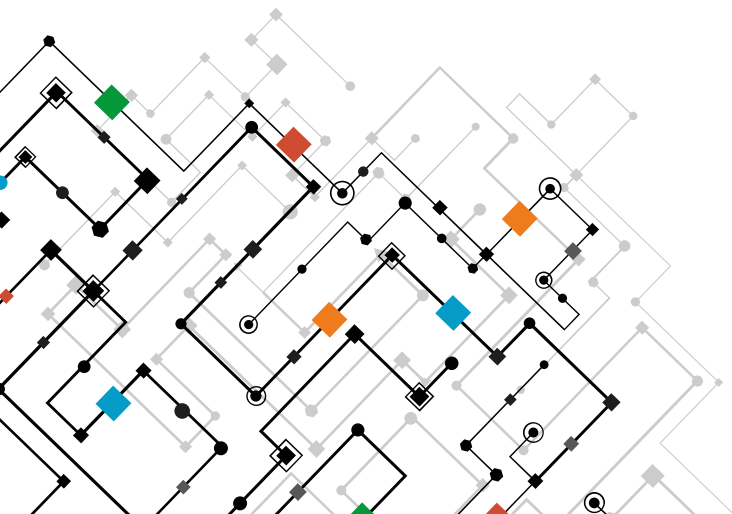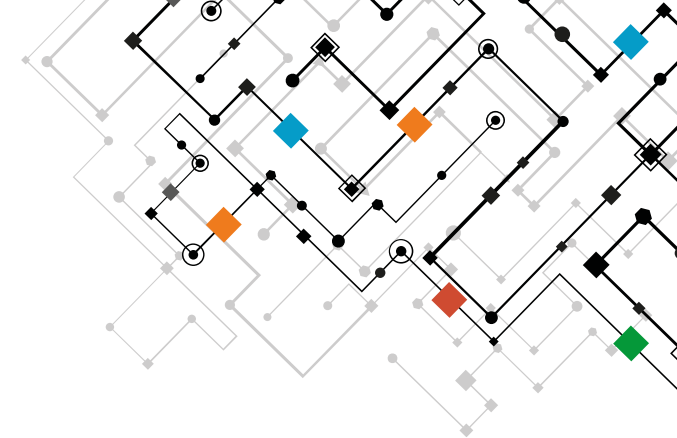# The outcomes of gaining digital skills for young people's lives and wellbeing:

A systematic evidence review

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Introduction

What are digital skills?

- "The ability to use ICTs in ways that help individuals to achieve beneficial, high-quality outcomes in everyday life [… and] reduce potential harm associated with more negative aspects of digital engagement." (ITU, 2018)
- Research shift in focus from definitional debates to identify outcomes of gaining digital skills.

Focus on children and young people

- Research and policy alike are often unclear about the expected or desired outcomes of youth gaining digital skills, especially compared with the adult agenda.
- Yet huge push to provide children with digital access, and blithe expectation that digital skills will follow and be beneficial.
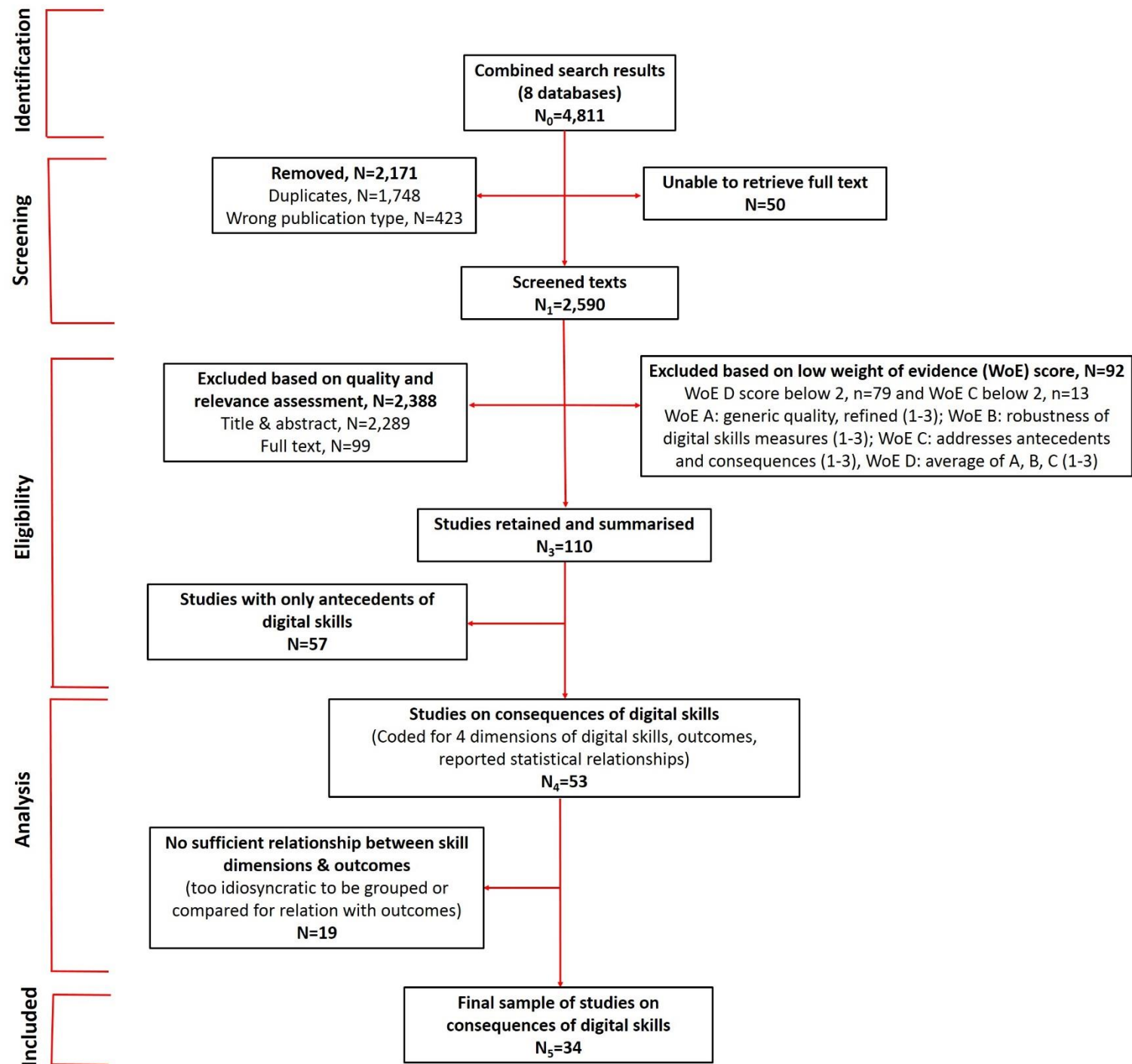
Methods

A systematic evidence review

Research questions

1. What are the outcomes of young people's digital skills?

2. Can the different dimensions of digital skills be linked to distinct outcomes?

3. How does the research literature explain the outcomes of digital skills?

Identification

Combined search results
(8 databases)
N_0=4,811

Screening

Removed, N=2,171
Duplicates, N=1,748
Wrong publication type, N=423

Unable to retrieve full text
N=50

Screened texts
N_1=2,590

Eligibility

Excluded based on quality and relevance assessment, N=2,388
Title & abstract, N=2,289
Full text, N=99

Excluded based on low weight of evidence (WoE) score, N=92
WoE D score below 2, n=79 and WoE C below 2, n=13
WoE A: generic quality, refined (1-3); WoE B: robustness of digital skills measures (1-3); WoE C: addresses antecedents and consequences (1-3), WoE D: average of A, B, C (1-3)

Studies retained and summarised
N_3=110

Studies with only antecedents of digital skills
N=57

Analysis

Studies on consequences of digital skills
(Coded for 4 dimensions of digital skills, outcomes, reported statistical relationships)
N_4=53

No sufficient relationship between skill dimensions & outcomes
(too idiosyncratic to be grouped or compared for relation with outcomes)
N=19

Included

Final sample of studies on consequences of digital skills
N_5=34

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4 skill dimensions	Description
Technical and operational skills ("Tech")	The ability to manage and operate ICTs and the technical affordances of devices, platforms and apps; from 'button' knowledge to settings management to programming.
Information navigation and processing skills ("Info")	The ability to find, select and critically evaluate digital sources of information.
Communication and interaction skills ("Comm")	The ability to use different digital media and technological features to interact with others and build networks as well as to critically evaluate the impact of interpersonal mediated communication and interactions on others.
Content creation and production skills ("Create")	The ability to create (quality) digital content and understand how it is produced and published and how it generates impact.

The outcomes of digital skills for children and young people (RQ1)

More skills, more opportunities

- Two thirds of studies examined the effect of digital skills on online opportunities and other benefits; one third examined online risks of harm.

- All examined proximal rather than long-term or distal outcomes.

- Findings suggest that greater digital skills are linked to more online opportunities, information benefits and, with differential effects by gender, a positive orientation to technology.

More skills, more risk but not harm

- Findings for other positive outcomes – academic grades, coping behaviours and civic participation – also show a link to greater digital skills but studies are fewer, and some findings are contradictory.

- A fair body of research supports the conclusion that greater digital skills are indirectly linked to more exposure to online risks. The relation to harm is suggestive but remains unclear.

The relationships between the dimensions of digital skills and outcomes (RQ2)

Mixed outcomes, more negative from technical skills

Overall

- Outcomes of children's and young people's digital skills are complex, encompassing both positive and negative effects.

- Shortcoming: common practice of combining separate skill measures into a composite score.

- Some skills have better overall outcomes than others

Technical skills

- Very mixed outcomes, with more harmful outcomes than beneficial ones, especially compared with the other dimensions of digital skills.

- Associated with a positive orientation to technology and online opportunities.

- But also with online risk and no relation to life satisfaction.

- No effect or even a negative effect on civic participation and on academic grades.

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Mixed outcomes, more positive from informational skills

Information skills

- Generally linked with beneficial outcomes: increase civic participation, online opportunities, academic grades, information seeking for homework (but not for everyday information needs).

- Notably, they are also linked to reduced online risk and are unrelated to online addiction.

Communication skills

- Little examined as an independent dimension.

- The evidence suggests positive outcomes - on online opportunities, especially social engagement and coping with online risk, though there was no effect on academic grades.

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Mixed outcomes, more positive from informational skills

Creative skills

- Mixed results from the few studies of creative skills.

- Positive effects on online opportunities (especially creative engagement) and academic grades.

- But also increased online risk and a negative association with academic grades, though no relation to online addiction.

Composite skill measures

- Harder to draw conclusions as effects may arise from the additive or interactive relationships among different digital skill dimensions.

- Information skills are most consistently linked to positive outcomes, especially combined with communication or creative skills.

- Technical skills show a more mixed, even negative pattern of outcomes.

Explaining the outcomes of digital skills (RQ3)

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Pathway models

- Eleven studies hypothesise and test specific pathways from the antecedents of digital skills to their outcomes for children and young people.

- The effort at model building reveals important interrelations that studies reliant on univariate statistical analysis can miss, notably between the fixed and malleable predictors of digital skills in relation to outcomes.

- Digital skills mediate the impact of socio-demographic factors on different online opportunities.

- Parental mediation and ICT availability at home were linked to informational benefits for children, mediated by informational skills.

- But inequality has a direct effect on outcomes that is unmediated by digital skills.

Conclusions

For researchers

- More research is needed on the differential effect of skills dimensions on different outcomes, and for children of different ages. The future use of composite digital skill measures is not recommended.

- Digital skills should be included in future modelling of the relation between demographic, psychosocial factors and digital and social divides, to understand and address the real-world outcomes of socio-digital inequalities.

- In studies of children and young people, the measures of antecedents and consequences of digital skills, as well as those of digital skills themselves, appear similar to those used for adults; there is good reason therefore to include young people in future population surveys.

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For policymakers

- Greater clarity is needed in specifying the expected outcomes of promoting digital skills among youth.

- Not all digital skills are linked to beneficial outcomes: promoting technical skills alone emerges as a problematic strategy.

- Conversely, information skills alone or in combination with other sets of skills are much more promising.

- Policymakers should be aware that promoting digital skills enhances both online opportunities and online risks.

- Statistical models help to pinpoint where future interventions could be focused to improve fairer outcomes for children, potentially maximizing opportunities to benefit and minimising the risk of harm through interventions that promote digital skills, redistribute ICT resources and raise awareness among parents of optimal (enabling) mediation strategies.

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For more, see ySKILLS: https://yskills.eu/

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Digital skills, risks and wellbeing among European children

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The youth Digital Skills Indicator

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