How Would You Learn It? Children's Choices Between Platforms and Humans as Knowledge Sources

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Abstract

As independent learning becomes increasingly important in digital contexts, understanding how children choose and evaluate information sources has become a key aspect of learning research. This study evaluated children's information seeking behaviors, and their associated self-regulated learning strategies. We interviewed 4th and 5th-graders, inquiring how they would approach learning a novel versus a partially-known concept, and the reasons guiding their choices. Children also described what they would do if they felt stuck during the learning process. We found that considerably more children (73.62%) chose to learn from platforms rather than human-sources, yet perceived humans as more trustworthy and anticipated greater enjoyment when learning from them. Learning expectations were similar across sources, regardless of the novelty of the concept. Interestingly, when feeling stuck, children who initially chose platforms were more likely to switch strategies than those who initially chose humans.

These findings deepen our understanding of children's preferences regarding learning, offering insights for educators to better support students' information-seeking and self-regulated learning, skills that are relevant beyond the classroom in lifelong personal and professional contexts.

Introduction

As technological advancements continue to reshape an increasingly interconnected world, the ability to learn independently has become an essential competence for continuous education and, widely recognized as a core competence, with considerable implications for both personal and professional success[1,2]. The importance of this ability, commonly referred to as *learning how to learn* and often framed as lifelong learning, is reflected in its inclusion in major global educational frameworks, such as UNESCO[3], the inter-American Development Bank[4], and the European Council's (2006) educational agenda[5], among others.

The concept of *learning to learn* emphasizes learners' capacity to direct and monitor their own learning processes, while flexibly adapting strategies across diverse contexts. At its core, it entails *learning to teach oneself*: developing the autonomy and intention to decide what, how, and when to learn. This particular perspective aligns closely with the framework of Self-Regulated Learning (SRL), which refers to the active control learners have over their cognitive, motivational, and behavioral processes to achieve specific learning goals[4,6,7]. SRL involves setting goals, planning, information seeking, monitoring progress, adapting strategies, and engaging in self-assessment, all of which could take place both individually and in social contexts. These activities require personal initiative, perseverance, and adaptive skills, collectively fostering autonomy and supporting lifelong learning.

A key component of SRL is *information-seeking*, defined as the set of cognitive activities undertaken to collect, use, evaluate, and process information[8], where information broadly refers to any data or insight that may alter an individual's state of knowledge[9]. Information-seeking is therefore crucial to SRL, as it

enables individuals to adapt and succeed across educational and social contexts. Yet, despite its central role in *learning to teach oneself*, relatively little is known about how children evaluate different potential sources of information, particularly when comparing traditional human sources with digital platforms.

Previous research has explored children's preferences when asking questions about unfamiliar facts[10–12], their exploratory learning behaviors[13,14], and their trust in human and digital information sources[15–20], providing insights into children's developing understanding and use of selective information-seeking.

Asking questions and seeking information are foundational to learning and knowledge acquisition[21,22]. By age three, children can already distinguish between knowledgeable and ignorant informants, showing a preference for learning from the former, both for human agents[11,12,23,24] and computers[10]. By age six, they can adapt their exploratory behavior, increasing inquiry when perceiving that the interlocutor is less knowledgeable, thereby compensating for information gaps[13,14]. These findings highlight children's early sensitivity to source credibility, which in turn shapes their selective information-seeking. Yet, it remains less clear how this sensitivity translates into choices across different types of sources, particularly as they increasingly navigate both human and digital informants.

Although children are frequently exposed to digital technologies, their understanding of these tools as sources of knowledge remains limited. Parents are often inaccurate in estimating their children's internet-related competencies[25,26]. In particular, gender stereotypes appear to influence these perceptions: although girls often perform as well as or better than boys in technology-related tasks, parents tend to underestimate girls' skills and overestimate boys'[25]. Such biases mirror broader patterns in the literature, where attitudes toward technology use and perceived self-efficacy differ systematically by gender[27], shaping both confidence and engagement with digital learning environments.

While children aged 4–6 can readily identify tablets and smartphones as devices for playing games, taking pictures, or watching movies, they are less likely to recognize their potential for work, learning, or communication, and often do not identify them as sources of information[25,28]. More recently, Girouard-Hallam et al.[18] reported that children's understanding of the internet develops substantially between ages 7 and 10 with improvements continuing through age 12[29]. This developmental trajectory underscores that middle childhood represents a critical window in which children are still consolidating their understanding of digital technologies as knowledge sources. Altogether, these findings show a critical distinction between children's familiarity with digital devices and their awareness of such tools as sources of information, and highlight how little is known about how children weigh digital platforms against traditional human sources when making learning choices.

Building on this foundation, recent studies have examined how children evaluate information sources in learning contexts. Girouard-Hallam and Danovitch[20] documented a developmental shift in how children aged 4–12 evaluate human and digital sources: younger children tend to favor familiar human informants, while older children increasingly rely on digital tools such as Google and make greater use of

epistemic cues (e.g., perceived knowledge). Notably, children aged 4 and 5 preferred learning factual information from humans over voice-based digital assistants, indicating that their preference for human sources is not limited to text-based information[16]. Relatedly, children this age are also sensitive to the temporal focus of information: the shift is particularly pronounced for present- and future-oriented questions, whereas preferences for past events remain relatively stable, already favoring Google[17].

Within contemporary digital learning environments, individuals are confronted with vast amounts of information, both accurate and misleading[30,31]. Equipping children with the ability not only to find information, but also to evaluate its credibility, the intentions behind its dissemination, and the reliability of different sources has become essential for fostering critical thinking and lifelong learning abilities[32,33].

Extending this emerging literature, the present study investigates how children navigate SRL scenarios that require them to decide how to learn a partially known or a novel concept and why. Specifically, we examined: (1) the sources that 4th and 5th graders select to learn a new concept; (2) whether children's preferred learning source varied as a function of age or gender; (3) whether the choice varies depending on the novelty of the concept to be learned; (4) the factors that might influence their choices; and (5) the strategies children employ when they encounter difficulties during learning.

In particular, the study focused on four factors that might shape children's choices: (A) perceived knowledge of the source, (B) trust in the source's response, (C) learning expectations, and (D) expected enjoyment when learning. Factors A and B build on prior research about children's beliefs in omniscience and trust in technological or human sources[17,34]. Factor C addressed children's subjective predictions of how easy or difficult it would be to learn about a novel or partially known concept with a given source[35,36]. Finally, factor D (expected enjoyment) was included to capture the idea, and widely held assumption, that children might prefer sources that are enjoyable or easier to engage with[37], despite the lack of systematic empirical evidence. Incorporating these factors allows us to consider motivational and affective aspects alongside cognitive and trust-related considerations in children's source selection.

Based on the literature reviewed above, we first hypothesized that children would choose to learn more from platforms when learning about a novel concept (i.e., '*Blickets*') compared to the partially known (i.e., '*Earthquakes*'), reasoning that in the absence of a clear referent, they might default to platforms as a more general or accessible option. We also expected that boys and older children would be more likely to choose to learn from platforms than girls and younger children. Lastly, we hypothesized that children would perceive both humans and platforms as more knowledgeable and trustworthy when the concept was partially known, anticipating lower ratings for entirely unfamiliar topics. However, due to the limited body of prior research, we refrained from formulating specific hypotheses for the remaining aspects of the questionnaire. These components were examined in an exploratory manner.

This study aims to advance our understanding of children's perceptions of information sources and the reasons underlying their information-seeking strategies in self-regulated learning contexts. Within the

current landscape of information overload, examining how children search for and evaluate reliable information remains an underexplored area, with the potential to inform educational practices that contribute to the development of lifelong learning skills.

Results

Children's prior knowledge of Blickets and Earthquakes and task engagement

We first examined children's prior knowledge to verify our design assumptions that *'Blicket'* represented novel concepts and *'Earthquakes'* partially-known concepts. We first asked whether they knew what a *'Blicket'* is or how an earthquake forms. In alignment with our experimental premise, most of the children (97.6%) reported not knowing what a *'Blicket'* was. Regarding *'Earthquakes'*, 43.4% of participants reported not knowing how an earthquake forms, while 48.1% indicated only partially knowing, and 8.5% reported full understanding, thus supporting our hypothesis.

Given the complexity of the interview task and to ensure task engagement, we included two control attentional-check questions before continuing with the questionnaire to assess whether children understood and monitored the ongoing task: (a) recalling what they were supposed to learn, and (b) recalling the time they had to present it. Most participants (75.4%) answered both questions correctly, while 21% did not remember when they were expected to present the corresponding concept. A smaller proportion failed to recall either what they were supposed to learn and present (1.2%), or both aspects (i.e., the concept and the time to present it) (2.4%). Children who did not recall either aspect were reminded of the learning task and the time available to complete it.

Information-Seeking: Which sources do children turn to?

Children's source selection was evaluated across the two questionnaires (one per learning concept), yielding a total of 246 responses from 123 participants. Overall, considerably more children favored platforms (73.62%) over human sources (26.38%). We examined whether the type of learning concept, either novel or partially known, influenced children's source selection. This selection pattern was observed for both novel and partially known concepts, yet children's preference for platforms strengthened when they possessed partial prior knowledge, implying that familiarity may promote greater reliance on digital learning sources (80.47% vs. 66.67%; Fig. 1).

An exact McNemar test was conducted to assess associations between paired categorical variables. Of the 123 participants, 75 consistently chose platforms for both concepts, while 17 consistently chose human sources. The remaining 31 students selected mixed methods: 23 of them preferred platforms for *'Earthquakes'*, and human sources for *'Blickets'*, whereas 8 preferred human sources for *'Earthquakes'* and platforms for *'Blickets'*. The exact McNemar test indicated a significant shift in learning strategies (p = .011), with children being significantly less likely to choose platforms for the novel concept. The odds ratio of 2.875, 95% CI [1.24, 7.23] indicated that children who chose platforms for *'Earthquakes'*

were nearly three times more likely to select human sources for *'Blickets'* than those showing the opposite pattern (see Fig. 1).

Bars show the percentage of children choosing to learn from platforms versus human sources when presented with either novel (dark blue) or partially-known (light blue) concepts. Graphics represent specific source types: tablet = digital, books = printed materials, teacher = educational, group of people = social. Only significant differences are shown.

*$p < .05$.

To further analyse whether school year or gender predicted children's choices, we conducted a generalized linear mixed-effect model including novelty of the concept (novel vs. partially-known), gender, and school grade as fixed effects, with random intercepts for participants. The effect of novelty remained significant (β = 1.09, SE = 0.395, z = 2.76, p = .006), while, neither gender nor grade reached significance (*p's* > .10), indicating that the preference for platforms over human sources was consistent across groups. Nonetheless, there was a tendency for fifth graders to choose platforms more often than fourth graders.

A closer examination revealed that children's platform choices were predominantly digital (88.24%), with a much smaller proportion corresponding to printed materials (11.76%). A binomial test confirmed that the proportion of digital choices was significantly greater than chance (95% *CI* [0.83, 0.92], $p < .001$). In contrast, human sources were more evenly distributed between educational (53.73%) and social contexts (46.27%), with the proportion of educational choices not differing significantly from chance (95% *CI* [0.41, 0.66], $p = .625$) (Fig. 1).

Behind the choices: What shapes children's approaches to learning?

We further examined four factors that may influence children's selection of information sources in order to learn about *'Blickets'* or *'Earthquakes'*: (A) Perceived knowledge of the source, (B) Trust in the source's response, (C) Learning Expectations, and (D) Expected enjoyment when learning. Briefly, participants rated each of these factors using a 1–7 Likert Scale, where 1 meant '*very little*' and 7 meant '*a lot*'. Therefore, higher values in the scale indicated more favorable evaluations.

To analyse these dimensions, we conducted cumulative link mixed models (CLMM). The models tested the effects of the chosen information source (platforms or human sources), the novelty of the concept (*'Blickets'*: novel, '*Earthquakes'*: partially-known), and their interaction on each of the four dimensions. Separate models were estimated for each dimension. Random intercepts for each participant were included to account for individual variability.

1. Perceived knowledge of the source

Children rated how knowledgeable they believed the chosen source was about *'Blickets'* or *'Earthquakes'*. Overall, considering both novel and partially-known concepts, children rated platforms as more knowledgeable (M = 5.459, SE = 0.07) than human sources (M = 5.061, SE = 0.14). However, this difference was driven by lower ratings for human sources when evaluating *'Blickets'* (M = 4.805, SE = 0.175), whereas ratings of human knowledge about *'Earthquakes'* (M = 5.48, SE = 0.20) were comparable to those given to platforms (See Fig. 2a).

The CLMM analysis revealed a significant interaction between information source and novelty of the concept (β = 1.35, SE = 0.65, z = 2.10, p = .036, $N_{Blickets}$ = 124 and $N_{Earthquakes}$ = 127), suggesting that human sources were rated as particularly less knowledgeable when asked about *'Blickets'* (i.e., a novel concept). In addition, a main effect of source indicated that humans were perceived as less knowledgeable than platforms (β = -1.16, SE = 0.42, z = − 2.70, p = .006). The novelty of the concept (*'Blickets'*: novel, *'Earthquakes'*: partially known) did not significantly affect perceived knowledge ratings (p = .288).

1. Trust in the source's response

Children rated human sources' responses as more trustworthy (M = 6.137, SE = .13) than platform responses (M = 5.059, SE = 0.10), regardless of the novelty of the concept ($N_{Blickets}$ = 94 and $N_{Earthquakes}$ = 95) (see Fig. 2b).

The CLMM showed a significant main effect of information source (β = 2.39, SE = 0.56, z = 4.26, p < .001). There was no significant main effect of concept, nor an interaction between both information source and concept (p = .56 and p = .76 respectively), suggesting that human sources were considered more trustworthy than platforms, regardless of the concept.

1. Learning expectations

The ratings of expected learning were similar for platforms (M = 5.17, SE = 0.07) and human sources (M = 5.30, SE = 0.15) ($N_{Blickets}$ = 126, $N_{Earthquakes}$ = 128). The CLMM analysis revealed no significant main effects of novelty of the concept (p = .97) or information source (p = .83), nor a significant interaction between the two (p = .28) (see Fig. 2c).

These results suggest that children perceived learning from platforms and human sources as comparably advantageous, regardless of the concept.

1. Expected enjoyment when learning

Children rated how much they would enjoy learning with the chosen source about *'Blickets'* or *'Earthquakes'*. Participants indicated they would enjoy more learning with humans (M = 5.88, SE = 0.15) rather than with platforms (M = 5.18, SE = 0.11) ($N_{Blickets}$ = 126 and $N_{Earthquakes}$ = 127) (see Fig. 2d).

The CLMM analysis showed a significant difference based on the selected source, indicating that children would enjoy more learning with humans than with platforms ($\beta = 1.31$, $SE = 0.47$, $z = 2.78$, $p = .005$), regardless of the novelty of the concept. No significant differences were found neither depending on the novelty of the concept nor in the interaction between source and concept ($p = .34$ and $p = .85$ respectively).

(a) Perceived knowledge of the source; (b) Trust in the source's response; (c) Learning expectations, and (d) Expected enjoyment when learning. Children rated these four dimensions using a 7-point Likert scale (1 = 'very little', 7 = 'a lot'). The boxplots show the distribution of each variable: boxes represent the interquartile range (IQR), with the median indicated by a horizontal line within each box. The whiskers extend to 1.5 × IQR. Black dots inside the box represent the mean values, and the ones outside the box represent outliers. Asterisks indicate statistically significant differences. Dark blue represents the novel concept (*'Blicket'*), and light blue represents the partially-known concept (*'Earthquakes'*). Only significant differences were marked. No significant differences were found for figure c.

*$p < .05$, **$p < .01$, ***$p < .001$.

Navigating obstacles: Children's strategies when feeling stuck

After completing the first part of the questionnaire for each concept, children were asked what they would do if they got stuck during the learning process. Their responses were categorized into three groups: (A) No Change: children who maintained the same strategy as their initial choice throughout the questionnaire; (B) Change Within Modality: children who adjusted their approach within the same modality (e.g., switching from one platform to another or from one human source to another); and (C) Change Across Modalities: children who shifted to a different modality compared to their initial choice (e.g., switching from a platform to a human source, from a human source to a platform, or adopting an alternative approach such as taking a break or summarizing the content).

We conducted a cumulative link mixed model (CLMM) analysis on 254 interviews corresponding to 131 participants. The dependent variable in the analysis was strategy change (No Change, Change Within Modality, or Change Across Modalities). Fixed effects included the novelty of the concept ('*Blickets'* vs. '*Earthquakes*') and their initial selection of sources (human vs. platform), as well as their interaction. A random intercept for participants was included to account for repeated measures.

Analysis revealed a significant main effect of the selected source: children who initially chose to learn with platforms were significantly more likely to change their strategy than those who chose to learn with human sources ($\beta = 2.493$, $SE = 0.57$, $z = 4.34$, $p < .001$). There was no main effect of the novelty of the concept ($p = .40$), nor an interaction effect between the selected source and the concept ($p = .68$) (see Fig. 3).

The figure shows the percentage of responses for each strategy (No Change, Change Within Modality, and Change Across Modalities) based on: (a) whether the concept to be learned is novel (dark blue) or

partially-known (light blue); or (b) whether the children's initial learning strategy was a platform (gray) or a human source (orange). Asterisks indicate significant differences ($p < .001$) between selected strategies when feeling stuck, depending on the initial chosen source. Only significant differences were marked.

***$p < .001$.

Discussion

The present study examined 4th and 5th graders' information-seeking behaviors in the context of hypothetical Self-Regulated Learning (SRL) scenarios. Children were asked how they would learn either a novel or a partially known concept, the factors that could influence their choices, and the strategies they would use if they felt stuck.

Consistent with prior evidence of children's increasing reliance on digital tools[20], most participants preferred to learn from platforms over human sources. This preference did not differ significantly by gender or school grade. However, the slight, non-significant trend for fifth graders to choose platforms more often than fourth graders is consistent with the view that this shift continues to strengthen across middle childhood. The absence of a significant difference may be partly explained by the fact that, due to ethical committee constraints, we did not collect participants' exact ages, which limited our ability to capture finer age-related differences between grades.

When delving into the factors influencing those choices, a complex and interesting pattern emerged. Children rated humans higher in trustworthiness and expected enjoyment, but lower in knowledge, while learning expectations did not differ between sources. Although children rated humans as less knowledgeable than platforms about *'Blickets'*, they paradoxically turned to humans more often when confronted with novelty. Prior work indicates that children often attribute greater epistemic authority to technological sources of factual knowledge[17], and egocentric anchoring biases suggest that children's own unfamiliarity with *'Blickets'* could lead them to assume that humans were similarly uninformed[38,39]. Instead, children turned even more to humans when faced with novelty. This dissociation between epistemic ratings and source selection suggests that factors beyond perceived knowledge and reported enjoyment may guide children's learning choices. Availability may be one such factor. Girouard-Hallam & Danovitch[19] found that children view Google as faster than a person, which could have influenced their choices, especially given that this study's hypothetical scenario asked them how they would learn within a three-hour time frame. This framing may also have led some participants to interpret the task as more school-related (because data was collected in school settings), potentially shaping their responses. Although we lack systematic data to examine this point, the audio recordings taken during our study may provide some anecdotical insight. Among children who reported low expectations of learning or enjoyment with platforms (ratings of 3 or below), about half cited time constraints or easy access as justifications. In contrast, among those who selected human sources but similarly reported low expectations, about half explained their choice in terms of the person's level of preparation. However,

further systematic research should be conducted to examine how availability, as well as related contextual factors such as time constraints and task framing, affects children's reasoning when choosing between digital and human sources.

Children's strategies when feeling stuck offer further insights into how information-seeking unfolds in the context of hypothetical SRL. Those who initially selected platforms were significantly more likely to switch their strategy compared to those who relied on human sources, regardless of whether the concept was novel or partially known. This result may reflect children's recognition that humans can provide interactive, adaptive, and affectively supportive feedback that platforms could not readily offer at the time of data collection, when conversational AI tools were not yet widely used by children of this age group (for instance, Chat GPT was released in November 2022, after data collection for our study had already begun). From an educational perspective, these results highlight the importance of considering not only children's initial preferences for sources, but also how they adapt their strategies when encountering obstacles. At the same time, literature suggests that children's understanding of the internet remains under development through age 12[29], and that they often struggle to evaluate the accuracy of online content[40], formulate queries successfully[41], or distinguish advertisements from content[42]. Given these challenges, evaluating children's preferences and perceptions of different information sources becomes especially relevant. Together with prior evidence, our findings highlight the potential value of interventions aimed at teaching children to critically select and evaluate information sources.

Beyond the task constraint regarding time, a limitation of the study is that it relied on reported preferences rather than actual learning performance. Future research could address these limitations by (a) extending the time frame and disentangling the task from school contexts, (b) examining how children's stated preferences translate into real learning outcomes, and (c) investigating how children use platforms in practice.

Overall, this study offers an initial step toward understanding which sources children choose, why they make these choices, and how they perceive them. Documenting these patterns provides a foundation for future research that directly compares children's perceptions with their actual learning performance, thereby deepening our understanding of self-regulated learning in the digital age.

Methods

Participants

A total of 134 fourth- and fifth-grade students were recruited from three schools in the Buenos Aires Metropolitan Area, Argentina (predominantly Hispanic-Latino and Caucasian). Due to ethical committee constraints, participants' exact ages were not collected; typical age ranges were 8–10 years for fourth graders and 9–11 years for fifth graders. Three participants were excluded due to attentional challenges that compromised their full engagement during the study, resulting in a final sample of 131 children

(54.2% girls, 45.8% boys). Additionally, for six children, one interview each was excluded due to experimenter errors (four from the *novel concept* condition and two from the *partially known condition*).

The study received approval from an Ethical Committee: Comité de Ética Para la Investigación Científica y Tecnológica de la Universidad Abierta Interamericana (CEICyT – UAI), Dictamen N° 1098 and was conducted in accordance with ethical principles established for the care and respect of children's rights - United Nations Convention on the Rights of the Child, Law No. 26,061. All data remained confidential and anonymized, with each participant assigned a unique ID number. Parents or legal guardians of all participants provided signed informed consent for their children's participation and all children provided oral assent.

A total of 126 responses were collected for the *'Blicket'* questionnaire and 128 for the *'Earthquakes'* questionnaire. Sample sizes varied across analyses for the following reasons: (i) in the Selected Source Analysis, only children who provided a choice of a platform or human source (see Design and Procedure) in both interviews were included, in order to allow repeated measures comparisons (participants discarded from one interview or giving other types of answers in either session were excluded); (ii) in the Trustworthiness Analysis, one school was excluded due to a change in the wording of this question and (iii) all "*I do not know*" responses were excluded from the specific analyses involving those questions.

Design and Procedure

A semi-structured interview with pre-established questions was designed to examine children's information-seeking behaviors in the context of Self-Regulated Learning (SRL). Each child completed two questionnaires, one on a novel concept, '*Blicket*', and one on a partially-known concept, '*Earthquakes*', presented in randomized order. These questionnaires were administered through one-on-one interviews, and all sessions were audio-recorded. Data were collected between November 2022 and November 2023, with the two questionnaires administered 1 to 5 weeks apart.

Each child was individually taken to a designated space (classroom or office, depending on each school's availability) to meet the experimenter. We ensured that no computers, books, or other individuals were present in the space to prevent any potential biases in their responses. Interviews were assessed orally to minimize written limitations. At the start of the interview, children were asked to imagine they should prepare a presentation in three hours for their science course that same afternoon. In the presentation, they would have to explain either (i) *What is a 'Blicket'* or (ii) *How an earthquake is formed*.

1. A *'Blicket'* is a non-existing word, frequently used in cognitive science[43]. Therefore, a '*Blicket'* represented the *Novel Concept*.
2. On the other hand, students this age in Buenos Aires, Argentina, have heard very little about earthquakes, as the region is characterized by very low seismic activity[44] and earthquakes are not included in the 4th- and 5th-grade curriculum. Most children had a general idea of what an

earthquake is, but they did not know how it originates or could barely grasp its meaning. Therefore, '*Earthquakes'* represented the *partially-known concept*.

After introducing the statement, we checked their previous knowledge of the concept and validated our hypothesis that '*Blicket'* would respond to the novel concept and '*Earthquakes*' to the partially-known one. Additionally, we asked them two control questions to check their attention to the statement: We inquired if they remembered when they had to present at school and what concept they were expected to present.

Following the attentional questions, children were first asked: "*How would you learn [the corresponding concept]*?". They were then asked several questions to explore the main factors underlying their choices on how to learn each of the two concepts: (A) "*How much do you think [the chosen source] knows about [the corresponding concept]?"*, (B) "*How much do you trust in [the chosen source's] response when asking about [the corresponding concept]?"*, (C) "*How much do you expect to learn with [the chosen source] about [the corresponding concept]?"*, and (D) "*How much do you expect to enjoy the learning process?"* (i.e., always in reference to their selected source, not a generic one). Children rated each factor on a 7-point Likert Scale, where 1 indicated '*very little*' and 7 indicated '*a lot*'. Higher values therefore indicated more favorable evaluations. The scale was presented on a printing material, with 1 shown in light blue and progressively darkening to dark blue at 7.

Lastly, children were asked: "*What would you do if you got stuck during the learning process?"*. The change in their learning strategy was analysed.

Based on their responses, children were grouped into two categories: Platform Learners and Human-Sources Learners for each concept. Platform Learners included children who chose to learn using digital sources (e.g., Google) or printed materials (e.g., books). Human-Sources Learners included those who chose to learn from people, either within the educational setting (e.g., teachers) or from social, non educational contexts (e.g., parents, relatives, or friends). Only two participants, one in each questionnaire, provided responses that did not fit to either category and were excluded from the analysis.

Data Coding

A glossary was elaborated in advance to define each category and specify how children's responses to the questionnaire would be classified. During the interviews, the experimenter coded children's responses in real time, using the same pre-established categories for both questionnaires. Since the interviews were audio-recorded, the initial coding could be verified afterward. One coder coded the entire dataset, and a second coder independently coded 57.25% of the data.

Inter-rater reliability was assessed using Cohen's Kappa[45] in order to estimate the coding concordance. This analysis should be conducted separately for ordinal and nominal data. For the ordinal data, a total

of 295 responses (those corresponding to the control and attentional questions) were included and assessed using squared weights, which account for the ordinal nature of the responses and provide a more refined measure of agreement. The Kappa value obtained in the coding of the ordinal responses was .94, which is considered an 'almost perfect' agreement[46]. Likert-scale questions concerning the factors that might influence children's source selection were not included in this analysis, as they did not require interpretation.

Likewise, inter-rater reliability for the nominal responses was evaluated using unweighted Cohen's Kappa, which treats all disagreements equally and is suitable for nominal data where the categories have no intrinsic ordering. This analysis included 598 responses, with a Kappa value of .933, reflecting a strong agreement between the two coders in their classification of nominal responses.

Data Analysis

Data analysis was conducted using *R* software[47]. The following packages were utilized: irr[48], pwr[49], emmeans[50], rcompanion[51], ordinal[52], and lme4[53].

To assess within-participant differences in source selection across the two learning concepts (novel vs. partially-known), an Exact McNemar test was conducted, as responses were paired and categorical. To further explore potential effects of children's gender and school grade on source selection, a binomial Generalized Linear Mixed Model (GLMM) with random intercepts for participants was fitted, allowing the inclusion of repeated measures and participant-level covariates. In addition, Cumulative Link Mixed Models (CLMM) were employed for the analysis of Likert scale ratings and the evaluation of children's reported strategies when feeling stuck, as these models are specifically suited for ordinal outcomes and can incorporate random effects to control for inter-individual variability.

None of the statistical models assumed normal distributions, as they are designed for either binary, categorical, or ordinal data. All tests were two-tailed, with a significance level of $\alpha = .05$.

Declarations

Code Availability

The underlying code for this study is not publicly available but may be made available to qualified researchers on reasonable request from the corresponding author.

Competing Interests

All authors declare no financial or non-financial competing interests.

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Declaration

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Author Contribution

J.G. designed the study and methodology, collected and coded the data; conducted the statistical analyses; discussed the results; and wrote the manuscript. C.A.G. provided methodological guidance; contributed to the data analysis and interpretation; discussed the results; and revised the manuscript. C.I.C. designed the study and methodology; supervised the project; discussed the results; contributed to the writing and editing of the manuscript; and acquired the funding. All authors read and approved the final version of the manuscript.

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Data Availability

The datasets generated and analysed during the current study are not publicly available due to ethical considerations, as they include children's information. However, they may be made available from the corresponding author on reasonable request.

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Figures

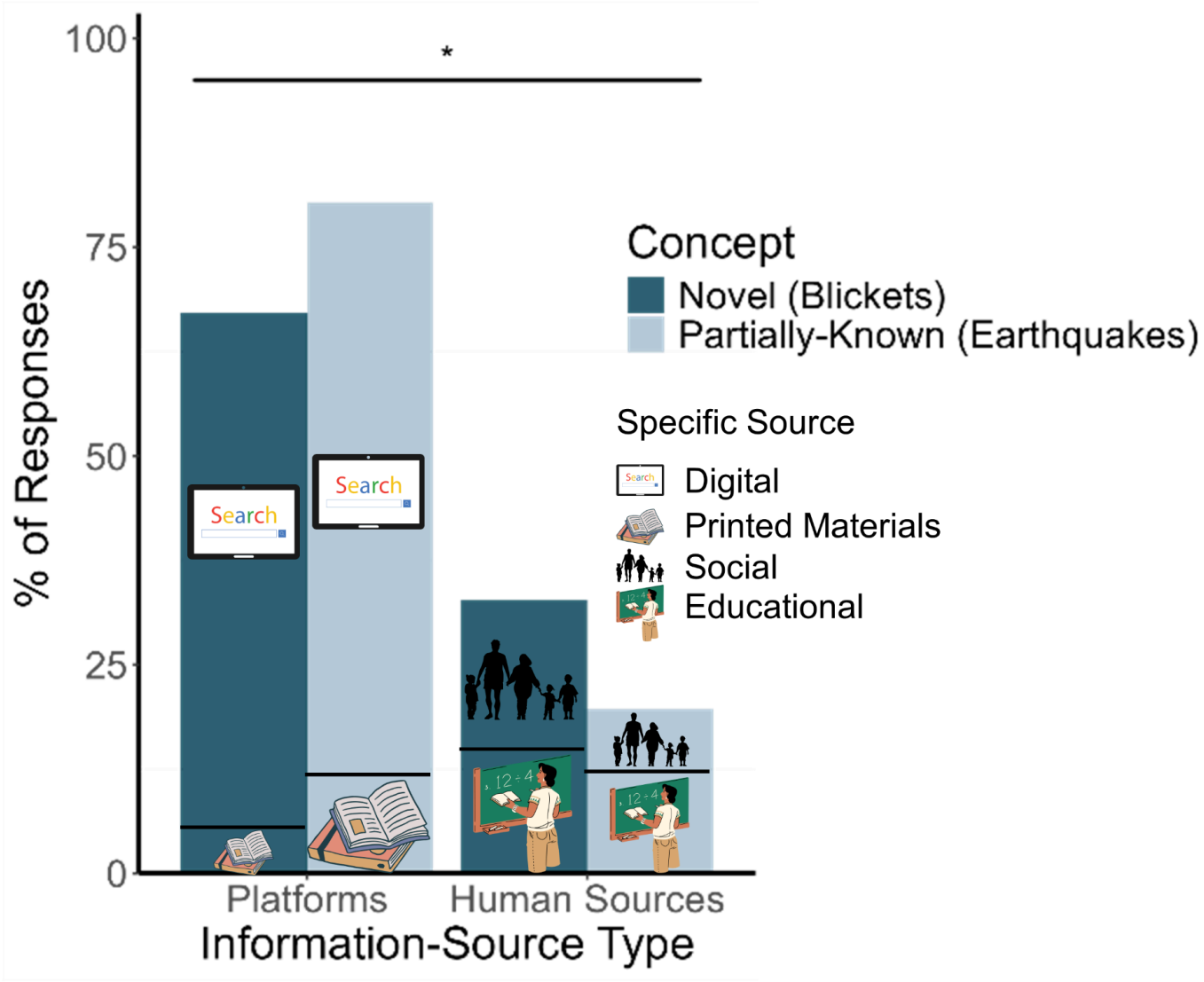

Figure 1

Children's selection of learning strategies based on concept type.

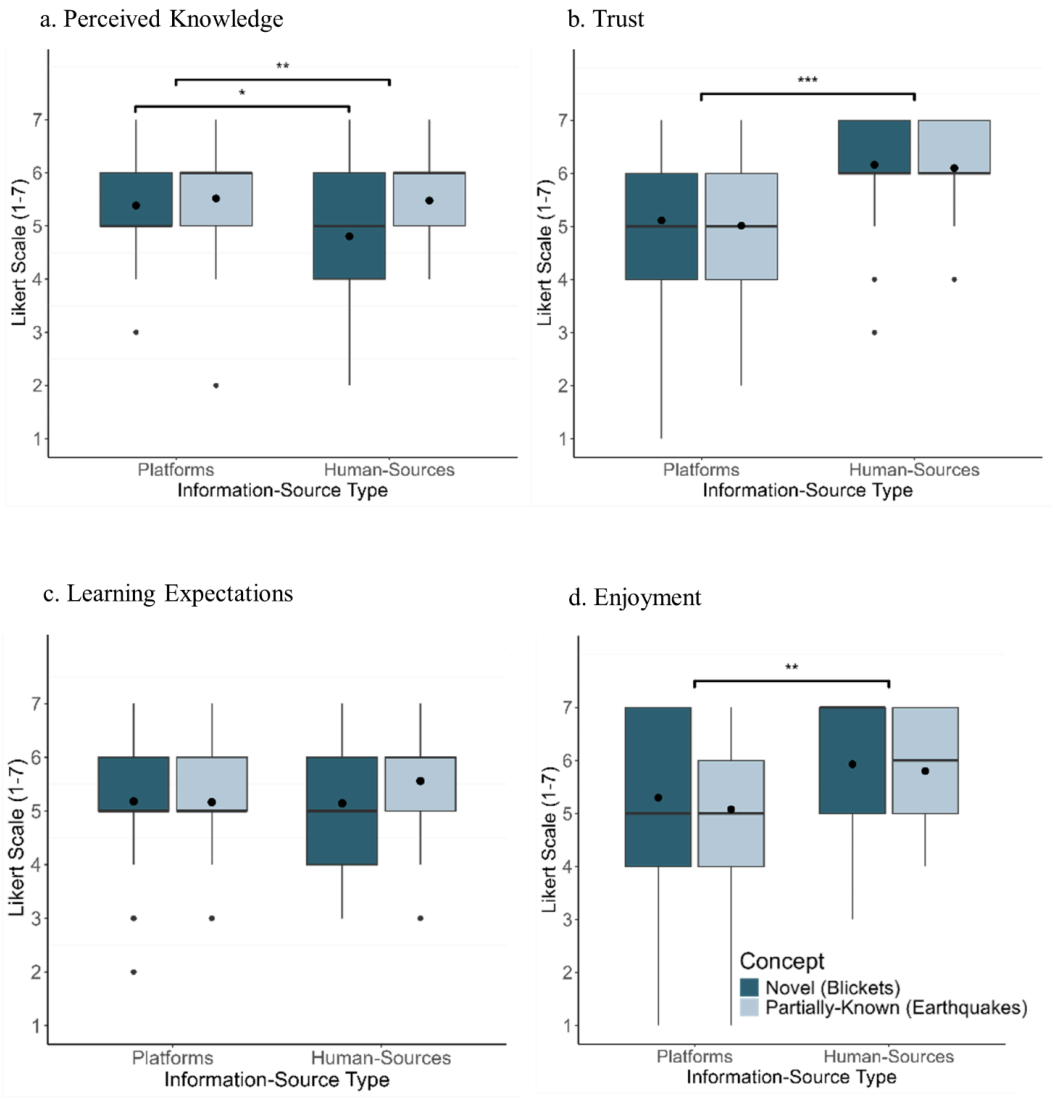

Figure 2

Children's ratings for the four dimensions of information sources.

(a) Perceived knowledge of the source; (b) Trust in the source's response; (c) Learning expectations, and (d) Expected enjoyment when learning. Children rated these four dimensions using a 7-point Likert scale (1 = 'very little', 7 = 'a lot'). The boxplots show the distribution of each variable: boxes represent the interquartile range (IQR), with the median indicated by a horizontal line within each box. The whiskers extend to 1.5 × IQR. Black dots inside the box represent the mean values, and the ones outside the box represent outliers. Asterisks indicate statistically significant differences. Dark blue represents the novel concept (*'Blicket'*), and light blue represents the partially-known concept (*'Earthquakes'*). Only significant differences were marked. No significant differences were found for figure c.
*$p < .05$, **$p < .01$, ***$p < .001$.

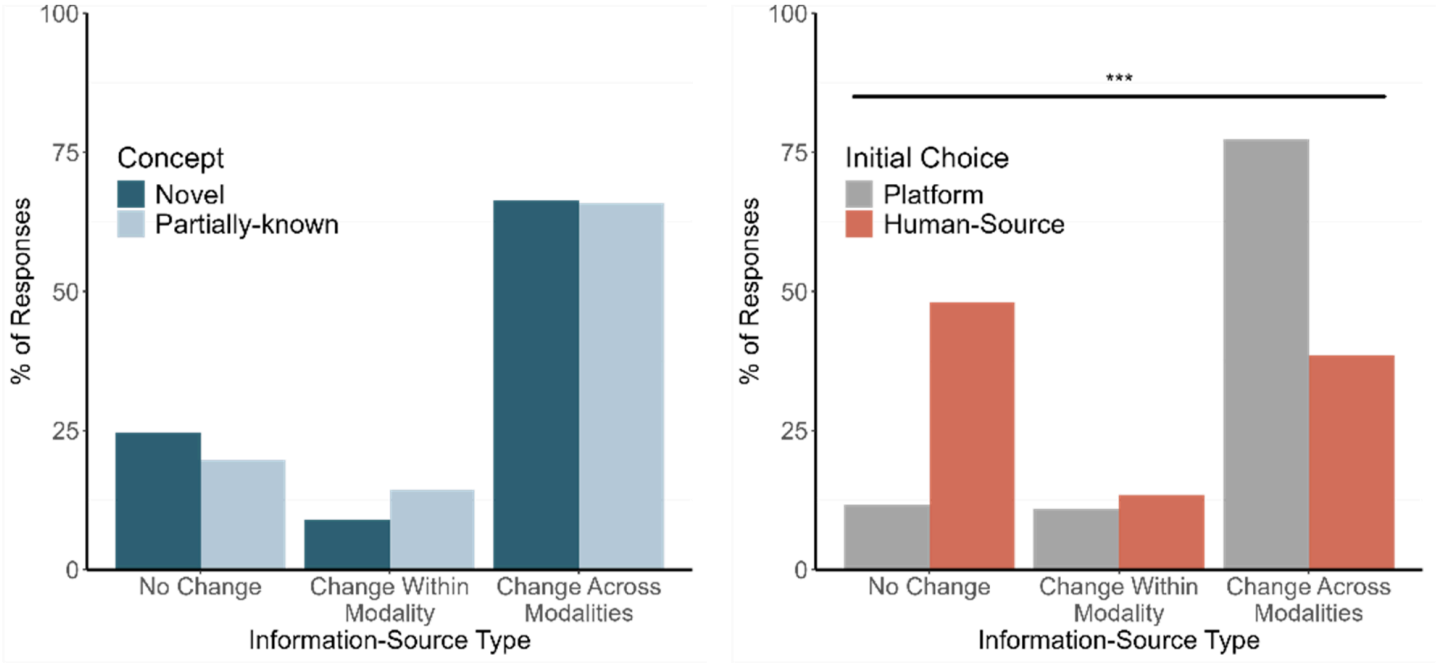

Figure 3

Children's use of strategies when feeling stuck.

The figure shows the percentage of responses for each strategy (No Change, Change Within Modality, and Change Across Modalities) based on: (a) whether the concept to be learned is novel (dark blue) or partially-known (light blue); or (b) whether the children's initial learning strategy was a platform (gray) or a human source (orange). Asterisks indicate significant differences ($p < .001$) between selected strategies when feeling stuck, depending on the initial chosen source. Only significant differences were marked.

***$p < .001$.