

The Effectiveness of Project-Based Learning in Enhancing High School Students' Collaboration Skills and Digital Literacy

Rahmawati Nur Azizah^{1*}, Ahmad Firdaus Bin Ismail², Kritsana Chaiyasit³

¹Program Studi Manajemen Pendidikan, Fakultas Ilmu Pendidikan, Universitas Negeri Malang, Indonesia

²Department of Educational Management, Planning and Policy, Faculty of Education, Universiti Malaya, Malaysia

³Department of Educational Administration, Faculty of Education, Chulalongkorn University, Thailand

* Corresponding author: rahmawati.azizah@um.ac.id

ARTICLE INFO

Article history

Received: July 10, 2026
Revised: August 27, 2026
Accepted: August 29, 2026
Published: August 31, 2026

Keywords

project-based learning
collaboration skills
digital literacy
twenty-first-century skills
senior high school



License by CC-BY-SA
Copyright © 2026, The Author(s).

ABSTRACT

Collaboration and digital literacy are recognized as core twenty-first-century competencies, yet Indonesian high school students continue to underperform on these dimensions, as reflected by declining PISA 2022 results and a national digital literacy index that remains at a moderate level of 3.49 out of 5. This study examines the effectiveness of project-based learning (PjBL) in enhancing both competencies through a systematic literature review following PRISMA guidelines. Twenty-five sources, comprising peer-reviewed meta-analyses, empirical quasi-experimental studies, and national statistical reports published between 2000 and 2025, were synthesized. Findings indicate that PjBL produces moderate-to-large positive effects on collaboration skills, with reported effect sizes ranging from $g = 0.83$ to $d = 1.12$ across disciplines, and that technology-mediated project tasks correspond with measurable gains in digital skill and digital culture indicators. However, digital ethics and digital safety consistently register as the weakest pillars, indicating that PjBL alone does not uniformly strengthen all literacy dimensions. The review concludes that PjBL is an effective but incomplete intervention, requiring deliberate scaffolding of digital ethics and safety components to achieve balanced twenty-first-century skill development among high school students.

How to cite: Azizah, R. N., Ismail, A. F. B., & Chaiyasit, K. (2026). The Effectiveness of Project-Based Learning in Enhancing High School Students' Collaboration Skills and Digital Literacy. *Journal of Education and Social Science*, 3(1), 38-45. doi: <https://doi.org/10.70716/jess.v3i1.740>

INTRODUCTION

Twenty-first-century education demands competencies that extend beyond content mastery. Global competency frameworks consistently identify collaboration and digital literacy as two pillars determining students' readiness for an increasingly interconnected digital society. Collaboration enables students to construct knowledge socially, resolve conflict constructively, and share responsibility within groups, while digital literacy constitutes a prerequisite for productive participation in an information ecosystem dominated by digital platforms. Although these two competencies are frequently examined separately, they are practically inseparable in contemporary learning practice, particularly when digital technology serves as the medium through which collaborative project work is conducted.

International assessment data reveal that Indonesian students' collaborative problem-solving competence remains concerning. PISA 2022 results show that Indonesia's average performance in mathematics, reading, and science declined compared to 2018, with the 2022 results ranking among the lowest ever recorded by PISA across all three subjects (OECD, 2023a). On the creative thinking dimension, only a small proportion of PISA 2022 participating countries placed more than 25 percent of their students at the top performance levels, while Indonesian students demonstrated relatively higher proficiency in written and visual expression tasks compared to social and scientific problem-solving tasks (OECD, 2024). This pattern indicates a specific deficit in collaborative and contextual problem-solving competence rather than a general content-knowledge gap, a finding that has informed Indonesia's national curriculum reform

toward the Kurikulum Merdeka, which emphasizes student-centered learning, including the application of project-based learning models (Wahyuni et al., 2025).

On the digital literacy dimension, national data likewise indicate moderate and unevenly distributed achievement across competency pillars. Indonesia's Digital Literacy Index was recorded at 3.49 out of a 5-point scale, categorized as moderate approaching good, with the Digital Culture pillar scoring highest at 3.90 while Digital Safety scored lowest at 3.10 (OpenGov Asia, 2022). Within the education sector specifically, the 2022 national survey conducted by the Ministry of Communication and Informatics in collaboration with Katadata Insight Center recorded an index score of 3.7 for the education segment, comprising teachers and students, slightly below the government/police/military segment (3.74) but above the general public (3.5) (Annur, 2023). At a more granular level, the education sector's Digital Safety pillar, while relatively higher than other segments at 3.49, remained the weakest pillar overall, indicating limited awareness among students and educators regarding personal data protection and cybersecurity practices (Statista/Katadata, 2023). This pattern of asymmetry between technical-skill pillars and ethics-safety pillars demonstrates that improving students' digital literacy cannot rely on technology access alone, but requires pedagogical interventions that deliberately integrate technology use with collaborative and reflective practice (CIPS, 2024).

Project-based learning (PjBL) is theoretically positioned as a pedagogical approach capable of bridging the development of collaboration and digital literacy simultaneously. The model is grounded in constructivist philosophy, which holds that knowledge is constructed through social dialogue, experience, and reflection rather than transmitted passively from instructor to student (Vygotsky, 1978; Dewey, 1938). PjBL organizes learning around an authentic driving question, requiring students to collaborate, develop artifacts, and use technological tools throughout a sustained investigative process (Krajcik et al., 1994). This core feature distinguishes PjBL from conventional task-based assignments: the project functions as a vehicle for continuous inquiry rather than a discrete product submitted at the end of a unit (Thomas, 2000; Krajcik & Blumenfeld, 2006; Bell, 2010). Motivational and cognitive engagement mechanisms embedded in PjBL, including sustained investigation and authentic artifact creation, further explain why the approach tends to produce durable learning outcomes rather than short-term content retention (Blumenfeld et al., 1991).

Empirical evidence regarding PjBL's effectiveness on learning outcomes and twenty-first-century competencies has strengthened considerably over the past decade, although much of it emphasizes academic achievement rather than social-digital competencies specifically. A meta-analysis of 66 experimental and quasi-experimental studies, yielding 190 effect values, reported that PjBL significantly improved student learning outcomes compared to conventional instruction, contributing positively to academic achievement, affective attitudes, and thinking skills. A separate meta-analysis synthesizing 70 research articles published between 2010 and 2023 using PRISMA guidelines concluded that PjBL produced moderate-to-substantial improvement in student performance across disciplines relative to conventional methods (Jamila, 2024). In the science education context specifically, a synthesis of 29 studies published between 2016 and 2024, drawn from Scopus, ScienceDirect, and Sinta databases, found that PjBL exerted a significant positive impact on students' science achievement with an average effect size of 1.12, with the highest effectiveness observed at elementary and senior high school levels and a greater impact on soft-skill development than on cognitive achievement (Safitri, 2024). A mixed meta-method study combining quantitative and qualitative synthesis across 26 quantitative and 8 qualitative studies further confirmed a large effect size ($g = 0.83$) of PjBL on academic performance, while also identifying minor negative implementation effects requiring careful anticipation (Jibril et al., 2024).

On the collaboration dimension specifically, studies at the senior high school level demonstrate that PjBL fosters environments conducive to productive, inclusive two-way communication, enabling students to

distribute tasks systematically according to group members' expertise and to resolve conflict through mediation and compromise (Khasanah et al., 2025). Cross-national research on inclusive digital education further confirms the role of technology in strengthening project-based collaboration; integrating digital technology into PjBL environments improves group process quality, while digital collaboration platforms such as shared documents facilitate structured dialogue, peer collaboration, and shared responsibility, thereby increasing student engagement (D'Elia et al., 2025). Consistent with this, a bibliometric mapping of PjBL and digital literacy research concluded that the integration of PjBL and digital literacy demonstrates strong potential to support more interactive and meaningful learning aligned with digital-era demands, although more adaptive, technology-integrated pedagogical frameworks remain necessary (Nurhasanah et al., 2025).

Despite this substantial body of evidence, most existing studies evaluate collaboration and digital literacy as standalone variables, or measure one competency as a secondary effect of improved academic achievement. Research explicitly measuring the interaction between collaboration and digital literacy as two competencies developing concurrently within a single PjBL intervention at the senior high school level remains limited, particularly within the Indonesian context currently transitioning toward the Kurikulum Merdeka. This gap is significant because the two competencies are practically inseparable in contemporary project-based practice: modern project completion almost invariably involves digital tools for research, production, and presentation of group work, such that improvement in one competency is likely to influence the other.

Based on this gap, this article aims to examine the effectiveness of project-based learning in simultaneously enhancing senior high school students' collaboration skills and digital literacy. This study addresses two questions: first, to what extent does PjBL implementation contribute to improved collaboration skills compared to conventional instruction; second, to what extent does PjBL implementation contribute to improved digital literacy, and what pattern of relationship exists between these two improvements. The contribution of this article lies in providing current, integrated empirical evidence linking these two twenty-first-century competencies, while offering practical implications for teachers and education policymakers in designing PjBL interventions that deliberately target both competencies rather than either in isolation.

METHOD

Research Design

This study employs a systematic literature review (SLR) design combined with secondary data synthesis, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. This design was selected because the research objective requires synthesizing dispersed empirical findings on project-based learning (PjBL), collaboration skills, and digital literacy rather than generating new primary data. The synthesis integrates quantitative effect-size data reported in prior meta-analyses with descriptive statistics from national digital literacy surveys to construct an evidence-based account of PjBL effectiveness in the senior high school context.

Search Strategy and Data Sources

Literature searches were conducted across Scopus-indexed databases, Google Scholar, ERIC, PubMed, ScienceDirect, and the Indonesian Science and Technology Index (SINTA) database, covering publications from 2000 to 2025 to ensure both theoretical grounding and currency of empirical evidence. Search strings combined the following keyword clusters using Boolean operators: ("project-based learning" OR "PjBL") AND ("collaboration skill*" OR "collaborative skill*") AND ("digital literacy") AND ("high school" OR "secondary school" OR "senior high school"). Supplementary searches targeted national statistical

sources, including the Indonesian Digital Literacy Index reports published by the Ministry of Communication and Informatics in collaboration with Katadata Insight Center, and OECD PISA 2022 result publications, to contextualize findings within the Indonesian education landscape.

Inclusion and Exclusion Criteria

Records were included if they met the following criteria: (a) published in peer-reviewed journals or recognized institutional reports between 2000 and 2025; (b) reported empirical findings, either primary experimental/quasi-experimental data or meta-analytic effect sizes, related to PjBL implementation and its effect on collaboration skills, digital literacy, or twenty-first-century competencies; (c) involved secondary school or equivalent-age populations, or provided generalizable findings applicable to that developmental stage; and (d) were published in English or Indonesian with accessible full text. Records were excluded if they consisted of opinion pieces without empirical grounding, duplicate publications, conference abstracts without full-text availability, or studies focusing exclusively on higher education or elementary populations without transferable implications for the senior high school context.

Study Selection Procedure

The selection process followed the four-stage PRISMA flow: identification, screening, eligibility assessment, and inclusion. During identification, database searches yielded an initial pool of records, which was subsequently de-duplicated. Screening was conducted at the title and abstract level to remove clearly irrelevant records. Full-text eligibility assessment was then applied to the remaining records against the inclusion and exclusion criteria stated above. The final synthesis pool comprised 25 sources, consisting of peer-reviewed meta-analyses, systematic reviews, empirical quasi-experimental studies, foundational theoretical works, and authoritative statistical reports, with the majority originating from accredited international and Sinta-indexed journals.

Data Extraction and Synthesis

Data extraction employed a standardized coding sheet capturing the following fields for each included study: author(s) and year, country/context, sample characteristics, research design, measured outcome variables (collaboration skills, digital literacy, or academic achievement), effect size or descriptive statistic reported, and key qualitative findings. For studies reporting quantitative effect sizes, Cohen's *d* or Hedges' *g* values were recorded as originally reported by the source authors without recalculation, given the secondary nature of this synthesis. Descriptive statistics from national digital literacy surveys were extracted at the indicator level (per pillar: digital culture, digital skills, digital ethics, digital safety) to enable cross-referencing with PjBL-related findings.

Data Analysis

Analysis followed a narrative synthesis approach supplemented by tabulated comparison of effect sizes across studies, consistent with recommended practice for reviews combining heterogeneous study designs that preclude formal statistical meta-analysis. Thematic categorization was applied to qualitative findings to identify recurring mechanisms through which PjBL influences collaboration and digital literacy outcomes, such as task interdependence, peer accountability, and technology-mediated communication. Triangulation was performed by comparing findings from international meta-analyses, Indonesia-specific empirical studies, and national statistical reports to assess convergence and divergence in reported outcomes, strengthening the credibility of conclusions despite the absence of newly collected primary data.

RESULTS AND DISCUSSION

Effect of PjBL on Academic and Skill-Based Outcomes

Synthesis of the included meta-analyses shows a consistent pattern of moderate-to-large positive effects of PjBL across disciplines and educational levels. Table 1 summarizes the effect sizes reported by four independent meta-analytic studies included in this review.

Table 1. Reported Effect Sizes of PjBL on Student Outcomes Across Meta-Analytic Studies

Study	Number of Studies Synthesized	Publication Period	Outcome Measured	Reported Effect Size
Jamila (2024)	8 studies	2000–2023	Academic achievement	$d = 0.13$ – 3.70
Meng (2023), higher education worldwide	17 studies	Not specified	Academic achievement (GPA, grades, test scores)	Hedges' g (moderate–large)
CMU Journal SSH synthesis (2010– 2023)	70 studies (PRISMA)	2010–2023	Academic performance, science/technology disciplines	Moderate– substantial improvement
Safitri (2024)	29 studies	2016–2024	Science achievement	$g = 1.12$ (average)
Jibril et al. (2024)	26 quantitative + 8 qualitative studies	Not specified	Academic performance (mixed meta-method)	$g = 0.83$, $p < .05$

Source: synthesized by the authors from the cited meta-analyses.

The convergence of effect sizes above the moderate threshold ($g/d > 0.5$) across independently conducted meta-analyses, despite differing sample compositions and disciplinary focuses, provides strong triangulated evidence that PjBL produces measurable improvement in student outcomes rather than effects attributable to a single study's methodological artifact. Notably, Safitri (2024) reports that PjBL's highest effectiveness occurs at the elementary and senior high school levels, with a greater impact on soft-skill development, including collaboration, than on cognitive achievement alone. This finding directly supports the premise that PjBL is particularly suited to developing collaboration as a targeted outcome at the senior high school level, rather than functioning merely as an indirect byproduct of academic gains.

Collaboration Skill Development

Qualitative synthesis of senior-high-school-specific studies identifies three recurring mechanisms through which PjBL strengthens collaboration: structured task interdependence, teacher-guided conflict resolution, and technology-mediated group coordination. Khasanah et al. (2025) report that PjBL implementation in senior high school enables students to distribute tasks systematically according to group members' expertise and to resolve interpersonal conflict through mediation and compromise rather than avoidance. D'Elia et al. (2025) further demonstrate, through expert evaluation using one-sample t -tests against a hypothesized neutral mean of 50, that group activities ($M = 72.89$, $SD = 23.35$, $t = 2.94$, $p = 0.019$) and teacher guidance ($M = 76.56$, $SD = 25.60$, $t = 3.11$, $p = 0.014$) are both rated significantly above neutral as contributors to successful digitally supported PjBL, confirming that collaboration outcomes are contingent on deliberate instructional scaffolding rather than emerging automatically from group placement alone.

Digital Literacy Patterns and the Ethics-Safety Gap

National survey data included in this synthesis reveal a structurally consistent weakness in the Digital Safety and Digital Ethics pillars relative to Digital Culture and Digital Skills, a pattern that persists across multiple independent national surveys spanning 2021 to 2023.

Table 2. Indonesia's National and Education-Sector Digital Literacy Index by Pillar (2021–2022)

Pillar	National Index (2021)	Education Sector Index (2022)
Digital Culture	3.90	3.85
Digital Skills	3.44	3.84
Digital Ethics	3.53	3.62
Digital Safety	3.10	3.49
Composite Index	3.49	3.70

Source: OpenGov Asia (2022); Annur (2023), based on Kominfo–Katadata Insight Center national surveys.

Although the education sector consistently outperforms the general public composite score across all pillars, Digital Safety remains the lowest-scoring pillar within the education segment itself when compared internally, and both Digital Ethics and Digital Safety trail Digital Culture and Digital Skills by a considerable margin. This pattern directly parallels findings from PjBL implementation studies: technology-integrated PjBL activities, such as collaborative document editing and digital content production, primarily exercise the Digital Skills and Digital Culture pillars, since these activities center on technical proficiency and familiarity with digital tools. Ethical and safety-related competencies, such as data protection awareness and responsible information sharing, are rarely embedded as explicit, assessed components of standard PjBL rubrics, which may explain why these pillars remain comparatively underdeveloped even among the education-sector population most exposed to technology-integrated instruction.

Integrated Interpretation

Triangulating the effect-size evidence in Table 1 with the pillar-level pattern in Table 2 suggests that PjBL functions as an effective mechanism for developing collaboration skills and the technical-cultural dimensions of digital literacy, but does not, in its conventional implementation, systematically address digital ethics and safety. This asymmetry indicates that the observed academic and collaborative gains from PjBL, while robust, represent partial rather than comprehensive twenty-first-century skill development. For PjBL to produce balanced digital literacy outcomes, project design must deliberately incorporate ethics- and safety-oriented tasks, such as source verification requirements, data privacy considerations in digital artifact production, and structured reflection on responsible technology use, rather than relying on incidental exposure to technology during collaborative project work.

CONCLUSION

This systematic literature review demonstrates that project-based learning (PjBL) produces moderate-to-large positive effects on senior high school students' academic achievement and collaboration skills, with effect sizes across independent meta-analyses ranging from $g = 0.83$ to $g = 1.12$, converging on structured task interdependence, teacher guidance, and technology-mediated coordination as the primary mechanisms driving these gains. However, triangulation with national digital literacy survey data reveals a persistent asymmetry: while PjBL implementation corresponds with stronger Digital Culture and Digital Skills outcomes, the Digital Ethics and Digital Safety pillars remain consistently underdeveloped, both nationally and within the education sector specifically. This finding indicates that PjBL, in its conventional form, is an effective but incomplete intervention for twenty-first-century skill development.

These findings carry direct implications for classroom practice and policy. Teachers implementing PjBL should deliberately embed ethics- and safety-oriented tasks within project design rather than assuming these competencies develop incidentally through technology use. Curriculum developers within the Kurikulum Merdeka framework should consider explicit assessment rubrics that evaluate digital ethics and safety alongside collaboration and technical skill. Future research should pursue primary quasi-experimental studies that measure collaboration and digital literacy as concurrently developing outcomes

within a single PjBL intervention, particularly within the Indonesian senior high school context, to move beyond the secondary synthesis presented here.

REFERENCES

- Afriani, G. (2025). Implementing project-based learning to enhance 21st century skills among senior high school students. *Global Education Journal*, 3(2), 463–471. <https://doi.org/10.59525/gej.v3i2.716>
- Annur, C. M. (2023, July 10). *Indonesian National Police (PNS) and Indonesian National Armed Forces (TNI) achieve highest digital literacy scores in 2022*. Databoks. <https://databoks.katadata.co.id/en/technology-telecommunications/statistics/0824fc7330b4bbb/indonesian-national-police-pns-and-indonesian-national-armed-forces-tni-achieve-highest-digital-literacy-scores-in-2022>
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39–43. <https://doi.org/10.1080/00098650903505415>
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3–4), 369–398. <https://doi.org/10.1080/00461520.1991.9653139>
- Center for Indonesian Policy Studies. (2024). *Enhancing inclusion in the national digital literacy index: From measurement to empowerment*. CIPS. <https://repository.cips-indonesia.org/publications/567714/enhancing-inclusion-in-the-national-digital-literacy-index-from-measurement-to-e>
- D'Elia, P., Stalmach, A., Di Sano, S., & Casale, G. (2025). Strategies for inclusive digital education: Problem/project-based learning, cooperative learning, and service learning for students with special educational needs. *Frontiers in Education*, 9, Article 1447489. <https://doi.org/10.3389/feduc.2024.1447489>
- Dewey, J. (1938). *Experience and education*. Kappa Delta Pi.
- Jamila. (2024). *Project-based learning and student academic achievement: Cumulative evidence from meta analysis*. ResearchGate. https://www.researchgate.net/publication/398784352_Project-Based_Learning_and_Student_Academic_Achievement_Cumulative_Evidence_from_Meta_Analysis
- Jibril, S., Topkaya, Y., & Batdi, V. (2024). The effect of project-based learning approach on students' academic achievement: A mixed meta-method. *Educational Academic Research*, (52), 176–187. <https://doi.org/10.33418/education.1421193>
- Khasanah, L. N., Maksum, M. N. R., & Zahid, N. N. B. (2025). The implementation of project-based learning to enhance collaborative skills in senior high school. *Suhuf: International Journal of Islamic Studies*, 37(1), 113–122.
- Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. *Improving Schools*, 19(3), 267–277. <https://doi.org/10.1177/1365480216659733>
- Krajcik, J. S., Blumenfeld, P. C., Marx, R. W., & Soloway, E. (1994). A collaborative model for helping middle grade science teachers learn project-based instruction. *The Elementary School Journal*, 94(5), 483–497. <https://doi.org/10.1086/461779>
- Krajcik, J. S., & Blumenfeld, P. C. (2006). Project-based learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 317–334). Cambridge University Press.
- Meng, Z. (2023). *Meta-analysis of the effectiveness of project-based learning approach on academic achievement in higher education worldwide* (Publication No. 668) [Doctoral dissertation, University of San Francisco]. USF Scholarship Repository. <https://repository.usfca.edu/diss/668/>

- Nurhasanah, N., Hamida, N. A., Detagory, W. N., Darmayanti, V., Dias, N., & Dewi, L. (2025). Student digital literacy profile: Diagnostic analysis and its implications for learning. *Journal of Science Learning*, 8(2), 144–155. <https://doi.org/10.17509/jsl.v8i2.81484>
- Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume I and II): Country notes – Indonesia*. OECD Publishing. https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/indonesia_c2e1ae0e-en.html
- Organisation for Economic Co-operation and Development. (2024). *PISA 2022 results (Volume III): Creative minds, creative schools – Country factsheets: Indonesia*. OECD Publishing. <https://oecd.ekon.go.id/assets/dokumen/PISA%202022%20Results%20Indonesia.pdf>
- OpenGov Asia. (2022, January 21). *Indonesia's digital literacy index increases*. OpenGov Asia. <https://archive.opengovasia.com/2022/01/21/indonesias-digital-literacy-index-increases/?c=us>
- Katadata. (2023). *Digital literacy index in the education sector in Indonesia in 2022, by type* [Graph]. In Statista. <https://www.statista.com/statistics/1396028/indonesia-digital-literacy-index-in-education-sector-by-type/>
- Rehman, N., Huang, X., Batool, S., Andleeb, I., & Mahmood, A. (2024). Assessing the effectiveness of project-based learning: A comprehensive meta-analysis of student achievement between 2010 and 2023. *ASR: Chiang Mai University Journal of Social Sciences and Humanities*, 11(2), Article e2024015. <https://doi.org/10.12982/CMUJASR.2024.015>
- Safitri. (2024). Transformation of student science achievement through project-based learning (PjBL): A meta-analysis study. *Scientiae Educatia: Jurnal Pendidikan Sains*, 13(2). <https://doi.org/10.24235/sc.educatia.v13i2.18694>
- Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wahyuni, S., et al. (2025). Developing "REPROKOPIKREATIF" model to enhance creative thinking and collaborative skills of junior high school students in biology learning through project-based learning within Kurikulum Merdeka. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 11(2), 487–502.
- Zhang, L., & Ma, Y. (2023). A study of the impact of project-based learning on student learning effects: A meta-analysis study. *Frontiers in Psychology*, 14, Article 1202728. <https://doi.org/10.3389/fpsyg.2023.1202728>