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From Digital Competence to Ethical AI Use: A Document Analysis of International and Turkish Educational Frameworks

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From Digital Competence to Ethical AI Use: A Document Analysis of International and Turkish Educational Frameworks

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Abstract

This study examines how digital competence, digital citizenship, and artificial intelligence ethics are represented in international and Turkish educational frameworks. Competence frameworks, curricula, and policy documents published by the European Commission, Council of Europe, UNESCO, OECD, and Turkish Ministry of National Education were analysed using qualitative document analysis. Erzurumlu İbrahim Hakkı's *Marifetname* was also used as a value-based interpretive source. The data were analysed using a semi-structured codebook, focusing on the themes of digital competence, digital citizenship, artificial intelligence ethics, privacy, security, critical literacy, digital self-regulation, and human oversight and agency. The findings show that AI ethics are represented more explicitly and systematically in international documents, whereas Türkiye documents emphasize values, safe use, privacy, and responsibility. The study proposes an integrated framework for value-based digital citizenship and AI ethics by linking technical competence with moral reasoning, self-regulation, human dignity, social benefit, and critical evaluation. The study argues that Türkiye's value-based educational orientation should not be replaced by international AI ethics frameworks. Rather it should be strengthened through operational concepts such as algorithmic bias, data ethics, explainability, accountability, and generative AI literacy. The proposed frameworks links technical competence with moral reasoning, self-regulation, human dignity, critical evaluation, and social benefit, thereby offering a culturally grounded policy contribution to curriculum and responsible AI education.

Keywords: Digital competence, digital citizenship, AI ethics, document analysis, *Marifetname*.

Da Competência Digital ao Uso Ético da IA: Uma Análise Documental de Marcos Educacionais Internacionais e Turcos

Resumo

Este estudo examina como a competência digital, a cidadania digital e a ética da inteligência artificial são representadas em marcos educacionais internacionais e turcos. Marcos de competências, currículos e documentos de políticas publicados pela Comissão Europeia,

Conselho da Europa, UNESCO, OCDE e Ministério da Educação Nacional da Turquia foram analisados utilizando análise documental qualitativa. O livro *Marifetname*, de Erzurumlu İbrahim Hakkı, também foi utilizado como fonte interpretativa baseada em valores. Os dados foram analisados utilizando um livro de códigos semiestruturado, com foco nos temas de competência digital, cidadania digital, ética da inteligência artificial, privacidade, segurança, letramento crítico, autorregulação digital e supervisão e agência humana. Os resultados mostram que a ética da IA é representada de forma mais explícita e sistemática em documentos internacionais, enquanto os documentos turcos enfatizam valores, uso seguro, privacidade e responsabilidade. O estudo propõe uma estrutura integrada para cidadania digital baseada em valores e ética da IA, vinculando competência técnica ao raciocínio moral, autorregulação, dignidade humana, benefício social e avaliação crítica. O estudo argumenta que a orientação educacional da Turquia, baseada em valores, não deve ser substituída por estruturas internacionais de ética em IA. Em vez disso, deve ser fortalecida por meio de conceitos operacionais como viés algorítmico, ética de dados, explicabilidade, responsabilidade e alfabetização em IA generativa. As estruturas propostas vinculam a competência técnica ao raciocínio moral, à autorregulação, à dignidade humana, à avaliação crítica e ao benefício social, oferecendo, assim, uma contribuição política culturalmente fundamentada para o currículo e para a educação responsável em IA.

Palavras-chave: Competência digital, cidadania digital, ética da IA, análise de documentos, *Marifetname*.

1. INTRODUCTION

Digital transformation in education systems has long been discussed in terms of access to digital technologies and the ability to use them. The rapid integration of artificial intelligence—and particularly generative AI applications, into educational settings shows that this approach is no longer sufficient (Baidoo-Anu & Ansah, 2023). Today, digital competence is no limited to the acquiring information, communicating, solving problems, and producing content. It also includes understanding how data is processed, how algorithmic systems influence individual and societal decisions, how AI outputs should be evaluated, and how ethical responsibility can be established in digital environments. Consequently, the relationship between digital competence, digital citizenship, and AI ethics is become an increasingly central issue in educational research (Carretero et al., 2017; Ferrari, 2012; Ferrari & Punie, 2013; Van Audenhove et al., 2024; Vuorikari et al., 2016).

The theoretical development of digital competence has been shaped substantially shaped by European-centered competency frameworks. The DigComp framework positions digital competence as a core civic competency for participation in work, learning, and social life. It organizes these competences around information and data literacy, content creation, communication, security, and problem-solving (Carretero et al., 2017; Redecker, 2017; Vuorikari et al., 2016). The inclusion of artificial intelligence, data literacy, and the Internet of Things in DigComp 2.2 indicates that digital competence is a dynamic field that is redefined in response to technological and social change (Van Audenhove et al., 2024; Vuorikari et al., 2022). Previous research also shows that digital competence frameworks differ in scope, target group, assessment logic, and normative orientation, and that teacher digital competence requires attention to technical knowledge, pedagogical integration, ethical responsibility, and professional development (Cartelli, 2010; Gisbert Cervera & Caena, 2022; Mattar et al., 2022; Mattar, Ramos, & Lucas, 2022; Rakisheva & Witt, 2023; Vrabec & Furtáková, 2024).

Vrabec and Furtáková (2024) note that while digital competencies are defined by common components (competence, ethics, and responsibility) in the recommendations of the European Union, the European Commission, and UNESCO, there are differences among these institutions in scope, emphasis, and normative orientation. This situation demonstrates that digital competence is not merely a technical skill but also an educational category related to policy, ethical responsibility, and citizenship. The ongoing transformation has made it necessary to address digital competence frameworks not only in terms of their conceptual structures but also in conjunction with teacher education, assessment, and educational policies. Cartelli (2010) highlighted the importance of the integrity of the framework, tools, and implementation in assessing digital competence. Mattar, Santos, and Cuque (2022), by comparing international digital competence frameworks, revealed that these frameworks differ in terms of their objectives, target groups, areas of competence, and levels of application. Mattar, Ramos, and Lucas (2022), on the other hand, stated that DigComp-based assessment tools play a significant role in measuring digital competence and in policy development processes. In the context of teacher education, Rakisheva and Witt (2023) noted that digital competence frameworks gain meaning through the relationships established between technical knowledge, pedagogical integration, ethical responsibility, and professional development. Gisbert Cervera and Caena (2022) also argue that teachers' digital competence should be addressed in a more holistic manner within the context of global teacher education.

This literature suggests that DigCompEdu, UNESCO, OECD, and Council of Europe documents should be read not only as technical frameworks but also as normative texts that guide the digital transformation of education systems. AI literacy adds a new ethical and pedagogical layer to digital competence. UNESCO's AI competency frameworks for students and teachers address AI literacy through human-centred perspectives, AI ethics, technical knowledge, application, and system design (Miao & Cukurova, 2024; Miao & Shiohira, 2024). Related studies define AI literacy as a multidimensional competence involving ethical evaluation, technical understanding, civic responsibility, and critical awareness (Chee et al., 2025; Sengsri & Khunratchasana, 2024). The use of generative AI in education also raises issues of human oversight, academic integrity, transparency, accountability, bias, data privacy, and fairness (Nguyen, 2025). In the Türkiye context, recent studies show that AI, digital competence, and ethics are becoming more visible, but that these themes require more systematic analysis in relation to curricula, teacher competences, digital citizenship, and values-based education (Kıymaz & Kaya, 2025; Özenç, 2025; Temur, 2026; Varol, 2025).

This study examines the Türkiye context through academic literature and official education documents. The Maarif Model, announced in 2024, introduced a values-virtues-action orientation; key documents from this period include the Maarif Common Curriculum Model, the Social Studies Curriculum, the Information Technology and Software Curriculum, the General Competencies for the Teaching Profession, and the Digital Literacy Skills Activity Book. The CTEM-DCE report, which evaluates the Century of Türkiye Education Model through the Council of Europe's Digital Citizenship Education Planner, also shows how digital competence, values, citizenship, security, privacy, responsibility, and safety are structured in Türkiye. These documents often connect digital competence to values, conscious use, responsibility, social benefit, and security. This indicates that Türkiye curriculum documents offer a value- and ethics-based foundation, while the systematic integration of AI ethics, algorithmic bias, transparency, human oversight, generative AI literacy, and accountability requires further examination.

1.1. Research Gap and Aim

Taken together, the literature points to three gaps. First, digital competence frameworks have been widely examined in terms of structure, components, and assessment tools, but their integration with digital citizenship and AI ethics remains insufficiently explained (Cartelli, 2010; Ferrari, 2012; Mattar et al., 2022; Mattar, Ramos, & Lucas, 2022; Vrabec & Furtáková, 2024). Second, although the literature on ethical AI and literacy is expanding rapidly, relatively

few studies have examined how these themes are represented in Türkiye education documents (Varol, 2025; Temur, 2026; Kıymaz & Kaya, 2025; Özenç, 2025). Third, values-based education often remains a supplementary element in discussions on AI ethics and digital citizenship, even though moderation, digital self-regulation, privacy awareness, ethical responsibility, critical literacy, and social benefit are also matters of moral reasoning and values education. This study therefore, examines the representation of digital competence digital citizenship, and AI ethics in international and Türkiye educational frameworks and relates these themes to Erzurumlu İbrahim Hakkı's values-based educational understanding. The aim to propose a value-based framework for digital citizenship and AI ethics in education. *Marifetname* is not used as a technical competence document, but as an interpretive source centred on moderation, wisdom, self-regulation, moral responsibility, and social benefit. Within this scope, the study sought to answer the following research questions:

RQ1: How are digital competence, digital citizenship, and AI ethics represented in international and Turkish educational frameworks?

RQ2: To what extent are ethical responsibility, digital self-regulation, digital well-being, privacy, security, and critical literacy emphasized in these documents?

RQ3. How can these themes be related to Erzurumlu İbrahim Hakkı's value-based approach to education, and how can a value-based framework for digital citizenship and AI ethics in education be developed from this perspective?

This study contributes to the field by examining digital competence, citizenship, and AI ethics within a holistic educational framework. By bringing international documents and Türkiye educational frameworks into dialogue with Erzurumlu İbrahim Hakkı's value-based educational understanding, the study identifies both strengths and identify areas requiring development.

2. METHOD

2.1. Research Design

Qualitative document analysis was used to examine how digital competence, digital citizenship, and artificial intelligence (AI) ethics are represented in international and Türkiye educational frameworks. Document analysis enables the systematic examination curricula, policy texts, written and visual publications, competency frameworks, institutional reports, and other written

sources (Bowen, 2009; Creswell et al., 2007). The study aimed to identify not only whether specific concepts appeared in the documents, but also how, at what level, and with what educational meanings they were represented. A directed qualitative content analysis approach was adopted because it allows initial codes to be developed from research questions and existing theoretical frameworks while still permitting contextual interpretation during analysis (Assarroudi et al., 2018; Hsieh & Shannon, 2005). Accordingly, the analysis combined deductive coding with interpretive thematic synthesis (Braun & Clarke, 2006; Schreier, 2012).

2.2. Data Sources and the Document Corpus

Purposive sampling was used to select the data sources (Campbell et al., 2020). Documents were included if they constituted an international or national education policy, a curriculum, or a competency framework; were related to digital competence, digital citizenship, digital competence, AI literacy, or AI ethics; provided conceptual, pedagogical, or policy content applicable to educational context; and contributed to the study's comparative international-Türkiye focus.

Table 1.

International Documents Included in the Analysis

Code	Institution	Document Type	Document Title	Analytical Role
EU-1	European Commission	Digital competence framework	DigComp 2.2: The Digital Competence Framework for Citizens	Main analytical document
EU-2	European Commission	Digital competence framework	DigComp 3.0: European Digital Competence Framework	Main analytical document
EU-3	European Commission	Teacher digital competence framework	European Framework for the Digital Competence of Educators (DigCompEdu)	Main analytical document
EU-4	European Commission	Policy monitoring report	Structural Indicators for Monitoring Education and Training Systems in Europe – 2023: Digital Competence at School	Contextual and supporting document
UNESCO-1	UNESCO	AI competency framework for students	AI Competency Framework for Students	Main analytical document
UNESCO-2	UNESCO	AI competency framework for teachers	AI Competency Framework for Teachers	Main analytical document
UNESCO-3	UNESCO	Policy guidance document	Guidance for Generative AI in Education and Research	Main analytical document
OECD-1	OECD	Digital education outlook / policy report	OECD Digital Education Outlook 2026: Exploring Effective Uses of Generative AI in Education	Contextual and supporting document
CoE-1	Council of Europe	Digital citizenship education handbook / framework	Digital Citizenship Education Handbook	Main analytical document

Table 1 presents the international sources of data. According to this table, the data sources consist of international competency and policy frameworks derived from documents of the European Commission (2023; Cosgro & Cachia, 2025; Redecker, 2027; Vuorikari et al., 2022), the Council of Europe (2022), UNESCO (Miao & Cukurova, 2024; Miao & Holmes, 2023; Miao & Shiohira, 2024), and the OECD (2026). These nine international sources are identified using a code within the table.

Table 2.

Turkish and Values-Based Documents Included in the Analysis

Code	Institution	Document Type	Document Title	Analytical Role
TR-1	Ministry of National Education	National curriculum model	Maarif Common Curriculum Model	Main analytical document
TR-2	Ministry of National Education	Curriculum document	Social Studies Curriculum (Grades 4–7)	Main analytical document
TR-3	Ministry of National Education	Curriculum document	Information Technology Curriculum (Grades 5-6)	Main analytical document
TR-4	Ministry of National Education	Skills and values report	21 st Century Skills and Values Report	Contextual and supporting document
TR-5	Ministry of National Education	Teacher competency framework	General Competencies for The Teaching Profession	Main analytical document
TR-6	Ministry of National Education	Digital literacy skills handbook / activity book	Digital Literacy Skills Handbook	Main analytical document
TR-EN-7	Ministry of National Education	Comparative curriculum analysis report	An Analysis of The Century of Türkiye Education Model (CTEM) Curricula Within the Framework of The Council of Europe’s Digital Citizenship Education (DCE) Planner	Contextual and supporting document
İH-1	Turkish Grand National Assembly Library Open Access Collection	Value-based interpretive source	Marifetname	Values-based interpretive source

Türkiye data sources are presented in Table 2. These sources consist of official documents and curricula, teacher qualifications, digital literacy reports, published by the Ministry of National Education of Türkiye (Erzurumlu, 1330; Ministry of National Education of Türkiye General Directorate of Secondary Education, 2023; Ministry of National Education of Türkiye, 2017; Ministry of National Education of Türkiye, 2024a; Ministry of National Education of Türkiye, 2024b; Ministry of National Education of Türkiye, 2024c; Ministry of National Education of Türkiye, 2024d; Ministry of National Education of Türkiye, 2025). The full corpus includes 17 sources, 16 of which are contemporary policies competence frameworks, curricula, and supporting reports. Erzurumlu İbrahim Hakkı’s was included value-based interpretive source developing the philosophical and cultural basis of the proposed model. This distinction was

maintained to avoid comparing a historical-philosophical text and contemporary policy documents on the same analytical plane.

2.3. Data Collection Process

A semi-structured coding manual was developed to guide the coding process. The manual included three code families aligned with the three research questions. The first group included concepts such as digital competence, digital citizenship, AI ethics, AI literacy, and teacher digital competence. These codes were used to determine the extent to which the documents represented key concepts in response to the first research question. The second group consists of ethical-thematic codes such as ethical responsibility, digital self-regulation, digital well-being, privacy, security, critical literacy, equality/inclusivity, and human oversight. These codes were used in the second research question to assess the levels of emphasis on these themes. The third group consists of value-based interpretation codes related to the *Marifetname*, such as self-awareness, moderation, wise knowledge, moral responsibility, human dignity, and beneficial action. These codes were used to develop a value-based model in the third research question (Table 3).

Table 3.

Code Families and Analytical Functions

Code Families	Codes	Analytical Function	Related RQ
Conceptual Codes	Digital competence, digital citizenship, AI ethics, AI literacy, teacher digital competence	Determining how key concepts are represented in documents	RQ1
Ethical-Thematic Codes	Ethical responsibility, digital self-regulation, digital well-being, privacy, security, critical literacy, equality/inclusion, human control	Comparing the emphasis levels of ethics and citizenship-related themes in the documents	RQ2
Value-based interpretation codes	Self-knowledge, moderation, wise knowledge, moral responsibility, human dignity, beneficial action	Establishing a model-developing relationship between <i>Marifetname</i> and contemporary digital citizenship and AI ethics themes	RQ3

The document type was used to determine the coding unit. Competency frameworks included the competency domain, competency description, indicators, and learning outcomes, while curricula included objectives, skills, value-based learning outcomes, and explanations. On the other hand, policy/guidance documents included principles, recommendations, risk statements, and implementation guidelines. The coding units for the *Marifetname* were passages related to knowledge, ethics, self-discipline, human dignity, responsibility, and the philosophy of education (Table 4).

Table 4.

Thematic Representation Level Scale

Score	Level	Operational meaning	Example criterion
0	None	Theme is absent.	No direct or indirect reference to the theme.
1	Low	Theme is mentioned indirectly or generally.	General reference to responsible or safe technology use.
2	Medium	Theme is explicit but not systematic.	AI reliability or privacy is mentioned, but not developed as a competence area.
3	High	Theme is explicit, central, systematic, and applicable.	Human oversight, bias, explainability, accountability, and data ethics are linked to learning outcomes, teacher competence, or policy guidance.

Each code was assigned a thematic representation level between 0 and 3. The scoring was based on the theme's clarity, centrality, systematic nature, educationally applicable, documents, and practical orientation and was not used as a frequency count. This approach ensured a focus not merely on how many times concepts appeared but also on the function they served within the document's analytical structure. "0" indicates that the relevant theme is not present in the document; "1" indicates that the theme is mentioned only superficially and to a limited extent; "2" indicates that the theme is clearly represented but has not developed into a systematic framework or policy area; and "3" indicates that the theme is presented in a detailed, transparent, systematic, central, and action-oriented manner. This scoring was not based only on keyword frequency but also on the depth and function of the theme with each document. The scale enabled the comparison of documents based on the frequency of concepts and their analytical weight. *Marifetname* was not scored through this scale because it was used only as a value-based interpretive source for developing the proposed framework.

2.4. Data Analysis

The research data were analyzed using content analysis as part of qualitative document analysis. The analysis process focused on predefined codes, such as digital competence, digital citizenship, ethics of artificial intelligence, security, privacy, digital well-being, critical literacy, and human oversight. Additionally, the process was conducted using a systematic approach that included data reduction, coding, and comparative analysis stages tailored to the research questions (Hsieh and Shannon, 2005; Kiral, 2020). Accordingly, the data analysis was conducted in five stages. First, all documents were classified by document type, institutional source, year of publication, target audience, and their analytical role in the study. In the second stage, the documents were converted into text-based structures. This enables page-based tracking. Text extraction was used solely for the purposes of intra-document search, identifying candidate sections, and page tracking, while final coding decisions were made through a contextual reading. In the third stage, first-round coding was performed using the coding

manual. At this stage, each document was screened for codes and ethical themes. Relevant sections were recorded along with the document code, page number, short excerpts, and analytical notes. When a statement corresponded to more than one theme, multiple codings were performed. For example, if personal data protection and ethical responsibility were represented together in the same section, both privacy and ethical responsibility codes were assigned to that section.

In the fourth stage, a document code matrix was created. This matrix shows which themes each document represented and to what extent. When evaluating coding density, consideration was given not only to the presence of keywords but also to the theme's location within the document, its scope, clarity, whether it translated into competency or learning outcomes, and whether it was supported by implementation recommendations. In the fifth stage, a comparative thematic synthesis was conducted (Braun & Clarke 2006; Schreier 2012). International and Turkish documents were compared in terms of digital competence, digital citizenship, and AI ethics to identify differences, similarities, and thematic gaps. The themes of self-knowledge, moderation, wise knowledge, human dignity, and moral responsibility derived from the *Marifetname* were also linked to the principles of ethical responsibility, critical literacy, digital self-regulation, privacy, and human-centered artificial intelligence found in modern documents. These were utilized to develop a value-based model of digital citizenship and artificial intelligence ethics.

2.5. Measures of Reliability, Validity, and Credibility

In this study, credibility, dependability, and confirmability were strengthened through several procedures rather than through an intercoder reliability coefficient. First, the coding manual provided explicit definitions, inclusion and exclusion criteria, relevant document types, and research-question links for each code. Second, coding decisions were documented through an audit trail that included document codes, page numbers, short excerpts, and analytical notes. Third, international and Türkiye documents were coded and compared separately before cross document synthesis in order to avoid treating Türkiye documents merely as deficient versions of international frameworks. Fourth, limited or absent representations of expected themes, such as AI ethics and human oversight in some Türkiye documents, were treated as analytical findings rather than ignored. Finally, a reflexive boundary was maintained for *Marifetname*: it was not coded as a contemporary policy document but used as a value-based interpretive source for model development. Because an independent second coder was not used at this stage, no intercoder reliability statistic is reported. This limitation was mitigated through transparent coding rules, traceable evidence, representative quotations (Appendix 1), and a clear separation

between document-based findings and value-based interpretation (Lincoln & Guba, 1985; O'Connor & Joffe, 2020; Tracy, 2010).

3. FINDINGS

This section, presents the findings in relation to the three research questions. the analysis used the conceptual, ethical-thematic, and value-based interpretation codes defined in the coding manual. Overall, digital competence, digital citizenship, and AI ethics appear more systematic and competency-based in international documents, whereas Türkiye documents foreground values, privacy, safe use, responsibility, and conscious technology use. The full document-code matrix is not included in the main text but was used as background evidence for interpreting the findings. The main text presents comparative thematic density, coded segments, and the model-development table.

RQ1. Representation of Digital Competence, Digital Citizenship, and AI Ethics

The analysis conducted to answer the first research question shows that the themes of digital competence, digital citizenship, and AI ethics are present in both international documents and Türkiye educational frameworks, but that these themes are represented with different emphases. The comparative findings are summarized in Table 5.

Table 5.

Representation of Digital Competence, Digital Citizenship and AI Ethics in International and Türkiye Education Frameworks

Theme	International Documents	Türkiye Documents	Main Finding
Digital Competence	Defined as confident, critical, safe and responsible use of digital technologies.	Emphasized through effective, conscious and safe technology use.	Both groups value digital competence, but international documents present it more systematically.
Digital Citizenship	Framed around online participation, well-being, rights and responsibilities.	Linked to digital citizenship awareness, ethical behaviour and safe online use.	International documents stress rights and participation; Türkiye documents stress awareness, ethics and safety.
AI Ethics	Presented as a central competence area, especially in UNESCO and OECD documents.	Represented mostly through AI literacy, reliability of AI-supported information and controlled use.	AI ethics is explicit in international documents but still emerging in Türkiye documents.
Overall Pattern	Move from digital competence toward AI ethics in a structured way.	Strong focus on values, safety, responsibility and digital literacy.	Türkiye has a strong values-based foundation, but AI ethics needs more explicit development.

In international documents, digital competence is defined within a broader framework than just technical skills. DigComp 2.2 addresses digital competence using the phrase “confident, critical, and responsible use,” elevating competence to a level of critical, safe, and responsible

use (EU-1, p. 8). While DigComp 3.0 updates this framework with themes such as artificial intelligence, cybersecurity, digital rights, well-being, and combating disinformation, DigCompEdu structures teachers' digital competence into professional and pedagogical competency areas.

In Türkiye documents, digital competence is strongly emphasized but is represented mainly through curricula, literacy skills, values, and safe use. The Maarif Common Curriculum Model emphasizes that students should use technologies “effectively, consciously, and safely” (TR-1, p. 30), while the Digital Literacy Skills Handbook links digital literacy to understanding, using, interpreting, and evaluating, information (TR-6, p. 6). This indicates that Türkiye documents frame digital competence as a field related to awareness, safety, and values rather than merely technical operation.

Digital citizenship is most clearly represented in international documents in the Council of Europe's Digital Citizenship Education Handbook. The handbook structures digital citizenship around “being online, well-being online, and rights online” (CoE-1, p. 11), thus connecting online presence, well-being, rights, responsibilities, and participation. In Türkiye documents, digital citizenship is particularly visible in the Information Technology and Software Curriculum and the CTEM-DCE alignment report. The curriculum aims to develop students' “digital citizenship awareness” (TR-3, p. 4), while the DCE analysis report positions digital citizenship as a core competence (TR-EN-7, p. 4).

The most notable difference concerns AI ethics. UNESCO documents define AI ethics as a direct and central competence area. The student framework presents “Human-centred Mindset” and “Ethics of AI” together (UNESCO-1, p. 3), while the teacher framework expands AI competence through human-centredness, ethics, pedagogical use, and professional learning. The OECD document also links generative AI use to human judgement, teacher autonomy, data protection, explainability, and bias reduction.

AI ethics is not yet represented with the same clarity and systematicity in Türkiye documents. The strongest representation appears in the Information Technology and Software Curriculum, where students are expected to question basic AI concepts and reflect on the reliability of information obtained from AI-supported resources (TR-3, pp. 16, 20). This finding indicates that AI literacy is beginning to enter Türkiye documents, but algorithmic bias, human oversight, accountability, explainability, and data ethics are not yet structured as explicitly as in international frameworks.

RQ2. Level of Ethical-Thematic Emphases

The coding results show that ethical responsibility, privacy, digital self-regulation, digital well-being, privacy, security, critical literacy, equity and inclusion, and human oversight are represented at different levels across the documents. Ethical responsibility, privacy, security, and critical literacy are visible in both document groups, whereas human oversight and agency are more explicit in UNESCO and OECD documents. In Türkiye documents, digital self-regulation and safe use are more strongly connected to values, responsibility, and balanced technology use (Table 6).

Table 6.

Comparative Thematic Density

Ethical-Thematic Code	International Documents	Türkiye Documents	Main Finding
Ethical Responsibility	High	High	Strong in both groups, but framed differently: accountability, transparency and responsible AI use internationally; values, rights, privacy and social responsibility in Türkiye documents.
Digital Self-Regulation	Low-Medium	Medium-High	Türkiye documents provide a stronger value-based language of self-control and balanced use, whereas international documents address it mainly through well-being and responsible use.
Digital Well-Being	Medium-High	Medium	CoE and OECD documents make well-being more explicit; Türkiye documents address it mainly through risk awareness, dependency, healthy use and balanced behaviour.
Privacy	High	Medium-High	International documents emphasize data protection, consent and AI data governance; Türkiye documents foreground personal data awareness and KVKK-related privacy responsibility.
Security	Medium-High	High	Security is especially practical in Türkiye documents through cybersecurity and safe use; international documents connect security with competence, rights and AI-related risk.
Critical Literacy	High	Medium	International documents link critical literacy to disinformation, verification and AI output evaluation; Türkiye documents emphasize critical thinking, source review and reliability of AI-supported information.
Equity and Inclusion	Medium-High	Medium	International AI frameworks address inclusion and non-discrimination more explicitly; Türkiye documents include equity mainly through values, access and social responsibility.
Human Oversight and Agency	High	Low	UNESCO and OECD foreground human judgement, oversight and agency; this theme remains weak and mostly implicit in Türkiye AI-related documents.
Ethical Responsibility	High	High	Strong in both groups, but framed differently: accountability, transparency and responsible AI use internationally; values, rights, privacy and social responsibility in Türkiye documents.
Digital Self-Regulation	Low-Medium	Medium-High	Türkiye documents provide a stronger value-based language of self-control and balanced use, whereas

			international documents address it mainly through well-being and responsible use.
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Ethical responsibility is strong in both document groups, although it is grounded in different conceptual traditions. International documents, particularly UNESCO and OECD frameworks, connect responsibility to accountability, human oversight, transparency, fairness, and responsible AI use. Türkiye documents construct ethical responsibility more through rights, privacy, values, social responsibility, and safe conduct. Digital self-regulation and digital well-being also show a complementary pattern: CoE and OECD documents make well-being a clearer dimension of digital citizenship and generative AI policy, whereas Türkiye documents address self-regulation through attention control, balanced use, digital addiction risks, and value-based behavior. Privacy and security are among the strongest themes. DigComp 2.2 places personal data and privacy protection within the security area of digital competence (EU-1, p. 118), and UNESCO links data privacy to consent and the data lifecycle. In Türkiye documents, the Digital Literacy Skills Handbook addresses personal data awareness within the context of the Personal Data Protection Law (KVKK) (TR-6, p. 13), while the ICT curriculum combines information ethics and cybersecurity under the same theme (TR-3, p. 9). Critical literacy is linked in international documents to disinformation, verification, algorithmic awareness, and AI output evaluation. In Türkiye documents, it is represented mainly through critical thinking, source review, and reflection on the reliability of AI-supported information (TR-2, p. 15; TR-3, p. 20). The main gap concerns human oversight and agency: while UNESCO and OECD documents explicitly preserve human judgement in AI-supported education, this theme remains limited and mostly implicit in Türkiye documents.

RQ3. Value-Based Interpretation through *Marifetname*

RQ3 examines how the themes identified in contemporary frameworks can be interpreted through Erzurumlu İbrahim Hakkı's value based educational understanding. *Marifetname* was not treated as a policy document, curriculum, or technological competence framework. Rather, it was used as historically situated philosophical-cultural source that provides as value vocabulary for interpreting the ethical orientation of digital citizenship and AI use. Accordingly, the analysis did not compare *Marifetname* with UNESCO, OECD, EU, or Ministry documents through the same intensity scale. Instead, selected value themes were used to develop an interpretive bridge between contemporary concepts such as digital self-regulation, privacy, critical literacy, human oversight and agency, and human-centered AI. The interpretive self-knowledge, moderation/self-regulation, wisdom-oriented knowledge, moral responsibility, and human dignity reading generated five values. These themes should not be read as direct

references to digital technologies rather, they provide normative resources for asking what kind of person, responsibility digital, judgement, and AI education should cultivate. Table 7 shows how these value themes were connected to modern framework concepts and translated into model dimensions.

Table 7.

Deriving a Framework for Value-Based Digital Citizenship and AI Ethics

Themes of Marifetname	Connection in Modern Frameworks	Model Dimension	Educational Outcome
Self-Knowledge	Digital self-regulation; the human subject, conscious use	Reflexive digital self-regulation	Learners reflect on intentions, attention, data traces, and dependence on digital or AI systems.
Moderation/Self-Regulation	Digital well-being; balanced use; risk awareness	Balanced and proportionate technology use	Technology use is connected to well-being, attention, autonomy, and life balance.
Wisdom-Oriented Knowledge	Critical literacy; verification, AI output evaluation	Wise and critical use of knowledge	AI outputs are questioned, verified, contextualised, and evaluated for educational and social purposes.
Moral Responsibility	Ethical responsibility; privacy; non-maleficence; academic integrity	Responsible and privacy-conscious action	Learners consider how digital actions and AI use affect others, rights, privacy, and trust.
Human Dignity	Human-centered AI; human oversight and agency; inclusion	Human dignity, agency, and social benefit	AI is used without reducing learners or teachers to data objects, performance indicators, or algorithmic decisions.

Within this interpretive model, self-knowledge is understood as a reflexive basis for digital self-regulation: learners are expected to become aware of their intentions, attention, data traces, and dependence on digital or AI tools. Moderation refers not only to screen-time control but also to avoiding cognitive over-reliance on generative AI and preserving human judgement. Wisdom-oriented knowledge corresponding critical literacy because outputs must be contextualised, verified, and evaluated in relation to educational social purposes. Moral responsibility links digital addiction to non-maleficence, privacy, academic integrity, and the effects of technology use on others. Human dignity functions as the normative limit of AI use: learners and teachers should not be reduced to data points, algorithmic objects, or performance indicators.

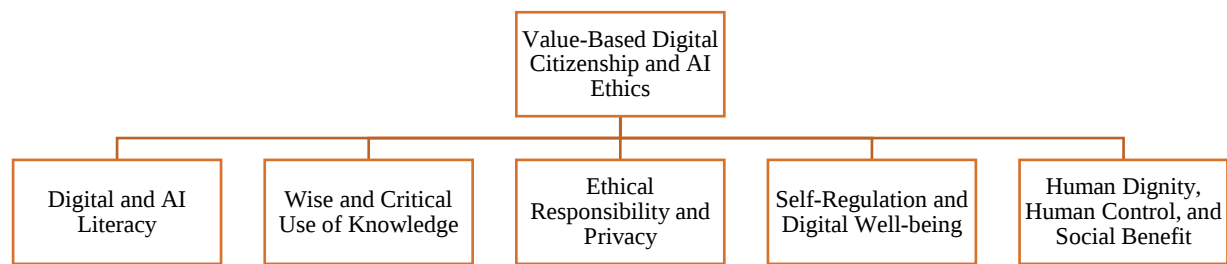


Figure 1. Proposed Value-Based Digital Citizenship and AI Ethics Model

The model presented in Figure 1 should therefore be read as an interpretive synthesis rather than an empirical validation of *Marifetname* for contemporary technology policy. It brings together three layers of findings: (a) international documents offer systematic concepts of AI ethics, privacy, inclusion, critical literacy, and human oversight; (b) Türkiye documents provide a strong pedagogical vocabulary of values, safe use, responsibility, privacy, and conscious technology use; and (c) *Marifetname* contributes a culturally grounded value language centered on self-knowledge, moderation, wisdom, moral responsibility, and human dignity. The resulting framework proposes that value-based digital citizenship and AI ethics education should integrate technical competence with ethical judgement, self-regulation, critical evaluation, human agency, and social benefit. Its main contribution is not to claim historical continuity between *Marifetname* and AI policy, but to show how a local value tradition can enrich contemporary educational discussions on responsible digital and AI use.

4. DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

The findings indicate that digital competence, digital citizenship, and AI ethics are increasingly converging within educational frameworks, but they are not represented through the same policy language. International documents tend to frame digital competence through systematic, competency-based, and application-oriented structures, whereas Türkiye documents connect it more strongly with values, conscious technology use, safe use, and responsibility. This finding is consistent with prior research showing that digital competence has moved beyond technical skills toward critical, safe, and responsible participation in digital society (Carretero et al., 2017; Ferrari, 2012; Van Audenhove et al., 2024; Vuorikari et al., 2016). It also supports studies arguing that DigComp-related frameworks increasingly position digital competence in relation to participation, citizenship, security, and policy development rather than merely individual operational skills (Mattar et al., 2022; Vrabec & Furtakova, 2024).

A central result of the study is that AI ethics is more systematic, explicit, and conceptually developed in international documents, especially in UNESCO and OECD frameworks. Concepts such as human oversight, data privacy, accountability, fairness, transparency, bias, and human-centered AI are directly connected to educational guidance and competence development. This aligns with studies that define AI literacy as multidimensional competence involving technical understanding, critical evaluation, ethical judgement, civic responsibility, and awareness of algorithmic systems (Chee et al., 2025; Miao & Cukurova, 2024; Miao & Shiohira, 2024; Sengsri & Khunratchasana, 2024). It also consistent with work emphasizing that generative AI in education should be addressed through human rights, academic integrity, accountability, transparency, and ethical leadership (Ali & Aysan, 2025; Crawford et al., 2023; Fukuda-Parr & Gibbons, 2021; Miao et al., 2024). In contrast, AI ethics is still emerging Türkiye documents. Although digital literacy, cybersecurity, privacy, safe use, responsible behaviour, and values are strongly represented, concepts such as explainability, algorithmic bias, human oversight, data ethics, accountability, and systematic evaluation of generative AI outputs are less explicitly circularized. This should not be read simply as a deficit; rather, it indicates that Türkiye documents offer a strong values-based and safety-oriented foundation that has not yet been fully integrated with contemporary AI ethics vocabulary.

The value-based orientation in Türkiye documents is therefore both a strength and an area requiring further development. It is a strength because it resists reducing digital education to technical proficiency and links technology use to responsibility, privacy, safe conduct, social benefit, and moral awareness. However, without explicit links to algorithmic bias, explainability, human oversight, data ethics, accountability, and validation of AI-generated outputs, this value language may remain too general to guide AI-related educational practice. The main implication is that Türkiye's value-based educational vocabulary should be expanded rather than replaced: it can provide a culturally meaningful foundation for AI ethics if it is connected to the operational concepts used in contemporary international frameworks.

The use of Erzurumlu İbrahim Hakkı's *Marifetname* constitutes the study's distinctive interpretive contribution, but this contribution must be understood with methodological caution. *Marifetname* is not treated as a source that directly addresses digital technologies or AI. Rather, its themes of self-knowledge, moderation, wisdom-oriented knowledge, moral responsibility, and human dignity are interpreted as value resources that can enrich contemporary discussions on digital citizenship and AI ethics. In this sense, the study does not claim a historical equivalence between *Marifetname* and current policy frameworks. It proposes that a local value

tradition can help articulate the kind of moral subject, judgement, self-regulation, and human dignity that responsible AI education should cultivate. This interpretive move strengthens the article's cultural contribution while avoiding an anachronistic reading of a historical-philosophical text.

In conclusion, the transition from digital competence to ethical AI use should not be understood as a linear expansion of skills. It requires an integrated educational framework that combines technical competence, critical literacy, ethical responsibility, privacy awareness, digital self-regulation, human oversight, and social benefit. International documents contribute systematic AI ethics concepts and policy-oriented guidance, while Türkiye documents provide a strong basis in values, safe use, privacy, responsibility, and conscious technology use. The proposed value-based digital citizenship and AI ethics framework seeks to bring these two strengths together. Its central argument is that AI ethics education in Türkiye should not abandon its value-based orientation, but should update it through explicit concepts such as algorithmic bias, explainability, data ethics, accountability, human oversight, and generative AI literacy.

4.1. Recommendations

Based on these results, several policy and research recommendations can be proposed. First, AI ethics should be structured as an explicit learning area in Türkiye education programs, and concepts such as algorithmic bias, data privacy, human oversight, explainability, accountability, and responsible use of generative AI should be included in age-appropriate ways. Second, teacher competencies should be updated to include generative AI pedagogy, ethical AI use, data privacy, and the critical evaluation of AI outputs. Third, digital citizenship education should be expanded beyond safe use and technical skills by integrating digital well-being, self-regulation, human dignity, privacy, social responsibility, and public benefit. Future studies may empirically test the proposed value-based framework with teachers, students, and curriculum developers. Comparative research with other national curricula may also clarify how Türkiye's value-based approach can be strengthened in relation to international AI ethics frameworks.

4.2. Limitations

As this study analyzes representations in documents, the findings do not directly reflect the classroom applications of the relevant policies or curricula. A strong representation of a theme in documents does not necessarily mean that the theme is equally represented in educational practices. Second, as the ethics of artificial intelligence is a rapidly evolving field, new national documents and updates may alter the findings of this study in the future. Third, while conceptual

equivalence was considered in the analysis of documents in different languages, it was acknowledged that differences in translation and terminology could affect interpretation. Finally, while the use of *Marifetname* in the model development process adds a unique value-based dimension to the study, this interpretation should be evaluated in a limited way, considering the cultural and historical context. This study does not claim that *Marifetname* directly addresses digital technologies; rather, it uses selected value themes as interpretive resources.

4.3. Ethical Considerations

In this study, data were not collected from human participants; only publicly available institutional documents and historical/published works were analyzed. Therefore, there are no ethical committee risks associated with human participants. However, for the sake of copyright and academic integrity, direct quotations have been kept brief and provided with document codes and page information. In the interpretations of *Marifetname*, care has been taken not to directly equate the historical context with contemporary political language.

Conflict of Interest Statement

The author declares that there is no conflict of interest regarding the research, authorship, and/or publication of this manuscript.

Data Availability Statement

All data analyzed in this study are publicly available documents cited in the manuscript. No private, confidential, or participant-based data were used.

REFERENCES

- ALI, H.; AYSAN, A. F. Ethical dimensions of generative AI: a cross-domain analysis using machine learning structural topic modeling. *International Journal of Ethics and Systems*, v. 41, n. 1, p. 3-34, 2025. DOI: <https://doi.org/10.1108/IJOES-04-2024-0112>.
- ASSARROUDI, A.; HESHMATI NABAVI, F.; ARMAT, M. R.; EBADI, A.; VAISMORADI, M. Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing*, v. 23, n. 1, p. 42-55, 2018. DOI: <https://doi.org/10.1177/1744987117741667>.
- BAIDOO-ANU, D.; ANSAH, L. O. Education in the era of generative artificial intelligence (AI): understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, v. 7, n. 1, p. 52-62, 2023.

- BOWEN, G. A. Document analysis as a qualitative research method. *Qualitative Research Journal*, v. 9, n. 2, p. 27-40, 2009. DOI: <https://doi.org/10.3316/QRJ0902027>.
- BRAUN, V.; CLARKE, V. Using thematic analysis in psychology. *Qualitative Research in Psychology*, v. 3, n. 2, p. 77-101, 2006. DOI: <https://doi.org/10.1191/1478088706qp063oa>.
- CAMPBELL, S.; GREENWOOD, M.; PRIOR, S.; SHEARER, T.; WALKEM, K.; YOUNG, S.; WALKER, K. Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, v. 25, n. 8, p. 652-661, 2020. DOI: <https://doi.org/10.1177/1744987120927206>.
- CARRETERO, S.; VUORIKARI, R.; PUNIE, Y. *DigComp 2.1: the digital competence framework for citizens with eight proficiency levels and examples of use*. [S. l.]: Publications Office of the European Union, 2017.
- CARTELLI, A. Frameworks for digital competence assessment: proposals, instruments, and evaluation. In: *Proceedings of Informing Science & IT Education Conference — InSITE*. [S. l.: s. n.], 2010. p. 561-573.
- CHEE, H.; AHN, S.; LEE, J. A competency framework for AI literacy: variations by different learner groups and an implied learning pathway. *British Journal of Educational Technology*, v. 56, n. 5, p. 2146-2182, 2025. DOI: <https://doi.org/10.1111/bjet.13556>.
- COSGROVE, J.; CACHIA, R. *DigComp 3.0: European Digital Competence Framework*. [S. l.]: European Commission; Council of Europe Publishing, 2025. DOI: <https://data.europa.eu/doi/10.2760/0001149>.
- COUNCIL OF EUROPE. *Digital citizenship education handbook*. [S. l.]: Council of Europe Publishing, 2022. Disponível em: <https://www.coe.int/en/web/education/-/digital-citizenship-education-handbook>. Acesso em: 28 jun. 2026.
- CRAWFORD, J.; COWLING, M.; ALLEN, K. A. Leadership is needed for ethical ChatGPT: character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching and Learning Practice*, v. 20, n. 3, p. 1-19, 2023. Disponível em: <https://search.informit.org/doi/10.3316/informit.T2024112000002891427961342>. Acesso em: 28 jun. 2026.
- CRESWELL, J. W.; HANSON, W. E.; CLARK PLANO, V. L.; MORALES, A. Qualitative research designs: selection and implementation. *The Counseling Psychologist*, v. 35, n. 2, p. 236-264, 2007.
- ÇOKÇALIŞKAN, A.; ŞENER, S. Bringing intercultural communicative competence and artificial intelligence into teacher education: integrating training and lifelong professional development. In: *Pedagogical Innovations in AI-Supported Intercultural Communications*. [S. l.]: IGI Global Scientific Publishing, 2026. p. 413-444. DOI: <https://doi.org/10.4018/979-8-3373-6325-7.ch013>.
- DATTNER, B.; CHAMORRO-PREMUZIC, T.; BUCHBAND, R.; SCHETTLER, L. The legal and ethical implications of using AI in hiring. *Harvard Business Review*, p. 1-7, 2019.

ERZURUMLU, İ. H. *Marifetname* [Old Turkish script text]. [S. l.: s. n.], 1330. Disponível em: <https://acikerisim.tbmm.gov.tr/items/37ceaca9-2499-4d5b-a0df-be6a757513c9/full>. Acesso em: 28 jun. 2026.

EUROPEAN COMMISSION. *Structural indicators for monitoring education and training systems in Europe – 2023: digital competence at school*. [S. l.]: Publications Office of the European Union, 2023. DOI: <https://doi.org/10.2797/886074>.

FERRARI, A. *Digital competence in practice: an analysis of frameworks*. [S. l.]: Publications Office of the European Union, 2012.

FERRARI, A.; PUNIE, Y. DIGCOMP: a framework for developing and understanding digital competence in Europe. [S. l.: s. n.], abr. 2013.

FUKUDA-PARR, S.; GIBBONS, E. Emerging consensus on ‘ethical AI’: human rights critique of stakeholder guidelines. *Global Policy*, v. 12, p. 32-44, 2021. DOI: <https://doi.org/10.1111/1758-5899.12965>.

FUNDIRA, M.; EDOUN, E. I.; PRADHAN, A. Evaluating end-users’ digital competencies and ethical perceptions of AI systems in the context of sustainable digital banking. *Sustainable Development*, v. 32, n. 5, p. 4866-4878, 2024. DOI: <https://doi.org/10.1002/sd.2945>.

GISBERT CERVERA, M.; CAENA, F. Teachers’ digital competence for global teacher education. *European Journal of Teacher Education*, v. 45, n. 4, p. 451-455, 2022. DOI: <https://doi.org/10.1080/02619768.2022.2135855>.

GUITER, M.; ROMEU, T.; BAZTÁN, P. The digital competence framework for primary and secondary schools in Europe. *European Journal of Education*, v. 56, n. 1, p. 133-149, 2021. DOI: <https://doi.org/10.1111/ejed.12430>.

HSIEH, H.-F.; SHANNON, S. E. Three approaches to qualitative content analysis. *Qualitative Health Research*, v. 15, n. 9, p. 1277-1288, 2005. DOI: <https://doi.org/10.1177/1049732305276687>.

KIYMAZ, M. S.; KAYA, T. Dijital okuryazarlık becerilerinin yapay zekâ ile geliştirilmesi ve yabancılara Türkçe öğretiminde kullanılabilirliği. *Uluslararası Türkçe Öğretimi Araştırmaları Dergisi*, v. 5, n. Özel Sayı, p. 256-280, 2025. DOI: <https://doi.org/10.5281/zenodo.17835249>.

ÖZENÇ, Y. Y. Eğitimde yapay zekâ etiği ve politikaları: Finlandiya, Güney Kore ve Türkiye örneği. *Siirt Eğitim Dergisi*, v. 5, n. 2, p. 1-27, 2025. DOI: <https://doi.org/10.58667/sedder.1777959>.

LINCOLN, Y. S.; GUBA, E. G. *Naturalistic inquiry*. [S. l.]: Sage, 1985.

MATTAR, J.; RAMOS, D. K.; LUCAS, M. R. DigComp-based digital competence assessment tools: literature review and instrument analysis. *Education and Information Technologies*, v. 27, n. 8, p. 10843-10867, 2022. DOI: <https://doi.org/10.1007/s10639-022-11034-3>.

MATTAR, J.; SANTOS, C. C.; CUQUE, L. M. Analysis and comparison of international digital competence frameworks for education. *Education Sciences*, v. 12, n. 12, artigo 932, 2022. DOI: <https://doi.org/10.3390/educsci12120932>.

MIAO, F.; CUKUROVA, M. *AI competency framework for teachers*. [S. l.]: UNESCO, 2024. DOI: <https://doi.org/10.54675/ZJTE2084>.

MIAO, F.; HOLMES, W. *Guidance for generative AI in education and research*. [S. l.]: UNESCO, 2023. DOI: <https://doi.org/10.54675/EWZM9535>.

MIAO, F.; SHIOHIRA, K. *AI competency framework for students*. [S. l.]: UNESCO, 2024. DOI: <https://doi.org/10.54675/JKJB9835>.

MIAO, J.; THONGPRAYOON, C.; SUPPADUNGSUK, S.; GARCIA VALENCIA, O. A.; QURESHI, F.; CHEUNG PASITPORN, W. Ethical dilemmas in using AI for academic writing and an example framework for peer review in nephrology academia: a narrative review. *Clinics and Practice*, v. 14, n. 1, p. 89-105, 2024. DOI: <https://doi.org/10.3390/clinpract14010008>.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE GENERAL DIRECTORATE OF SECONDARY EDUCATION. *Dijital okuryazarlık becerileri etkinlik kitabı*. [S. l.]: Millî Eğitim Bakanlığı, 2023. ISBN 978-975-11-6488-9. Disponível em: <https://ogmmateryal.eba.gov.tr/kitap/okuryazarlik-becerileri/dijital-okuryazarlik/index.html>. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *Öğretmenlik mesleği genel yeterlikleri*. [S. l.]: Öğretmen Yetiştirme ve Geliştirme Genel Müdürlüğü, 2017. Disponível em: <https://oygm.meb.gov.tr/www/ogretmenlik-meslegi-genel-yeterlikleri/icerik/486>. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *Information Technology Curriculum*. [S. l.]: Ministry of National Education of Türkiye, 2024a. Disponível em: <https://tymm.meb.gov.tr/upload/program/bilisim-teknolojileri-ve-yazilim-tegm.pdf>. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *Maarif Common Curriculum Model*. [S. l.]: Ministry of National Education of Türkiye, 2024b. Disponível em: <https://tymm.meb.gov.tr/ortak-metin>. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *Social Studies Curriculum*. [S. l.]: Ministry of National Education of Türkiye, 2024c. Disponível em: <https://tymm.meb.gov.tr/upload/program/2024programsos4567Onayli.pdf>. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *21st Century Skills and Values Report*. [S. l.]: Ministry of National Education of Türkiye, 2024d. Disponível em: https://ttkb.meb.gov.tr/meb_iys_dosyalar/2023_05/11153521_21.yy_becerileri_ve_degerlere_yonelik_arastirma_raporu.pdf. Acesso em: 28 jun. 2026.

MINISTRY OF NATIONAL EDUCATION OF TÜRKİYE. *An analysis of The Century of Türkiye Education Model (CTEM) curricula within the framework of the Council of Europe's Digital Citizenship Education (DCE) Planner: CTEM-DCE report*. [S. l.]: Ministry of National Education of Türkiye, 2025. Disponível em: <https://ttkbyayin.meb.gov.tr/yayin/332>. Acesso em: 28 jun. 2026.

NGUYEN, K. V. The use of generative AI tools in higher education: ethical and pedagogical principles. *Journal of Academic Ethics*, v. 23, n. 3, p. 1435-1455, 2025. DOI: <https://doi.org/10.1007/s10805-025-09607-1>.

NOOTHIGATTU, R.; BOUNEFFOUF, D.; MATTEI, N.; CHANDRA, R.; MADAN, P.; VARSHNEY, K. R.; CAMPBELL, M.; SINGH, M.; ROSSI, F. Teaching AI agents' ethical values using reinforcement learning and policy orchestration. *IBM Journal of Research and Development*, v. 63, n. 4/5, p. 2:1-2:9, 2019. DOI: <https://doi.org/10.1147/JRD.2019.2940428>.

O'CONNOR, C.; JOFFE, H. Intercoder reliability in qualitative research: debates and practical guidelines. *International Journal of Qualitative Methods*, v. 19, p. 1-13, 2020. DOI: <https://doi.org/10.1177/1609406919899220>.

OECD. *OECD digital education outlook 2026: exploring effective uses of generative AI in education*. [S. l.]: OECD Publishing, 2026. DOI: <https://doi.org/10.1787/062a7394-en>.

RAKISHEVA, A.; WITT, A. Digital competence frameworks in teacher education: a literature review. *Issues and Trends in Learning Technologies*, v. 11, n. 1, 2023. DOI: <https://doi.org/10.2458/itlt.5205>.

REDECKER, C. *European framework for the digital competence of educators: DigCompEdu*. Punie, Y. (ed.). [S. l.]: Publications Office of the European Union, 2017. DOI: <https://doi.org/10.2760/159770>.

SCHREIER, M. *Qualitative content analysis in practice*. [S. l.]: Sage, 2012.

SENGSRI, S.; KHUNRATCHASANA, K. Artificial intelligence competence: a crucial skill for the digital citizens. *International Education Studies*, v. 17, n. 3, p. 75-83, 2024. DOI: <https://doi.org/10.5539/ies.v17n3p75>.

TEMUR, S. Türkiye'de yapay zekâ kullanımına yönelik eğitim politikası belgelerinde kapsayıcı eğitim perspektifi. *Türk Eğitim Bilimleri Dergisi*, p. 457-490, 2026. Publicação antecipada online. DOI: <https://doi.org/10.37217/tebd.1766423>.

TRACY, S. J. Qualitative quality: eight "big-tent" criteria for excellent qualitative research. *Qualitative Inquiry*, v. 16, n. 10, p. 837-851, 2010. DOI: <https://doi.org/10.1177/1077800410383121>.

VAN AUDENHOVE, L.; VERMEIRE, L.; VAN DEN BROECK, W.; DEMEULENAERE, A. Data literacy in the new EU DigComp 2.2 framework: how DigComp defines competences on artificial intelligence, internet of things and data. *Information and Learning Sciences*, v. 125, n. 5/6, p. 406-436, 2024. DOI: <https://doi.org/10.1108/ILS-06-2023-0072>.

VAROL, N. Eğitimde yapay zekâ ve etik: bir alanyazın taraması. *Okul Yönetimi*, v. 5, n. 1, p. 117-125, 2025. Disponível em: <https://izlik.org/JA87US93SW>. Acesso em: 28 jun. 2026.

VRABEC, N.; FURTÁKOVÁ, L. Ways of defining digital competences and their components in the EU, EC and UNESCO recommendations. *Annales Universitatis Paedagogicae Cracoviensis. Studia de Cultura*, v. 16, n. 2, p. 5-17, 2024. DOI: <https://doi.org/10.24917/20837275.16.2.1>.

VUORIKARI, R.; KLUZER, S.; PUNIE, Y. *DigComp 2.2: the Digital Competence Framework for Citizens — with new examples of knowledge, skills, and attitudes*. Seville: Joint Research Centre, 2022. DOI: <https://data.europa.eu/doi/10.2760/115376>.

VUORIKARI, R.; PUNIE, Y.; CARRETERO, S.; VAN DEN BRANDE, G. *DigComp 2.0: the digital competence framework for citizens: update phase 1: the conceptual reference model*. [S. l.]: Publications Office of the European Union, 2016. Disponível em: <https://ideas.repec.org/p/ipt/iptwpa/jrc101254.html>. Acesso em: 28 jun. 2026.

Appendix 1,

Representative Codes Sections

Theme	Document	Brief Evidence	Analytical Interpretation
Digital Competence	EU-1	“confident, critical and responsible use”	Digital competence is framed as critical, safe and responsible use rather than as a purely technical skill.
Digital Competence	TR-1	“etkili, bilinçli ve güvenli”	Türkiye documents emphasize effective, conscious and safe technology use.
Digital Citizenship	CoE-1	“being online, well-being online and rights online”	Digital citizenship combines online presence, well-being, rights, responsibilities and participation.
AI Ethics’	UNESCO-1	“Human-centred mindset, Ethics of AI”	AI ethics is positioned as a clear and central dimension of AI competence.
Human Control	OECD-1	“human judgement, feedback and oversight”	Human judgement and oversight are preserved in generative AI use.
Teacher Competency	TR-5	“effectively uses information and communication technologies”	Teacher competence includes the effective use of ICT in professional practice.
Privacy	TR-6	“privacy datas”	Privacy is linked to personal data awareness and KVKK-related responsibility.
Security	TR-3	“information ethics and cyber security”	Ethics and cybersecurity are presented as an integrated curricular theme.
Critical Literacy	TR-2	“critical perspective”	Students are expected to evaluate digital and visual resources critically.
Self-knowledge	İH-1	“who knows herself, knows her Lord”	Self-knowledge provides a value-based basis for self-regulation and responsible technology or AI use.
Human dignity	İH-1	“honor of beings”	Human dignity provides a philosophical basis for human-centred AI ethics.

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