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The contribution of Knowledge Building to Human Trasformative Education

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Contemporary life and the news from the world are increasingly accustoming us to cruel and brutal scenarios that darken both individual and collective horizons. Climate change, pandemics, inequality, and war in different countries are some of the tragic situations that threaten peaceful and sustainable coexistence in the human community.

What role does technology play in all of this? Some claim that the role covered by technology in the current political and social scenarios is relevant, and they blame technology for any disaster we have to face; others, instead, think that the only way to find a solution to the current problems is to rely on technology and many consider still crucial the human responsibility (Ligorio, 2025; Tigard, 2021).

In this Special Issue we still believe in the human responsibility and we offered this venue to a collection of papers proving that digital technologies from WhatsApp (Annese & Ligorio, in this issue) to

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artificial intelligence (AI) (Bereiter & Scardamalia, in this issue; Cacciamani & Khanlari, in this issue), as well as big data, virtual learning environments, and automation are transforming not only how knowledge is produced, disseminated, and used but also how the information contributes in building thinking frames. While these technologies offer significant affordances in terms of access, personalization, and efficiency, they also pose risks, including ethical dilemmas, unequal power distribution, misinformation, and a reductionist view of the human person.

As Pötzsch (2019) argues, critical digital literacy must "comprehensively address issues of knowledge, competencies, and skills in relation to digital technologies" (p. 212) rather than focus exclusively on technical or labour-market aims. Education in the digital era must, therefore, concern itself not only with *what* learners can do, but *who* they become by using technology. The actual global scenario calls for transforming educational systems to foster their potential to "help us shape peaceful, just and sustainable futures" (UNESCO, 2021, p. 1). Therefore, there is a strong need to reassert human dignity, creativity, solidarity, and the common good as a paradigm for guiding education toward value creation rather than mere economic utility.

The papers here collected go beyond technical proficiency and include "critical awareness, self-reflection and evaluation of one's own and others' digital practices and online engagement" (Hinrichsen & Coombs, 2013, p. 2). Metacognition, critical thinking, self-assessment, and collaborative strategies are all skills education needs to value, now more than ever. The ability to analyze critically, to select purposefully, to evaluate reflectively, and to decide responsibly what to believe and do is nowadays central to learners' engagement in digital environments (Warnick, 2001). Ethical reasoning, in turn, requires awareness of the societal and structural implications of digital technology – surveillance, algorithmic bias, commercialization, and privacy concerns.

To address the interconnected challenges of the digital age, such as climate change, pandemics, and inequality, learners need systems thinking. Systems thinking enables one to see "the interactions among system components and the patterns that emerge from those interactions" (Kordova et al., 2018, p. 4).

Systems thinking has become increasingly prominent in educational research, particularly in relation to sustainable development (Bozkurt & Bozkurt, 2024). Similarly, Kuijpers et al. (2024) argue that teaching must be re-envisioned through a systems lens to capture complexity and interconnectedness.

Creativity and innovation are essential for generating novel solutions that serve both personal fulfillment and the common good. Intercultural and collaborative skills are also critical, as networked environments demand communication across cultural differences and digital divides (Castellví et al., 2020). Also transformative agency, expressed in recognizing problematic situations and in the engagement in changing the context (Lund & Vestøl, 2020), can play a crucial role.

In addition, resilience and adaptive learning are vital in a rapidly changing and uncertain world. Coluzzi et al. (2024) highlight that higher education must balance digital and soft skills, such as emotional intelligence and critical thinking, in order to humanize AI-driven education.

Students can be involved in real-world knowledge creation, collaborating with professional partners in order to address real-world challenges. As Underwood and colleagues report in this issue, KB offers the possibility 'for extending students' creative knowledge beyond the subject boundaries and classroom walls', providing meaningful and open-ended challenges for students.

In the digital era, education must aim higher than technical competence or employability. A transformative humanism demands a framework that cultivates critical digital literacy, ethical responsibility, systems thinking, creativity, transformative agency, collaboration, and resilience. Only by developing these competencies education could contribute to value creativity, not merely economic, but social, cultural, and ecological.

From this perspective, technology can support KB dialogue, providing a safe space where students can *Speech and Act* (Arendt, 1958; 2023) with their ideas, not only fostering the advancement of community knowledge, but also contributing to a better world (De Jong, in this issue). Knowledge Building supports dialogical knowledge crea-

tion interactions, considering the mind as an idea generator; it is not information-centered, but action, human-centered.

With this Special Issue, The Collaborative Knowledge Building Group (CKBG), which holds Qwerty, celebrates 20 years since its foundation. Our main inspiration has been and still is the concept of Knowledge Building (KB). This approach (Scardamalia & Bereiter, 2006) offers a powerful framework for rethinking education in the digital era. KB emphasizes that learning should not be limited to the acquisition of facts or individual mastery but should instead focus on the collective advancement of knowledge. According to Scardamalia and Bereiter (2006), "the central principle of knowledge building is that the goal of a community or classroom is to advance collective knowledge" (p. 98). "Knowledge Building is the creation and improvement of knowledge of value to one's community" (Scardamalia & Bereiter, 2010, p. 8). This orientation aligns closely with the concept of education as value creation. In the digital era, value is not derived merely from access to information – now abundant and easily retrievable – but from the capacity to transform information into socially, ethically, and culturally meaningful knowledge. Knowledge Building's emphasis on idea improvement mirrors the principle that educational value must be continuously generated, refined, and applied in response to emerging challenges (Scardamalia & Bereiter, 2014).

Another critical connection between KB and value creation lies in the notion of epistemic agency, which refers to learners' responsibility for managing inquiry and directing their own learning processes. In the context of digital transformation, epistemic agency equips learners to navigate complex global issues – such as misinformation, climate change, or AI ethics – by fostering adaptability, critical thinking, and ethical decision-making. Finally, Knowledge Building situates learning within authentic problems that require collaborative inquiry. This approach reflects the digital era's demand for value creation through collaboration and innovation. As Scardamalia and Bereiter (2006) argue, "knowledge creation is both a social and cognitive process, with individuals and communities working together to advance understanding" (p. 101). Similarly, education for transformative humanism calls for learners not only to advance their own competencies

but also to contribute to collective well-being and sustainable futures. In this way, KB provides both a pedagogical model and a theoretical foundation for understanding how education can foster value creation in the digital era. It reframes learners as knowledge creators and value co-constructors, embodying the principles of transformative humanism. This represents an opportunity to rethink educational systems to contribute to a peaceful, fair, and sustainable world for both current and new generations.

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Editoriàl

La vie contemporaine nous confronte de plus en plus à des scénarios brutaux qui assombrissent les horizons individuels et collectifs. Changements climatiques, pandémies, inégalités et guerres menacent une coexistence pacifique et durable dans la communauté humaine.

Quel est le rôle de la technologie dans tout cela? Certains attribuent à la technologie une responsabilité importante dans les scénarios politiques et sociaux actuels; d'autres estiment que la solution aux pro-

blèmes actuels réside précisément dans la technologie; d'autres encore soulignent la responsabilité humaine (Ligorio, 2025; Tigard, 2021).

Nous continuons à croire en la responsabilité humaine. Les technologies numériques – de WhatsApp à l'intelligence artificielle, aux big data, aux environnements d'apprentissage virtuels et à l'automatisation – transforment non seulement la manière dont la connaissance est produite, diffusée et utilisée, mais aussi comment l'information contribue à construire des cadres de pensée. Bien que ces technologies offrent des opportunités significatives en termes d'accès, de personnalisation et d'efficacité, elles posent également des risques: dilemmes éthiques, distribution inégale du pouvoir, désinformation et vision réductionniste de la personne humaine.

Comme le soutient Pötzsch (2019), la littératie numérique critique doit "aborder de manière globale les questions de connaissance, de compétences et d'aptitudes en relation avec les technologies numériques» (p. 212), plutôt que de se concentrer exclusivement sur des objectifs techniques ou de marché du travail. L'éducation à l'ère numérique doit donc se préoccuper non seulement de ce que les apprenants peuvent faire, mais de qui ils deviennent. Le scénario global actuel exige de transformer les systèmes éducatifs pour développer leur potentiel de nous aider à façonner des avenirs pacifiques, justes et durables" (UNESCO, 2021, p. 1). Il faut donc réaffirmer la dignité humaine, la créativité, la solidarité et le bien commun comme paradigme pour orienter l'éducation vers la création de valeur plutôt que vers la simple utilité économique.

La pensée métacognitive, la pensée critique, l'auto-évaluation et les stratégies collaboratives sont toutes des compétences que l'éducation doit valoriser, maintenant plus que jamais (Hinrichsen & Coombs, 2013). La capacité d'analyser de manière critique, de sélectionner intentionnellement, d'évaluer de manière réflexive et de décider de manière responsable de ce qu'il faut croire et faire est aujourd'hui centrale pour l'engagement des apprenants dans les environnements numériques (Warnick, 2001). Le raisonnement éthique nécessite une prise de conscience des implications sociales et structurelles de la technologie numérique: surveillance, biais algorithmiques, commercialisation et questions de vie privée.

Pour faire face aux défis interconnectés de l'ère numérique, les apprenants ont besoin de la pensée systémique, qui permet de voir "les interactions entre les composants du système et les patterns qui émergent de ces interactions" (Kordova et al., 2018, p. 4). La créativité et l'innovation sont essentielles pour générer de nouvelles solutions qui servent à la fois l'épanouissement personnel et le bien commun. Les compétences interculturelles et collaboratives sont également cruciales, car les environnements en réseau exigent une communication à travers les différences culturelles et les fractures numériques (Castellví et al., 2020). De plus, l'agentivité transformatrice peut jouer un rôle crucial (Lund & Vestøl, 2020), ainsi que la résilience et l'apprentissage adaptatif dans un monde en rapide changement.

À l'ère numérique, l'éducation doit viser plus haut que la compétence technique ou l'employabilité. Un humanisme transformateur nécessite un cadre qui cultive la littératie numérique critique, la responsabilité éthique, la pensée systémique, la créativité, l'agentivité transformatrice, la collaboration et la résilience. Ce n'est qu'en développant ces compétences que l'éducation peut contribuer à valoriser la créativité non seulement économique, mais sociale, culturelle et écologique.

Dans cette perspective, la technologie peut soutenir le dialogue de Knowledge Building (KB), en fournissant un espace sûr où les étudiants peuvent parler et agir (Arendt, 1958; 2023) avec leurs idées, favorisant l'avancement de la connaissance communautaire et contribuant à un monde meilleur. La technologie de soutien au Knowledge Building favorise des interactions dialogiques de création de connaissance; elle n'est pas centrée sur l'information, mais sur l'action et l'humain.

L'approche du Knowledge Building (Scardamalia & Bereiter, 2006) offre un cadre puissant pour repenser l'éducation à l'ère numérique. Le KB souligne que l'apprentissage ne devrait pas se limiter à l'acquisition de faits ou à la maîtrise individuelle, mais devrait se concentrer sur l'avancement collectif de la connaissance. "Le Knowledge Building est la création et l'amélioration de la connaissance ayant de la valeur pour sa propre communauté" (Scardamalia & Bereiter, 2010, p. 8). Cette orientation s'aligne avec le concept

d'éducation comme création de valeur. À l'ère numérique, la valeur ne dérive pas de l'accès à l'information – désormais abondante – mais de la capacité à transformer l'information en connaissance socialement, éthiquement et culturellement significative.

Une connexion critique entre le KB et la création de valeur réside dans la notion d'agentivité épistémique, qui se réfère à la responsabilité des apprenants dans la gestion de l'enquête et la direction de leurs propres processus d'apprentissage. Dans le contexte de la transformation numérique, l'agentivité épistémique équipe les apprenants pour naviguer dans des questions globales complexes – comme la désinformation, le changement climatique ou l'éthique de l'IA – en favorisant l'adaptabilité, la pensée critique et la prise de décision éthique.

Le Knowledge Building situe l'apprentissage dans des problèmes authentiques qui nécessitent une enquête collaborative, reflétant la demande de l'ère numérique pour la création de valeur à travers la collaboration et l'innovation. Comme le soutiennent Scardamalia et Bereiter (2006), "la création de connaissance est à la fois un processus social et cognitif, avec des individus et des communautés travaillant ensemble pour faire avancer la compréhension" (p. 101). Ainsi, le KB fournit à la fois un modèle pédagogique et une fondation théorique pour comprendre comment l'éducation peut favoriser la création de valeur à l'ère numérique, redéfinissant les apprenants comme créateurs de connaissance et co-constructeurs de valeur. Cela représente une opportunité de repenser les systèmes éducatifs pour contribuer à un monde pacifique, équitable et durable pour les générations actuelles et futures.

Editoriale

La vita contemporanea ci confronta sempre più con scenari brutali che oscurano gli orizzonti individuali e collettivi. Cambiamenti climatici, pandemie, disuguaglianze e guerre minacciano una coesistenza pacifica e sostenibile nella comunità umana.

Qual è il ruolo della tecnologia in tutto questo? Alcuni attribuiscono alla tecnologia una responsabilità rilevante negli attuali scenari

politici e sociali; altri ritengono che la soluzione ai problemi attuali risieda proprio nella tecnologia; altri ancora sottolineano la responsabilità umana (Ligorio, 2025; Tigard, 2021).

Noi continuiamo a credere nella responsabilità umana. Le tecnologie digitali – da WhatsApp all'intelligenza artificiale, ai big data, agli ambienti virtuali di apprendimento e all'automazione – stanno trasformando non solo il modo in cui la conoscenza viene prodotta, diffusa e utilizzata, ma anche come l'informazione contribuisce a costruire cornici di pensiero. Sebbene queste tecnologie offrano significative opportunità in termini di accesso, personalizzazione ed efficienza, pongono anche rischi: dilemmi etici, distribuzione diseguale del potere, disinformazione e una visione riduzionista della persona umana.

Come sostiene Pötzsch (2019), la critical digital literacy deve "affrontare in modo comprensivo questioni di conoscenza, competenze e abilità in relazione alle tecnologie digitali" (p. 212), piuttosto che concentrarsi esclusivamente su obiettivi tecnici o di mercato del lavoro. L'educazione nell'era digitale deve quindi preoccuparsi non solo di ciò che i discenti possono fare, ma di chi diventano. Lo scenario globale attuale richiede di trasformare i sistemi educativi per sviluppare il loro potenziale di "aiutarci a plasmare futuri pacifici, giusti e sostenibili" (UNESCO, 2021, p. 1). Occorre quindi riaffermare la dignità umana, la creatività, la solidarietà e il bene comune come paradigma per orientare l'educazione verso la creazione di valore piuttosto che verso la mera utilità economica.

Il pensiero metacognitivo, il pensiero critico, l'autovalutazione e le strategie collaborative sono tutte competenze che l'educazione deve valorizzare, ora più che mai (Hinrichsen & Coombs, 2013). La capacità di analizzare criticamente, selezionare intenzionalmente, valutare riflessivamente e decidere responsabilmente cosa credere e fare è oggi centrale per l'impegno dei discenti negli ambienti digitali (Warnick, 2001). Il ragionamento etico richiede consapevolezza delle implicazioni sociali e strutturali della tecnologia digitale: sorveglianza, bias algoritmici, commercializzazione e questioni di privacy.

Per affrontare le sfide interconnesse dell'era digitale, i discenti necessitano del pensiero sistemico, che consente di vedere "le interazio-

ni tra i componenti del sistema e i pattern che emergono da tali interazioni" (Kordova et al., 2018, p. 4). La creatività e l'innovazione sono essenziali per generare soluzioni nuove che servano sia la realizzazione personale sia il bene comune. Anche le competenze interculturali e collaborative sono cruciali, poiché gli ambienti in rete richiedono comunicazione attraverso differenze culturali e digital divide (Castellví et al., 2020). Inoltre, l'agency trasformativa può svolgere un ruolo cruciale (Lund & Vestøl, 2020), insieme alla resilienza e all'apprendimento adattivo in un mondo in rapido cambiamento.

Nell'era digitale, l'educazione deve mirare più in alto della competenza tecnica o dell'occupabilità. Un umanesimo trasformativo richiede un framework che coltivi la critical digital literacy, la responsabilità etica, il pensiero sistemico, la creatività, l'agency trasformativa, la collaborazione e la resilienza. Solo sviluppando queste competenze l'educazione può contribuire a valorizzare la creatività non solo economica, ma sociale, culturale ed ecologica.

Da questa prospettiva, la tecnologia può supportare il dialogo di Knowledge Building (KB), fornendo uno spazio sicuro dove gli studenti possono parlare e agire (Arendt, 1958; 2023) con le loro idee, promuovendo l'avanzamento della conoscenza comunitaria e contribuendo a un mondo migliore. La tecnologia a supporto del Knowledge Building favorisce interazioni dialogiche di creazione della conoscenza; non è information-centered, ma action e human-centered.

L'approccio del Knowledge Building (Scardamalia & Bereiter, 2006) offre un potente framework per ripensare l'educazione nell'era digitale. Il KB sottolinea che l'apprendimento non dovrebbe limitarsi all'acquisizione di fatti o alla padronanza individuale, ma dovrebbe concentrarsi sull'avanzamento collettivo della conoscenza. "Il Knowledge Building è la creazione e il miglioramento della conoscenza di valore per la propria comunità" (Scardamalia & Bereiter, 2010, p. 8). Questo orientamento si allinea con il concetto di educazione come creazione di valore. Nell'era digitale, il valore non deriva dall'accesso all'informazione – ora abbondante – ma dalla capacità di trasformare l'informazione in conoscenza socialmente, eticamente e culturalmente significativa.

Una connessione critica tra KB e creazione di valore risiede nella nozione di epistemic agency, che si riferisce alla responsabilità dei

discenti nella gestione dell'indagine e nella direzione dei propri processi di apprendimento. Nel contesto della trasformazione digitale, l'epistemic agency attrezza i discenti per navigare questioni globali complesse – come la disinformazione, il cambiamento climatico o l'etica dell'AI – promuovendo adattabilità, pensiero critico e decision making etico.

Il Knowledge Building situa l'apprendimento all'interno di problemi autentici che richiedono indagine collaborativa, riflettendo la domanda dell'era digitale per la creazione di valore attraverso collaborazione e innovazione. Come sostengono Scardamalia e Bereiter (2006), "la creazione di conoscenza è sia un processo sociale che cognitivo, con individui e comunità che lavorano insieme per far avanzare la comprensione" (p. 101). In questo modo, il KB fornisce sia un modello pedagogico sia una fondazione teorica per comprendere come l'educazione possa favorire la creazione di valore nell'era digitale, ridefinendo i discenti come creatori di conoscenza e co-costruttori di valore. Questo rappresenta un'opportunità per ripensare i sistemi educativi per contribuire a un mondo pacifico, equo e sostenibile per le generazioni attuali e future.