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Guido Salza & Robin Samuel

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Digital engagement and youth: a scoping review of opportunities, risks, and the role of socioeconomic resources

Guido Salza [a] and Robin Samuel[b]

[a]Faculty of Political, Economic and Social Sciences, University of Milan, Milan, Italy; [b]University of Luxembourg, Esch-sur-Alzette, Luxembourg

ABSTRACT

The rapid expansion of digital technologies has created both opportunities and risks for young people. Previous research shows that their digital engagement is often driven by educational or informational needs, social interaction, and entertainment. However, many practitioners and scholars warn of youth-specific risks. Moreover, pre-existing socioeconomic advantages shape not only access but also young people's digital motivation, mastery, and patterns of engagement. Adopting an inclusive approach that encompasses a wide range of methodologies, we conduct a scoping review to explore the impact of digital engagement on young people's life outcomes, with a particular focus on the role of socioeconomic resources. We selected relevant studies from a systematic search of the Web of Science, PsycINFO, and the International Bibliography of the Social Sciences. We then categorized the empirical evidence based on its relevance to our topic and analyzed each study's results, determining whether it showed benefit or harm based on the observed direction of the effect. Findings from 57 empirical studies suggest that digital activities are not inherently harmful or beneficial but depend on the specific task in focus and the domain of life outcomes considered. While digital engagement tends to have a positive impact on academic outcomes, its effects on wellbeing are mixed. Socioeconomic resources generally give young people an additional advantage in using digital devices and activities for more positive life outcomes and in balancing online opportunities and risks. However, more research is needed to analyze the channels through which this advantage is realized.

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Digitalization; digital engagement; youth outcomes; scoping review; online opportunities and risks; socioeconomic resources

1. Introduction

Digitalization, the use of digital technology to mediate or facilitate social and economic interactions and transactions (Skopek, 2023), has been revolutionizing communication, transforming education, and reshaping workplaces for over two decades (DiMaggio et al.,

CONTACT Guido Salza guido.salza@gmail.com Faculty of Political, Economic and Social Sciences, University of Milan, Via Conservatorio, 7, 20122 Milan, Italy

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2001). Within this evolving landscape, digital engagement, the continuum from nonuse to sustained interaction with digital technologies, has become a defining feature of contemporary life. The share of the world's population using the Internet has doubled in the past decade, reaching 68% (5.5 billion people) in 2024.[1] This trend is particularly pronounced among young people: worldwide, 79% of those aged 15–24 are active online, rising to 98% in high-income countries. In the EU-28, households with children are more likely to have internet access than those without, and smartphone use among 9-16-year-olds has risen sharply over the last decade (Smahel et al., 2020).

The use of digital technology raises concerns about inequalities. The concept of the digital divide has evolved (Bruno et al., 2011), shifting its focus from access barriers to differences in skill acquisition and the impact of different internet usages on life chances (DiMaggio & Hargittai, 2001). Digital engagement comprises interrelated stages (Van Dijk, 2020): motivation (the willingness and perceived need to engage with digital technologies), material access (the physical availability of devices, infrastructure, and connectivity), skills (the ability to effectively operate digital tools and critically evaluate digital content), and usage (the type and breadth of digital engagement). Inequalities can emerge, persist and accumulate at each stage, and earlier barriers often reinforce later disparities.[2]

People at different life stages have distinct motivations, opportunities, and ways of using digital technology (Mollborn et al., 2021). For young people, digital engagement is often driven by educational or informational needs, social interaction, and entertainment (Smahel et al., 2020), each of which can shape life outcomes differently (UNICEF, 2017). Across OECD countries (Burns & Gottschalk, 2019), 73% of 15-year-olds use social networks, 61% chat online, and 34% play online games. Additionally, 88% of students view the internet as a valuable information resource (*ibidem*). Digital technology provides young people with unprecedented learning opportunities, access to and sharing of information, and new jobs and professions (Haddock et al., 2022).

While the so-called 'digital natives' (Prensky, 2001) are likely to benefit the most from digital technology, practitioners and scholars warn of youth-specific risks. Extensive device use and online activities may harm cognitive development and psychological well-being (Small et al., 2020). In addition, those who fail to acquire the new skills necessary to navigate the digital world may suffer from poor academic performance and attainment (van der Vlies, 2020) and experience difficult transitions to adulthood and economic independence (OECD, 2019).

Because young people typically depend on their families for digital access, parental socioeconomic status (SES) likely shapes their digital engagement (Smahel et al., 2020). Compared to low-SES parents, high-SES parents tend to adopt more authoritative, investment-oriented, and nurturing educational styles (Baumrind, 2013; Lareau, 2011) and can mobilize resources to compensate for potential negative life outcomes (Bernardi, 2014). From a culturalist perspective (Ragnedda 2018), digital capital links online and offline life chances by converting economic, cultural, and social resources into digital advantages. Human capital theory (Becker, 1993) and rational action models (Breen & Yaish, 2006) complement this view predicting that digital advantages can influence educational success and labor market opportunities. These perspectives suggest that digital engagement functions both as a medium for reproducing existing inequalities and as a

potential channel for upward mobility, depending on how SES-related resources are converted.

Digital engagement and its impact on life outcomes also depend on the contexts where young people self-direct their activities, cultivate relationships, and draw on resources across physical and virtual spaces (Barron, 2004; Sangrá et al., 2019; OECD, 2015). These contexts are inherently hybrid, as they integrate formal and informal learning, and are constituted by diverse configurations of activities, material resources, and relationships at home, in schools, through peer networks, and in community settings. Formal contexts such as childcare centers, schools, and universities may integrate digital devices in their pedagogy or view digital engagement as mainly disruptive. Beyond formal settings, young people's peer networks can offer opportunities for skill development or expose them to heightened risks (Hollis et al., 2020). Across these contexts, SES remains a central factor of motivation, material access, skills, and usage but intersects with other axes of inequality, including gender and migration or ethnic background (Gracia et al., 2023).

1.1. Objectives of the scoping review

Our goal is to identify the key findings and the types of evidence on the association between digital engagement and life outcomes among young people. Life outcomes include education, work, peer relationships, family, health, wellbeing, and overall risks and opportunities. We focus on understanding how this relationship varies across different socioeconomic backgrounds. Specifically, we ask:

1) To what extent does the impact of digital engagement for young people vary across domains of life outcomes?
2) How do socio-economic resources moderate the impact of digital engagement on different domains of young people's lives?

We also aim to identify future directions for empirical research and data collection and to provide insights for policymakers and educators.

The paper is organized as follows. Section 2 describes the methodology. Section 3 presents results, focusing on study characteristics and effect directions. Section 4 takes a narrative approach and organizes the selected studies around four themes. The conclusion discusses implications for future research and policy.

2. Methodology

Given our broad research questions, we conduct a scoping review. Scoping reviews use systematic, transparent, and reproducible searches, with standardized strategies to improve the reliability of their conclusions (Munn et al., 2018). Unlike systematic reviews, they address a broad question rather than systematizing the evidence on a single practice or aspect (*ibidem*). Following recent guidelines for systematizing evidence (Higgins et al., 2023), we use a comprehensive search of research repositories to identify relevant literature. We next describe the dimensions of interest, selection criteria, search procedure, relevance assessment, and synthesis of the results.

Table 1. Search strings.

Block	Search string
Target population	"young" OR "youth" OR "adolescent*" OR "teenage*" OR "young adult*" OR "young people" OR "teen*" OR "digital native*"
Digitalization	"digital*" OR "digital technolog*" OR "social media"
Individual characteristics	"Socio(-)economic" OR "economic status" OR "cultural status" OR "ESCS" OR "social background" OR "social class" OR "migr*" OR "race" OR "ethnic*" OR "gender"
Life outcomes	"health" OR "education" OR "school" OR "work" OR "peer" OR "family" OR "well(-)being"

2.1. Search procedure

A systematic search in Web of Science, PsycINFO, and the International Bibliography of the Social Sciences was performed in December 2022. The search terms were chosen to capture the key concepts of digital technology, digital engagement, youth, and life outcomes. We deliberately defined life outcomes broadly, encompassing the central domains in the lives of young individuals: education, work, peer relationships, family, health, and overall wellbeing as well as associated risks and opportunities. We use four blocks of search terms separated by the operator 'AND' (Table 1).

2.2. Selection criteria

We applied predefined criteria regarding quality, target population, and relevant outcomes. Studies were included only if they met all of the following: (i) Empirical study published in a scientific journal (study quality); (ii) Focus on the general population of children and/or young people aged 0–35, using a sample thereof (population). This broad age range allowed for the inclusion of studies that examine the long-term effects of digitization on later life outcomes (such as transitions to the labor market); (iii) Clear social scientific perspective, i.e., use of social scientific theoretical and/or conceptual frameworks (rather than, e.g., just describing differences in blood pressure), and consideration of life outcomes/chances defined above (outcome); (iv) Discussion of the role of socioeconomic resources in the link between digital engagement and life outcomes (outcome). Both authors conducted preliminary rounds of pre-screening on titles and abstracts on random samples of retrieved studies (see Section 2.4) to test and refine these criteria, ultimately arriving at the phrasing presented here.[3]

2.3. Search results

The search detected 3,372 studies, 587 of which were duplicates, resulting in 2,785 single records (Figure 1). Title and abstract screening identified 176 studies that included SES as a key dimension paired with digital engagement. Of the eligible studies, 123 were further excluded during full-text screening for the following reasons: SES and/or digital engagement were not key dimensions (N = 24); target subjects were out of the age range (N = 6); did not use empirical data (N = 2); not in English (N = 5); the analysis targeted specific subpopulations (N = 10); did not comment on the interaction or group differences in relation to socioeconomic resources (N = 51); full text was not available (N = 10); in addition, 15 studies did not meet the relevance criteria. We integrated the resulting 53 by analyzing the references in Livingstone et al. (2023), a large scoping literature review

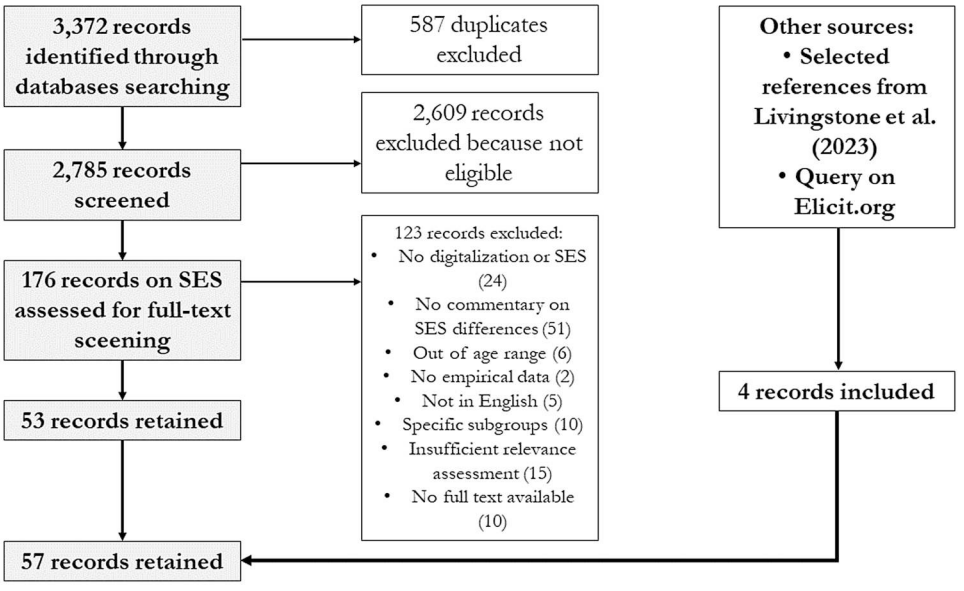

Figure 1. PRISMA chart.

on young people's digital skills, which provided two additional studies that met our criteria. Moreover, we included two of the 35 results from a query on the AI-powered literature review tool Elicit.org to cover gray literature.[4] This left us with 57 studies included in the literature review (Appendix A1 and Table A5.1).

2.4. Relevance assessment

Assessing relevance in a scoping review is challenging when methods and outcomes vary. We adapt the protocol proposed by Gough (2007) and combine generic and review-specific criteria to assess each study's contribution. Specifically, we use three components to calculate an overall relevance index for each retrieved study that met our selection criteria (Table 2).

Component (A) pertains to the overall scientific quality of the paper. For instance, if a study follows a rigorous design, uses a large and diverse sample, and employs appropriate

Table 2. Criteria for overall assessment of the studies.

Component	Focus	Criteria	Example criteria
A	Overall scientific quality	Rigorous research methods, large/diverse sample, appropriate statistical analysis	Follows rigorous methods, uses diverse sample, employs proper statistical analysis
B	Research design appropriateness	Appropriate research design, data collection on digital device usage among diverse socioeconomic backgrounds, controls for relevant variables	Uses longitudinal data, collects data on digital device usage across socioeconomic backgrounds, controls for gender or migration background
C	Review-specific quality of evidence	Strong and statistically significant evidence, contrasts findings for different socioeconomic backgrounds	Provides evidence of positive impact on lower socioeconomic backgrounds, contrasts findings for higher socioeconomic backgrounds

analysis, it would receive a high rating in Component (A) for its overall scientific quality. The second component (B) is review-specific and focuses on the appropriateness of the research design in addressing the review question. Component (B) evaluates whether a study employs an appropriate research design with respect to its research questions and aims (e.g., longitudinal data), collects data on digital device usage among young people from various socioeconomic backgrounds, and analyzes the data with controls for relevant variables (e.g., gender or migration background). Finally, the third component (C) addresses the review-specific quality of the evidence in answering the review question. For example, if a study in the review provides strong and statistically significant evidence that digital engagement has a positive impact on the life outcomes of low-SES young people, while also presenting contrasting findings for those from higher socioeconomic backgrounds, it would receive a high rating in component (C). We assign each component a score from 1 to 3. We compute an overall assessment (D) by summing the three components.

Based on the assessment, we categorize studies on their relevance. A study falls into the 'Core Study' category when both components (B) and (C) have a score of 3, and component (D) is greater than 7, indicating a high overall relevance. Studies that have a score of at least 2 in component (A), and either component (B) or (C) (or both) have a score of 3, are classified as 'Intermediate Relevance Study', indicating moderate relevance. Studies that do not meet the criteria for being a 'Core' or 'Intermediate Relevance Study' fall into the 'Ancillary Evidence' category, providing some supporting evidence but not central to the review question. Finally, we excluded studies with scores less than 3 in both review-specific components (B) and (C) and an overall assessment (D) score of less than 6. While no formal inter-rater reliability test was conducted for the relevance scoring, we developed the index through iterative feedback and validation between the two authors: one author performed the scoring and the second systematically reviewed and validated the results, resolving ambiguities through discussion.

2.5. Risk of bias assessment

Following current guidelines for conducting rigorous reviews (Ayorinde et al., 2020; Higgins et al., 2023; Pintor et al., 2023), we assess the risk of bias for each non-randomized study (Appendix A4). First, we examine potential common causes that affect both the selection of the intervention (*e.g.*, device use) and the outcome of interest (*e.g.*, school grade). Second, for each study, we assess the risk that participant selection or follow-up duration is related to both the intervention and the outcome (selection bias), the risk of misclassification of intervention status or outcome measurement bias (information bias), and the risk of selective reporting of noteworthy outcomes (reporting bias). Third, given our interest in the relationship between digital engagement and SES, we assess whether data and designs adequately address mediation and moderation. In the context of mediation, we examine biases arising from the lack of formal mediation tests that may increase the risk of confounding between mediator and outcome. Moreover, we specifically consider temporal order bias, which occurs when data for the mediator are measured simultaneously. With respect to moderation, we assess the risk of mediator-outcome

confounding bias, in which a third variable affects both the mediator and the outcome (*e.g.,* COVID-19 measures or gender). We also examine insufficient variability in the sample with respect to the moderator variable, and the absence of explicit tests of the interaction between moderator and treatment. Table A5.1 provides the risk assessment for each non-randomized study.

2.6. Vote counting

When meta-analysis is not possible and quantitative synthesis is difficult, as here, vote counting can be considered when only effect direction is available or when effect measures or data are inconsistent across studies (Higgins et al., 2023). Although vote counting does not provide insight into the magnitude of effects and does not account for variation in the relative size of studies, it represents a pragmatic choice to increase transparency and reproducibility. Vote counting categorizes each estimate as showing either benefit or harm based solely on its observed direction, creating a standardized binary metric. The categorization should not consider statistical significance or effect size (*ibidem*).

In this review, we label the influence of digital technology as harmful or beneficial to life outcomes. For randomized trials and experimental studies, we use the reported direction of effects. For non-randomized studies (e.g., cross-sectional or panel-data), we record the sign of each coefficient or adjusted mean, regardless of its statistical significance. When a set of coefficients within the same digitalization domain (or set of socioeconomic resources) yielded mixed signs, we label the result as conflicting. For qualitative studies, we extract the direction of the effect from the text, with a particular focus on the reported textual data. Please note that this categorization method focuses on the substantial outcome of the reported effects on life chances. For example, a positive coefficient of a digitalization aspect (e.g., social media use) on a harmful life outcome (e.g., depression) is categorized as harmful.

We produce harvest plots and heat plots stratified by dimensions of interest to visualize the direction of the results. Tables A3.1 – A3.3 in the Appendix report sign tests (Nikolakopoulos, 2020) assessing whether effects are evenly distributed around the null hypothesis of no difference. We compute the proportion of results favoring digital engagement for each life outcome, digitalization domain, and age group, assuming $H_0{:}\pi_d = 0.5$ and $H_a{:}\pi_d > 0.5$, where π_d is the proportion of studies in each stratum that find an effect with direction $d = \{harmful; conflicting; beneficial\}$. For brevity, we discuss these tables only when the sign test is significant.

3. Results

3.1. Descriptive statistics

The dataset and replication package are available in the supplemental online materials.[5] Table A5.1 in the Appendix shows a detailed description of the 57 studies included.

Four life outcome categories emerge (Table 3). The first includes studies that focus on early development, learning and educational outcomes (N = 12). A subset of these studies focuses on preschool children and investigates outcomes such as intelligence

Table 3. Descriptive statistics.

	N	%	Cum. %
Outcome			
Development, learning & education	12	21.05	21.05
Wellbeing & health	12	21.05	42.10
Online opportunities	20	35.09	77.19
Online risks	13	22.81	100.00
Analytical design			
SES → *DIG* (Prediction)	21	36.84	36.84
SES → *LO* ← *DIG* (Controlled effect/association)	13	22.81	59.65
SES × *DIG* → *LO* (Modified effect/association)	14	24.56	84.21
SES → *DIG* → *LO* (Mediation path)	9	15.79	100.00
Nature of data			
Cross-sectional	42	73.68	73.68
Longitudinal	8	14.04	87.72
Qualitative	4	7.02	94.74
Random assignment	3	5.26	100.00
Type of evidence			
Regression models	32	56.14	56.14
SEM	7	12.28	68.42
Qualitative	4	7.02	75.44
Treatment effect	3	5.26	80.70
Other	11	19.30	100.00
Digitalization domain			
Device usage (time)	13	22.81	22.81
Digital skills	10	17.54	40.35
Device access	8	14.04	54.39
Informational use	5	8.77	63.16
ICT attitudes	4	7.02	70.18
Social media use	3	5.26	75.44
Other	14	24.56	100.00
SES measure			
Aggregate index	12	21.05	21.05
Parental education	12	21.05	42.10
Parental education + income	9	15.79	57.89
Family income	7	12.28	70.17
Cultural capital	4	7.02	77.19
High school track	2	3.51	80.70
Others (or other combinations)	11	19.30	100.00
Assessment			
Ancillary	25	43.86	43.86
Intermediate	22	38.6	82.46
Core	10	17.54	100.00

development and vocabulary mastery. For adolescents in school or training, outcomes span standardized tests and attitudes toward curricular subjects. A second group of life outcomes brings together studies on wellbeing and health (N = 12), linking digital engagement to subjective measures of wellbeing, such as life satisfaction and family and peer support, and to measures of mental and physical health (such as depression or lack of physical activity). Two additional groups of studies consider life outcomes in terms of opportunities (N = 20) and risks (N = 13) that young people experience online. These studies primarily provide evidence of online behaviors with offline consequences, such as school – and university-related device use (online opportunities) and social media or game addiction (online risks).

Considering analytical designs, 21 studies use one or more measures of SES to predict online risks and opportunities young people encounter (*SES* → *DIG*). These treat SES as an antecedent of online digital activities with offline consequences. Thirteen studies

report the controlled effect or association of SES and digital engagement on life outcomes ($SES \rightarrow LO \leftarrow DIG$). This group focuses separately but simultaneously on the role of socioeconomic resources and the domain of digitalization, providing evidence on the residual effect of one factor (e.g., parental occupation or screen time) on a critical outcome (e.g., standardized math test) after controlling for the other factor (e.g., screen time or parental occupation). Another group of studies (N = 14) examines the modified effect of digital engagement at different levels of SES ($SES \times DIG \rightarrow LO$). SES moderation exists when the direction or magnitude of the association varies, i.e., a particular area of digital engagement is beneficial or harmful to different degrees for young people with different socioeconomic resources. Finally, 9 studies investigate the mediating role of digital engagement in explaining SES differences in life outcomes ($SES \rightarrow DIG \rightarrow LO$). For this group, we raise a bias concern when no formal mediation test is reported (see Section 2.4). Table A2.1 in the Appendix shows the distribution by outcome and analytical design. Bias concerns for each study are reported in Table A5.1.

Most studies are cross-sectional (N = 42), 8 use longitudinal data, 4 qualitative methods, and only 3 experimental designs. More than half report evidence from regression models, 7 coefficients from structural equation models, and 4 in-depth interviews or participant observation.

The studies encompass a wide array of digitalization domains, including device usage time, digital skills, device access, informational use, ICT attitudes, and social media use. SES measures vary: 12 use an aggregate index, 12 parental education, 9 combine parental education and income, 7 rely on family income alone, 4 adopt a cultural capital perspective, 2 infer SES from high school track, and 11 use multiple measures.

Following the criteria described in Section 2.2, Table 3 reports the relevance assessment: 25 studies are ancillary, 22 intermediate, and 10 core. Figure A2.1 in the Appendix illustrates the distribution of studies based on the age of the sample: most involve 12–18-year-olds. Additionally, there is substantial representation of ages 0–5 and 8–11.

3.2. Direction of the effects and correlations

Figure 2 shows the harvest plots corresponding to the four categories of life outcomes (development, learning and education; well-being and health; online opportunities; online risks). Harvest plots for the direction of effects are commonly used in meta-analyses to display the direction of effects across multiple studies (Ogilvie et al., 2008). They are particularly useful when studies address the same research question but rely on different methodologies and sample sizes (Pintor et al., 2023). Here we use them to assess whether effects or correlations of interest point consistently in one direction across studies. The main findings for each life outcome are discussed below. When we refer to a specific paper, we indicate the number that corresponds to the reference in Appendix A1.

3.2.1. Development, learning & education

There is a mixed pattern of findings on the association between development, learning and education-related life outcomes and digital engagement (upper left panel, first row), with 6 studies suggesting harmful association. Longer screen time and digital device use for communication and entertainment are negatively associated with flourishing markers and academic outcomes. Four studies present conflicting evidence on the

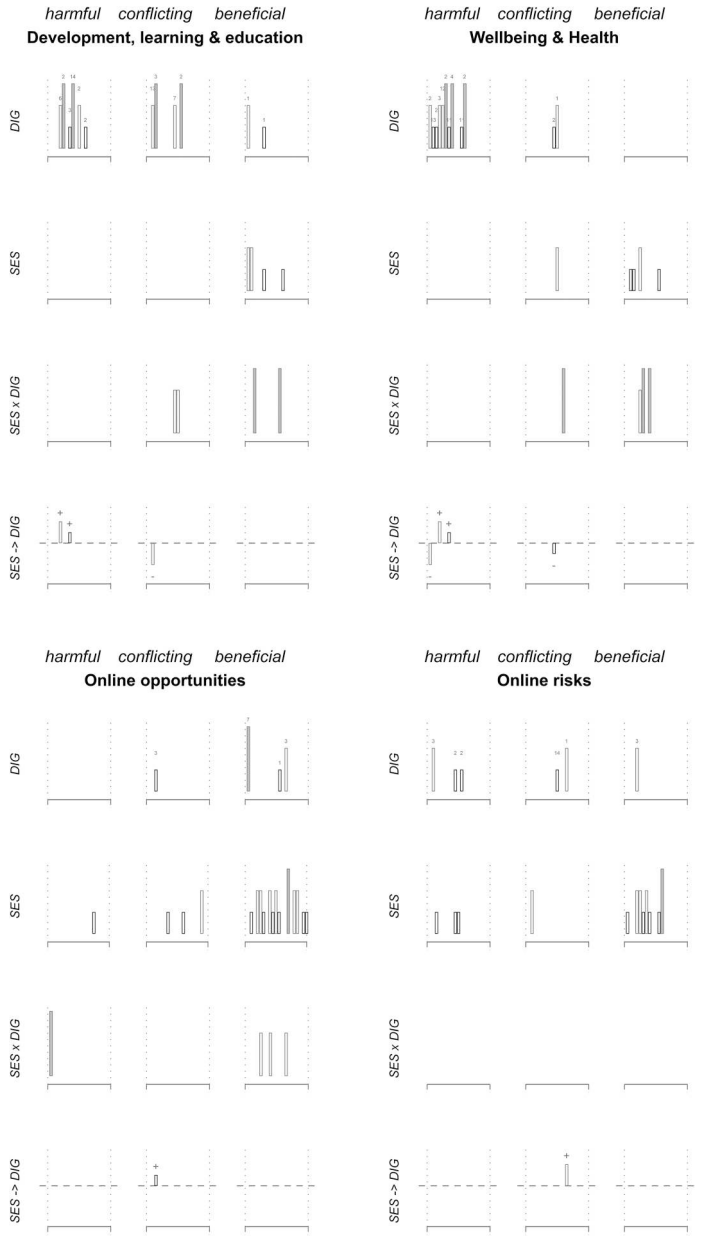

Figure 2. Harvest plots for direction of effects by life outcome. Each panel is organized into four rows according to the covariate of interest: (i) digitalization domain (DIG), (ii) SES, (iii) the interaction between SES and digital engagement (SES × DIG), and (iv) the indirect effect of SES through digital engagement (mediation; SES → DIG). Studies are placed in the first, second, or third columns if they report a harmful, conflicting, or beneficial effect (or correlation) on each life outcome, respectively. Bar height indicates the study's relevance (ancillary, intermediate, or core), while numbers above bars refer to the digitalization domains: 1. Device access; 2. Device usage (time); 3. Digital skills; 4. Digital status seeking; 5. E-health literacy; 6. Entertainment and communication online; 7. Game intervention; 8. ICT attitudes; 9. Informational use; 10. Lexical richness in online contexts; 11. Problematic use; 12. Recreational use; 13. Social media use; 14. More than one. The fourth row shows the sign of mediation effects, aligned with the direction indicated in the first row.

relationship between digital engagement and developmental learning outcomes. Study 14 (Table A5.1) finds mixed effects of teaching methods involving digital tools on preschoolers' cognitive, socioemotional, and early math skills; however, conclusions are limited because the methods did not differ uniquely by offline versus online approach. A qualitative study in schools (36, classified as core) highlights that digital youth culture can function as a form of capital but may also generate disciplinary tensions that undermine educational benefits, with positive effects observed only among high-SES students. Study 42 reports that digital media use can positively influence intelligence when genetic and socioeconomic factors are controlled, but the direction of effects vary substantially by type of activity, with some uses (e.g., gaming) linked to gains and others (e.g., passive watching) linked to losses. Finally, Study 43 (core) finds that the impact of ICT on reading achievement follows a curvilinear pattern: both minimal and excessive educational computer use relate to lower scores, with benefits at moderate levels and varying by social group. Finally, among studies reporting positive associations, one study from China (25, intermediate) reports a positive impact of distributing laptops programed for learning environments on students' mathematics scores and computer skills. In another study from Bangladesh (1, ancillary), internet access is associated with more minutes of study per day. Both studies are flagged in our risk of bias assessment: the first due to low variability in the population baseline (intervention limited to migrant schools in Beijing), and the second because it covers COVID-19 lockdown periods. Consistent with the broader literature on educational inequalities, four studies link higher SES to higher educational achievement and attainment (upper left panel, second row).

Four studies report the interaction between SES and digital engagement (upper left panel, third row). In one study (36), teachers in high-SES contexts recognize the value of digital skills, while those in low-SES contexts discipline students, treating such skills as irrelevant for learning. Similarly, study 43 reports that young people's ability to convert computer use for educational purposes increases with parental education. Notably, the two studies (14 and 40) that did not find a significant interaction between SES and digital engagement are flagged in our risk of bias assessment. The latter does not report any explicit interaction test.[6] Finally, three studies examine how digital engagement mediates SES, producing some evidence of harmful mediation pathways (see the t-test in Tabel A3.1). Higher SES is associated with lower levels of certain screen-based activities (42), less frequent use of the internet for communication and entertainment (5),and more digital literacy events outside school (27).

3.2.2. Wellbeing & health

A set of studies explores psychological and physical wellbeing outcomes, including life satisfaction, behavioral problems, subjective wellbeing, psychiatric symptoms, social appearance anxiety, socio-emotional problems, depression, and cognitive functioning (upper-right panel, Figure 2). The data suggests that the duration and nature of digital activities, such as screen time and type of digital activity, relate to multiple aspects of wellbeing. Overall, evidence points to a negative association between digital activities and wellbeing, with 10 out of 12 studies report declining wellbeing (sign test in Table A3.1 in the Appendix is significant for this group of studies). Intensive social media use is associated with lower life satisfaction, and excessive screen time with more behavioral and socio-emotional problems. Problematic use of digital devices, including social

media and gaming addiction, is also linked to poorer well-being and health. Studies 35 and 10, which report conflicting results, are flagged in our risk of bias assessment due to incomplete reporting of SES-related estimates and inconsistent or missing interaction tests. Four studies explore the role of SES in moderating the negative effect of digital activities. In two (20 and 27), low-SES participants who spent less time on screen-related activities report higher subjective wellbeing and lower depression. Study 30 finds that SES significantly moderated the interaction on substance use and risky sexual behavior. Study 2 does not find significant differences between SES groups in Ireland and is classified here as conflicting.

3.2.3. Online opportunities

Four studies examine the relationship between specific digital activities and online opportunities, three report positive outcomes, including one randomized game-based intervention. In line with the digital divide literature, SES is positively correlated with digital literacy, and high-SES individuals show greater exposure to online opportunities (sign test in Table A3.1 in the Appendix is significant for this group of studies). One study (44) reports conflicting evidence: operational skills had a positive indirect effect but a negative direct effect on academic use. Twelve studies examine the influence of socioeconomic factors on shaping digital skills, access to online information, and engagement with academic-related digital content. On average, high-SES youth use digital media more for information and less for entertainment. SES also plays a role in shaping digital health literacy, with parental education and income positively associated with students' health information retrieval. A smaller body of research examines the role of SES as a moderator between digital engagement and digital opportunities. One intervention that aimed to improve school-related digital skills finds that parental low SES increased home and school computer use for study more than high SES (38). In contrast, two other studies (9 and 37) suggest that the interaction between SES favored high SES in relevant school activities and time spent reading.

3.2.4. Online risks

Findings suggest a negative association between digital engagement and online risks, particularly concerning problematic screen use, cyberbullying victimization, and cyberbullying perpetration. Digital skills and digital literacy are protective, whereas more time on digital devices increases exposure to online risks. Two studies report conflicting results. Study 23 finds that higher SES is linked to greater access to digital devices, which in turn increase both online opportunities and risks, with digital skills moderating these relationships. In contrast, study 46 identifies small differences in internet use and digital skills between online victims and non-victims, with higher SES less prevalent among non-victims. In fact, in eight studies out of twelve, SES represents a protective factor when predicting the exposure to online risks. One comparative study across EU countries (32) finds that high SES is negatively associated with online risks. A study based on repeated cross-sectional data (24) finds that the share of young people reporting online sexual solicitation has declined across recent cohorts, for both boys and girls and in all age groups, but not among minority youth or those from less affluent households in the US. However, one study from Chile (46) and one from Pakistan (41) find that low-SES students reported less cyberbullying victimization, accounting for internet access.

Figure A2.3 offers an alternative visual summary of the results. For each analytical design, heat plots display the average effect direction across outcome and digitalization domains. Qualitatively, the figure reveals a general lack of consistent beneficial effects across digitalization domains, especially pronounced for wellbeing and health outcomes. In contrast, SES appears consistently protective in relation to digital engagement.

3.3. Evidence by age groups

Finally, we examine the age-specific direction of effects and correlations. Figure A2.2 in the Appendix presents harvest plots grouped by outcome across four age ranges: 0–6 (N = 6), 7–14 (N = 10), 15–17 (N = 20), and 18–35 (N = 21). Table A3.3 shows corresponding t-tests. Negative effects are mainly concentrated in the 0–6 and 15–17 age groups, where SES appears to play a protective role. Evidence is more mixed for ages 18–35. These patterns suggest age-specific mechanisms and warrant finer-grained investigation (see Section 5).

4. Thematic review on the role of SES

In this section, we organize the available evidence with a narrative and thematic approach, focusing on SES. Across the 57 papers, three ways emerge in which SES shapes how digital engagement affects young people's life outcomes.

4.1. Parenting style mediates SES in beneficial vs. harmful digital activities

Parents play a fundamental role in determining children's time allocation online and offline, and SES contributes to shaping parenting styles (*e.g.,* Lareau, 2011). In Hong Kong, study 57 finds that high-SES families were less likely to provide digital devices to their 3–5-year-olds, and when they do, use is more limited than in lower-SES families. Children of high-SES parents are less likely to watch cartoons and more likely to play interactive games, while in medium-SES families, parents are more likely to hand over digital devices when busy. Similarly, a population-based study in the US (35) shows that children with less-educated parents spend, on average, more time in front of screens. Study 8 further examines parental protection, showing that restrictive mediation encourages informational Internet use among 11–17-year-olds across 10 European countries. High-SES parents have a greater propensity to shape their children's Internet time budget by prioritizing informational and social activities over entertainment activities. The authors argue that high-SES parents tend to deprive their children of fun online experiences, steering free time toward perceived benefits. An earlier comparative study (32) reaches similar conclusions concerning online risk behaviors among 16-year-olds. However, high-SES parents manage digital access less consistently than other areas of their children's lives. In-depth interviews in a recent US-based mixed-method study (26) reveals that high-SES parents both worry about drawbacks and view digital skills as important drivers of human capital. This ambivalence leave them less inclined to follow pediatric screen-time guidelines, which they consider unrealistic.

4.2. Digital skills are contextual and can be linked to SES

The studies in this review suggest the same digital skills can yield different life outcomes depending on context and SES. Digital exposure can build ICT skills that support academic success. Study 5 asks whether variations in access and use of digital media across SES influence Swiss middle-schoolers' academic performance. The analysis reveals an indirect link between a family's SES and children's grades: lower parental income is associated with more Internet use for entertainment and online communication. Even when digital skills are similar across SES groups, some educational settings yield greater returns for high-SES children. An early qualitative study (31) examines how technology practices relate to cultural capital among 15-year-old Australians, interpreting digital tastes as a manifestation of habitus within the digital realm. Home ICT practices that mirror those in school lead to dispositions to acquire more cultural capital. One ethnography (36) of three socioeconomically diverse US middle schools shows that teachers' perception of digital skills varied by students' SES and minority status. Teachers in the upper-class school try to integrate digital youth culture into their instructional philosophies and teaching practices, and, as a result, students see the school as a setting that can accommodate their technology and digital interests for academic success. In one more diverse school setting, teachers carefully policy boundaries between digital youth culture and school culture. In the underprivileged school, teachers discipline spontaneous digital youth culture, labeling it irrelevant while issuing a labor market-oriented digital skill set.

More generally, specific digital skills learned outside school can be difficult to convert into academic advantage, further disadvantaging low-SES youth. A qualitative study (8) in two socioeconomically diverse UK colleges reveals that students answered controversial questions by utilizing the Internet. The findings indicate that students in the low-SES college are more inclined to accord naïve truthfulness to the results obtained from an online search engine, but also display less interest in applying their digital skills to this task in the school field. Evidence also suggests that adolescents from privileged backgrounds use typographic communication (*e.g.*, emoji) less frequently online (16 and 17).

4.3. Socioeconomic resources balance online opportunities and risks

Socioeconomic resources help translate digital use and skills into positive life outcomes (such as education and learning) and mitigate online risks (such as social media addiction or excessive screen time). One study (23) finds that access to digital devices fully mediates the association between SES and online risks. Comparative studies observe that adolescents aged 14–16 from less-educated households exhibit higher online risky behavior levels than their counterparts in several countries (3 and 32). Similarly, in a US-based study (55), low-SES children are also more likely to use apps that register sensitive personal data. In the same country, another study (24) reports that online sexual solicitations are not lower for Hispanic and Black youth or for those in poor household after adjusting for demographics and Internet use. The authors hypothesize that low-income parents may have weaker digital skills or less well-equipped devices to protect against online harassment and unwanted exposure to pornography. One additional study (51) of Flemish adolescents aged 14–19 finds that young people from low-SES

households have higher probabilities of adding strangers on social networks and receiving sexual messages while chatting.

Evidence on the channels through which SES confers advantage is limited, and findings often diverge. For example, one study examining the association between the frequency of ICT use and reading achievement (measured with PISA standardized test scores among 15-year-old Canadian youth) finds a pronounced curvilinear relationship, moderated by gender and maternal education (43). Authors suggest that cultural resources in the family moderate the effect of ICT use only partially: when an optimal point is reached, the negative effect for children with educated mothers was at least as great as for those with less-educated mothers. Another study (2) compares two cohorts (1998 and 2008) of adolescents in Ireland. Its findings indicate that media use was significantly associated with increased socioemotional problems among 9-year-olds. Although gaming is positively associated with greater socioemotional problems for low-SES, socioeconomic status does not play a significant role in moderating risks of other online activities. Study 30 explores the relationship between digital status-seeking and health risk behaviors, namely substance use and the number of sex partners. Digital status-seeking, independently from offline social status, is associated with greater risks for a sample of US teenagers. One explanation proposed by the authors is that risky behaviors match the prototype of popularity. Even if high-SES youth is more likely to be digital status seekers, the interaction between SES and digital status seeking is non-significant. Finally, another study (10) finds that 12–24-year-olds in moderate-high SES areas in Australia are more likely to be exposed to online tobacco promotion, with no differences in whether the exposure is through online advertising or social media.

5. Discussion and conclusions

We mapped how digital engagement relates to youth life outcomes. Reflecting the variety and intertwining of contexts in which young people perform their daily activities, the evidence gathered here indicates that digital engagement is neither inherently harmful nor beneficial. Offline outcomes depend on use (e.g., studying vs. social networking), intensity (e.g., one vs. ten hours per day), and the life domain (e.g., academic performance vs. social anxiety). On balance, impacts tend to be more beneficial for academic outcomes and more harmful for wellbeing, and high-SES young people more easily compensate negative outcomes. At the same time, being a multistep process, digital engagement already carries implications within the online sphere: access does not automatically translate into opportunities to build skills valuable in school or the labor market, and may instead expose young people to risks such as overuse, addiction, or cyberbullying.

By offering a more informed meta-analytical reflection on youth digital engagement, this review highlights avenues for future research. First, much of the existing evidence remains descriptive, relying on qualitative insights or cross-sectional data. These studies have been crucial in laying the theoretical foundations of the field, but they should be complemented by experimental and longitudinal designs that can test hypotheses and provide causal estimates. Such approaches would corroborate existing evidence and identify conditions under which digital engagement fosters positive outcomes. Indeed, research on young people has disproportionately emphasized risks, while systematic analysis of potential benefits remains comparatively underdeveloped.

Second, while socioeconomic resources generally provide young people with an advantage in using digital devices and engaging in activities that lead to more positive life outcomes and better balance online opportunities and risks, further research is needed on the mechanisms through which this advantage is (or is not) realized. Promising avenues include exploring how SES-related parenting styles intersect with parental mediation of digital engagement, a likely pathway through which offline advantages are translated into digital capital and reinforce themselves. Importantly, the role of SES should be considered within the broader set of hybrid contexts of daily life.

Third, integrating digital engagement and the digital divide within a life course perspective remains essential. Effects differ by age, calling for more granular analyses, panel data, and designs that separate cohort from age effects.

Finally, regional disparities persist in the focus of international scholarship. Studies using data from Asia, South America, and the Middle East highlight differences in access and use. In contrast, in European countries such as Denmark, research has focused on returns to Internet use and differential benefits across social groups. Recognizing regional patterns is key to develop region-specific strategies to address disparities across levels of the digital divide.

Our inclusive approach has limitations. While stricter criteria would have resulted in missing important aspects of the broader picture, the openness of our approach is the main limitation of this review. Because we did not focus a priori on specific aspects of digital engagement and life outcomes domains, we compared evidence across diverse analytic designs and methodological approaches, increasing the risk of bias in selecting and comparing evidence. This necessarily implies that any causal inference should be made with caution, as only a small number of the reviewed studies explicitly adopt a causal perspective or implement analytical designs capable of supporting such claims. We also acknowledge that our reliance on categorical labels of effects (beneficial, harmful, conflicting) inevitably simplifies the complexity of findings and that the absence of statistical parameters such as effect sizes, confidence intervals, or significance thresholds limits the precision of our interpretations. Another limitation is the lack of attention to other important sociodemographic factors, such as gender and migration background, which likely interact with SES in shaping digital engagement outcomes. Each of these factors merits a dedicated review.

Our findings are relevant to policymakers and educational researchers aiming to reduce digital inequalities and promote positive youth development. They highlight the need for strategies that not only expand access but also support skill-building, parental mediation, and institutional practices sensitive to socioeconomic, age, and regional differences. Importantly, interventions should account for the varying impacts of digital engagement across different life outcome domains and, for the youngest, recognize the role of schools as both sites of opportunity and potential amplifiers of inequalities. Grounding policies and educational practices in these insights can help foster inclusive digital environments that contribute to more equitable life outcomes for all young people.

Notes

1. Source: International Communication Union. Retrieved from https://www.itu.int/itu-d/reports/statistics/2024/11/10/ff24-internet-use/

2. For example, although the access gap has narrowed, it still affects many low-income countries and deprived communities (UNESCO, 2023).
3. Validation of the criteria during pre-screening and screening of titles, abstracts, and full texts was performed using Cadima.org (Kohl et al., 2018).
4. The query on Elicit.org was: 'What are the socioeconomic differences in the impact of digital engagement on youth life outcomes? Life outcomes include health, education, peers, work transitions, and wellbeing.'
5. The data and replication files that support the findings of this study are also openly available in OSF.IO at https://doi.org/10.17605/OSF.IO/2UMQJ
6. Per our guidelines, we excluded four additional papers that found no significant interaction from the third row of the upper-left panel of Figure 2 because they did not report coefficients.

Data availability statement

The data that support the findings of this study are openly available in the Open Science Framework (OSF) at https://doi.org/10.17605/OSF.IO/2UMQJ, reference number 2UMQJ.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Guido Salza is Assistant Professor at the Faculty of Political and Social Sciences at the University of Milan, Italy. His research focuses on analyzing educational inequality, particularly in terms of educational outcomes. He investigates both institutional and informal constraints that hinder equal educational opportunities across different contexts, utilizing a wide range of data and statistical methodologies.

Robin Samuel is an Associate Professor at the University of Luxembourg and Head of the Center for Childhood and Youth Research, where he also leads the Youth Studies Research Group. His research explores youth transitions, health and well-being, sustainability, and research methods, with a focus on data analysis and experimental designs. Currently, he is investigating the role of digitality in shaping young people's lives.

ORCID

Guido Salza http://orcid.org/0000-0001-7793-5304

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*For studies included in the review, see the Appendix A1.

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