. https://doi.org/10.1093/jcmc/zmab013

[32] Sanders, N., & Wood, J. (2021). Combining humans and machines in an emerging form of enterprise: The Humachine. *Foresight: The International Journal of Applied Forecasting*, *61*, 28–35.

[33] Bozkurt, A. (2023). Generative artificial intelligence (AI) powered conversational educational agents: The inevitable paradigm shift. *Asian Journal of Distance Education*, *18*(1), 198–204. https://doi.org/10.5281/zenodo.7716416

[34] Woo, J. H., & Choi, H. (2021). Systematic review for AI-based language learning tools. *arXiv Preprint: 2111.04455*. https://doi.org/10.48550/arXiv.2111.04455

[35] Nassaji, H., & Kartchava, E. (2021). Corrective feedback in second language teaching and learning. In H. Nassaji & E. Kartchava (Eds.), *The Cambridge handbook of corrective feedback in second language learning and teaching* (pp. 1–20). Cambridge University Press. https://doi.org/10.1017/9781108589789.001

[36] Lipnevich, A. A., & Panadero, E. (2021). A review of feedback models and theories: Descriptions, definitions, and conclusions. *Frontiers in Education*, *6*, 720195. https://doi.org/10.3389/feduc.2021.720195

[37] Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. In *2023 IEEE Global Engineering Education Conference (EDUCON)*, 1–9. https://doi.org/10.1109/EDUCON54358.2023.10125121

[38] de Cremer, D., Bianzino, N. M., & Falk, B. (2023). How generative AI could disrupt creative work. *Harvard Business Review*, *13*. https://hbr.org/2023/04/how-generative-ai-could-disrupt-creative-work

[39] Mikalef, P., & Gupta, M. (2021). Artificial intelligence capability: Conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance. *Information & Management*, *58*(3), 103434. https://doi.org/10.1016/j.im.2021.103434

[40] Moruzzi, C. (2021). Measuring creativity: An account of natural and artificial creativity. *European Journal for Philosophy of Science*, *11*(1), 1. https://doi.org/10.1007/s13194-020-00313-w

[41] Schober, R. (2022). Passing the turing test? AI generated poetry and posthuman creativity. In H. Nagl-Docekal & W. Zacharasiewicz (Eds.), *Artificial intelligence and human enhancement: Affirmative and critical approaches in the humanities* (pp. 151–166). De Gruyter. https://doi.org/10.1515/9783110770216-009

[42] Nah, F., Cai, J., Zheng, R., & Pang, N. (2023). An activity system-based perspective of generative AI: Challenges and research directions. *AIS Transactions on Human-Computer Interaction, 15*(3), 247–267. https://doi.org/10.17705/1thci.00190

[43] Roose, K. (2022). A.I.-generated art is already transforming creative work. *The New York Times*. https://www.nytimes.com/2022/10/21/technology/ai-generated-art-jobs-dall-e-2.html

[44] Horvatić, D., & Lipic, T. (2021). Human-centric AI: The symbiosis of human and artificial intelligence. *Entropy*, *23*(3), 332. https://doi.org/10.3390/e23030332

[45] Peeters, M. M. M., van Diggelen, J., van den Bosch, K., Bronkhorst, A., Neerincx, M. A., Schraagen, J. M., & Raaijmakers, S. (2021). Hybrid collective intelligence in a human–AI society. *AI & Society*, *36*, 217–238. https://doi.org/10.1007/s00146-020-01005-y

[46] Schwartz, O. (2018). Competing visions for AI: Turing, Licklider and generative literature. *Digital Culture & Society*, *4*(1), 87–106. https://doi.org/10.14361/dcs-2018-0107

[47] Humble, N., & Mozelius, P. (2019). Artificial intelligence in education—A promise, a threat or a hype. In *Proceedings of the European Conference on the Impact of Artificial Intelligence and Robotics,* 149–156.

[48] Tzirides, A. O., Saini, A., Zapata, G., Searsmith, D., Cope, B., Kalantzis, M., . . . , & Kastania, N. P. (2023). Generative AI: Implications and applications for education. *arXiv Preprint: 2305.07605*. https://doi.org/10.48550/arXiv.2305.07605

[49] MacDonald, M. N., Badger, R., & Dasli, M. (2006). Authenticity, culture and language learning. *Language and Intercultural Communication*, *6*(3–4), 250–261. https://doi.org/10.2167/laic252.0

[50] Kushner, E. (2003). English as global language: Problems, dangers, opportunities. *Diogenes*, *50*(2), 17–23. https://doi.org/10.1177/0392192103050002002

[51] Köstler, L., & Ossewaarde, R. (2022). The making of AI society: AI futures frames in German political and media discourses. *AI & Society*, *37*(1), 249–263. https://doi.org/10.1007/s00146-021-01161-9

[52] Yu, H., & Guo, Y. (2023). Generative artificial intelligence empowers educational reform: Current status, issues, and prospects. *Frontiers in Education*, *8*, 1183162. https://doi.org/10.3389/feduc.2023.1183162

[53] Ahuja, K., Diddee, H., Hada, R., Ochieng, M., Ramesh, K., Jain, P., . . . , & Sitaram, S. (2023). MEGA: Multilingual evaluation of generative AI. *arXiv Preprint: 2303.12528*. https://doi.org/10.48550/arXiv.2303.12528

[54] Yağiz, O., & Izadpanah, S. (2013). Language, culture, idioms, and their relationship with the foreign language. *Journal of Language Teaching and Research*, *4*(5), 953–957. https://doi.org/10.4304/jltr.4.5.953-957

[55] Ferrara, E. (2023). Fairness and bias in artificial intelligence: A brief survey of sources, impacts, and mitigation strategies. *SSRN Preprint.* https://doi.org/10.2139/ssrn.4615421

[56] de Vasconcellos, S. L., da Silva Freitas, J. C., & Junges, F. M. (2021). Digital capabilities: Bridging the gap between creativity and performance. In S. H. Park, M. A. Gonzalez-Perez & D. E. Floriani (Eds.), *The Palgrave handbook of corporate sustainability in the digital era* (pp. 411–427). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-42412-1_21

[57] Padget, S. (2013). *Creativity and critical thinking*. UK: Routledge.

[58] Creely, E., Henriksen, D., Crawford, R., & Henderson, M. (2021). Exploring creative risk-taking and productive failure in classroom practice. A case study of the perceived self-efficacy and agency of teachers at one school. *Thinking Skills and Creativity*, *42*, 100951. https://doi.org/10.1016/j.tsc.2021.100951

[59] Eshraghian, J. K. (2020). Human ownership of artificial creativity. *Nature Machine Intelligence*, *2*(3), 157–160. https://doi.org/10.1038/s42256-020-0161-x

[60] Zhuo, T. Y., Huang, Y., Chen, C., & Xing, Z. (2023). Red teaming ChatGPT via jailbreaking: Bias, robustness, reliability and toxicity. *arXiv Preprint: 2301.12867*. https://doi.org/10.48550/arXiv.2301.12867

[61] Crawford, J., Cowling, M., & Allen, K. A. (2023). Leadership is needed for ethical ChatGPT: Character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching & Learning Practice*, *20*(3), 02. https://doi.org/10.53761/1.20.3.02

[62] Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. In D. Mhlanga (Ed.), *FinTech and artificial intelligence for sustainable development: The role of smart technologies in achieving development goals* (pp. 387–409). Springer Nature. https://doi.org/10.1007/978-3-031-37776-1_17

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