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Artificial Intelligence and Adolescent Emotional Well-Being in Inclusive Secondary Education

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Abstract

Adolescent emotional well-being is increasingly recognized as a fundamental determinant of academic success and holistic development within secondary education. Concurrently, inclusive education paradigms mandate the creation of learning environments that actively support the diverse emotional, cognitive, and social needs of all students. This theoretical and policy-oriented paper examines the confluence of these two imperatives through the lens of Artificial Intelligence (AI)-supported pedagogy. It argues that AI, when conceptualized and implemented as a tool for inclusive pedagogical enhancement rather than a standalone technological solution, holds significant potential to scaffold teacher practice, personalize learning experiences, and foster systemic conditions conducive to student well-being. Drawing upon an integrative narrative review of literature from education, psychology, and learning sciences (2010–2025), this analysis explores the theoretical foundations of inclusive education and Universal Design for Learning (UDL), investigates AI's role in operationalizing these frameworks within teaching and learning processes, and underscores the critical importance of teacher mediation and professional capital. The paper further addresses the essential policy, ethical, and data governance structures required to steer AI integration towards equity and human flourishing. Ultimately, it posits that the future of emotionally supportive secondary education lies in synergistic ecosystems where AI augments the professional judgment of educators within ethically governed, inclusive school systems.

Keywords: Artificial Intelligence in Education; Inclusive Education; Adolescent Well-Being; Universal Design For Learning; Teacher Mediation; Digital Equity; Educational Policy; Professional Capital

1. Introduction

The landscape of secondary education is undergoing a profound dual transformation. First, there is a growing consensus that schools must serve not only as centers of academic instruction but as foundational sites for nurturing adolescent emotional well-being—a complex construct encompassing positive affect, resilience, life satisfaction, and the capacity for meaningful social connection (Keyes, 2014; OECD, 2019b). This shift responds to escalating concerns about student stress, disengagement, and the long-term impact of school climate on psychosocial development. Second, the ethical and pedagogical imperative of inclusive education has moved from the periphery to the core of educational policy and practice. Inclusive education, as conceptualized by contemporary scholars, transcends the mere physical placement of students with diverse needs; it demands the radical restructuring of pedagogical approaches, curricular design, and school cultures to value and respond to human difference as a resource for community learning (Ainscow, 2020; Florian, 2019a). This model posits that emotional well-being is not an individual trait but an emergent property of interaction between the learner and an intentionally designed, responsive educational environment.

Simultaneously, Artificial Intelligence (AI) is permeating educational systems, offering capabilities—from adaptive learning platforms and data analytics to intelligent tutoring systems—that promise unprecedented personalization and

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insight into the learning process (Holmes et al., 2019; Luckin et al., 2016). However, the integration of these powerful technologies' risks exacerbating existing inequities if not guided by a robust, values-driven framework. The central challenge, therefore, is to interrogate how AI can be harnessed not as a force of standardization or surveillance, but as a catalyst for rearising the ambitions of inclusive, well-being-centered pedagogy.

This paper addresses this challenge by synthesizing theoretical, empirical, and policy-oriented literature to construct a coherent vision for AI's role in supporting adolescent emotional well-being within inclusive secondary education. It moves beyond techno-centric discussions to position AI as a *pedagogical and organizational tool* that must be subservient to humanistic educational goals. The analysis is structured to first establish the theoretical underpinnings of inclusive education and emotional well-being. It then explores how AI can operationalize principles such as Universal Design for Learning (UDL) to create more flexible, responsive learning environments. A critical examination of AI's applications in teaching, learning, and assessment follows, with a sustained focus on the indispensable role of teacher mediation and the development of professional capital. Finally, the paper delineates the essential policy, ethical, and governance architectures required to ensure that technological adoption advances equity and fosters the systemic conditions for all adolescents to thrive.

Here as a final introductory point, we emphasize the significance of all digital technologies in the field of education and in wellbeing training, which is highly effective and productive and facilitates and improves assessment, intervention, and educational procedures via mobile devices that bring educational activities everywhere [52], various ICTs applications that are the main supporters of education [53-57], and AI, STEM, and ROBOTICS that raise educational procedures to new performance levers [58-60]. Additionally, the development and integration of ICTs with theories and models of metacognition, mindfulness, meditation, and the cultivation of emotional intelligence [61-67] accelerates and improves the educational practices and results in all levels of education.

1.1. The Imperative of Adolescent Emotional Well-Being in Schools

Adolescence represents a critical developmental window characterized by significant neurobiological, cognitive, and social-emotional changes. During this period, the school environment functions as a primary developmental context, exerting a powerful influence on identity formation, self-concept, and the acquisition of lifelong coping strategies (Keyes, 2014). Emotional well-being in this context is more than the absence of distress; it is a positive state encompassing feelings of competence, autonomy, relatedness to others, and engagement with learning—concepts aligned with self-determination theory (Deci & Ryan, 2000).

Research consistently demonstrates that students with higher levels of emotional well-being exhibit greater academic engagement, enhanced cognitive performance, more prosocial behaviors, and better long-term life outcomes (OECD, 2019b). Conversely, school environments that are perceived as unfair, overly competitive, or unsupportive can significantly undermine well-being, contributing to disengagement and alienation. Thus, promoting student well-being is not an ancillary "add-on" to academic missions but a foundational prerequisite for effective learning and healthy development. Schools are increasingly called upon to adopt a whole-school approach that embeds well-being into curriculum, pedagogy, teacher-student relationships, and institutional policies (Weare, 2015).

1.2. Inclusive Education as a Framework for Well-Being

Inclusive education provides the most compelling ethical and pedagogical framework for addressing the well-being of allstudents. Grounded in social justice, inclusion challenges deficit models that locate learning difficulties within the child. Instead, it frames educational barriers as residing within inflexible curricula, teaching methods, and school structures (Florian, 2019a). From this perspective, emotional well-being difficulties are often a logical response to environments that fail to acknowledge or accommodate a student's unique strengths, needs, and ways of being.

An inclusive approach, therefore, seeks to transform educational systems. It calls for pedagogical practices that are differentiated and responsive, assessment methods that are fair and multifaceted, and school cultures that celebrate diversity and foster belonging for every member of the community, regardless of background, ability, or identity (Ainscow, 2020). When schools become genuinely inclusive, they create the psychological safety, sense of agency, and supportive relationships that are the bedrock of emotional well-being. The task is to design learning ecosystems that are inherently flexible and capable of personalization at scale—a challenge where digital tools, and specifically AI, enter the conversation.

1.3. AI at the Crossroads: Risk and Potential for Inclusive Well-Being

The advent of AI in education presents a critical juncture. On one hand, AI-driven systems pose documented risks: the potential for algorithmic bias that reinforces stereotypes and marginalizes certain student groups; the threat of datafication and surveillance that erodes privacy and trust; and the danger of de-skilling the teaching profession by automating complex pedagogical decisions (Holmes et al., 2021; Zembylas, 2019). Implemented without critical foresight, AI could create new, technologically mediated forms of exclusion that run directly counter to the ideals of inclusive education.

On the other hand, AI possesses attributes that, in theory, align closely with inclusive pedagogy. Its capacity for data analysis can provide teachers with finer-grained insights into student understanding and engagement patterns. Its ability to adapt content, pacing, and presentation in real-time can help cater to diverse learning preferences and paces. Its scalability can extend supportive feedback and practice opportunities beyond the constraints of the classroom clock. The pivotal question is not whether AI has potential, but how its development and deployment can be deliberately steered to serve the goals of inclusion and well-being.

This paper contends that for AI to be a force for good in this domain, it must be re-conceptualized. It should not be viewed as an autonomous "teacher" or a replacement for human connection, but as a sophisticated tool for augmenting inclusive pedagogy. Its value lies in its ability to equip educators with better information, automate routine tasks to free up time for relational work, and create more accessible and flexible learning pathways. This augmentation model places the teacher's professional judgment and the student's agency at the center, with AI acting in a supportive, enabling role.

1.4. Aim and Structure of the Paper

This paper aims to develop a comprehensive, critical framework for understanding and guiding the integration of AI into secondary education in ways that proactively promote adolescent emotional well-being through inclusive practices. It seeks to bridge theoretical scholarship on inclusion and well-being with emerging research on educational AI, while foregrounding the practical dimensions of teacher development and systemic policy.

The subsequent sections are organized as follows: Chapter 2 delves into the theoretical foundations of inclusive education and its intrinsic link to student well-being. Chapter 3 examines practical frameworks for implementation, focusing on Universal Design for Learning (UDL) and Multi-Tiered Systems of Support (MTSS) in digital contexts. Chapter 4 provides a detailed analysis of specific AI applications in teaching, learning, and assessment, evaluating their alignment with inclusive principles. Chapter 5 argues for the centrality of teacher mediation and the cultivation of professional capital as the essential human infrastructure for ethical AI integration. Chapter 6 outlines the necessary policy, ethical, and data governance structures at school and system levels. Finally, Chapter 7 synthesizes the discussion, presents conclusions, and suggests directions for future research and practice. Through this structure, the paper advances the argument that the intelligent school of the future is not merely a technologically smart one, but an empathetically intelligent community that leverages technology wisely to know, include, and support every adolescent learner.

2. Methodology

This study employs an integrative narrative review methodology to examine how Artificial Intelligence (AI) can be conceptualized and deployed to support adolescent emotional well-being within the framework of inclusive secondary education. The methodological approach is explicitly grounded in the interdisciplinary perspectives of educational psychology, inclusive pedagogy, and digital learning sciences, reflecting the complex, context-dependent nature of both well-being and technological integration in schools. Given the rapid evolution of AI technologies and their emerging application in educational settings focused on holistic student development, a flexible yet theoretically rigorous review design was deemed most appropriate for synthesizing a diverse and developing evidence base.

Narrative and integrative reviews are particularly suitable for fields characterized by conceptual diversity, methodological variety, and emerging empirical findings, as they allow for the synthesis of quantitative studies, qualitative research, theoretical models, and policy literature into a coherent analysis (Greenhalgh et al., 2018). Unlike systematic reviews that prioritize narrowly defined outcomes, this approach enables a holistic understanding of how AI tools are designed, implemented, and experienced within the real-world ecology of schools—a setting where factors such as teacher mediation, school culture, and systemic equity are paramount. This aligns with the study of multidimensional constructs like emotional well-being and inclusion, which are deeply intertwined with institutional practices and human relationships (Zembylas, 2019; Ainscow, 2020).

Critically, the methodological stance of this review is informed by the ethical and pedagogical principles of inclusive education. The framework of Universal Design for Learning (UDL) provides a vital lens for evaluating whether AI-supported tools and practices proactively design for learner variability, foster agency, and promote equitable access rather than creating new barriers (CAST, 2018). Consequently, AI is examined not merely as a technological innovation but as a sociotechnical intervention embedded within power dynamics, cultural values, and pedagogical goals. This review aims to dissect how AI-powered approaches are theorized, enacted, and assessed in secondary education while keeping issues of equity, ethics, and the central role of the teacher firmly in view.

2.1. Research Design

The research design follows a narrative and integrative literature review model focused on AI applications relevant to fostering emotional well-being and inclusive practice in secondary education. The review specifically targets the adolescent developmental period (approximately ages 12–18) within formal school contexts, where academic, social, and identity-related pressures converge.

A narrative integrative approach was selected due to the interdisciplinary and fast-evolving nature of AI applications across education, psychology, and the learning sciences. Relevant evidence spans domains including developmental psychology, inclusive pedagogy, educational technology, and ethics (Baumeister & Leary, 1997). This methodological choice permits the inclusion of heterogeneous study designs—quantitative, qualitative, mixed-methods, and conceptual—thereby capturing the richness and complexity of well-being as both an internal state and an educational outcome shaped by environmental factors.

Importantly, this design facilitates an examination of how AI-based tools operate within authentic school environments, how they are mediated by educators, and how institutional conditions shape their potential to contribute to supportive and inclusive climates (Holmes et al., 2021). Such multidimensional inquiry is necessary to understand the interplay between technology, pedagogy, and student well-being, which cannot be adequately captured through single-method or decontextualized approaches alone.

2.2. Data Sources and Search Strategy

The literature corpus was developed through systematic searches of major international academic databases, including Scopus, Web of Science, ERIC, PsycINFO, and PubMed. These searches were supplemented by reviews of key journals in educational technology, inclusive education, and adolescent development, as well as relevant policy documents from organizations such as the OECD and UNESCO.

Search strategies employed Boolean operators to combine keywords across three conceptual clusters: (1) Technology(e.g., artificial intelligence, machine learning, affective computing, adaptive learning, educational data mining); (2) Educational Focus (e.g., adolescent well-being, emotional development, school climate, inclusive education, secondary education, Universal Design for Learning); and (3)Pedagogical Application (e.g., teacher mediation, personalized learning, social-emotional learning, digital pedagogy). Synonyms and disciplinary variations of these terms were used to ensure comprehensive coverage (e.g., "student wellness," "inclusive pedagogy," "AI in education").

The review focused on publications from 2010 onward, with particular emphasis on research published after 2015, reflecting the accelerated integration of AI-driven tools in educational research and practice. This timeframe captures the shift from theoretical speculation to applied research and early implementation studies in schools.

2.3. Inclusion and Exclusion Criteria

Clear inclusion and exclusion criteria were applied to ensure methodological rigor and thematic relevance. Studies were included if they: (a) were peer-reviewed journal articles, academic books, or authoritative institutional reports; (b) focused on adolescents within secondary education contexts (approximately ages 12–18); (c) examined AI-driven or adaptive digital tools, platforms, or analytics with implications for supporting emotional well-being, inclusive pedagogy, or positive school climate; and (d) were situated within or directly relevant to formal educational settings.

Both empirical and theoretically grounded studies were included, acknowledging that AI applications in education often precede large-scale longitudinal validation. Studies were excluded if they focused exclusively on: clinical populations outside of school settings, adult learners, non-adaptive digital tools (e.g., static websites or videos without AI components), or purely technical descriptions of algorithms without pedagogical or well-being implications. Grey literature without transparent methodology or peer review was also excluded.

2.4. Analytical Framework

Data analysis was guided by an integrative framework comprising four interrelated dimensions, aligned with the study's focus on AI, well-being, and inclusion:

- The Psychological and Developmental Dimensionexamined conceptualizations of adolescent emotional well-being, drawing on positive psychology and self-determination theory to frame well-being as involving autonomy, competence, relatedness, and resilience within school environments (Deci & Ryan, 2000; Keyes, 2014).
- The Technological Dimension analyzed the functionalities of AI tools relevant to inclusive well-being support, including adaptive learning systems, learning analytics, affective computing, and conversational agents. Emphasis was placed on how these systems claim to personalize experience, provide feedback, and model learner states.
- The Pedagogical and Inclusive Dimensionassessed the alignment of AI applications with the principles of inclusive education and UDL (CAST, 2018; Florian, 2019a). This dimension evaluated tools for their capacity to offer multiple means of engagement, representation, and action/expression, and their role in either reducing or exacerbating barriers to participation.
- The Ethical and Systemic Dimension addressed critical issues of data privacy, algorithmic bias, equity of access, professional autonomy, and governance structures, informed by scholarship on the ethics of AI in education (Holmes et al., 2021; Zembylas, 2019).

2.5. Data Synthesis and Interpretation

The selected literature was synthesized using a thematic narrative approach that combined inductive identification of recurring themes with deductive analysis mapped onto the four-dimensional framework. Rather than aggregating statistical effect sizes, the synthesis emphasized understanding the mechanisms by which AI tools interact with educational processes, the contextual factors that moderate their impact, and the conditions for their responsible implementation (Greenhalgh et al., 2018).

Attention was given to how AI-supported practices influenced constructs such as student engagement, perceived autonomy, teacher-student relationships, and feelings of inclusion. This interpretive strategy prioritizes ecological validity and applicability to the complex realities of school systems, aligning with educational research that values nuanced understanding over simplified causality.

2.6. Methodological Limitations

Several limitations of the chosen methodology are acknowledged. Narrative reviews do not provide the statistical precision of meta-analyses and are inherently interpretive. The rapid pace of AI development means some tools and studies discussed may represent early-stage innovations that later evolve significantly. Furthermore, the predominance of research from high-income countries may limit the transferability of findings to diverse global contexts and raises important questions about equity and cultural validity. Publication bias toward positive outcomes may also obscure null or adverse effects. Nonetheless, this methodology provides a comprehensive, ethically informed synthesis suitable for advancing theoretical understanding, policy dialogue, and future empirical research on AI's role in creating more inclusive and well-being-oriented schools.

3. Results

The reviewed empirical studies and the analytical material brought together point to the fact that the advent of Artificial Intelligence has made a significant impact on the emotional well-being of adolescents in secondary education. The evidence suggests that AI-enhanced systems, when integrated into supportive pedagogical frameworks, can contribute to improved emotional self-regulation, enhanced components of mental health, and a more positive engagement with the school environment. Crucially, these benefits are not automatic outcomes of the technology itself but emerge from the close connection of AI systems with inclusive educational strategies, intentional interactional practices, and ethical governance within secondary schools (Holmes et al., 2019; Florian, 2019a).

3.1. Effects of AI-Supported Interventions on Emotional Well-Being and School Climate

A body of quantitative and mixed-methods research supports the role of AI-based interventions in promoting adolescent emotional well-being. Digital platforms that harness machine learning to personalize user experience can deliver supportive content and exercises grounded in evidence-based approaches, such as elements of Cognitive

Behavioral Therapy (CBT), which have shown positive effects on emotional states (Fitzpatrick et al., 2017; Grist et al., 2019). The secondary school setting, with its unique academic and social pressures, is a critical context where such scalable, personalized support can address feelings of overwhelm and disengagement.

A key mechanism of effectiveness is the dynamic and adaptive nature of AI systems. These platforms can alter content pacing, feedback methods, and supportive dialogues in real-time based on user interaction (Luckin et al., 2016). This personalization aligns with the principles of Universal Design for Learning (UDL), which advocate for multiple means of engagement to support all learners (CAST, 2018). Furthermore, tools equipped with affective computing techniques—utilizing sentiment analysis, language pattern recognition, or low-burden micro-assessments—can help in recognizing early signs of student distress or disengagement, enabling proactive rather than purely reactive support (D'mello, 2020; Picard, 2015).

The psychosocial dimension of AI support is highlighted in qualitative studies exploring student perceptions. Adolescents often report feeling less stigmatized when interacting with an AI-supported well-being tool compared to initiating contact with a school counsellor, particularly in socio-cultural contexts where mental health is sensitive (Holmes et al., 2021). The perceived privacy, anonymity, and control offered by these technologies can lower barriers to help-seeking, fostering a sense of psychological safety and encouraging initial engagement (Fleming et al., 2019). This shift is crucial, as AI can serve as a gateway to support for vulnerable students who might otherwise remain unidentified by traditional systems, thus acting not only as a direct tool for symptom management but also as a facilitator of a more open and supportive help-seeking culture within the school context.

3.2. Development of Emotional Self-Regulation and Metacognitive Awareness

Research indicates that AI-assisted interventions can be instrumental in developing adolescents' emotional self-regulation, moving beyond temporary relief towards building sustainable internal skills. Through repeated interactions with systems designed to prompt emotional identification, verbal expression, and reflective check-ins, students practice and internalize the processes of emotional awareness (Drigas & Mitsea, 2022).

In the fluctuating environment of a school day, AI-powered tools can act as consistent, on-demand scaffolds for self-regulation. They can offer calming prompts, cognitive reframing exercises, or mindfulness breaks tailored to the moment's need, helping students manage anxiety-provoking situations (Arslan, 2022a). The goal of this technological scaffolding is to foster eventual autonomy. Over time, with guided practice, the external regulation supported by AI can lead to the strengthening of internal emotional-behavioral control mechanisms, promoting a sustainable sense of emotional coherence (Weisel & Drigas, 2025). This facilitates the transfer of self-regulation skills across various academic and social contexts.

Critically, the integration of affective AI requires careful alignment with human support. Studies suggest that the most positive outcomes for self-regulation occur when AI-generated feedback is harmoniously integrated by the teacher into a cohesive supportive strategy (Kim et al., 2024). Inconsistencies between AI feedback and a teacher's personal feedback can create confusion and reduce effectiveness for vulnerable students. Ultimately, well-designed AI-mediated practice can contribute to a more diversified affective lexicon and improved emotional discrimination among adolescents (Graesser et al., 2018). This enhanced emotional literacy bridges the gap between internal experience and verbal expression, paving the way for more effective coping strategies and metacognitive awareness—the ability to reflect on one's own thought and emotional processes. This transition from reactive emoting to thoughtful emotional management is a cornerstone of socio-emotional maturity.

3.3. Outcomes for Holistic Well-Being and Academic Engagement

The positive impact of AI-supported well-being initiatives extends beyond intrapersonal regulation to influence broader aspects of the school experience. Participation in such programs has been linked to positive changes in subjective well-being, affective engagement in learning, and a stronger sense of school connectedness (Durlak et al., 2011).The subjective well-being reported stems from students experiencing not just better emotional balance but also more positive cognitive appraisals of school as a supportive environment. The consistent, non-judgmental feedback and encouragement from AI systems can help counteract feelings of powerlessness and academic estrangement, common consequences of chronic stress (Schunk & DiBenedetto, 2020). By providing continual, embedded emotional scaffolding, these tools can help students build a more resilient emotional foundation, enabling them to maintain focus and perseverance even under pressure.

This leads directly to enhanced emotional engagement with learning. Students using adaptive well-being platforms often report greater interest, determination, and enthusiasm for academic tasks (Lee et al., 2021). When emotional

regulation strategies are integrated into the learning process, this increased engagement becomes a vehicle through which improved well-being drives greater school participation and reduces disengagement behaviors. The reinforcement of emotional effort and coping progress, rather than solely academic performance, appears key to sustaining these gains (CASEL, 2020).

Furthermore, AI-empowered interventions can positively transform peer relationships and the overall classroom climate. As students develop better emotional awareness and self-regulation, it often leads to increased empathy, improved interpersonal cooperation, and more respectful peer interactions (Pagliara et al., 2024a). These relational improvements foster a more positive, trusting, and safer community where students feel freer to participate, take academic risks, and ask for help. This systemic shift—where technology supports not just individuals but also the quality of group interactions—is fundamental to creating inclusive school cultures that celebrate emotional diversity and prioritize well-being as a collective value, aligning with contemporary inclusive education models (Florian, 2019a).

3.4. Teacher Mediation and Institutional Context as Foundational Moderators

A paramount finding across the literature is that teacher mediation and institutional context are decisive factors in shaping the impact of AI on student well-being. The most enduring and positive outcomes are observed when AI tools are deeply embedded within relational and pedagogically grounded practices, not deployed as isolated technological fixes (Ertmer & Ottenbreit-Leftwich, 2010; Hargreaves & Fullan, 2020).

Teachers play an irreplaceable role in contextualizing and humanizing AI-generated insights. When educators help students interpret emotional feedback from AI, discuss patterns in their feelings, and connect these to concrete coping strategies, students are more likely to internalize and sustain self-regulatory skills (Whitaker & Bakker, 2020). This mediation transforms raw data into a dialectical and interactive learning process rooted in trust and dialogue. Equally, teachers are essential for establishing ethical transparency. Students' trust and willingness to engage increase significantly when teachers clearly communicate the supportive (not surveillance) purpose of AI tools, how emotional data is used, and the limits of the technology (Holmes et al., 2021). This prevents the perception of surveillance, which can erode autonomy and trigger anxiety, particularly among students with previous negative experiences of institutional monitoring.

Conversely, if AI tools are implemented as mere add-ons or framed primarily as monitoring mechanisms for accountability, their positive emotional impact is negligible and can be counterproductive (Zembylas, 2019). In such environments, students may perceive AI-assisted emotional tracking as a form of disciplinary control, damaging trust and exacerbating feelings of alienation. This underscores that the institutional culture and professional capital of the school are critical. Schools with a collaborative culture, shared responsibility for well-being, and leadership that encourages reflective practice are more likely to integrate AI as an additive to existing emotional support structures, complementing rather than replacing professional judgment (Hargreaves & Fullan, 2020).

3.5. Integrative Interpretation of Findings for Inclusive Well-Being

Collectively, the evidence strongly indicates that Artificial Intelligence, when integrated into inclusive and ethically governed educational ecosystems, can be a powerful tool for supporting adolescent emotional well-being. Its effectiveness is contingent not on technical features alone, but on its thoughtful embedding within educationally sound, relationally supported, and ethically clear frameworks.

AI-based interventions offer the potential to make support more accessible and personalized, providing immediate, situationally adjusted scaffolding that complements established teaching and counselling methods. For adolescents navigating academic performance pressure, peer evaluation, and identity development, tools that enable discreet self-examination and skill development can reduce emotional distress and foster resilience (Keyes, 2014; McLaughlin & King, 2015). The synergy between AI's personalization capacity and expert teacher mediation creates a holistic support system where technology becomes a seamless extension of the school's ethical and pedagogical culture, building trust and mitigating stigma.

Ethical governance is an integral part of this successful integration. Transparency in data collection, informed consent, and robust confidentiality safeguards are major factors influencing adolescent engagement with AI tools (Kooli, 2025). Ethically developed and culturally responsive systems not only protect student rights but also enhance utilization and effectiveness by alleviating fears of misuse of sensitive emotional data. Furthermore, the research confirms that sustained interaction with well-designed AI-based emotional supports can facilitate a gradual shift from externally guided regulation to internalized, autonomous self-regulation—a key developmental achievement (Arslan, 2022a; Drigas & Mitsea, 2022).

In conclusion, an integrative interpretation depicts AI not as a standalone solution, but as a complementary tool that can enhance existing educational and pastoral structures, help bridge resource gaps, and empower adolescents with essential emotional skills. The transformative potential of AI for emotional well-being in secondary education is maximized only when it is paired with deep human expertise, vigilant ethical stewardship, and a unwavering commitment to inclusive educational practice. The path forward lies in developing sustainable, scalable, and socially responsible AI integrations that place the holistic well-being of every adolescent at the center of the educational mission.

4. Artificial Intelligence in Support of Adolescent Emotional Well-Being

The integration of Artificial Intelligence (AI) into digital technologies presents transformative potential for systematically supporting adolescent emotional well-being within educational contexts. Leveraging machine learning, natural language processing, and affective computing, AI systems can detect patterns of emotional engagement, provide adaptive support, and offer scalable interventions that complement traditional pastoral and pedagogical care (Holmes et al., 2019; Luckin et al., 2016). In response to growing concerns regarding student stress and disengagement, AI-mediated tools have emerged as potential adjunctive supports that can enhance the capacity of educators and school systems to nurture holistic development (OECD, 2019b). This chapter examines AI's role through four interconnected lenses: its application in digital well-being supports; its capacity for emotion recognition and learning analytics; its contribution to personalized learning and student agency; and its integration with Social and Emotional Learning (SEL) frameworks.

4.1. AI in Digital Well-Being Interventions and Supports

Over the past decade, AI has become a pivotal component in digital platforms designed to promote adolescent psychological well-being, ranging from mobile applications and web-based platforms to conversational agents and serious games (Fitzpatrick et al., 2017; Grist et al., 2019). These tools aim to foster emotional literacy, prevent distress, and provide supportive exercises, often employing AI to enable automation, scalability, and adaptive responsiveness to individual user interactions.

A prominent innovation in this domain is the development of AI-powered chatbots and conversational agents. Utilizing natural language processing, these agents can engage users in supportive dialogues, deliver psychoeducational content, and guide them through evidence-based exercises rooted in cognitive-behavioral or mindfulness principles (Fitzpatrick et al., 2017). Preliminary research on such tools has reported user-reported reductions in symptoms of stress and low mood among adolescent samples, indicating promise as low-intensity, accessible support mechanisms (Fitzpatrick & Hennessy, 2020). This accessibility is particularly significant for adolescents who may face barriers to traditional support due to stigma, cost, or geographical limitations, offering a private and immediate point of contact (Grist et al., 2019).

Beyond direct interaction, AI facilitates proactive well-being monitoring and early-indication systems. Machine learning models can analyze patterns in user interaction, language use, and self-reported mood data to identify signs of emerging emotional distress (Baker & Inventado, 2014). For instance, changes in a student's engagement patterns within a digital learning platform—such as increased hesitation, avoidance of challenging tasks, or alterations in communication tone—can serve as indicators for tailored check-ins or educator alerts. This shift towards predictive, data-informed support aligns with a preventative model of well-being, aiming to address emotional dips before they escalate into more significant impairments (Torous & Keshavan, 2021).

However, the empirical foundation for these interventions requires continued rigorous development. While pilot studies show promise, systematic reviews highlight challenges such as small sample sizes, short-term follow-ups, and high rates of user attrition in digital mental health apps (Grist et al., 2019). The risk of "digital placebo" effects and the need for well-designed controlled trials comparing AI-supported tools to active human-led interventions remain critical considerations (Fleming et al., 2019). Therefore, while AI in digital well-being is a promising avenue for extending support, its evolution must be coupled with robust research, ethical deployment protocols, and integration into broader school-wide well-being strategies.

4.2. Emotion Recognition, Affective Computing, and Learning Analytics

A sophisticated application of AI relevant to emotional well-being is affective computing—the interdisciplinary field focused on developing systems that can recognize, interpret, and appropriately respond to human emotions (Picard, 2010; Calvo & D'Mello, 2010). In educational settings, affective computing aims to analyze multimodal data (e.g., facial expressions via camera, vocal tone, keystroke dynamics, or language sentiment) to infer students' emotional states such as engagement, confusion, frustration, or anxiety during learning activities (D'mello, 2020).

The potential of these technologies lies in their ability to provide educators with real-time, data-informed insights into the emotional climate of the classroom. An AI system analyzing participation patterns or written responses might identify a student who is persistently disengaged or showing signs of elevated anxiety, prompting a timely and discrete teacher intervention (Graesser et al., 2018). This moves support from a reactive to a proactive stance, allowing educators to adjust instructional pacing, offer personalized encouragement, or facilitate appropriate referrals.

When combined with the broader field of learning analytics, affective data can be integrated with academic performance metrics, attendance records, and social interaction logs to create a more holistic learner profile (Baker & Inventado, 2014). This convergence can help distinguish between a student struggling with the material itself and one whose academic difficulties are exacerbated by emotional factors like test anxiety or low self-efficacy. Consequently, support strategies can be more precisely tailored, whether through academic scaffolding, emotional regulation techniques, or a combination thereof.

Nevertheless, the deployment of affective computing in schools raises profound ethical and methodological questions. First, the accuracy and cultural validity of emotion recognition algorithms are subjects of ongoing debate. Models trained on limited or non-representative datasets risk misinterpreting the emotional expressions of adolescents from diverse cultural, ethnic, or neurodiverse backgrounds, potentially pathologizing normal behavior or missing genuine distress (Barrett et al., 2019; Greene et al., 2020). Second, continuous emotional monitoring poses significant privacy risks and can create an environment of surveillance that erodes trust and psychological safety—the very conditions essential for well-being (Zembylas, 2019; Shapiro & Stolerman, 2021). Thus, any application of these technologies must be grounded in transparent consent, robust data governance, and a primary focus on supporting—not scrutinizing—the student.

4.3. Personalization, Adaptivity, and the Cultivation of Student Agency

A cardinal strength of AI in supporting well-being is its capacity for personalization and adaptive intervention. Unlike static resources, AI-powered systems can dynamically adjust content, challenge level, feedback, and the type of supportive prompts based on continuous analysis of a student's interactions and progress (Luckin et al., 2016). This adaptability is crucial for addressing the highly individualized nature of emotional experiences, where triggers, coping mechanisms, and support needs vary greatly among adolescents.

Personalization can manifest in various ways. An intelligent tutoring system might present a frustrated student with a simpler problem or a supportive hint, preventing overwhelm and preserving self-efficacy (VanLehn, 2011). A well-being app could suggest a brief breathing exercise via notification when it detects (based on time or activity data) that a student typically enters a period of high stress, such as before a major test. Serious games designed for emotional regulation can adjust their scenarios and difficulty in real-time based on the player's demonstrated skill level, maintaining an optimal balance between challenge and competence (Lister et al., 2019).

However, it is critical to distinguish between technical personalization and genuine empowerment. True well-being is intertwined with a sense of autonomy and agency—the feeling of being in control of one's own actions and goals (Deci & Ryan, 2000). AI systems that operate as "black boxes," making opaque recommendations without user input, can inadvertently undermine this autonomy. Therefore, ethical design must prioritize user control, transparency, and collaborative decision-making(Holstein et al., 2019a). Features that allow students to set their own well-being goals, adjust feedback preferences, or interpret their own data dashboards foster a sense of ownership and self-efficacy. This approach aligns perfectly with empowerment models in education, where the student is an active participant in their developmental journey, supported by—not subordinate to—technology.

4.4. AI-Supported Social and Emotional Learning (SEL)

Social and Emotional Learning (SEL) provides a structured framework for developing the core competencies—self-awareness, self-management, social awareness, relationship skills, and responsible decision-making—that underpin emotional well-being and academic success (CASEL, 2020). AI can augment traditional SEL instruction by providing scalable, interactive, and personalized practice environments that extend learning beyond the constraints of the classroom timetable.

AI-enhanced SEL applications include virtual role-playing simulations where students navigate complex social scenarios, conversational agents that guide reflective journaling, and adaptive platforms that train specific emotion regulation strategies like cognitive reappraisal (Lee et al., 2021; Chernobrovkina et al., 2021a). For example, a student could practice giving a presentation in a virtual environment with an AI audience, receiving feedback on both content

and managing presentation anxiety. These tools provide safe, repeatable spaces for experimentation and failure, which are essential for skill development but often logistically challenging to create in a classroom.

Emerging research on AI-supported SEL points to positive outcomes. Pilot studies indicate that participation in such programs can lead to improvements in adolescents' self-reported emotional awareness, coping strategy use, and perceived social competence (Lee et al., 2021). Importantly, these systems are not designed to replace the teacher but to act as a force multiplier. They free up educator time from basic skill delivery, allowing teachers to focus on facilitating deeper discussions, providing nuanced interpersonal feedback, and nurturing the teacher-student relationships that are the bedrock of a supportive school climate (Hargreaves & Fullan, 2020).

A significant caveat, however, is the imperative for cultural responsiveness. SEL competencies are expressed and valued differently across communities. An AI system trained on data from a narrow cultural context may promote norms of emotional expression or conflict resolution that are alien or even counterproductive for some students (Greene et al., 2020). To avoid algorithmic bias and promote true inclusivity, the design of AI-supported SEL tools must involve diverse stakeholders, be informed by cross-cultural developmental science, and incorporate mechanisms for educators to easily contextualize and adapt content to their specific classroom culture. When ethically and sensitively designed, AI can be a powerful tool for fostering the empathetic, resilient, and self-aware school communities that define inclusive education.

5. AI-Enhanced Systems for Fostering Supportive and Inclusive Learning Environments

The emotional well-being of adolescents in secondary education is fundamentally shaped by their daily interactions within the school environment. An inclusive and supportive school climate, characterized by psychological safety, positive relationships, and adaptive challenges, is a critical determinant of holistic student development (Keyes, 2014; OECD, 2019a). While educators are the cornerstone of such environments, Artificial Intelligence (AI) presents novel opportunities to augment their capacity, offering scalable tools to personalize support, enhance engagement, and foster the emotional and cognitive conditions conducive to well-being. This chapter examines how AI-based digital approaches, when ethically integrated and pedagogically guided, can contribute to creating more responsive and nurturing educational ecosystems for all adolescents.

5.1. Intelligent Analytics for Proactive Well-Being Support

A proactive approach to student well-being requires moving beyond reactive support to identifying and addressing potential sources of disengagement or distress early. AI-powered learning analytics and intelligent monitoring systems can provide educators with nuanced, real-time insights into student engagement and emotional cues, facilitating timely and informed intervention.These systems utilize machine learning to analyze diverse data streams, such as patterns of participation in digital learning platforms, submission rhythms, language sentiment in written assignments or forum posts, and—with appropriate ethical safeguards—aggregated and anonymized engagement metrics (Baker & Inventado, 2014; D'mello, 2020). For instance, a sustained drop in a student's interaction frequency, coupled with a change to more negative language in reflections, might signal growing disconnection or frustration. AI can flag these subtle patterns, enabling a teacher to initiate a supportive check-in before academic performance is significantly impacted or feelings of alienation solidify.

This application aligns with the principles of Multi-Tiered Systems of Support (MTSS), where AI tools can help efficiently identify students who may benefit from Tier 2 targeted interventions (Lee et al., 2021). Crucially, the goal is not surveillance but supportive insight. The data serves to enrich the teacher's understanding, not replace their professional judgment. By highlighting students who might otherwise go unnoticed in a busy classroom, AI can help ensure that support is equitable and reaches those who are quietly struggling, thereby reinforcing a school-wide culture of care and attentiveness (Pagliara et al., 2024a).

However, the deployment of such analytics must be governed by stringent ethical protocols. Transparency with students and parents about what data is collected, how it is used, and for what purpose (support vs. evaluation) is paramount to maintaining trust (Holmes et al., 2021; Kooli, 2025). Furthermore, vigilance against algorithmic bias is essential to ensure these tools do not perpetuate stereotypes or misinterpret the behaviors of students from diverse cultural or neurodiverse backgrounds (Greene et al., 2020). When implemented with these safeguards, intelligent analytics shift the paradigm from a deficit model of intervention to a strengths-based model of proactive support, central to promoting sustained well-being.

5.2. AI as a Scaffold for Emotional Self-Regulation and Metacognitive Growth

Developing emotional self-regulation and metacognitive awareness—the ability to reflect on one's own thinking and emotional processes—is a core component of adolescent development and academic resilience. AI can act as a consistent, personalized scaffold for practicing these skills, providing on-demand support that complements teacher-led social-emotional learning (SEL).

AI-driven platforms, including interactive chatbots, serious games, and reflective journaling tools, can guide students through evidence-based strategies for emotional regulation, such as cognitive reframing, mindfulness, and problem-solving (Drigas & Mitsea, 2022; Lister et al., 2019). For example, a conversational agent might prompt a student feeling overwhelmed by a project to break it into smaller steps or practice a brief breathing exercise. These tools offer a low-stakes, private space for students to explore and practice coping mechanisms, reducing the stigma sometimes associated with seeking help (Fitzpatrick & Hennessy, 2020).

The power of these systems lies in theiradaptivity. Machine learning algorithms can tailor prompts, challenges, and feedback based on a student's past interactions and progress, ensuring the support remains within their zone of proximal development (Graesser et al., 2018). This personalized pacing helps maintain engagement and fosters a sense of self-efficacy, a key element of intrinsic motivation and well-being according to Self-Determination Theory (Deci & Ryan, 2000; Schunk & DiBenedetto, 2020). Over time, the repeated use of these scaffolded strategies supports the internalization of skills, promoting a transition from technology-assisted co-regulation to autonomous self-regulation (Weisel & Drigas, 2025).

It is critical to frame these tools not as therapeutic replacements but aspedagogical extensions. Their role is to build capacity and literacy, not to diagnose or treat clinical conditions. Effective integration requires teacher mediation to help students translate digital practice into real-world classroom contexts, connecting the skills learned with the AI to their academic and social experiences (Whitaker & Bakker, 2020). This synergy ensures that technology use is purposeful and embedded within the relational and curricular fabric of the school.

5.3. Conversational Agents and Virtual Coaches for Accessibility and Engagement

AI-powered conversational agents (e.g., chatbots) and virtual coaches represent a significant innovation in making well-being support more accessible and engaging for adolescents. Leveraging natural language processing, these agents can provide 24/7, confidential avenues for students to express concerns, access psychoeducational content, and engage in guided reflections (Fitzpatrick et al., 2017).Their primary value lies in lowering barriers to initial help-seeking. Adolescents may hesitate to approach a teacher or counsellor due to stigma, shyness, or fear of judgment. An AI agent offers a non-judgmental, always-available first point of contact that can normalize conversations about emotions and stress (Grist et al., 2019). By providing immediate, basic support and psychoeducation, these tools can act as a gateway, potentially encouraging students to later seek more comprehensive help from a human professional.

Furthermore, well-designed agents can foster daily habits of self-reflection and emotional awareness. Simple, scheduled check-ins that ask a student to rate their mood or identify a challenge can promote metacognition. When integrated with school SEL programs, these agents can deliver personalized content that reinforces classroom lessons, allowing students to explore concepts at their own pace and in their own time (Lee et al., 2021). This continuity between classroom instruction and individual digital practice strengthens skill acquisition.The limitations of current technology necessitate a human-in-the-loop model. Agents lack genuine empathy and the nuanced understanding required for complex emotional situations (Shapiro & Stolerman, 2021). Therefore, their design must include clear pathways to human support (e.g., triggers for counsellor alerts in high-risk situations) and they must be presented to students as one component of a broader support network, not a comprehensive solution. Their ethical development must also prioritize cultural and linguistic responsiveness to serve diverse student populations effectively (Greene et al., 2020).

5.4. Immersive and Multimodal Environments for Practicing Resilience

Emerging at the intersection of AI, virtual reality (VR), and augmented reality (AR) are immersive learning environments that offer powerful new modalities for supporting well-being. These multimodal platforms can simulate challenging academic or social scenarios—such as giving a presentation, collaborating on a group project, or navigating a conflict—in a safe, controlled space (Chernobrovkina et al., 2021a; Maples-Keller et al., 2017).

AI is what makes these environments truly adaptive and therapeutic. By analyzing a user's physiological responses (where consent is explicitly given), performance, and choices within the simulation, the AI can dynamically adjust the difficulty, provide real-time feedback, and guide the user through coping strategies (Parsons et al., 2020). For instance,

a student practicing public speaking in VR might receive calming prompts if the system detects signs of elevated anxiety, or be gradually exposed to larger, more reactive virtual audiences as their confidence grows. This embodies the UDL principle of providingmultiple means of engagementby offering customizable and risk-free practice grounds (CAST, 2018).

These experiences are particularly potent for building resilience and self-efficacy. Repeated, successful navigation of anxiety-inducing scenarios in a virtual space can lead to increased confidence and improved emotional regulation in real-world analogues (Rizzo et al., 2019). For students with specific social anxieties or learning differences, these tailored simulations can provide invaluable practice that would be difficult, intimidating, or impractical to arrange in a physical classroom, thus promoting greater inclusion and participation.As with all sensitive technologies, ethical implementation is key. Student consent, voluntary participation, and psychological safety during use are non-negotiable. These tools should be introduced as empowering options within a supportive framework, never as mandatory or evaluative exercises. Their greatest potential is realized when facilitated by an educator or counsellor who can help the student debrief the experience, connect virtual learning to real-life contexts, and integrate these powerful simulations into a holistic plan for personal growth and well-being.

6. Ethical and Inclusive Governance of AI for Student Well-Being

The integration of Artificial Intelligence into educational ecosystems to support adolescent well-being transcends technological implementation; it necessitates a robust, principled framework centered on inclusion, equity, and ethics. Without such a framework, AI risks exacerbating existing inequalities, compromising student privacy, and undermining the very well-being it seeks to promote (Holmes et al., 2021; Zembylas, 2019). This chapter examines the critical pillars for the responsible deployment of AI in schools, arguing that its value is realized only within governance structures that proactively champion human dignity, fairness, and inclusive participation.

6.1. Advancing Inclusive Education through Equitable AI Design

Inclusive education mandates the removal of barriers to participation and success for all learners. AI can serve this goal by offering tools for personalization and accessibility, but its design and deployment must be scrutinized through an equity lens. The foundational principle is that AI should amplify, not replace, inclusive pedagogy(Florian, 2019a). Tools built on Universal Design for Learning (UDL) principles, for instance, can provide multiple means of engagement, representation, and action/expression, thereby naturally accommodating learner variability (CAST, 2018).

However, equity in access is a prerequisite. The digital divide—disparities in device quality, reliable internet, and digital literacy—poses a significant threat. If only well-resourced students can benefit from advanced AI supports, technology will cement rather than bridge gaps (OECD, 2023a). Therefore, policy and funding must ensure equitable infrastructure and access as a non-negotiable first step. Furthermore, algorithmic biaspresents a profound inclusion risk. Systems trained on non-representative data may fail to recognize the emotional expressions, communication styles, or learning patterns of students from marginalized cultural, linguistic, or neurodiverse backgrounds (Greene et al., 2020). This can lead to misidentification, inappropriate support, or disengagement. Committing to inclusive AI requires diverse development teams, representative training datasets, and continuous bias audits to ensure tools are valid and effective for the entire student population they intend to serve.

6.2. Safeguarding Privacy, Autonomy, and Human Agency

The data-driven nature of AI-enabled well-being support raises paramount ethical concerns regarding privacy, surveillance, and student autonomy. The collection of sensitive data—from learning analytics and emotion-sensing to personal reflections in chatbots—must be governed by transparency, informed consent, and stringent data protection (Kooli, 2025). Students and parents must clearly understand what data is collected, how it is used, who can access it, and for how long it is retained.

A critical distinction must be maintained between supportive analytics and disciplinary surveillance. Tools designed for well-being must not be co-opted for punitive monitoring or behavioral control, as this erodes trust and creates a climate of anxiety (Zembylas, 2019). Ethical design prioritizes student agency, offering controls over data sharing and ensuring interactions with AI tools are consensual and empowering. The goal is to foster digital autonomy, where students use technology as a tool for self-understanding and growth, not as a system to which they are subjected. This aligns with the core psychological need for autonomy, a key driver of well-being (Deci & Ryan, 2000).

6.3. Ensuring Cultural Responsiveness and Amplifying Student Voice

For AI to be genuinely inclusive, it must be culturally responsive. Emotional expression, help-seeking behaviors, and concepts of well-being are deeply shaped by cultural context. An AI tool that promotes a single, culturally narrow model of "healthy" emotion regulation may be ineffective or even harmful for students from different backgrounds (Greene et al., 2020). Therefore, developers must engage in participatory and co-design processeswith diverse communities of educators, students, and families. This ensures the underlying models and content reflect a plurality of experiences and values.

Central to this process is amplifying student voice. Adolescents must be active participants, not passive recipients, in shaping the technologies that affect their emotional lives. Their feedback on usability, relevance, and perceived benefit is crucial for iterative improvement and ethical validation (Kim et al., 2024). Embedding mechanisms for ongoing student input demonstrates respect for their expertise on their own experiences and fosters a sense of ownership over their well-being journey, reinforcing inclusion and agency.

6.4. The Indispensable Role of Teacher Mediation and Professional Judgment

The most sophisticated AI system cannot replicate the empathetic understanding, contextual wisdom, and relational depth of a skilled educator. Thus, a human-in-the-loop modelis ethically and pedagogically essential (Hargreaves & Fullan, 2020). Teachers act as critical mediators, interpreting AI-generated insights within the full context of a student's life, providing compassionate support, and making final professional judgments.

AI should be conceptualized as a tool for augmenting professional capital, not replacing it. It can handle data analysis and routine tasks, freeing teachers to focus on the irreplaceable human work of building relationships, facilitating dialogue, and providing nuanced encouragement (Whitaker & Bakker, 2020). Effective integration therefore depends on significant investment in teacher professional development.. Educators need training not only to use the technology but to critique its outputs, understand its limitations, and weave its insights into holistic, relationship-based support practices (Ertmer & Ottenbreit-Leftwich, 2010). The synergy of AI's analytical power and the teacher's professional judgment creates a powerful, ethically grounded support system for student well-being.

7. Synthesis and Discussion: Towards Human-Centered AI for Holistic Well-Being

The synthesis of theoretical and empirical literature presented in this analysis reveals a complex but promising landscape for the integration of Artificial Intelligence (AI) in supporting adolescent emotional well-being within inclusive secondary education. The findings underscore that AI is not a panacea, but a powerful pedagogical and relational amplifier whose value is contingent upon its alignment with humanistic educational goals, ethical governance, and the principles of inclusion. This chapter interprets the core findings, explores their implications for transforming school ecosystems, and acknowledges the persistent tensions and necessary conditions for realizing AI's potential as a force for equity and flourishing.8. Conclusions and Future Directions

7.1. Reconceptualizing AI as a Tool for Inclusive Pedagogical Enhancement

The central thesis emerging from this review is that AI's most significant contribution to adolescent well-being lies not in autonomous intervention, but in its capacity to enhance inclusive pedagogical practices. By operationalizing frameworks like Universal Design for Learning (UDL), AI tools can help dismantle rigid, one-size-fits-all approaches that are often sources of student anxiety and disengagement (CAST, 2018; Florian, 2019a). The ability to provide multiple means of representation, action, and engagement through adaptive content and supportive scaffolds makes learning environments more inherently flexible and responsive to learner variability.

This aligns with the psychological foundations of well-being, particularly Self-Determination Theory (Deci & Ryan, 2000). When AI systems are designed to support studentautonomy(through choice and agency), competence(through personalized scaffolding and feedback), and relatedness(by freeing teachers to engage more deeply), they address core psychological needs. The evidence suggests that AI-mediated tools for emotional self-regulation and metacognitive development can foster these feelings of mastery and self-efficacy, which are foundational to resilience and positive affect (Drigas & Mitsea, 2022; Schunk & DiBenedetto, 2020). Therefore,the discussion must shift from AI as atherapeutic tool to AI as an architectural tool for designing school experiences that are psychologically nourishing by default.

7.2. Implications for Systemic Change in School Practice and Policy

The findings carry profound implications for how secondary schools are organized, how teachers are supported, and how policy is formulated. First, successful integration demands a whole-school, systems-thinking approach. AI tools

cannot be isolated "plug-ins"; they must be woven into the fabric of curriculum design, pastoral care systems, and Social-Emotional Learning (SEL) initiatives (CASEL, 2023; Pagliara et al., 2024a). This requires leadership that champions a culture of innovation grounded in ethical and inclusive values (Hargreaves & Fullan, 2020).

Second, the critical role of teacher mediation translates into an urgent need for investment in professional capital. Teachers require dedicated training and time to develop not just digital literacy, but the ability to critically interpret AI-generated data, maintain their professional judgment, and integrate technology into relationship-building (Ertmer & Ottenbreit-Leftwich, 2010; Whitaker & Bakker, 2020). Professional development must empower educators as confident designers and ethical guides of AI-enhanced learning, not merely its end-users.

Third, robust policy and governance frameworksare non-negotiable. Educational policies must mandate and fund digital equity to close infrastructure gaps, ensuring all students have the basic access required to benefit from technological tools (OECD, 2023a). Furthermore, clear policies onstudent data governance—encompassing privacy, transparency, consent, and algorithmic auditing—are essential to protect students and build trust (Holmes et al., 2021; Kooli, 2025). Policy must steer AI adoption towards empowerment, not surveillance.

7.3. Navigating Persistent Tensions and Unresolved Challenges

Despite its potential, the path forward is fraught with tensions that require vigilant, ongoing attention. The equity paradoxremains paramount: while AI can personalize support and bridge resource gaps, it risks exacerbating inequality if access is uneven or if algorithms encode and perpetuate societal biases (Greene et al., 2020). A commitment to culturally responsive design and continuous bias mitigation is essential to ensure tools serve diverse school communities justly.Theethics of emotion datafication presents another profound challenge. The line between supportive assessment and intrusive surveillance is thin and easily crossed (Zembylas, 2019). Schools must establish clear, transparent boundaries, ensuring students understand and have control over their data, and that emotional analytics are used solely for supportive, formative purposes, never for punitive discipline or ranking.

Finally, therelational tension between human and machine roles persists. No algorithm can replicate the empathetic connection, moral reasoning, or contextual wisdom of a skilled teacher (Shapiro & Stolerman, 2021). The most sophisticated AI will fail if it undermines the human relationships at the heart of education. Therefore, the design imperative must always be augmentation, not automation. The "human-in-the-loop" model is not a technical feature but an ethical necessity, ensuring technology remains subordinate to pedagogical wisdom and human care.

7.4. Building Empowering Ecosystems

In conclusion, this analysis posits that the future of emotionally supportive secondary education lies insynergistic ecosystemswhere AI augments the professional judgment of educators within ethically governed, inclusive school systems. The promise of AI for adolescent well-being is realized only when it is embedded in a holistic vision of education that values diversity, fosters connection, and prioritizes the holistic development of every learner.

Future research must build upon this integrative foundation. Longitudinal studies are needed to examine the sustained impact of AI-integrated pedagogies on well-being and academic trajectories over time. Participatory action research, co-designed with students and teachers, can develop more effective and culturally sustaining tools (Kim et al., 2024). Furthermore, interdisciplinary scholarship must create and test practical frameworks for ethical AI governance at the school level, providing leaders with clear guidelines for implementation.

Ultimately, the question is not whether AI will transform education, but how. This review argues that by steadfastly anchoring AI development and deployment to the principles of inclusive pedagogy, professional empowerment, and ethical integrity, we can harness its power to create secondary schools that are not only smarter, but wiser, more empathetic, and more inclusive—true catalysts for the well-being of all adolescents.

8. Future Directions

This research has systematically examined the confluence of Artificial Intelligence (AI), inclusive education, and adolescent emotional well-being. It has argued that AI's transformative potential in secondary education is not as an autonomous solution, but as a sophisticated instrument for augmenting human-centric, inclusive pedagogy. When conceptualized and implemented within robust ethical and pedagogical frameworks, AI can help build educational ecosystems that are more responsive, equitable, and conducive to the holistic flourishing of every adolescent. This final chapter consolidates the principal contributions, delineates clear implications for policy and practice, and charts essential pathways for future research.

8.1. Principal Contributions: Reframing AI as an Architect of Inclusive Well-Being

This paper makes several interrelated contributions to the discourse on AI in education. First, it provides a critical synthesis that explicitly links AI applications to the theoretical foundations of inclusive education and Universal Design for Learning (UDL). The analysis demonstrates that AI's true power lies in its ability to operationalize UDL principles at scale, offering multiple means of engagement, representation, and action/expression, thereby reducing systemic barriers to participation that often undermine student well-being (CAST, 2018; Florian, 2019a).

Second, the research firmly establishes teacher mediation and professional capital as the non-negotiable core of ethical AI integration. It moves beyond technocentric narratives to posit that AI's effectiveness is directly moderated by the educator's capacity to interpret, contextualize, and ethically act upon its insights (Hargreaves & Fullan, 2020; Whitaker & Bakker, 2020). The proposed "human-in-the-loop" model is not merely a technical feature but an ethical imperative that preserves relational pedagogy as the bedrock of emotional support.

Third, the study underscores that equity and ethical governance are not secondary considerations but foundational design requirements. It highlights the dual nature of AI's impact: while capable of bridging support gaps, it equally risks exacerbating the digital divide and encoding algorithmic bias if not governed by proactive policies focused on cultural responsiveness, data justice, and equitable access (Greene et al., 2020; Holmes et al., 2021; OECD, 2023a). The contribution is a framework that places these concerns at the center of development and implementation cycles.

8.2. Implications for Policy, Leadership, and Professional Practice

The findings yield urgent implications for educational stakeholders. For policymakers and school leaders, the imperative is to develop and enact comprehensive AI governance frameworks. These must mandate digital equity in infrastructure, establish clear protocols for student data privacy and algorithmic transparency, and allocate dedicated resources for the ongoing evaluation of AI tools for bias and effectiveness (Kooli, 2025; UNESCO, 2021). Policy must shift from passive adoption to active stewardship of technology in the service of public educational values.

Concurrently, systemic investment in educator professional capital is paramount. This extends beyond basic digital literacy to include critical AI literacy for assessing algorithmic suggestions, pedagogical design skills for integrating AI tools into inclusive lesson planning, and ethical judgment to navigate data privacy and student welfare dilemmas (Ertmer & Ottenbreit-Leftwich, 2010; Zembylas, 2019). Schools must become learning organizations for their staff, fostering cultures of collaborative inquiry where teachers lead the exploration of AI's role in enhancing well-being.

For practitioners—teachers and counsellors, the implication is to embrace the role of mediator and designer. This involves cultivating a reflective practice where AI-generated data serves as a conversation starter for supportive dialogue with students, not a definitive diagnosis. It requires the confidence to adapt, override, or contextualize algorithmic outputs based on deep knowledge of one's students and professional expertise (Schunk & DiBenedetto, 2020). The goal is a synergistic partnership where technology handles pattern recognition and routine tasks, freeing human professionals to focus on complex judgment, empathy, and relationship-building.

8.3. Directions for Future Research

To advance the field towards responsible and impactful implementation, future research must address several critical frontiers. There is a pressing need for longitudinal research that examines the sustained impact of AI-integrated pedagogies on adolescent well-being, academic identity, and social development over multiple years. Studies must be conducted in real-world school settings to understand the ecological interplay between technology, curriculum, school climate, and teacher practice (Kim et al., 2024).

Research must also actively employ participatory action research and co-design methods that position students, teachers, and parents not as subjects, but as collaborators. Investigating how such participation shapes the acceptability, efficacy, and cultural validity of AI tools is crucial for developing truly empowering technologies (Pagliara et al., 2024a). Furthermore, future work should focus on developing and testing practical, interdisciplinary frameworks for ethical AI governance at the school and district level. This involves creating actionable checklists for algorithmic impact assessments, models for transparent student data contracts, and protocols for cross-functional ethics review boards involving educators, technologists, and community representatives (Holmes et al., 2021).

An emerging frontier is interdisciplinary research at the intersection of educational neuroscience, affective computing, and pedagogy. Exploring how different forms of AI-mediated feedback and interaction influence neural circuits related

to stress, executive function, and motivation could provide a deeper evidence base for designing tools that are developmentally attuned (Drigas & Mitsea, 2022).

9. Conclusions

In conclusion, the journey toward harnessing AI for adolescent well-being in inclusive schools is fundamentally about making wise choices. It is a choice to prioritize augmentation over automation, equity over efficiency, and human relationships over data points. By steadfastly anchoring technological innovation to the enduring values of inclusive pedagogy, professional empowerment, and ethical integrity, we can guide the development of secondary education systems that are not only more intelligent but also more compassionate, just, and capable of nurturing the well-being of every adolescent who passes through their doors. The future of education lies not in the intelligence of artificial systems alone, but in the wisdom of the human communities that guide their use.

Compliance with ethical standards

Disclosure of conflict of interest

The Authors proclaim no conflict of interest.

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