Generative Artificial Intelligence Use Among Students: A Cross-National Comparison Between Türkiye and England

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Abstract: Generative artificial intelligence (GenAI) tools are increasingly present in children's everyday digital lives, yet research on primary school students remains limited. This study examines how students in Türkiye and England conceptualise and use GenAI, and whether family AI use is associated with students' own use. A quantitative cross-national survey was conducted with 359 students in Türkiye and 98 students in England. The questionnaire included open-ended and closed-ended items on AI conceptualisations, frequency of use, purposes of use, and family AI use. Open-ended responses were coded thematically, and chi-square tests were used to examine group differences and associations. Findings showed that students in Türkiye more often described AI in technological and functional terms, whereas unclear understanding was more common among students in England. GenAI use frequency did not differ significantly between countries, with most students reporting occasional use. However, purposes of use varied: students in Türkiye reported more diverse and creative uses, while students in England more often used GenAI for information seeking or reported unclear/non-use. In the England sample, family AI use was strongly associated with students' own use frequency. The study highlights the need for developmentally appropriate AI literacy initiatives involving both schools and families.

Keywords: Generative Artificial Intelligence, AI Literacy, Primary School, Digital Technology Use, Cross-Cultural Comparison

1. Introduction

Artificial intelligence (AI), particularly generative AI (GenAI), is becoming increasingly embedded in children's everyday digital environments. Conversational agents, content generators, and AI-powered learning tools are no longer used only by adults or older students; children are also encountering these technologies at younger ages. Recent evidence suggests that many children aged 7–12 already interact with GenAI tools, indicating a rapid diffusion of these technologies into childhood digital practices (Mansfield et al., 2025). As AI becomes more accessible in both domestic and educational settings, understanding how children perceive, interpret, and use these tools has become an important research priority.

Existing research shows that children often conceptualize AI through familiar and human-centred ideas. Rather than explaining AI in technical terms, they frequently describe it as a robot, helper, intelligent machine, or human-like entity capable of thinking, responding, or assisting (Andries & Robertson, 2023; Samuelsson, 2023). Such descriptions suggest that children's early understandings of AI are shaped by everyday experiences and social interaction rather than by formal technical knowledge. At the same time, children's awareness of how AI systems process data, generate responses, and raise ethical or privacy-related concerns remains limited. This gap between use and understanding highlights the need to examine children's conceptualizations of AI alongside their actual patterns of engagement.

Children's engagement with GenAI is also shaped by social and familial contexts. Previous research on children's technology use shows that parents' and family members' practices influence when, how, and for what purposes children use digital tools (Beneteau et al., 2020; Druga et al., 2022; Nikken & Jansz, 2014). Children may encounter AI not only through school-based platforms, but also through siblings, parents, peers, household devices, games, and informal online activities. Therefore, children's early experiences with GenAI may be mediated as much by family and home environments as by formal educational policy or classroom practice.

This study focuses on Türkiye and England because these two contexts provide a meaningful comparison in relation to AI in education. Both have recently developed policy-level discussions and guidance concerning AI use, yet their emphases differ. In England, policy discourse has more strongly highlighted the pedagogical potential of AI and its possible role in supporting teaching and learning, whereas in Türkiye, recent policy developments have placed greater emphasis on ethical principles, safety, transparency, and responsible use. However, it remains unclear whether these national policy orientations are reflected in children's everyday encounters with GenAI, especially when much of their AI exposure may occur informally outside school. In response to this gap, the present study examines how primary school students in Türkiye and England

conceptualize and use GenAI, how frequently they use it, for what purposes they use it, and whether family members' AI use is associated with students' own AI use behaviors. By adopting a cross-national perspective, the study aims to identify both shared patterns and contextual differences that can inform age-appropriate AI literacy initiatives involving schools, families, and wider digital environments.

1.1 Research Questions

RQ1. How do students in Türkiye and England conceptualize artificial intelligence?

RQ2. How frequently do students use generative artificial intelligence?

RQ3. How do students' purposes of using generative artificial intelligence (e.g., homework, research, design, entertainment) differ between Türkiye and England?

RQ4. Is the presence of family members who use AI related to students' own AI use behaviours?

2. Background

2.1 Generative AI in Education

Generative artificial intelligence (GenAI), particularly large language model-based tools, has become increasingly visible in education by enabling natural language interaction, generating contextually relevant responses, and providing on-demand learning support (Bauer et al., 2025; OECD, 2026). With tools such as ChatGPT becoming widely accessible, AI is no longer limited to institutionally provided technologies but can also be used independently by students in their everyday learning practices.

Research suggests that students use GenAI for a range of purposes, including accessing information, understanding concepts, completing homework, and generating content (Zhu et al., 2025). These patterns indicate that GenAI can function both as a cognitive support tool and as a production-oriented assistant. However, students may also use these tools to speed up or simplify tasks rather than to deepen learning, raising questions about the quality of engagement and the development of AI literacy (Caffaratti et al., 2025; OECD, 2026).

A further issue is that students' GenAI use often occurs outside formal school settings. Many students access these tools at home and use them according to individual needs, often without systematic teacher guidance (Zhao et al., 2025; OECD, 2026). Although teachers are beginning to use GenAI for tasks such as lesson planning, content creation, and material preparation, systematic classroom integration remains limited (Diliberti et al., 2024; OECD, 2026). This suggests that students' early encounters with GenAI may be shaped not only by formal education but also by informal and domestic contexts.

2.2 Use of Generative Artificial Intelligence in Türkiye and England

Türkiye and England provide a meaningful basis for comparison because both contexts have recently addressed generative artificial intelligence in education, yet they differ in how AI is framed at the policy level. In England, official guidance from the Department for Education emphasises the potential of AI to support teaching and learning, reduce teacher workload, and contribute to pedagogical processes, while also recognising risks related to safety, accuracy, and data protection (Department for Education, 2023). Thus, AI is positioned both as an educational opportunity and as a technology requiring responsible implementation.

In Türkiye, recent policy developments have placed stronger emphasis on the ethical, safe, transparent, and responsible use of AI in educational settings. The Ethical Guidelines for Artificial Intelligence Applications in Education, published by the Ministry of National Education, identifies principles intended to guide educational stakeholders and manage potential risks associated with AI use (Ministry of National Education, 2026). Within this context, AI in education is framed primarily through ethical governance, awareness raising, data security, and responsible use.

Overall, while England more explicitly emphasises the pedagogical integration of AI, Türkiye foregrounds ethical principles and responsible implementation. However, in both contexts, children's actual encounters with GenAI may occur outside formal school structures, particularly through family members, peers, home technologies, and informal digital practices. This creates an important tension between policy-level expectations and

children's everyday experiences, which the present study addresses through a cross-national comparison of students' GenAI perceptions and use.

2.3 Theoretical Perspective

This study is informed by social constructivist and developmental perspectives on children's encounters with generative artificial intelligence. GenAI systems are increasingly relevant to children's everyday experiences because they provide dialogue-based interaction and respond in ways that may resemble human communication. Research in child development has long emphasised the role of conversational exchanges with parents, siblings, teachers, and peers in supporting language development, cognitive growth, and social understanding (Golinkoff et al., 2019; Gelman, 1990). As conversational AI systems become part of children's digital environments, it is important to consider how children interpret these systems within broader social and communicative contexts (Xu, 2023).

Social constructivism provides a useful lens for examining children's perceptions of AI because children's understandings of new concepts are shaped through interaction with their social and cultural environments rather than through isolated individual experience (Vygotsky, 1978). From this perspective, children's ideas about GenAI may develop through everyday interactions with family members, peers, digital media, and household technologies. Previous research similarly suggests that children often learn about emerging technologies through informal encounters with family members and peers rather than through structured instruction (Druga et al., 2022; Zhao et al., 2025). This perspective is directly relevant to the present study, which examines not only students' own AI use but also the role of family members' AI use in shaping children's engagement with these tools.

Vygotsky's concept of the "more knowledgeable other" further supports the focus on family influence. Family members who use AI may introduce children to these tools, model possible uses, and provide informal guidance about when and how AI can be used. In this sense, the family can function as an informal learning environment in which children's early AI experiences are socially mediated. This theoretical perspective is especially important because children's encounters with GenAI may occur at home as much as, or even more than, in formal school settings.

Developmental perspectives also help explain why children may conceptualize AI in anthropomorphic or human-centred ways. Children in middle childhood are still developing the ability to understand complex abstract systems and may rely on familiar concepts when interpreting unfamiliar technologies. Therefore, descriptions of AI as a robot, helper, or human-like entity may reflect age-appropriate attempts to make sense of computational systems through existing mental models (Andries & Robertson, 2023; Samuelsson, 2023).

Finally, the study is informed by contemporary discussions of AI literacy. AI literacy is often conceptualized as a multidimensional construct involving awareness, practical use, critical evaluation, ethical understanding, and knowledge of how AI systems operate (Zhou et al., 2025). However, given the age of the participants, this study focuses primarily on children's awareness, conceptual understandings, and usage experiences rather than advanced technical or ethical competencies. Combining social constructivist, developmental, and AI literacy perspectives therefore provides a framework for interpreting how children in Türkiye and England encounter, understand, and use GenAI within different social and national contexts.

3. Methodology

This study used a quantitative descriptive survey design to examine primary school students' use of, and awareness of, generative artificial intelligence in Türkiye and England. During the data collection process, a questionnaire was administered to students in both countries. Within the scope of the study, data were collected from 98 students in England and 359 students in Türkiye; valid sample sizes varied slightly by item because of unclear or missing responses. The participants were aged between 9 and 11.

The questionnaire was developed specifically for this study and included both open-ended and closed-ended items addressing students' conceptualisations of AI, frequency and purposes of GenAI use, awareness of these technologies, and family members' AI use.

All data were collected anonymously, and the research process was conducted in accordance with ethical guidelines. Ethical approval for the study was obtained from the relevant institution. Prior to data collection,

informed consent was obtained from school administrations, teachers, parents, and students. Participation was voluntary, and no compensation was provided to the participants.

3.1 Data Analysis

The data were analysed in accordance with the four research questions. For the first research question, students' open-ended responses defining artificial intelligence were analysed through content-based coding. The responses were classified into five conceptual categories: anthropomorphic/robotic, functional/help-oriented, technological/tool-based, evaluative/affective, and unclear/no clear understanding. Frequency and percentage distributions were calculated separately for the Türkiye and England samples. A chi-square test of independence was then conducted to determine whether the distribution of conceptual categories differed significantly by country. Cramer's V was calculated to evaluate the strength of the association.

For the second research question, responses concerning frequency of GenAI use were coded as never, sometimes, or very often. Descriptive statistics were calculated for each country, and a chi-square test of independence was performed to examine whether reported frequency of use differed between the Türkiye and England samples. Unclear or missing responses were excluded from the inferential analysis.

For the third research question, students' open-ended responses regarding their purposes of GenAI use were analysed using a multiple-response coding approach, as some participants reported more than one purpose of use. Responses were coded into four thematic categories: education and academic support, information and research, games and entertainment, and creative production. Responses indicating non-use or unclear purposes were coded separately. Frequencies and percentages were calculated on the basis of the total number of cases in each country sample.

For the fourth research question, students' responses regarding family members' AI use were coded as yes, no, or unclear/missing. Frequency distributions were first calculated to describe family AI use in each country. Cross-tabulation and chi-square analysis were then used to examine the association between family AI use and students' own reported frequency of GenAI use. Since the Türkiye sample showed almost no variation in the family-use variable, inferential analysis for this relationship was conducted only for the England sample. Cramer's V was calculated to assess effect size.

3.2 Limitations

While AI literacy is often conceptualized as a multidimensional construct involving technical understanding, critical evaluation, ethical awareness, and practical use, the present study focuses primarily on children's awareness and usage-related dimensions. Therefore, the findings should not be interpreted as a comprehensive assessment of AI literacy.

4. Findings

4.1 RQ1. How do Students in Türkiye and England Conceptualize Artificial Intelligence?

To examine children's conceptual understandings of artificial intelligence, the open-ended responses were coded into five categories.

Table 1: Conceptual Categories of Artificial Intelligence by Country

Conceptual Category	Türkiye n	Türkiye %	England n	England %
Anthropomorphic/robotic	77	21.4	16	16.3
Functional/help-oriented	96	26.7	19	19.4
Technological/tool-based	105	29.2	13	13.3
Evaluative/affective	52	14.5	13	13.3
Unclear / no clear understanding	29	8.1	37	37.8
Total	359	100.0	98	100.0

As shown in Table 1, children in Türkiye and England differed in how they conceptualized artificial intelligence. In the Türkiye sample, technological/tool-based and functional/help-oriented descriptions were the most common, whereas in the England sample the largest category was unclear/no clear understanding. While both groups also produced anthropomorphic/robotic, technological/tool-based, and evaluative/affective descriptions, the relative distribution of these categories varied across countries. The chi-square analysis showed that this difference was statistically significant, $\chi^2(4, N = 458) = 36.72$, $p < .001$, with a Cramer's V of .28, indicating a meaningful association between country and children's conceptualizations of AI.

4.2 RQ2. How Frequently do Students use Generative Artificial Intelligence?

To examine students' reported frequency of generative AI use, frequency and percentage distributions were calculated by country, followed by a chi-square test of independence.

Table 2: Frequency of Generative AI Use by Country

Frequency of GenAI Use	Türkiye n	Türkiye %	England n	England %
Never	92	25.6	17	18.7
Sometimes	221	61.6	57	62.6
Very often	46	12.8	17	18.7
Total	359	100.0	91	100.0

Table 2 shows the distribution of students' reported frequency of generative AI use in the Türkiye and England samples. In both countries, the most frequently reported category was "sometimes". In the Türkiye sample, 61.6% of students reported using generative AI sometimes, 25.6% reported never using it, and 12.8% reported using it very often. In the England sample, after excluding seven unclear or missing responses, 62.6% of students reported using generative AI sometimes, while 18.7% reported never using it and another 18.7% reported using it very often. A chi-square test of independence indicated that the distribution of AI use frequency did not differ significantly by country, $\chi^2(2, N = 450) = 3.24$, $p = .197$. The effect size was small (Cramer's V = .08), suggesting that students in Türkiye and England showed broadly similar patterns in their reported frequency of generative AI use.

4.3 RQ3. How do Students' Purposes of Using Generative Artificial Intelligence (e.g., Homework, Research, Design, Entertainment) Differ Between Türkiye and England?

To examine students' reported purposes for using GenAI, the open-ended responses were coded using a multiple response framework, allowing for students who reported overlapping usage purposes to be accurately represented.

Table 3: Reported Purposes of Generative AI use by Country (Multiple Response)

Purpose Category	Türkiye (n)	Türkiye % of Cases	England (n)	England % of Cases
Education & Academic Support	87	24.2	18	18.4
Information & Research	103	28.7	32	32.7
Games & Entertainment	91	25.3	21	21.4
Creative Production	75	20.9	1	1.0

Purpose Category	Türkiye (n)	Türkiye % of Cases	England (n)	England % of Cases
Non-users / Unclear	3	0.8	35	35.7
Total Cases (N)	359	100.0*	98	109.2*

(Note: Because a multiple response analysis was employed for the England sample where students reported overlapping purposes, the total percentage of cases for England exceeds 100%. The Türkiye sample did not report overlapping purposes in single responses.)

Table 3 presents the distribution of students' reported purposes for using generative AI across the Türkiye and England samples. In the Türkiye sample, students demonstrated a relatively balanced and diverse distribution of AI usage, with Information & research (28.7%) and Games & entertainment (25.3%) being the most common, followed closely by Education & academic support (24.2%). Notably, Creative production—such as prompting AI to write stories, draw pictures, or code—emerged as a substantial and unique use case in Türkiye (20.9%).

Conversely, in the England sample, the primary use case was information and research, with students positioning GenAI mainly as a functional tool for finding facts or asking questions. The multiple-response analysis also showed that some students used GenAI for games and entertainment and for education-related purposes, sometimes reporting these purposes together (e.g., “work and games”). However, engagement in creative production was very limited among students in England. In addition, a higher proportion of students in the England sample reported non-use or unclear purposes compared with the Türkiye sample. These findings indicate that, while both groups used GenAI for research and educational support, students in Türkiye reported broader and more creative applications, whereas students in England more often used GenAI as a functional information-retrieval tool or reported unclear/non-use.

4.4 RQ4. Is the Presence of Family Members who use AI Related to Students’ Own AI use Behaviours?

To examine the role of family AI use, frequency distributions were calculated and cross-tabulation analysis was conducted between family AI use and students’ own reported frequency of AI use.

Table 4A: Family AI Use by Country

Family AI Use	Türkiye (n)	Türkiye %	England (n)	England %
Yes / at least one family member	359	99.7	61	62.2
No	0	0.0	16	16.3
Unclear / missing	1	0.3	21	21.4
Total	360	100.0	98	100.0

Table 4A shows the distribution of family AI use across the two country samples. In the Türkiye sample, almost all students (99.7%) reported that at least one family member used AI, whereas in the England sample 62.2% reported family AI use, 16.3% reported no family AI use, and 21.4% provided unclear or missing responses. Because the Türkiye family-use variable showed almost no variation, a statistical test of association could not be meaningfully conducted for that sample.

Table 4B: Cross-tabulation of Family AI Use and Students' Own AI Use Frequency in the England Sample

Family AI Use	Never n (%)	Sometimes n (%)	Very Often n (%)	Total
No	7 (43.8)	9 (56.3)	0 (0.0)	16
Yes	3 (4.9)	41 (67.2)	17 (27.9)	61
Total	10	50	17	77

For the England sample, the cross-tabulation presented in Table 4B indicated that students who reported family AI use were more likely to report using AI themselves more frequently. Among students who reported family AI use, 67.2% reported using AI sometimes and 27.9% reported using it very often, whereas none of the students who reported no family AI use reported using AI very often. A chi-square test of independence showed that the association between family AI use and students' own frequency of AI use was statistically significant in the England sample, $\chi^2(2, N = 77) = 19.41$, $p < .001$. The effect size was large (Cramer's $V = .50$), indicating a strong association between family AI use and students' reported AI use frequency.

Taken together, the findings show that children's engagement with GenAI differs not only in terms of conceptual understanding and usage purposes, but also in relation to family context. While students in both countries reported similar overall frequency of use, cross-national differences were observed in how they understood AI and the purposes for which they used it. These findings are interpreted in the following discussion in relation to children's AI literacy, developmental understandings of AI, and informal family-based mediation.

5. Discussion

The findings of this study show that children in Türkiye and England engage with generative artificial intelligence in broadly similar ways in terms of frequency but differ in how they conceptualize and use these tools. Regarding RQ1, students' definitions suggest that many children understand AI through familiar, concrete, and human-centered concepts, such as robots, helpers, intelligent machines, or systems that think like humans. This finding is consistent with previous studies showing that children often attribute human-like characteristics to AI systems and evaluate them as socially responsive entities (Andries & Robertson, 2023; Samuelsson, 2023). From a developmental perspective, such anthropomorphic interpretations may reflect children's attempts to make sense of abstract computational systems through familiar social categories. At the same time, the high proportion of unclear responses, particularly in the England sample, suggests that children's growing exposure to AI does not necessarily correspond to a clear understanding of how these systems work. This supports the view that children's AI literacy may develop more slowly than their practical exposure to AI technologies (OECD, 2026).

Regarding RQ2, most students in both countries reported using GenAI only sometimes. This suggests that, although GenAI is becoming increasingly visible in children's digital lives, it has not yet become a fully routinised everyday practice among this age group. The relatively occasional nature of use may also reflect the developmental stage of the participants, as AI use tends to increase with age and educational level (OECD, 2026). From a social constructivist perspective, children's technology practices develop gradually through repeated exposure, social modelling, and participation in meaningful activities. Therefore, the predominance of occasional use may indicate an emerging stage of engagement in which children are still exploring the possible functions of GenAI rather than using it as a stable learning or production tool.

Regarding RQ3, students in both countries reported using GenAI mainly for information seeking, asking questions, homework support, games, and entertainment. However, students in Türkiye reported more diverse purposes, including creative production such as writing stories, generating images, or coding, whereas students in England more often positioned GenAI as a functional information-seeking tool or reported unclear/non-use. This difference suggests that children's GenAI use may be shaped not only by access to technology, but also by the social and cultural contexts in which technology use is modelled and encouraged. Through a social constructivist lens, technology use can be understood as a socially situated practice: children learn how tools should be used by observing family members, peers, teachers, and wider digital communities. Therefore, cross-national differences in reported purposes may reflect differences in family practices, digital cultures, and opportunities for informal experimentation rather than differences in the technology itself.

Regarding RQ4, the findings highlight the role of family environments in shaping children's engagement with AI. In the England sample, family AI use was strongly associated with students' own frequency of GenAI use. Although this finding does not imply causation, it indicates that children whose family members use AI may have more opportunities to observe, discuss, and experiment with these tools. This interpretation is consistent with Vygotsky's concept of the more knowledgeable other, as family members may introduce children to AI, model its use, and provide informal guidance about its possible applications. In this sense, the family can be understood as an important site of informal AI learning. The findings therefore suggest that AI literacy should not be treated only as a school-based responsibility, but as a broader developmental and social process involving families, schools, and children's everyday digital environments.

Overall, the study demonstrates that children's engagement with GenAI is shaped by the interaction of conceptual understanding, usage frequency, usage purposes, and family context. While children in Türkiye and England showed similar levels of occasional use, their conceptualizations and purposes of use differed in meaningful ways. These findings suggest that early experiences with GenAI are embedded in wider social, cultural, and familial contexts. Consequently, AI literacy initiatives for primary school students should move beyond technical definitions and include age-appropriate discussions of how AI works, what it can and cannot do, and how children encounter these technologies in both school and home settings.

6. Conclusion

This study shows that children's engagement with generative artificial intelligence is shaped by the interaction of usage frequency, conceptual understanding, purposes of use, and family context. Although students in Türkiye and England reported broadly similar levels of GenAI use, differences emerged in how they conceptualised and used these technologies. The findings indicate an important gap between children's emerging use of GenAI and their understanding of how these systems work.

The study also highlights the importance of family environments in shaping children's early AI experiences. AI literacy initiatives should therefore move beyond technical definitions and involve both schools and families in supporting children's responsible and informed use of GenAI. Future research should examine children's GenAI engagement through mixed-method designs, more balanced national samples, and multidimensional AI literacy frameworks that capture not only use, but also understanding, critical evaluation, and ethical awareness.

Ethics Declaration

The confidentiality and anonymity of all participants were strictly maintained. All collected data were stored securely and used solely for research purposes. No identifiable personal information was disclosed.

AI Declaration

This paper was prepared with the assistance of Chatgpt-4.0, which was employed to proofread, edit, and refine the text, enhancing clarity and coherence. The AI tool was used as a supplementary editorial aid, complementing the human editorial process by refining language while preserving the author's original analysis and intent.

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