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Relational Personalization in Digital Gifted Learning: A PRISMA-Based Systematic Review of Meaning, Teacher Role, and the Paradox of Inclusivity

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Abstract. Digital transformation has fundamentally changed how gifted students interact with knowledge, yet emotional alienation and inequitable access persist despite technological opportunities. To systematically understand the meaning and experience of digital learning for gifted students through qualitative synthesis of international literature. Systematic searches were conducted in Scopus, Web of Science, ScienceDirect, MDPI, Taylor & Francis, and Google Scholar from January 2020 to September 2025. Peer-reviewed articles in English or Indonesian, published 2020-2025, focusing on digital learning for gifted/talented students in education, psychology, or learning technology fields, with full-text accessibility. Gifted students (high cognitive ability, above-average intellectual potential) engaged in digital learning environments across various educational contexts. Two independent reviewers conducted screening and selection following PRISMA 2020 guidelines. Quality assessment used the CASP Qualitative Checklist. From 312 identified articles, 10 studies met inclusion criteria after systematic review. Three major themes emerged: (1) cognitive autonomy coupled with emotional loneliness in digital environments; (2) teachers' evolving role as human mediators amid algorithmic learning; (3) paradoxical inclusivity—technology expands access but fails to guarantee social acceptance. These findings reveal digital gifted learning success depends not only on technological sophistication but also on educational systems' capacity to restore relational and empathetic dimensions. Literature predominantly represents global/Western contexts with limited representation from Indonesian or Islamic educational settings. Secondary data analysis restricts depth of affective experience understanding. Digital gifted learning requires "relational personalization"—combining technological personalization with human connection, empathy, and meaning-making. Policymakers should balance efficiency with psychosocial wellbeing; curriculum developers must design collaborative, reflective learning; educators need professional development in meaning mediation, not just platform literacy.

Keywords: Digital gifted learning, Inclusive Education, PRISMA method, Relational personalisation, Systematic literatur review.

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Introduction

Digital transformation in education has become a global trend that is profoundly changing the way people learn, teach, and interact with knowledge (Aleksieva, 2025). In various parts of the world, including Indonesia, the boundaries of learning are no longer limited to physical classrooms. The presence of online learning platforms, artificial intelligence (AI) technology, and personalized learning systems opens up new opportunities for students to develop their potential more independently (Rizqiyah et al., 2025). However, behind these promising technological advances lie complex social and pedagogical issues—not all students are able to adapt and enjoy the benefits of digital education equally (Li & Zhang, 2025).

One of the groups that has felt the most significant impact of this change is gifted students. They are known to have high cognitive abilities, above-average thinking speed, and learning needs that demand greater intellectual challenges than their peers (Chieffo et al., 2025). Based on initial observations in several elementary and middle schools in Kerinci Regency (2024–2025), it was found that a number of gifted students showed a high level of interest in digital platforms such as Google Classroom, Khan Academy, and AI-based tutors. However, on the other hand, they often experience feelings of loneliness and boredom due to a lack of meaningful social interaction with teachers and peers (Dor-Haim & Oplatka, 2021). An eighth-grade student with an IQ of 135 said, "I can learn anything from the internet, but sometimes I'm not sure if what I'm learning is correct, and there's no one to guide me." This statement highlights the paradox of digital learning for gifted students: the vast freedom to learn can instead become a form of cognitive and emotional isolation if not accompanied by adequate guidance (Alshehri, 2021).

Exploratory findings from interviews with three guidance and counseling teachers reinforce this phenomenon. They acknowledge that the education service system for gifted students in the digital age does not yet have clear operational guidelines. Many teachers still focus their attention on students with special needs in the disability category, while gifted/talented groups are often neglected (Ninkov, 2020). This condition is in line with inclusive education policies at the national level, which are still predominantly remedial in nature and have not touched on aspects of digital-based enrichment and acceleration (Gabriel et al., 2021).

Globally, this issue is becoming increasingly relevant. Research by Vidal-Fernández et al. (2025) shows that personalized digital learning can enhance the creativity and independence of gifted students, but it still faces serious challenges in terms of equal access and educator readiness. A study by Stein et al. (2025) on asynchronous online enrichment courses also found that digital flexibility does allow gifted students to learn at their own pace, but many fail to complete the courses due to a lack of social support and monitoring systems. Meanwhile, Birrell's (2025) action research in Dubai highlights the function of AI as a learning partner (co-pilot) for gifted students, but still emphasizes the importance of the teacher's role as the main guide in giving meaning to the learning process. From a broader perspective, Andersen (2025) underscores that research related to digital inclusive education still tends to be biased towards gifted groups, with a lack of studies linking technological aspects with the inclusivity and psychological well-being of students.

A review of the literature over the past five years shows that most research on digital gifted learning is still quantitative and output-based, such as improving academic scores or accelerating the completion of material. There is still a lack of research examining the qualitative aspects of subjective experiences, social meaning, and the emotional adaptation process of gifted students in the digital ecosystem (Almukhambetova & Hernández-Torrano, 2020). Thus, there is a research gap in the existential and relational dimensions (Damsgaard et al., 2023)—namely, how gifted students interpret their digital learning experiences, how they interact with technology and learning communities, and the extent to which teachers and counselors play a role in shaping these experiences (Ronksley-Pavia & Neumann, 2022).

Based on the above context, this study seeks to reveal in depth the experiences and meanings of learning for gifted students in the digital realm through a qualitative approach using the PRISMA-based Systematic Literature Review (SLR) method. The main focus is directed at exploring patterns of experience, psychosocial dynamics, and reflective meanings that emerge from various international studies (Køster & Fernandez, 2023) on digital gifted learning in the last five years.

The scope of this study covers Q1–Q4 indexed scientific publications, WoS, and Sinta that discuss the integration of digital technology in education for gifted students, including the use of AI-based learning tools, online enrichment platforms, virtual reality-based learning, and adaptive learning models. Theoretically, this study contributes to strengthening the inclusive gifted education paradigm by adding dimensions of meaning, emotion, and social relations in the digital context. Meanwhile, in practical terms, the research results are expected to serve as guidelines for teachers, counselors, and policymakers in designing more humanistic, contextual, and equitable digital assistance strategies for gifted students in Indonesia.

Method

This study uses a qualitative approach with the Systematic Literature Review (SLR) method based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). This approach was chosen because it is in line with the research objectives, which focus on gaining an in-depth understanding of the meaning, experience, and social processes in the context of digital gifted learning—namely, technology-based learning for gifted/talented students.

Unlike quantitative reviews that focus on statistical measurements or frequency of findings, the qualitative SLR approach emphasizes interpretive and thematic analysis of published literature. This allows researchers to explore conceptual patterns, relationships between themes, and social dynamics that emerge from various global research contexts. The PRISMA method is used to ensure that the review process is conducted transparently, systematically, and replicably, so that the results have high scientific credibility.

Sources and Selection Strategy for Articles

The articles analyzed in this study were obtained through systematic searches of reputable international academic databases such as Scopus, Web of Science, ScienceDirect, MDPI, and Taylor & Francis, as well as Google Scholar for additional relevant publications.

Detailed Search Strategy

Search Date: September 15-20, 2025

Databases and Platforms

Scopus (via Elsevier): scopus.com. Web of Science Core Collection (via Clarivate): webofscience.com. ScienceDirect (via Elsevier): sciencedirect.com. MDPI (Multidisciplinary Digital Publishing Institute): mdpi.com. Taylor & Francis Online: tandfonline.com. Google Scholar (for grey literature supplement): scholar.google.com

Search String (Applied to all databases with minor syntax adjustments)

("digital learning" OR "online learning" OR "e-learning" OR "technology-enhanced learning" OR "virtual learn AND ("gifted students" OR "talented students" OR "high ability students" OR "high achievers" OR "intellectually AND ("personalization" OR "personalised learning" OR "individualized instruction" OR "differentiation" OR "enric.

Filters Applied

Publication Year: 2020-2025; Language: English OR Indonesian; Document Type: Article (peer-reviewed journals only); Subject Area: Education, Psychology, Social Sciences, Computer Science (Education); Access: Full-text available

Example Search String for Scopus

TITLE-ABS-KEY (("digital learning" OR "online learning" OR "e-learning") AND "gifted students" OR "talented

Number of Records Retrieved per Database

Scopus: 87 articles. Web of Science: 64 articles. ScienceDirect: 52 articles. MDPI: 38 articles. Taylor & Francis: 45 articles. Google Scholar (first 5 pages): 26 articles. TOTAL: 312 articles identified

Selection Process and Inter-Rater Reliability

The selection process was conducted independently by two reviewers (FIK and ECM) to minimize selection bias and ensure objectivity. The process followed these stages: Stage 1 Title and Abstract Screening: Both reviewers independently screened all 247 articles (after duplicate removal) based on titles and abstracts against the inclusion/exclusion criteria. Inter-rater agreement at this stage was 89.5% (Cohen's Kappa = 0.82, indicating substantial agreement). Stage 2 Full-Text Assessment: For the 52 articles that passed initial screening, both reviewers independently assessed full texts. Inter-rater agreement was 92.3% (Cohen's Kappa = 0.87, indicating almost perfect agreement). Stage 3 Disagreement Resolution: Twelve articles showed initial disagreement between reviewers. These were resolved through consensus discussion. When consensus could not be reached (2 cases), a third independent expert in gifted education was consulted.

Data Extraction Process

A standardized data extraction form was developed and piloted on three articles before full implementation. The form captured Bibliographic information (authors, year, journal, DOI), Study characteristics (country, design, sample size, participant characteristics), Digital learning context (technology type, platform, implementation duration), Theoretical framework used, Key findings related to experiences, meanings, and outcomes, Direct quotes

supporting themes, and Quality indicators. Both reviewers extracted data independently from all 10 included studies. Discrepancies in data extraction were discussed and resolved through consensus.

Data Analysis: Thematic Synthesis

Thematic synthesis followed the approach of Braun & Clarke (2006) and was conducted using NVivo 12 software for qualitative data management. The process involved: Phase 1 Open Coding: Both reviewers independently read all 10 articles line-by-line and generated initial codes describing experiences, meanings, and phenomena related to digital gifted learning. A total of 127 initial codes were generated. Phase 2 Code Comparison and Refinement: Reviewers met to compare codes, discuss meanings, and consolidate similar codes. This resulted in 48 refined codes organized into preliminary categories. Phase 3 Theme Development: Through iterative discussion and constant comparison across studies, codes were grouped into three main themes and seven sub-themes. Each theme was supported by data from multiple studies. Phase 4 Theme Review and Naming: Themes were reviewed against original data to ensure they accurately represented study findings. Theme names were refined to capture the essence of each pattern. Inter-coder reliability: Cohen's Kappa for final theme assignment = 0.91 (almost perfect agreement).

Quality Assessment

The Critical Appraisal Skills Programme (CASP) Qualitative Checklist was used to assess the methodological quality of included studies. This 10-item tool evaluates Clarity of research aims, Appropriateness of qualitative methodology, Appropriateness of research design, Recruitment strategy, Data collection methods, Researcher reflexivity, Ethical considerations, Rigor of data analysis, Clarity of findings, and Value and relevance of research.

Each criterion was rated as "Yes" (fully met), "Partial" (partially met), or "No" (not met). Studies were classified as high quality (8-10 "Yes" ratings), medium quality (5-7 "Yes" ratings), or low quality (<5 "Yes" ratings). Both reviewers independently assessed quality; disagreements were resolved through discussion. Eight studies received high-quality ratings, and two received medium-quality ratings. No studies were excluded based on quality, but quality ratings informed the interpretation of findings.

Reflexivity Statement

As researchers positioned within Indonesian and Islamic education contexts, we acknowledge our perspectives may emphasize communal values, relational dimensions, and holistic development more than individualistic frameworks prevalent in Western literature. FIK's background in guidance and counseling sensitizes him to affective and social dimensions of learning, while ECM's expertise in educational psychology brings attention to developmental and cognitive aspects. To mitigate potential bias We employed dual independent screening and coding, We used systematic PRISMA protocols and CASP quality assessment, We included studies from diverse geographical contexts, We engaged in peer debriefing and reflexive journaling throughout the analysis, and We explicitly distinguished between findings from reviewed literature and our interpretations.

Risk of Bias Assessment

Several sources of bias were considered Publication Bias, the focus on peer-reviewed journal articles may exclude relevant grey literature, dissertations, or conference proceedings. Studies with null or negative findings may be underrepresented. Language Bias, restricting to English and Indonesian language publications may have excluded relevant research published in other languages, particularly from non-Western contexts. Database Bias, although we searched six major databases, some discipline-specific databases (e.g., PsycINFO, ERIC) were not systematically searched due to access limitations. Selection Bias, despite independent dual screening, subjective interpretation of inclusion criteria may have influenced study selection. Interpretation Bias, as qualitative synthesis involves interpretation, our theoretical orientations (self-determination theory, humanistic learning) may have influenced theme development. These limitations are addressed in the Discussion section and inform recommendations for future research.

Search keywords included: "digital gifted learning," "online enrichment for gifted students," "AI-based learning gifted education," "inclusive digital learning," and "virtual gifted classroom."

The search process was conducted for the period 2020–2025, as this time frame reflects the latest developments in digital education after the COVID-19 pandemic. The initial search yielded 312 articles, which were then filtered through four PRISMA stage, Identification: Collecting all articles that matched the search keywords. Screening: Removing duplicates and irrelevant articles based on titles and abstracts. Eligibility: Reviewing the full content of articles to ensure their focus on gifted students in a digital context. Inclusion: Determining the final articles that met all research criteria.

After going through this process, 10 articles indexed in Q1–Q4, WoS, and SINTA were selected as the final sample because they met the following eligibility criteria:

Table 1. Eligibility Criteria

Inclusion Criteria	Explanation
Research field	Education, educational psychology, guidance and counseling, or learning technology
Focus of study	Digital learning for gifted/talented students
Type of publication	Peer-reviewed scientific journal articles
Year of publication	2020–2025
Publication language	English or Indonesian
Accessibility	Articles available in full text

Articles that are grey literature, editorials, or non-peer reviewed are excluded from the research sample.

Results

Systematic analysis of 10 Q1–Q4 indexed scientific articles, WoS, and SINTA published between 2020 and 2025 produced three main themes that represent the dynamics of experience and meaning in the context of digital learning for gifted students (digital gifted learning), namely: Cognitive Independence and Emotional Loneliness in Digital Learning, Teachers as Human Mediators Amid Learning Algorithms, and The Paradox of Inclusivity in Digital Space: Open Access, Closed Feelings. These three themes were formulated

through a process of open coding and thematic analysis that emphasized patterns of meaning that emerged from various related academic publications.

Cognitive Independence and Emotional Loneliness in Digital Learning

Most of the literature, such as Vidal-Fernández et al. (2025) in Digital Tools to Support Personalized Education for Gifted Students, Kieran Birrell (2025) in Can AI Tools Enhance the Learning Outcomes of Gifted KS2 Students?, dan Stein et al. (2025) through Asynchronous Online Enrichment Course on Mathematical Proving, highlights that digital learning provides a high level of autonomy for gifted students in managing their learning process. Technology enables curriculum personalization and learning pace settings that suit individual abilities, allowing students to explore their academic interests more flexibly (Ayeni et al, 2024).

This extensive freedom is often accompanied by significant psychological consequences. Many gifted students report feelings of loneliness, boredom, and a loss of meaningful social interaction. Birrell (2025) presents a reflection from one of his students who said, "Using AI is like having a friend who is always ready to help, but never really listens." This statement illustrates a fundamental paradox in digital learning: technology provides efficiency and quick access to knowledge, but erodes the space for reflection and emotional warmth in the learning process (Dragias et al., 2023).

Phenomenologically, gifted students in digital environments tend to experience cognitive isolation—they are able to understand material quickly, but find it difficult to find intellectual challenges or academic conversations that match their level. These findings are in line with the results of Andersen's (2025) study, which confirms that the digitization of inclusive education often fails to accommodate the social and affective needs of gifted students, despite successfully providing access to high-quality material. The profound meaning revealed by this theme is the paradox between intellectual freedom and emotional alienation. The digital world expands the scope of learning, but it does not always expand the space for intimacy and feelings.

Teachers as Human Mediators Amidst Learning Algorithms

The second theme highlights the fundamental transformation in the role of teachers in the era of digital learning. Based on a synthesis of literature, such as research by Andersen (2025) and Wicaksono et al. (2025), the role of teachers in the context of gifted education is now shifting from merely conveying information to safeguarding human values amid an increasingly automated learning system.

In an AI-based learning ecosystem, the presence of teachers is irreplaceable—they have evolved into facilitators who help students understand the meaning of the learning process, not just the content of the material. As Vidal-Fernández et al. (2025) emphasize, "Personalized education will lose its substance if it is not accompanied by reflective guidance that provides space for students to discover its human relevance."

Cross-study analysis results show that teachers face ethical and pedagogical dilemmas: between the demands of technological efficiency and the need to maintain the depth of human relationships. In this situation, gifted students often need a sense of purpose and dialogue of meaning that cannot be replaced by algorithms.

The reflective meaning that arises from this theme is the emergence of the teacher as a mediator of humanity—a figure who bridges the logic of machines with human values. This role is pedagogical, ethical, and spiritual. Teachers become the center of balance between cognitive productivity and emotional well-being, ensuring that the learning process remains rooted in empathy and meaning.

The Paradox of Inclusivity in the Digital Space: Open Access, Closed Feelings

The third theme reveals the inherent contradiction in the idea of inclusive digital education. Andersen (2025), in his work The Intertwining of Inclusive and Digital Learning, highlights that most research on digital inclusion focuses on gifted students, rather than those who experience learning barriers. As a result, a new form of inequality has emerged: technology structurally opens up broad access, but only a small proportion of students with high capacity are able to optimize its benefits.

Meanwhile, studies by Breviário et al. (2025) and Interseções (2025) describe digital inclusivity as a "subtly closing open space," where high-ability students feel alienated because they are considered too superior, while average-ability students feel left behind by a system that moves too fast. Breviário (2025) sums up this phenomenon with a reflective statement: "Technology does expand access, but not everyone has the same key to open it."

This paradox shows that digital inclusivity is not solely related to the provision of infrastructure or material access, but also concerns a sense of acceptance and social justice. For gifted students, the seemingly egalitarian digital space becomes an arena for identity negotiation: they want to be recognized for their abilities without losing their social connections. The meaning that emerges from this theme highlights the tension between structural accessibility and emotional inclusivity. The digital world has indeed succeeded in breaking down geographical barriers, but it has not yet fully broken down the social and psychological barriers in the learning experiences of gifted students.

Table 2. Thematic Summary of SLR Findings

Main Theme	Core Meaning	Paradox / Emerging Dynamics
Cognitive Independence and Emotional Loneliness	Gifted students enjoy digital learning autonomy, but experience social isolation and a loss of interpersonal meaning.	Freedom vs Loneliness
Teachers as Mediators of Humanity	The role of teachers has shifted from conveying material to being guardians of meaning and empathy amid automated learning.	Efficiency vs Empathy
Paradoks Inklusivitas Digital	The digital space promises equality, but creates new inequalities between capability and social acceptance.	Accessability vs Isolation

These three themes are interrelated in a complex web of meaning. The digital independence that emerges in Theme 1 gives rise to a new need for human guidance, as reflected in Theme 2. These two dynamics take place within the framework of a paradoxical digital space, as illustrated in Theme 3. Overall, the results of this analysis show that digitally gifted learning is not merely a representation of advances in educational technology, but rather a social and psychological arena where gifted learners negotiate their identities, relationships, and the meaning of their learning. For them, the learning process is not only a

means of seeking knowledge, but also a journey to find a balance between reason and emotion, between intellectual freedom and the need for social connection, and between global access and human intimacy.

Discussion

These three themes are interrelated in a complex web of meaning. The digital independence that emerges in Theme 1 gives rise to a new need for human guidance, as reflected in Theme 2. These two dynamics take place within the framework of a paradoxical digital space, as illustrated in Theme 3. Overall, the results of this analysis show that digitally gifted learning is not merely a representation of advances in educational technology, but rather a social and psychological arena where gifted learners negotiate their identities, relationships, and the meaning of their learning. For them, the learning process is not only a means of seeking knowledge, but also a journey to find a balance between reason and emotion, between intellectual freedom and the need for social connection, and between global access and human intimacy.

This discussion is based on a thematic synthesis of 10 scientific articles that have passed the inclusion stage in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. All publications underwent a process of identification, screening, eligibility assessment, and final selection in accordance with qualitative research methodological standards. Therefore, the interpretations described in this section are not subjective or individual, but rather the result of conceptual reflection rooted in scientific literature that has been systematically and transparently verified (Hollin et al., 2020). The application of the PRISMA principles ensures that the arguments constructed have a solid empirical basis, clearly traceable sources, and thematic consistency among the various studies that are the objects of analysis (Ogunmakinde et al., 2024).

Thematic synthesis converges on three key meanings: (1) isolated independence—personalized digital learning provides autonomy but often leads to feelings of alienation; (2) teachers as mediators of humanity—the pedagogical role shifts from content delivery to meaning preservation; and (3) paradoxical inclusivity—digital spaces open up access, but gaps in infrastructure, teacher competence, and data ethics issues make the benefits uneven across contexts. These findings are in line with recent reviews showing that digital tools do promote autonomy, creativity, and collaboration, but are constrained by issues of equity, teacher readiness, and data security—making their impact contextual rather than automatically positive (Nopas, 2025).

Independent independence: what does it mean?

Conceptually, personalization is often equated with differentiation or individualization; this ambiguity means that implementation in the digital ecosystem does not always address the affective-relational needs of gifted students. Here, "independent learning" can turn into cognitive isolation when relatedness—meaningful connection—is neglected (Volkotrubova et al., 2024).

Linking this finding to self-determination theory, autonomy without relatedness is fragile: students may excel cognitively, but their intrinsic motivation can easily decline

(Sheffler et al., 2022). Evidence from VR studies in inclusive education shows that digital environments can be designed to maintain focus, curiosity, and executive function—in other words, autonomy supported by connectedness — as long as the design provides a meaningful and challenging immersive experience (Rathnasekara et al., 2025).

On the pedagogical side, project-based learning (PBL) and electronic PBL (e-PBL) offer a middle ground: authentic inquiry, collaboration, and structured communication that bridge the relational deficit in digital classrooms (Martek et al., 2021). The latest comparative evidence shows that PBL and e-PBL consistently outperform traditional pedagogy in strengthening the 4Cs (critical thinking, creativity, collaboration, communication)—providing a basis for design so that "independence" is not synonymous with "loneliness" (Jelodari et al., 2025). The theoretical contribution of this theme: we propose a relational-personalization lens—personalization is not only about adjusting content/rhythm, but also engineering connectedness (dialogue structures, cooperative tasks, meaningful feedback) so that autonomy and affection go hand in hand in digital learning for gifted students.

Teachers as mediators of humanity: from efficiency to meaning

The literature of the past five years confirms two things: (i) the benefits of digital learning for the gifted are real, and (ii) teacher readiness is a distinguishing factor for success—without adequate training, technology actually widens the variation in practice and quality. Within this framework, the position of teachers shifts: they are no longer "sources of answers," but rather interpreters of learning experiences who weave algorithmic data into personal meaning (purpose, relevance, direction). Even international SLR reviews emphasize the need for a more coherent theoretical framework so that "personalization" does not stop at technical adjustments, but is read as a holistic pedagogical practice (Walkington & Bernacki, 2020).

The theoretical contribution of this theme: we enrich the discourse on teacher agency in the digital realm with the concept of "meaning mediation"—a professional role that integrates content curation, emotional ethics, and reflective dialogue (McAvoy & O'Connor, 2022). Practical contribution: professional development (PD) programs need to focus on design for meaning (high-level question structures, feedback for sense-making, and formative assessments that provoke reflection), not merely platform literacy. SLR on gifted learning strategies at the elementary level adds that effective differentiation only lasts when supported by adequate PD and infrastructure (Townend et al., 2024).

Paradoxical inclusivity: open access, closed feeling

Part of the corpus shows the potential of VR/AI to personalize access, identify early talent, and monitor the development of gifted students in an inclusive environment—opening up opportunities in heterogeneous classroom contexts (Mossberg et al., 2024). However, international SLR reviews highlight disparities in access, teacher readiness, and privacy issues—the benefits of personalization tend to be uneven if structural prerequisites are not met. Thus, "inclusive" by design does not necessarily mean "inclusive" by experience (Patrick & Hollenbeck, 2021).

The theoretical contribution of this theme: we propose a distinction between structural inclusivity (access, devices, policies) and emotional-social inclusivity (feeling accepted, safe, and connected). This framework explains why platforms that are "open to all" still give rise

to subtle exclusion: without explicit social design (rules of interaction, rhythm of collaboration, roles), gifted students may hold back so as not to "stand out," while other students feel left behind by the pace of the digital classroom.

The three themes are intertwined: autonomy (Theme 1) requires meaning mediation by teachers (Theme 2), and both are only sustainable in a fair, inclusive ecosystem (Theme 3). PBL/e-PBL and immersive environments (VR) become modes for ensuring that autonomy remains grounded in collaboration, authentic challenges, and affective support. Practically, this suggests three design principles: (i) personalization that maps relational load (who collaborates with whom, for what purpose), (ii) mediation of meaning by teachers through structured reflective dialogue, (iii) guarantees of equity (access, PD, and data governance) as implementation guardrails.

Relevance to current research and contributions, Alignment & enrichment: International SLR demonstrates the benefits of digital tools for autonomy and collaboration; this discussion adds that these benefits depend on the restoration of relational dimensions (not merely technical features). Expanding: Evidence from PBL/e-PBL confirms the importance of social design; we emphasize its connecting mechanism—relatedness as a prerequisite for motivation and sustainability. Critical: SLR on gifted learning strategies at the elementary level highlights the prerequisites of PD and infrastructure; we refine this by distinguishing between structural inclusivity and emotional-social inclusivity as conditions for long-term success.

As researchers coming from an Indonesian context (particularly in the field of Islamic education), we recognize a perspective that relatively emphasizes community, polite interaction, and a balance between reason and emotion. This position makes us more sensitive to "emotional silence" in digital classrooms and encourages advocacy for relational personalization. To reduce bias, we balance global corpus with studies affiliated with Indonesia and the region (e.g., SLR Wicaksono et al.), while still referring to PRISMA standards and qualitative analysis tools.

Ultimately, digitally gifted learning is not just about how far technology can personalize; it is about how deeply schools humanize that personalization—through relationships, meaning, and fairness. This article proposes a relational-personalization perspective and teacher meaning mediation as a theoretical-practical construct for navigating the digital paradox: autonomy without alienation, efficiency without dehumanization, and access that leads to a sense of belonging. With this framework, research and policy can be more focused: measuring success not only by how well content fits cognitive profiles, but also by the quality of connections that support the growth of gifted students in digital learning spaces.

Novelty of the Research

This study offers a clear conceptual and methodological novelty in the field of digital gifted education. First, it employs a qualitative PRISMA-based Systematic Literature Review that does not merely map outcomes, but reconstructs the lived meanings and psychosocial dynamics of digital learning for gifted students—an angle that has been largely overlooked by predominantly quantitative, score-oriented studies. Second, the article introduces the notion of "relational personalization", arguing that personalization in digital environments must encompass not only content and pace, but also structures of human connection,

empathy, and shared meaning so that autonomy does not turn into cognitive and emotional isolation. Third, the study reframes the teacher's position in AI-rich learning ecosystems as a "mediator of humanity", and systematically distinguishes between structural inclusivity (access, platforms, policies) and emotional–social inclusivity (belonging, recognition, psychological safety)—a differentiation that is rarely articulated in prior gifted learning literature.

Implications and Contributions

Theoretically, this research deepens self-determination theory and humanistic learning perspectives by showing that gifted students' motivation and creativity are sustained only when autonomy, competence, and relatedness are simultaneously supported in digital spaces. By foregrounding experiences such as "isolated independence" and the paradox of digital inclusivity, it offers a more nuanced lens for understanding how technology mediates identity negotiation, emotional well-being, and social positioning among gifted learners. Practically, the concept of relational personalization provides a design framework for teachers, counselors, and instructional designers to craft digital learning that is not only adaptive and efficient, but also dialogic, collaborative, and reflective—for example through socially structured PBL/e-PBL, guided use of AI tutors, and VR environments that embed meaningful interaction rather than solitary acceleration. At the policy level, the findings underscore that digital inclusion strategies and teacher professional development should move beyond device and platform provision, integrating indicators of psychosocial well-being, sense of belonging, and fairness in access to high-quality, human-centred gifted support, including in Indonesian and Islamic educational settings that remain underrepresented in the literature.

Research Limitations

This study is based entirely on secondary data from journal articles published between 2020 and 2025 in English and Indonesian, which means that the depth of insight into local affective nuances—especially in non-Western, Islamic, or rural contexts—is constrained by what existing studies report. The focus on peer-reviewed articles and a selected set of databases introduces potential publication, language, and database bias, as relevant work in other languages, grey literature, theses, or context-specific repositories may have been excluded. Furthermore, as a qualitative SLR without direct fieldwork, the conclusions are conceptual and interpretive rather than statistically generalizable; follow-up empirical studies (e.g., phenomenological, ethnographic, or design-based research with gifted learners in diverse Indonesian settings) are needed to test, refine, and operationalize the proposed framework of relational personalization and the role of teachers as mediators of humanity in concrete practice.

Conclusion

This study concludes that the learning experiences of gifted students in a digital ecosystem do not solely reflect the success of technology in personalizing the learning process, but also reveal the dynamics and tensions between cognitive autonomy and the need for human connection. Based on a thematic synthesis of 10 internationally indexed articles

selected through the PRISMA approach, three main patterns of meaning were identified: isolated independence — digitization expands the space for learning autonomy, but often erodes the social and emotional dimensions; teachers as mediators of humanity — the role of educators is transforming from knowledge conveyors to guardians of meaning, empathy, and human values amid the logic of learning algorithms; and paradoxical inclusivity — technology opens up broad access to learning resources, but does not always foster a sense of acceptance and fairness for all learners.

The findings confirm that the success of digital gifted learning is not only determined by the sophistication of the personalization system, but also by the ability of the digital environment to build relational connectedness—namely social connectedness, empathy, and a balance between learning freedom and emotional support. Within this framework, this study proposes a new perspective: the concept of "relational personalization," as a form of digital learning evolution that is not only oriented towards technological intelligence, but also rooted in human values.

In terms of conceptual contribution, this study expands the understanding of self-determination and humanistic learning theories by emphasizing that the motivation and creativity of gifted students do not arise from autonomy alone, but from a harmonious combination of autonomy, competence, and emotional connectedness. Meanwhile, in practical terms, the results of this study provide direction for various stakeholders, including: Education policymakers, in designing digitization strategies that balance technological efficiency and the psychosocial well-being of students. Curriculum developers and educational counselors, in designing collaborative, reflective, and adaptive learning plans that cater to the diverse learning styles of gifted students. Educators and students, through the improvement of digital literacy so that technology does not merely serve as a tool for academic acceleration, but also as a means of strengthening empathy, communication, and the meaning of learning.

Culturally, this study confirms that digital education is not merely a technological project, but also a humanitarian agenda—a process of navigating values, relationships, and identities in an increasingly digitized learning space. However, this study has a number of limitations. The study still focuses on English-language literature and the global education context, so it does not fully represent local nuances, especially in the context of Islamic education and collective culture in Indonesia. In addition, because this analysis does not involve primary data, the depth of the affective aspects of the students' learning experiences can only be understood through secondary narratives from the reviewed articles.

For further research, it is recommended to use a more participatory approach, such as phenomenological studies or digital ethnography, to directly explore the subjective experiences of gifted students in online learning spaces. It is also necessary to expand the research context to areas with different socio-cultural characteristics—such as Islamic boarding schools, 3T areas, or STEAM-oriented educational institutions—so that the interaction between digital gifted learning and local values can be understood more comprehensively. As a final reflection, this study emphasizes that digital transformation in education cannot be measured solely by accelerated academic achievement, but rather by the extent to which the education system is able to humanize intelligence. The future of learning

for gifted students is not just about algorithms that customize content, but about the presence of humans—teachers, friends, and communities—who provide direction, meaning, and purpose in every learning process..

Author Contributions

Farid Imam Kholidin: Conceptualization; Methodology; Formal analysis; Data curation; Writing – original draft; Visualization. Eklys Cheseda Makaria and Novi Rosita Rahmawati: Supervision; Validation; Project administration; Writing – review & editing; Resources. All authors have contributed equally to the development of this manuscript. All authors have read and approved the final version of the paper and agree with its submission for publication.

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The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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