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A BİBLİOMETRİC AND SYSTEMATİC ANALYSİS OF THE RELATİONSHİP BETWEEN DİGİTAL LEARNİNG DYNAMİCS AND MAARİF MODEL AXİOLOGY

UMA ANÁLISE BIBLIOMÉTRICA E SISTEMÁTICA DA RELAÇÃO ENTRE A DINÂMICA DA APRENDIZAGEM DIGITAL E A AXIOLOGIA DO MODELO MAARIF

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Abstract
The techno-sociological transformation brought about by digital technologies in the 21st century has given rise to a new student profile known as "digital natives." Shaped by the speed of information access, the pursuit of instant gratification, and visually-oriented thinking, this algorithmic mindset necessitates the transformation of traditional teaching paradigms. This study aims to examine the ontological and epistemological relationship between the techno-cultural habitus of digital natives and value-oriented educational approaches, utilizing the "Maarif Model" as a sample. In this research designed with a mixed-methods literature review, a macroscopic bibliometric analysis was conducted using VOSviewer on the literature obtained from the Web of Science database. Subsequently, a microscopic systematic review was performed on 40 international studies selected in accordance with the PRISMA protocol. The findings reveal that the new generation's demands for autonomy, personalization, and experiential learning demonstrate a pedagogical alignment with flexible curriculum structures. Conversely, an ontological tension was identified between process orientation and virtue building, and the codes of dromological speed and instant gratification triggered specifically by artificial intelligence and digital platforms. Emphasizing that this tension is a process that needs to be managed, the study introduces the concepts of 'Axiological Slow Pedagogy' and 'Phygital Wisdom' to the literature—responding to the pursuits of global literature—and presents new

Resumo
A transformação tecno-sociológica provocada pelas tecnologias digitais no século XXI deu origem a um novo perfil de aluno conhecido como "nativos digitais". Moldada pela velocidade do acesso à informação. pela busca da gratificação instantânea e pelo pensamento orientado para o visual. essa mentalidade algorítmica exige a transformação dos paradigmas tradicionais de ensino. Este estudo tem como objetivo examinar a relação ontológica e epistemológica entre o habitus tecnocultural dos nativos digitais e as abordagens educacionais orientadas para valores. utilizando o "Modelo Maarif" como amostra. Nesta pesquisa projetada com uma revisão bibliográfica de métodos mistos. foi realizada uma análise bibliométrica macroscópica usando o VOSviewer na literatura obtida do banco de dados Web of Science. Posteriormente. foi realizada uma revisão sistemática microscópica de 40 estudos internacionais selecionados de acordo com o protocolo PRISMA. Os resultados revelam que as demandas da nova geração por autonomia. personalização e aprendizagem experiencial demonstram um alinhamento pedagógico com estruturas curriculares flexíveis. Por outro lado. foi identificada uma tensão ontológica entre a orientação para o processo e a construção de virtudes. e os códigos de velocidade dromológica e gratificação instantânea desencadeados especificamente pela inteligência artificial e pelas plataformas digitais. Enfatizando que essa tensão é um processo que precisa ser gerenciado. o estudo

pedagogical synthesis strategies where the teacher assumes the roles of 'curriculum designer' and 'moral filter'.

Keywords: Digital Natives. Maarif Model. Digital Learning Dynamics. Bibliometric Analysis. Systematic Review. Phygital Wisdom.

introduz os conceitos de "Pedagogia Lenta Axiológica" e "Sabedoria Fígital" na literatura — respondendo às buscas da literatura global — e apresenta novas estratégias de síntese pedagógica nas quais o professor assume os papéis de "designer de currículo" e "filtro moral".

Palavras-chave: *Nativos Digitais. Modelo Maarif. Dinâmica de Aprendizagem Digital. Análise Bibliométrica. Revisão Sistemática. Sabedoria Fígital.*

1 INTRODUCTION

1.1 Techno-sociological transformation and the network society in the digital age

In the first quarter of the twenty-first century, human history is witnessing one of the most profound ontological and epistemological fractures observed since the industrial revolution. Digital technologies have evolved beyond mere communication tools or instruments for accessing information, becoming an all-encompassing ecosystem that radically restructures the individual's mode of existence, perception of time, and social relations. Validating McLuhan's (1964) prophecy that "the medium is the message," this transformation process makes it an academic imperative to focus not on the content itself, but on how the media presenting that content formats the cognitive processes of the individual and models of social organization.

Examined from a sociological perspective, this new structure, conceptualized by Castells (2010) as the "Network Society," has shifted traditional vertical hierarchies to a horizontal plane by altering the speed and direction of information flow, significantly blurring the boundaries of time and space. The traditional hierarchy of cultural memory transmission from authority figures (teacher to student, parent to child) has been shaken; multidirectional and horizontal knowledge acquisition processes, which Deleuze and Guattari (1987) defined as rhizomatic, have been triggered. Directly impacting the socialization processes of individuals, this techno-cultural environment causes physical institutions such as family and school to increasingly yield their place to digital platforms and algorithmic networks. As pointed out by Bauman's (2006) concept of "Liquid

Modernity," this ground, dominated by uncertainty and dromological speed, produces a social structure where identities are continuously and instantaneously reconstructed, devoid of a stable foundation. Consequently, in the analysis of educational policies and pedagogical models, there is a need for an interdisciplinary perspective that encompasses these ruptures created by technology in the social fabric.

1.2 The sociological evolution from digital natives to generation alpha

Structurally analyzing the student profile at the center of educational processes requires analyzing the "generational" reality in which they exist through sociological and technological variables. In Mannheim's (1952) sociology of generations theory, the formation of a generation is not solely related to existing within a biological age range; it is linked to witnessing similar historical transformations at the same developmental stage and "sharing a common destiny". These generational boundaries, drawn by wars or revolutions in the past, are today indexed to the pace of change in technological paradigms (Web 1.0, Web 2.0, Artificial Intelligence). The twenty-year cyclical archetype theories posited by Strauss and Howe (1991) are losing their explanatory power in the face of the non-linear development speed of the digital age; paving the way for a new theoretical ground where the level of access to technology becomes a more determinant identity-building element than the factor of age.

The literature reveals the use of a rich terminology to define the masses socializing in this technological ecosystem. While Tapscott (1998, 2009) defines this generation as the "Net Generation," characterized by being interactive, questioning, and active content producers thanks to the internet; Gardner and Davis (2013) posit the concept of the "App Generation," which perceives the world through mobile applications and seeks packaged solutions to complex problems. However, the most comprehensive and debated distinction in the literature is the classification of "Digital Natives" and "Digital Immigrants" conceptualized by Prensky (2001). Prensky argues that as a result of their exposure to high-speed and hyper-textual stimuli, neuroplastic changes occur in the brain structures of digital natives, developing their skills in parallel processing and random access to information. In the criticisms directed at this ambitious approach, Helsper and Eynon (2010) present empirical data showing that digital nativeness cannot be explained

solely by the age variable; factors such as "technological breadth," experience, and self-efficacy are also determinant, and socio-economic factors create a "digital divide". Today, "Generation Alpha," defined by Mark McCrindle (2020) and born into the environment of artificial intelligence and the Internet of Things (IoT), lives on a "phygital" plane where physical and digital boundaries melt away. For this generation, technology has ceased to be a mere tool and has become a lived and breathed environment itself.

1.3 Paradigm shift in education and the axiological framework of the maarif model

The "algorithmic mindset" of digital natives, characterized by speed, instant gratification, visual orientation, and a connective mode of thinking, is fundamentally shaking the traditional teaching paradigms of education systems. Existing educational structures, designed for linear and text-based information processing, experience an ontological mismatch with these new minds that possess a rhizomatic and hyper-reading style. In this context, the "Maarif Model" implemented by the Ministry of National Education (MoNE) represents a radical paradigm shift that redefines the philosophical codes of the education system.

Rejecting the positivist and mechanical understanding of human beings, the Maarif Model presents a holistic structure that addresses the individual within their ontological, epistemological, temporal, and axiological integrities. At the core of the model lies the ideal of the "competent and virtuous individual," who is equipped with the technical skills demanded by the era but utilizes these skills upon a moral foundation. The balance between educational institutions' mission of ensuring cultural continuity and the 21st-century skills (critical thinking, collaboration, communication) demanded by the global economy is secured through the model's "Virtue-Value-Action" framework. The model aims to cultivate personalities who have internalized values such as patience, compassion, patriotism, and wisdom, who use Turkish effectively, and who can connect with their historical memory. However, regardless of the strength of its philosophical construct, the practical reflection of an educational model depends on the pedagogical interaction it can establish with the sociological reality of its target student (the digital native).

1.4 The research problem, gap in the literature, and research questions

An examination of the current academic literature reveals that research on digital natives and technology integration is largely conducted through an instrumental approach. Studies are generally limited to investigating the quantitative impact of technology on academic achievement, the adaptation of Web 2.0 tools into lessons, or the consequences of screen addiction. While Western-centric literature predominantly focuses on the dimensions of "digital skills" and "access," there is a lack of structural studies that systematically synthesize and examine the moral use of technology, value-oriented educational frameworks, and the ontological confrontation between the new generation's algorithmic mindset and philosophical-axiological structures (such as the Maarif Model). How a mindset oriented towards speed, fragmentation, and high expectations for gamification will interact with a curriculum that demands deepening, contemplation, moral responsibility, and prolonged attention (points of alignment and conflict) constitutes a clear theoretical gap in the literature.

Aiming to fill this gap, this study utilizes the highly impactful "mixed literature review" method to structurally analyze the complex network of relationships between digital natives and axiological educational frameworks (through the sample of the Maarif Model) with distinct lines. While the intellectual and thematic structure of the field is mapped with macroscopic data (via VOSviewer), conceptual tensions and areas of alignment are synthesized through a microscopic systematic review. In this context, the primary research questions (RQs) around which the study is structured are as follows:

- RQ1: What kind of macroscopic distribution does the bibliometric structure of academic publications (trends by year, co-author/country networks, and co-occurrence maps) in the context of digital natives and value-oriented education exhibit?
- RQ2: In which areas is pedagogical alignment structurally observed between the natural tendencies of the algorithmic mindset, such as autonomy, personalization, and experiential learning, and the flexible, student-centered teaching strategies of the Maarif Model?
- RQ3: What philosophical conflicts occur between the ontological and epistemological codes of digital culture (dromological speed, instant gratification

loop, global fluidity) and the axiological expectations of the Maarif Model (process-oriented patience, virtue ethics, national identity)?

- RQ4: How can these identified areas of ontological and epistemological tension be transformed into a pedagogical synthesis within the context of educational policies and applied instructional designs?

2 METHODOLOGY

2.1 Research design and methodological approach

In the social sciences, the in-depth examination of a phenomenon and the revelation of multidimensional relationships necessitate that the methodological choice is appropriate for the research object. Since this research aims to scrutinize the ontological and epistemological relationships between a multi-layered sociological reality like "digital natives" and a normative educational policy text like the "Maarif Model," it is fundamentally built upon the qualitative research paradigm. Qualitative research is an approach that examines phenomena within their natural settings from a holistic perspective and attempts to deeply interpret the meanings of events (Creswell, 2013).

However, in order to objectively map the current trends in international literature, the study was expanded beyond a purely qualitative investigation and adapted into a "mixed literature review" (bibliometric analysis) design. While bibliometric coupling techniques were utilized in the macroscopic phase of the research, the document analysis method was preferred in the microscopic analysis phase. Document analysis is a systematic process that encompasses the analysis of written materials containing information about the phenomenon or phenomena targeted for research (Karasar, 2012). This method is considered one of the most highly suitable tools in the literature, particularly for decoding the philosophical codes of educational policies and curricula. Bowen (2009) defines document analysis as a process of extracting meaning, gaining insight, and developing empirical knowledge through the examination and interpretation of data. In this study, the foundation of the document analysis method rests on the premise that the philosophical background of the research object (the Maarif Model) can only be deciphered through a hermeneutic (interpretive) reading. Furthermore, the vastness and

fragmentation of the digital natives literature necessitated the construction of this field as an "ideal type" through a systematic review.

2.2 Data sources and search strategy

To ensure content validity, the data set of the research was composed of two main categories. The first category is the "Digital Natives Literature," which includes academic studies defining the human profile of the digital age. The second category is the Maarif Model Common Text published by the Ministry of National Education.

A comprehensive search strategy was conducted in the Web of Science (WoS) Core Collection database to map the international literature, scan the national literature, and track Turkey-based publications on WoS. The search string used during the scanning process was formulated with Boolean operators to cover the core concepts of the study as follows:

Search String: TS=("digital native" OR "generation Z" OR "generation Alpha") AND TS=("pedagogy" OR "education" OR "learning ecology" OR "values" OR "value" OR "character" OR "moral*" OR "ethic" OR "pedagogy" OR "holistic")

In determining the search terms, the concepts of "digital natives," "net generation," "generation alpha," and "generation Z" were centralized, based on the definitions of Helsper and Eynon (2010). To capture the universal dimension of the subject, the conceptualizations of foundational theorists in the field, such as Prensky (2001), Tapscott (2009), and Oblinger and Oblinger (2005), were included in the search strategy. For the analysis of the national framework, the "Maarif Modeli Öğretim Programları Ortak Metni" (MoNE, 2025) was added to the data set as the primary base document. As a result of this strategy, a total of 1097 bibliometric records were obtained.

2.3 Inclusion and exclusion criteria (PRISMA scope)

To prevent the 1097 sources obtained from the search strategy from deviating from the research focus and to establish the systematic review (qualitative analysis) pool, a strict filtering process was implemented. The following criteria were utilized as the basis for studies to be included in and excluded from the analysis:

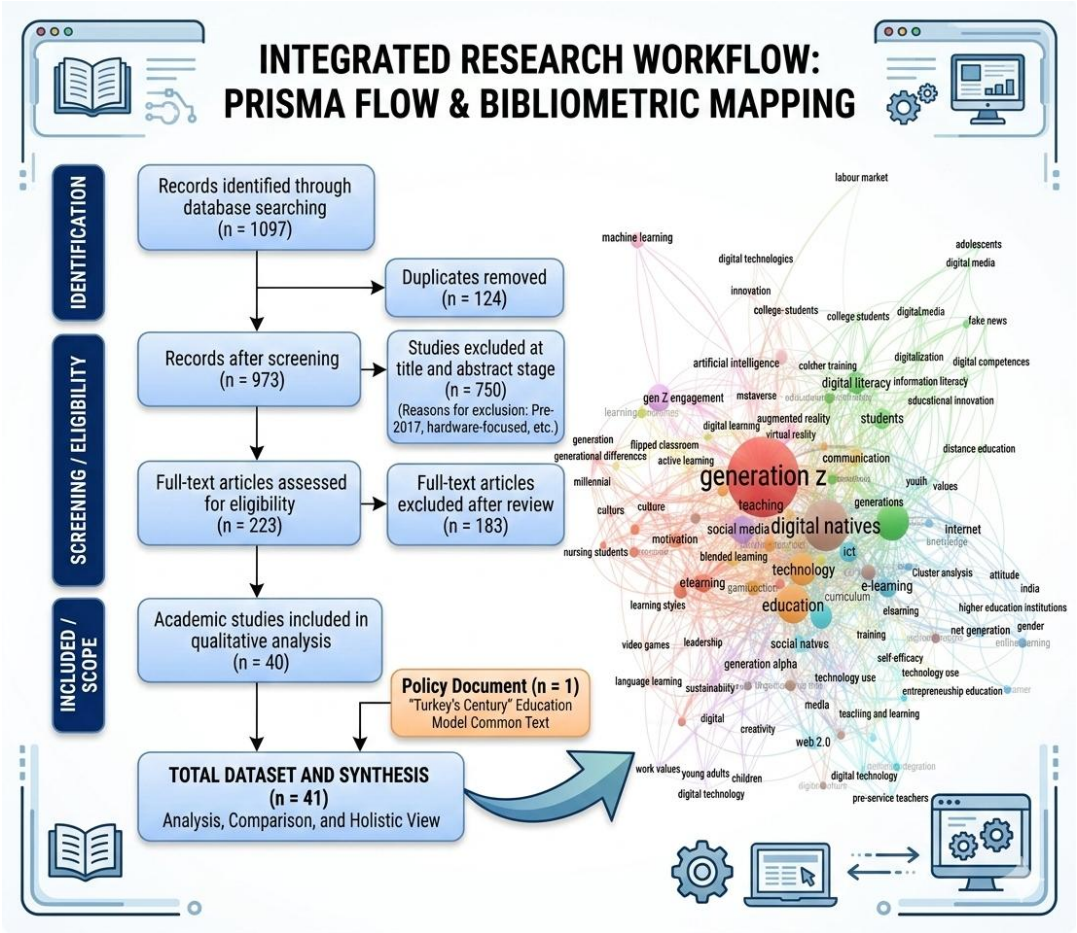
- Time Frame: To accurately reflect the conceptual evolution and current trends in the literature, only studies published between 2017 and 2026 were included in the analysis.
- Publication Type: To ensure scientific validity and reliability, only research and review articles published in peer-reviewed academic journals indexed in the Web of Science (WoS) Core Collection database were accepted; proceeding abstracts, book reviews, reports, and editorial letters were excluded.
- Thematic Focus: Publications examining the integration of technology into education solely from a technical/hardware perspective (tool usage, coding, etc.) were excluded; studies analyzing the cognitive characteristics of the digital generation, their learning ecology, and their positioning within the context of "values education/character building"—in a manner that aligns with the philosophy of the Maarif Model—were included.

2.4 Data selection and PRISMA flow diagram

To guarantee the transparency and reproducibility of the research, the data selection process was conducted according to the steps of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol and is illustrated in Figure 1.

Figure 1

PRISMA flow diagram (Generated via Gemini)



- Identification: A total of 1097 records were retrieved from the databases.
- Screening: After removing 124 duplicate studies, the titles and abstracts of the remaining 973 articles were screened, and 750 thematically unsuitable studies were eliminated.
- Eligibility: The full texts of the remaining 223 studies were reviewed by two independent researchers through a blind peer-review process, and 183 studies that did not meet the inclusion criteria were excluded.
- Included: A total of 40 core articles, along with the Maarif Model Common Text, were included in the qualitative analysis and bibliometric coupling processes.

2.5 Data analysis and synthesis process

The analysis of the collected data was conducted through two simultaneous branches: macroscopic and microscopic:

- Macroscopic (Bibliometric) Analysis: The bibliometric data of the obtained 1097 articles were mapped using VOSviewer (v.1.6.20) software. Co-occurrence networks and bibliographic coupling maps were generated to reveal the intellectual structure of the literature.
- Microscopic (Systematic) Analysis: The internal philosophical dynamics of the selected articles and the Common Text were analyzed using a hybrid technique of content analysis and descriptive analysis. While descriptive analysis was used in summarizing the literature and determining the characteristics of digital natives, content analysis was preferred for uncovering the implicit values and philosophical assumptions within the Maarif Model text. The data were systematized using the "matrix building" technique proposed by Miles and Huberman (1994) for qualitative data analysis. In this matrix construct, the characteristics of digital natives (e.g., rapid consumption) were placed in one column, and the expectations of the Maarif Model (e.g., patience and perseverance) were placed in the other; the relationship between these two data sets was coded on the axes of "overlap" (alignment) or "tension" (conflict). "Concepts" and "themes" within the context were taken as the primary units of analysis.

2.6 Validity, reliability and limitations

To increase the validity of the research, the "data triangulation" strategy proposed by Yin (2009) was followed, and the views of different theorists were synthesized without relying on a single source. The primary methodological limitation of the study is that the data set does not include field applications (teacher/student observations) and is entirely restricted to written documents and academic publications. Due to the nature of sociological phenomena and educational policies, the rapid change in technology and digital culture harbors the risk that current theoretical definitions may evolve over time.

Therefore, the obtained results should be evaluated as a theoretical projection built upon the existing literature and curriculum texts, rather than as absolute and immutable judgments.

3 FINDINGS (BIBLIOMETRIC ANALYSIS AND SYSTEMATIC REVIEW)

The simultaneous analyses conducted on the 40 core academic studies meeting the inclusion criteria (PRISMA) and the "Maarif Model Common Text" constitute the macroscopic (quantitative-bibliometric) and microscopic (qualitative-thematic) findings of the study. Rather than utilizing a sequential listing logic, the obtained findings were synthesized by blending them around analytical themes that respond to the research questions (RQ1, RQ2, RQ3).

3.1 Macroscopic findings: the Bibliometric map of the literature (RQ1)

The intellectual structure of the international and national literature on the integration of the algorithmic mindset and axiological frameworks (values education) in education was mapped multidimensionally using VOSviewer (v.1.6.20) software.

3.1.1 Publication trends and geographical distribution

In the examined data set, the distribution of publications addressing the concept of digital natives alongside pedagogical and axiological variables by year was analyzed. The findings indicate a distinct geometric (exponential) increase, particularly from the year 2020 onwards. It is noteworthy that this increase coincides with the integration process of Generation Alpha into the education system. When the geographical distribution and co-citation networks of the studies are examined, it is observed that the epicenters of academic knowledge production are Australia (45 publications), Austria (11 publications), and Argentina (6 publications). However, in the literature published in recent years, it has been identified that Turkey-based research has also begun to form a research cluster, particularly in the context of "character building" and "national values."

3.1.2 Co-occurrence network and thematic clusters

The co-occurrence network analysis, conducted on the author keywords of the 1097 articles obtained from the Web of Science database, was mapped utilizing the VOSviewer software. The numerical breakdown of the word network structure constituting the map and the bibliometric indicators of the concepts with the highest frequency are presented in Table 1:

Table 1

Most Frequently Occurring Keywords and Their Bibliometric Indicators Across 1097 Records Retrieved from the Web of Science Database

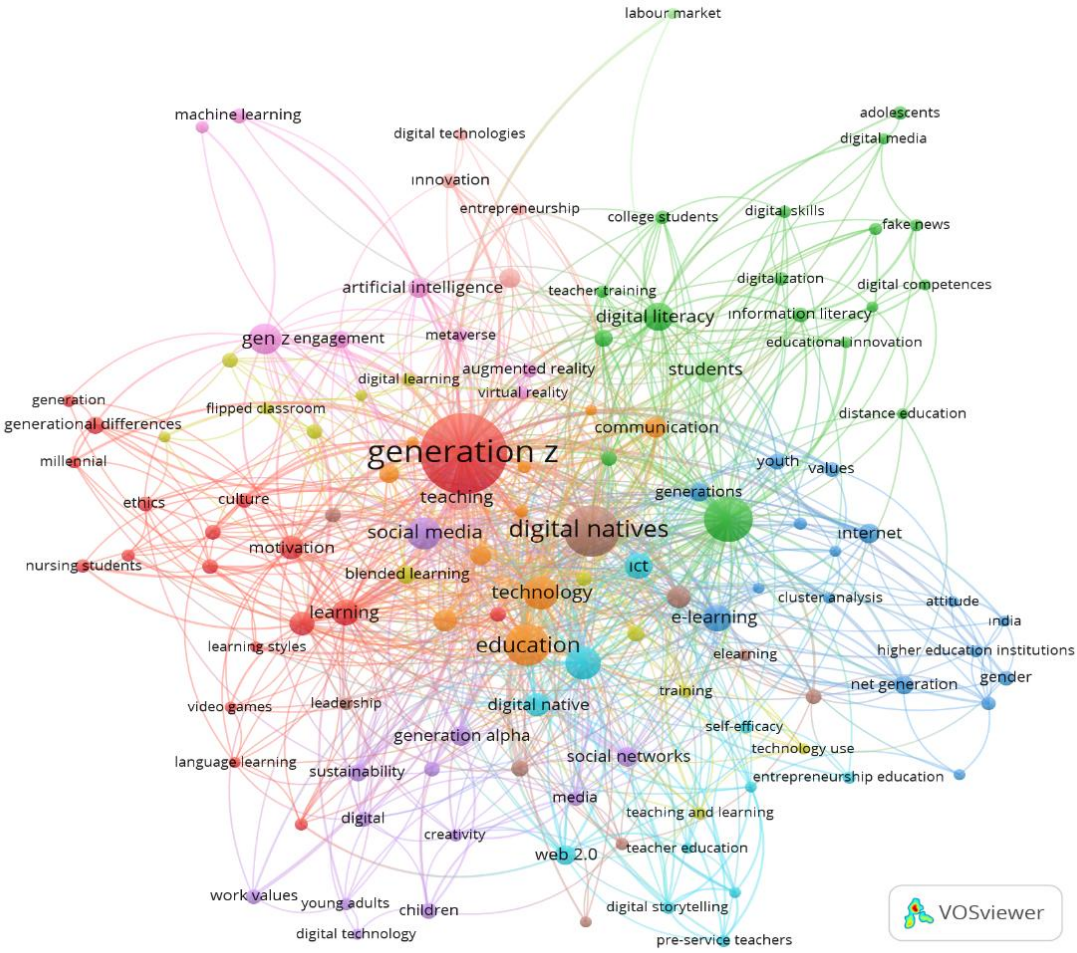
Rank	Keyword (Label)	Occurrences	Total Link Strength (TLS)	Cluster
1	generation z	234	231	1
2	digital natives	94	88	3
3	higher education	75	71	2
4	education	63	59	2
5	technology	41	38	2
6	pedagogy	39	36	6
7	social media	38	35	5
8	digital literacy	29	27	2
9	e-learning	28	26	3
10	learning	25	23	1

An examination of Table 1 reveals that the concepts of *generation z* (n=234) and *digital natives* (n=94) establish an absolute dominance within the conceptual network structure of the literature. In particular, the *generation z* node, which possesses the highest total link strength (TLS=231), serves as the primary bridge connecting all other sub-concepts to one another. The high TLS values of concepts such as *higher education* (n=75) and *pedagogy* (n=39) in the table quantitatively confirm that the subject of digital natives is built upon a pedagogical foundation.

During the analysis, the threshold value in the VOSviewer application was set to 5, and the 120 keywords meeting this criterion were visualized through the colored network map presented in Figure 2.

Figure 2

Colored Network Map (Network Visualization)



As seen in Figure 2, the co-occurrence network analysis conducted on the bibliometric data has revealed the conceptual architecture and nodal points of the field with numerical data. When the interaction of a total of 120 keywords is examined, it is determined that the strongest conceptual foci of the literature are *generation z* (n=234), *digital natives* (n=94), *higher education* (n=75), and *education* (n=63). Particularly, the concept of *generation z*, with a total link strength of 231 units, is positioned at the epicenter of the map. The clustering structure obtained as a result of the VOSviewer analysis and the most dense concepts of these clusters are as follows:

- Cluster 1 (Red- Axiological and Process-Oriented Learning): The driving force of this cluster, which consists of 18 keywords, are the concepts of *generation z* (n=234) and *learning* (n=25). This cluster is the region that interacts most

intensely with the axiological framework presented by the Maarif Model, as it represents the behavioral and ethical attitudes of the digital generation in their learning processes.

- Cluster 2 (Green- Academic and Competence Focus): In this cluster, the concepts of *higher education* (n=75) and *digital literacy* (n=29) are dominant. These data reflect the institutional reflection of digital competencies in the academic world and the literacy levels of teachers/students.
- Cluster 3 (Blue- Digital Tools and Generational Definition): Shaped around the concepts of *e-learning* (n=28) and *generations* (n=15), this cluster emphasizes the determinant effect of technology on generational identity.
- Cluster 4 (Yellow- Curriculum and Hybrid Approaches): The concepts of *blended learning* (n=12) and *curriculum* (n=10) form a methodological trajectory regarding how educational programs are blended with technology.
- Cluster 5 (Purple- Social Interaction and Future Projection): The concepts of *social media* (n=38) and *generation alpha* (n=14) constitute the most dynamic part of the network. The fact that Generation Alpha (n=14) has already begun to become prominent in the literature supports the future-oriented vision of the Maarif Model.
- Cluster 6 (Turquoise- Pedagogical Conceptualization): The concepts of *pedagogy* (n=39) and *digital native* (n=24) represent the region where publications forming the theoretical and pedagogical infrastructure of digitalization are concentrated.

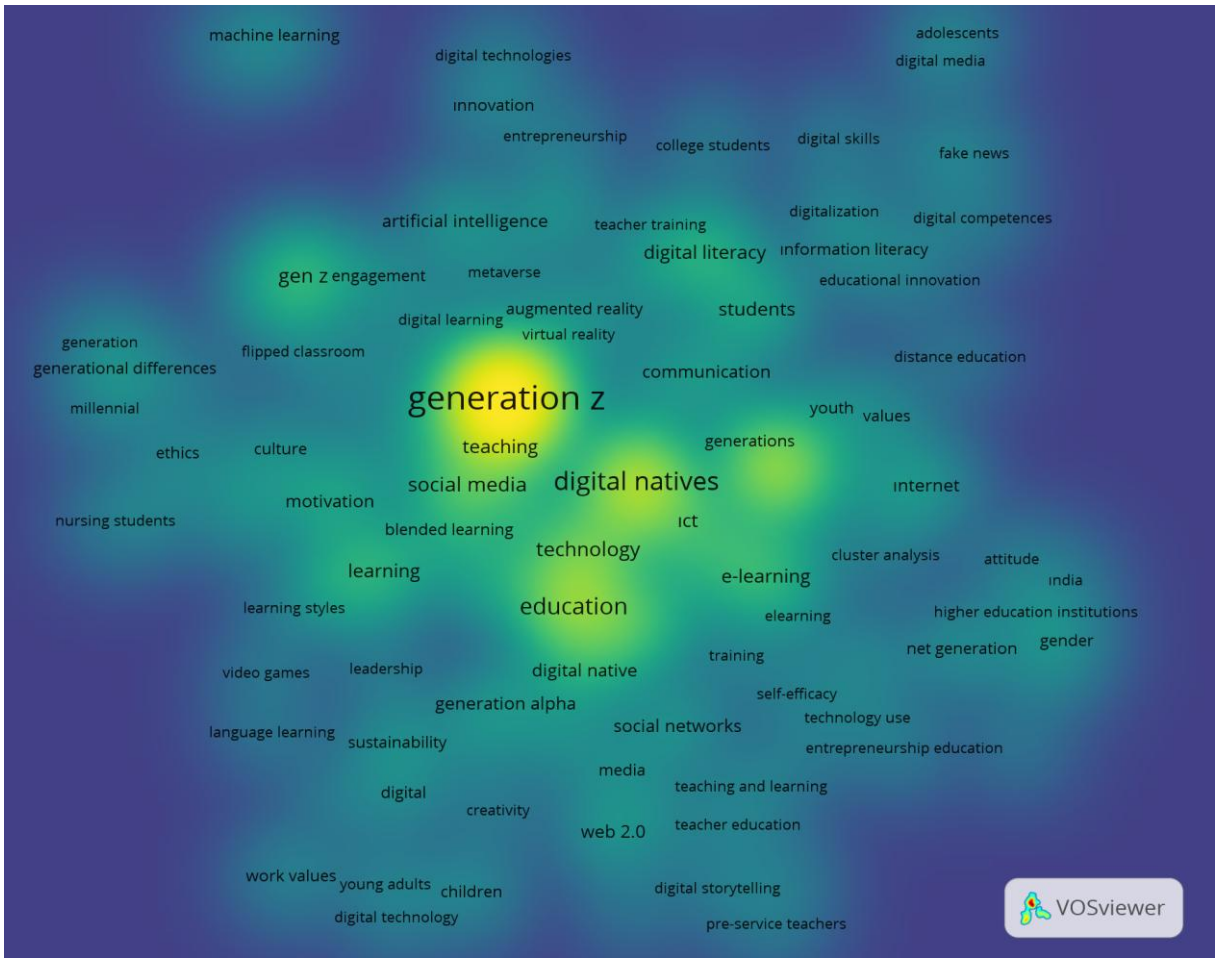
These quantitative data scientifically verify that the accumulation of *pedagogy* (n=39) and *digital literacy* (n=29) in the global literature needs to be synthesized with the virtue-oriented axiological structure of the Maarif Model.

3.1.3 Conceptual density and literature gap analysis

The density analysis (Density Visualization), performed following the co-occurrence network, reveals the focus of the conceptual clusters within the 1097 examined publications and their relative weight in the literature (Figure 3). The bright yellow areas on the map represent high research density, whereas the dark and purple areas represent scarcity in the literature.

Figure 3

Conceptual Density Map of the Literature



When the density map is examined, it is observed that the concepts of *generation z* (n=234) and *digital natives* (n=94) form the brightest and widest yellow focus at the center of the map. This situation proves that the main body of the existing literature has crystallized around these two concepts and that these generational definitions lie at the center of academic discussions.

In contrast, it has been determined that concepts located at the peripheries of the map, such as *ethics*, *values*, *attitudes*, and *generation alpha*, remain in lower-density (darker-colored) regions. This finding proves that while research targeting digital generations is heavily concentrated on technical and pedagogical competencies (n=75, n=29), the axiological (value-oriented) development of these generations—which also constitutes the foundation of the Maarif Model—remains an area in the literature that is

still in its developmental stage and in need of verification. This visual distribution on the density map serves as mathematical evidence that the academic accumulation regarding digital natives must transition from the technical usage phase to the value construction phase.

3.2 Microscopic findings: systematic review and thematic synthesis (RQ2 and RQ3)

Following the bibliometric mapping, an in-depth content and descriptive analysis of the selected 40 articles and the Maarif Model Common Text (MoNE, 2025) was conducted. This analysis synthesizes the relationship between the new generation's learning ecology and the model's philosophical expectations across two opposite poles: "Areas of Pedagogical Alignment" and "Points of Ontological/Epistemological Conflict".

Other qualitative and quantitative studies, which were included in the systematic review pool as a result of the PRISMA protocol but not individually detailed in the focused findings, also support the theoretical framework of the current research by holistically examining the digital generation's expectations in educational environments, their technology usage habits, their pedagogical needs, and various variables within this process (Bag et al., 2022; Berková et al., 2024; Bezruchko et al., 2025; Calvo-Ferrer, 2020; Chen et al., 2024; Dennen et al., 2023; Dickinson-Delaporte et al., 2020; Dugarova et al., 2021; Gunduz, 2021; Hassan et al., 2024; Huang et al., 2021; Hughes, 2023; Hughes et al., 2018; Hughes & Bunney, 2025; Kumar et al., 2025; Liu et al., 2025; McLay, 2019; Nurannisaa et al., 2020; Owatnupat & Kunlasuth, 2023; Polo, 2021; Price-Williams & Sasso, 2021; Quadir et al., 2019; Rudenkin, 2022; Sakdapat et al., 2025; Shliakhovchuk et al., 2021; Smith et al., 2020; Sunny & Ramasamy, 2025; Tunde & Ramona, 2019; Zhang & Yu, 2023).

Recent research examined within the scope of the systematic review indicates that self-regulated learning strategies and dynamic interactions on online platforms are determinant factors in Generation Z's learning ecology. Kim and Ryoo (2025) note that digital natives actively utilize digital forms of socialization to create an organized study environment. However, the literature also warns against the misconception that digital nativeness will always produce positive learning outcomes; indeed, the intensive use of technologies such as smartphones and gaming can create a cognitive load, thereby

negatively affecting active learning skills. This situation, highlighted by Onjewu et al. (2025), proves that technology integration must be designed with pedagogical care and caution.

3.2.1 Areas of pedagogical alignment between the algorithmic mindset and the maarif model (RQ2)

The findings of the systematic review indicate that there are high-potential structural overlaps between the natural habitus of digital natives and the flexible teaching strategies of the Maarif Model:

- Demand for Personalization and Autonomy: The literature emphasizes that the digital generation rejects standard formats in every field, from media consumption to product design, and acts with the motive of "appropriating" the process (Tapscott, 2009). The examined studies confirm that this demand for autonomy creates resistance against one-size-fits-all curricula in education. In contrast, the philosophical foundation of the Maarif Model, which accepts the student as "unique" (MoNE, 2025), has the potential to break this resistance. The student choices and flexible curriculum structure emphasized by the model exhibit an ontological alignment with the digital world's expectation of algorithmic personalization.
- The Transition from Egocentrism to Student-Centered Pedagogy: Studies conducted on the new generation point out that this group carries an egocentric tendency based on the desire to be visible on social networks and to be the protagonist of their own lives (Twenge, 2014; Palfrey & Gasser, 2008). Findings indicate that the student-centered structure of the Maarif Model can transform this individual energy into a state of "being a subject". The model's approach, which prioritizes the student's questions and autonomy (MoNE, 2025), offers a structural response to digital natives' need to make their voices heard and be content creators. At this point, the motive for self-expression is blended with the model's competence in "expressing thoughts and identity based on values".
- Collaborative Culture and Experiential Learning: Contrary to the popular assumptions that digital natives are asocial individuals behind screens, academic

findings prove that this generation has a collaborative (wiki culture) structure that forms clans over networks and produces knowledge in forums (Prensky, 2001; Tapscott, 2009). This situation, explained by Lévy's (1997) concept of "collective intelligence," is in perfect harmony with the "ability to collaborate" and "solidarity" goals located on the Epistemological Integrity axis of the Maarif Model (MoNE, 2025). Furthermore, the desire for practical experience of this generation, who learns through trial and error without reading the user manual (Oblinger & Oblinger, 2005), pedagogically overlaps with the model's principles of learning by doing and experiencing.

The concepts of "student autonomy" and "experience orientation" prominent in the examined literature show a high level of alignment with the flexible and student-centered structure of the Maarif Model. The network-based collaboration tendencies of digital natives create a pedagogical intersection with the model's "social responsibility" and "coexistence" skills.

3.2.2 Points of ontological and epistemological conflict with the axiological framework (RQ3)

Despite the potentials for alignment, the in-depth analysis of the literature reveals deep structural conflicts between the behavioral codes imposed by digital culture and the axiological core of the Maarif Model:

- The Ontological Tension Between Dromology (Speed) and Patience: The digital ecosystem, explained in the literature by the concept of the "Attention Economy" (Goldhaber, 1997), has created a regime of speed where information and gratification occur within seconds. In this state, defined by Virilio (2007) as "dromology" (the science of speed), it is observed that waiting is coded as a waste of time for the digital mind. These findings point to a deep-rooted ontological conflict with the virtues of "perseverance," "persistence," and "patience," which hold a central place in the student profile of the Maarif Model (MoNE, 2025). The system experiences a frequency mismatch with the digital generation, which shows resistance to process-oriented learning and maturation processes where they cannot see the immediate result.

- The Conflict Between the Pleasure Principle and Virtue Ethics (Axiological Dimension): Research data demonstrate that digital platforms and gamification dynamics stimulate the brain's reward center, leading to instant dopamine release and the pursuit of instant gratification (Kapp, 2012). This extrinsic, pleasure-based motivation structure is diametrically opposed to the Maarif Model's virtue ethics, which stipulate delaying gratification, enduring hardships, and inner willpower (MoNE, 2025). Analyses emphasize that a crisis of meaning may occur between the algorithmic mindset, which measures the value of an action by instant entertainment, and the model, which grounds action in moral responsibility (*Homo Ethicus*).
- Epistemological Friction Between Visual and Textual Information: The transition from McLuhan's (1962) "typographic man" to the "visual man" of the digital age has created a profound epistemological divergence regarding the nature of information. Due to their rhizomatic and hyper-reading styles, it is observed that digital natives' conceptual thinking and focusing skills are blunted (Wolf, 2007; Carr, 2010), and they prioritize visuals over text. However, the Maarif Model is epistemologically based on "Logos" (the Word); it centers on the depth of knowledge, the effective use of Turkish, and the goal of wisdom (MoNE, 2025). There is a direct friction between the algorithmic mind, which views data as a pragmatically fast-consumed tool, and the model, which codes knowledge as a totality of meaning and wisdom.
- Digital Globalization and the National Identity Crisis: The borderless digital networks, expressed by McLuhan's (1964) concept of the "global village," have forged hybrid and global identities independent of belonging in the new generation. A strong identity conflict has been identified between this rootless mode of existence and the "national and spiritual values" reference of the Maarif Model, built upon patriotism and historical memory (MoNE, 2025). This duality between the student's borderless avatar in the digital world and the local personality the model strives to construct is determined as one of the primary obstacles hindering the internalization of values education.

4 DISCUSSION

The document analysis and theoretical comparisons conducted in this study have revealed a complex network of relationships between the Maarif Model and digital natives (Generation Z & Alpha) on both ontological and epistemological planes. Bibliometric and systematic findings indicate that this relationship is not a one-dimensional "conflict" or an absolute "alignment," but rather a dynamic "tension" that needs to be managed and transformed into a pedagogical synthesis. This tension is the aspect reflecting the global crisis between Bauman's (2006) concept of "liquid modernity" and the rigid structure of traditional values onto the Turkish education system.

Research findings clearly reveal the axiological gaps created by technological speed and particularly the use of artificial intelligence (AI) in education. Students' positive attitudes and high usage rates towards artificial intelligence tools (ChatGPT, Gemini, etc.) do not spontaneously resolve ethical adoption and academic integrity issues. Indeed, the literature shows that students experience technostress during their use of these tools and that ethical perceptions need to be redefined (Acosta-Enriquez et al., 2024; Pondelíková & Luprichová, 2025; Routray & Khandelwal, 2024). Analyses conducted by Weng et al. (2025) also draw attention to the fact that while artificial intelligence provides efficiency in accessing information, it harbors serious threats such as data security, excessive dependence, and ethical violations. This situation proves that the virtues of "patience," "compassion," and "moral development" centralized by the Maarif Model are the strongest ontological shields against these ethical ruptures brought about by the digital age.

4.1 The axis of identity construction and the "Digital Citizenship" synthesis

The analysis results showed that the identities of digital natives are constructed on a global scale through virtual references (game avatars, social media profiles), whereas the Maarif Model prioritizes the construction of a national and spiritual identity. The concept of "Digital Citizenship," defined by Ribble (2015) in the literature, can be considered the pedagogical resolution point for this ontological conflict. The discussion findings reveal that the goal of the education system is an axiology-based "digital

integration" rather than "digital isolation". Without restricting digital natives' access to global networks, they should be endowed with the consciousness to exist within these networks utilizing their own cultural codes; rather than becoming alienated in the virtual world, the student should be positioned as a cultural ambassador who carries their own values into that world.

4.2 The spirit of the time: speed, patience, and "axiological slow pedagogy"

One of the most prominent areas of conflict in the research is in the context of time and speed; the "right now" imposition of the digital ecosystem creates an ontological contrast with the Maarif Model's emphasis on "patience" and "process". The "Slow Pedagogy" approach in the literature, inspired by Honoré's (2004) "Slow Movement," does not adequately address the educational context at this point and carries the risk of remaining superficial. Because the main problem in education is not merely to reduce cognitive speed, but to fill that created deceleration interval with virtue and wisdom. To address this deficiency, the study proposes the approach of *"Axiological Slow Pedagogy"* as an original concept to the literature. Rather than being completely swept away by the speed of the algorithmic mindset or absolutely rejecting it, the education system should develop "pedagogical braking mechanisms" (effective reading hours, digital detoxes, contemplation practices, etc.) that will engage while using technology.

4.3 Epistemological and "Phygital Wisdom"

The Maarif Model's ultimate goal of deepening and the pursuit of gnosis (*irfan*) can only be realized by passing digital speed through a moral filter and elevating it to the level of "Phygital wisdom". Examined in terms of information and authority, the teacher has lost the attribute of being the sole source of information in the algorithmic age; however, they have assumed the obligation of being the sole "filter" and "guide" of information. While digital natives do not experience any technical problems in accessing information, they show a serious weakness in verifying the accuracy of the information and passing it through a moral filter. Phygital wisdom is the student's capacity to synthesize their agile practices in the virtual world with their virtues in the real world.

Therefore, it necessitates the evolution of the educational process from a "data loading" function to a "meaning construction" process.

Going beyond mere technical skills and information transfer in the education of the digital generation, the integration of cultural values with modern technological standards is also one of the fundamental pursuits of global literature. Studies conducted in different cultural contexts such as India and Vietnam (Nguyen, 2024; Singh, 2024) draw attention to the necessity of raising responsible global citizens by focusing on patriotism, sense of duty, respect, and holistic well-being in the education of the new generation. Similarly, the importance of integrating national character building (Nuryadi et al., 2023) and "conscious living" practices based on ethical consumption into the curriculum among the digital generation is frequently emphasized in the literature (Aghaz et al., 2025; Garai-Fodor & Huszak, 2025). This common call in the international literature proves how accurate, universal, and timely a pedagogical intervention the *Türkiye Yüzyılı* (Century of Turkey) Maarif Model's vision of balancing technological equipment (phygital skills) with axiological foundations such as compassion, patience, and virtue (wisdom) is.

5 CONCLUSION

The systematic review and macroscopic mapping data prove that there is a dynamic interaction that can be managed with careful pedagogical design, rather than merely a structural tension, between the student profile emerging in the digital age and the Maarif Model. Digital natives' expectations regarding personalization, autonomy, collaboration, and experiential learning overlap significantly with the Maarif Model's student-centered, flexible, and holistic approach on a theoretical level. This overlap has the potential to increase the efficiency of educational processes through the conscious use of active methods such as project-based learning and the flipped classroom.

However, the tensions between speed and patience, visuality and textuality, and pleasure and virtue create a transformative area of pedagogical tension that, when guided correctly, supports the cognitive and moral development of the student. For example, the tendency for gamification can be transformed from merely a tool for generating pleasure-oriented motivation into a conscious educational strategy that supports the transmission

of values and virtues. In this process, the fundamental principle is that the tool should not overshadow the purpose, and pedagogical goals must maintain their priority over technological tools.

Furthermore, the transformative effect of digital communication forms on Turkish is not merely a linguistic deformation but a matter of cognitive continuity, since language is the constitutive element of thought. The structural emphasis the Maarif Model places on Turkish bears the characteristics of a strategic move aimed at preserving cultural existence and intellectual depth in the digital age. Ultimately, the success of the Maarif Model lies in the ability to position technology within a value-centered pedagogical framework and not deviate from the compass of virtue and cultural continuity, rather than adopting a polarized approach that either excludes technology or completely surrenders to it. Therefore, the practical achievement of this pedagogical balance inherently depends on the successful implementation of the 'Phygital Wisdom' and 'Axiological Slow Pedagogy' concepts introduced to the literature in this study.

6 RECOMMENDATIONS FOR PRACTICE AND EDUCATIONAL POLICIES

In the context of the fourth research question (RQ4), the recommendations on how the identified areas of ontological and epistemological tension can be transformed into a pedagogical synthesis across the axes of educational policies and applied instructional designs are classified under three main domains:

- At the Institutional and Policy Level: A systematic terminology policy must be developed against the destruction of language by digital culture; intellectual continuity must be preserved by creating Turkish equivalents for concepts related to new technologies. Digital literacy should not be reduced to technical skills; a "digital wisdom" perspective encompassing digital ethics, algorithm awareness, and cyber responsibility must be integrated into the curriculum.
- In Teacher Training Processes: Within the scope of the Maarif Model, the teacher must step out of the role of a practitioner who delivers standard content and assume the identity of a "curriculum designer" who constructs the learning experience. Teacher candidates must be trained with this designer identity, which gives meaning to technology by passing it through an axiological filter, and new

professional development models that nourish intergenerational interaction must be devised.

- In Teaching Practices: Gamification dynamics should be used as a means of value transmission in a way that nourishes intrinsic motivation; students must be removed from being passive content consumers and trained as creative producers in digital media. A conscious "phygital balance" must be observed in educational environments, preserving face-to-face interaction, handwriting, and detailed reading practices.

7 RECOMMENDATIONS FOR FUTURE RESEARCH

In light of the findings of this study, which presents a theoretical projection, it is essential in future research to examine the field reflections of the "algorithmic mindset and axiological framework" tensions theorized herein. In this context, it is recommended that the proposed theoretical syntheses be tested through qualitative research based on teachers' opinions or empirical (observational) field studies directly focusing on student behaviors. Additionally, developing quantitative scales or mixed-methods measurement tools to gauge the new generation students' levels of internalizing the education model's virtue-oriented curriculum and their "phygital wisdom" capacities, as conceptualized in this study, will provide a significant contribution to the field in order to monitor the translation of theory into practice.

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All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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