

Systematic literature review on parental involvement in digital education



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ABSTRACT

Today it is generally known that digital tools suitable for enriching education can benefit and hinder teaching-learning. To understand the reasons behind students' behavior, one must take an ecological approach to digital education. It would be misleading to think that only teachers experience difficulties; Digital education raises many questions and is the subject of constant debate, to which the COVID-19 pandemic has contributed significantly. In our systematic literature review, using the PRISMA model, we aimed to explore parental techniques and the degree of parental efficiency revealed by the literature on the digital education of children in families. After the multi-step screening, we finally examined 12 studies. The findings suggest that parents in digital education, acting as mediators, can be classified into groups fearing the consequences of digital tools, experiencing knowledge gaps, with an intersection of both apparent in literature. Parents express a need for support and assistance in digital education.

Keywords: *digital parenting, parental involvement, digital literacy, digital competence, media literacy.*



INTRODUCTION

Ideally, parents and educators can work together to overcome the difficulties they face, but the rapid development of technology and children's intuitive approach to digital devices can make it very difficult for both sides to participate effectively in children's digital education. The literature defines digital parenting as the practice of parental efforts to understand, support and control children's activity in the digital space (Benedetto & Ingrassia, 2021). The intuitive attitude of children towards digital devices, as mentioned above, can quickly lead to the development of digital competences, which can allow children to surpass their parents in this area. This phenomenon, termed *reverse socialisation*, can make parents' task particularly difficult (Benedetto & Ingarissa, 2021). Another enormous challenge arises from the lack of a model for today's parents to follow. As a consequence, parents are particularly uncertain about digital parenting and often look to schools and/or teachers for help in teaching their children how to use digital devices appropriately (Vodopivec, 2011). In this context, it is important to highlight that one of the factors of digital education is digital literacy, which is often mentioned and identified as a competence to be developed in schools (Livingstone & Helsper, 2008; Sanders et al., 2016). Competences are viewed as complex systems of knowledge, skills, abilities, personality traits and attitudes that enable the holder (or make them competent) to act efficiently in different situations, even in solving complex, real-life tasks (Szabó & Dani, 2020). The interpretation of digital access is commonly narrowed down to the possession of ICT tools, but it is a complex concept with digital knowledge, skills and attitudes as important pillars (Vuorikari, Kluzer & Punie, 2022).

For schools to be of assistance to parents, it is not sufficient to look only at the digital competence level of teachers. At this point, we consider it essential to interpret the term 'parental involvement', which is already very well established in the international literature (Bacsikai, 2020). Parental involvement can be extremely diverse and can take several forms in an educational institution at the same time. In order to examine the subject of our research from the perspective of parental involvement, it is necessary to be familiar with Epstein's (2001) model. The first of Epstein's six types of parental involvement is called 'parenting' and refers to the basic practice of creating the learning environment for children at home. The second category is 'communication', which includes communication

initiatives and programmes between parents and schools. This is followed by 'volunteering', i.e. the voluntary involvement of parents in school life. The fourth category is 'home learning', which is more directly related to the learning process of children than parenting, as teachers and/or schools provide specific suggestions to parents regarding children's schoolwork or learning. Also, an important part of parental involvement is the category of 'decision making', which emphasises the role of parents in decision making and management in school life. The last type of parental involvement identified by Epstein (2001) is 'collaboration with the community', which implies the inherent resources of the parental community for enhancing the learning opportunities of students.

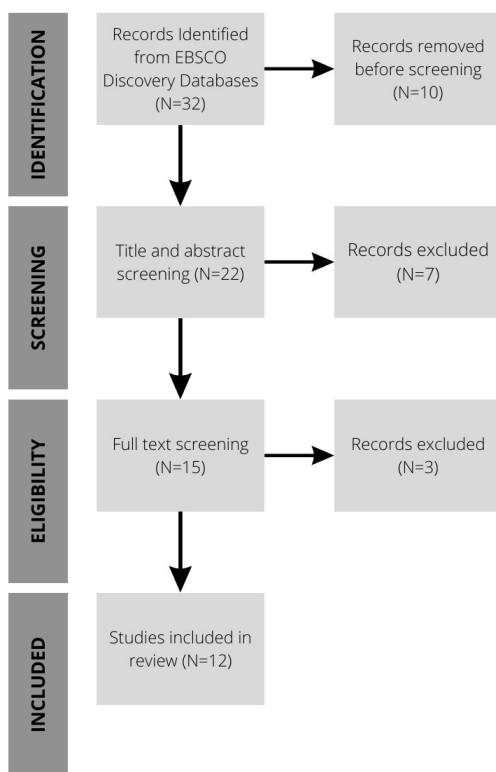
As Steyer says, "Digital technology has made our lives easier in many ways. Yet it has not made raising children easier at all" (Steyer, 2015, p. 6). Like early socialisation, the first stage of media literacy education takes place in the family as parents also have to help their children in the online world, guiding them on the way. This educational process is hindered by the fact that parents themselves have no experience of media education, they do not usually follow their children's online activities and their individual Internet use is not necessarily conscious. According to Potter, media literacy refers to a set of skills and knowledge that ensure informed, critical and active media consumption and use (Potter, 2014). It enables us to utilize the advantages of the communication space around us, to enjoy media content and to reduce the impact of its harmful and detrimental elements. Therefore, our main research question is the following: *Based on academic research, what role do parents play in the digital education of their children, and how do schools support parents in this task?*

During our research, we aimed to give a comprehensive and systematic analysis of the literature, thus providing an opportunity for our analysis to guide policy makers, practicing teachers and researchers alike.

METHOD

In order to answer our research questions, we used the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) model recommended by Kamarási and Mogyorósy (2015), which provides a checklist of 27 items for scientific analysis (Liberati et al., 2009) (Figure 1).

Figure 1. Four-step flow diagram of the PRISMA model (Kamarási & Mogyorósy, 2015)



We searched the EBSCO database, which provides access to academic articles, e-books, e-journals, theses, conference presentations, image and video collections. Our research was limited to the years 2010 to 2021 during the EBSCO database search. The procedure, in accordance with the steps of the PRISMA model, started with the selection of keywords. The search was carried out in English in order to review the international literature. We searched the entire database for parental involvement using the words *parental involvement* or *parent engagement* or *parent participation*, which we paired with the words *critical thinking* and *digital literacy* or *computer literacy* or *technological literacy*. (We used the keyword *digital literacy* because it has a narrower meaning than *digital competence*). We also paid special attention to the keywords *parent* or *mother* or *father* or *caregiver* and *media* or *television* or *internet* or *social media* in the abstracts. Our search was limited

to the years 2010 to 2021, as we wanted to analyse the latest research on the topic due to the rapid evolution of technology. The full-text studies to be included had to be peer reviewed and published in academic journals on education. The search by this method yielded 22 results. The following step was the screening procedure. The review of the publications and the coding was carried out by three of the co-authors. We first screened the titles and abstracts. For each study, we judged whether we considered it to be eligible according to the title and abstract search criteria. If all three of us judged a study positively, the classification was obvious. If there was no unanimous opinion on the study, we jointly decided to exclude it. If the study did not contain any empirical evidence, it resulted in automatic exclusion. These criteria led to the exclusion of 7 papers, leaving 15 papers for further analysis. The analysis of the full texts resulted in the exclusion of a further 3 papers due to the fact that they did not treat parental involvement or children's digital literacy in a way that was compatible with our investigation. Thus, a total of 12 publications were selected for inclusion in the systematic literature review (Table 1).

Of the 12 studies that met the criteria, the earliest were written in 2011. Having looked at the time span from 2011 to 2021, we were able to include studies in our analysis from every year except 2014 and 2015. In total, 10 different countries are represented in the 12 studies – Australia, Canada, New Zealand, Poland, Portugal, Singapore, Slovenia, Turkey, the United Kingdom and the United States of America. With the exception of the United States, each of the other countries appeared in only one study. However, it cannot be said that any part of the world is over-represented in this comparison. More than half of the studies were published in high quality journals with a high international ranking¹, with several papers appearing in the Q1 journals *British Journal of Educational Technology* and *Education & Information Technologies*. Although the journals where the rest of the selected studies appeared² were not ranked in Scimago, the journal *Education, Business & Society: Contemporary Middle Eastern Issues* was included in the Scimago database.

¹ British Journal of Educational Technology, Education & Information Technologies, Literacy, South African Journal of Education.

² Acta Didactica Napocensia, Education, Business & Society: Contemporary Middle Eastern Issues, International Journal of Child, Youth & Family Studies, Journal of Hasan Ali Yücel Faculty of Education

Table 1. *Examples of the exclusion and inclusion of studies based on specific criteria*

Search criteria	Definition of criteria	Justification	A study which was included	A study which was excluded	Reason for exclusion
Keywords	Checking the occurrence of the selected keywords (see the paragraph above) in the title and/or abstract	Search criteria: inappropriate keywords in the title and abstract of the study	Brito et al. (2018). Young children, digital media and smart toys: How perceptions shape adoption and domestication.	Chen et al. (2021). Discrimination of the contextual features of top performers in scientific literacy using a machine learning approach.	Neither the title nor the abstract of the study contained the relevant keywords
Method	Empirical information	Our purpose was to analyse relevant empirical studies on the subject over the past 10 years	Ebbeck et al. (2016). Singaporean Parents' Views of Their Young Children's Access and Use of Technological Devices.	Monk et al. (2015). Portal Pedagogy: From interdisciplinarity and internationalization to transdisciplinarity and transnationalization.	The study did not contain any empirical evidence
Mention of parents and/or children and/or teachers in the studies	Were parents' and/or children's and/or teachers' digital competence, digital literacy and/or digital education examined?	Parents' and/or children's and/or teachers' digital competence, digital literacy and/or digital education were not examined.	Tomczyk & Potyrała (2021). Parents' knowledge and skills about the risks of the digital world.	Gelmez Burakgazi, S., Yildirim, A., & Weeth Feinstein, N. (2016). Communicating Science to Impact Learning? A Phenomenological Inquiry into 4th and 5th Graders' Perceptions of Science Information.	Parents' and/or children's and/or teachers' digital competence, digital literacy and/or digital education were not examined.

The majority of the reviewed publications were researched at ISCED 0-1-2 levels. Regarding the target groups of research, parents were involved in all studies, but they were often only interviewed in order to be asked about their children's digital habits, so unfortunately some of the studies did not provide us with sufficient information on parents' digital attitudes and competences. The number of studies that included teachers was 5. As for methodology, quantitative methods were typically used, but mixed methods were also favoured (Table 2).

RESULTS

During the analysis of the 12 studies, it became clear that research approaches to parental involvement in digital education show great diversity. However, we managed to identify two distinctive approaches.

Parents as mediators in digital education

One characteristic subject of research that we were able to isolate from the studies was connected to the role of parents as mediators. The majority of the studies can be classified into this group, which we were able to break down into two further subgroups. However, we observed a mixed use of research approaches in several studies, which allowed them to be placed in multiple categories.

Research on the mediation of digital behaviour. One of the factors of digital education is the digital behaviour and literacy of parents, and therefore a significant number of the studies approaches the subject from this perspective.

Vodopivec's study focuses on the media literacy of Slovenian parents and teachers. She empirically investigated the competences of parents and teachers, but, in accordance with our research question, we concentrated on parents' data in the analysis of the study. Two thirds of the parents stated that they were satisfied with their own media literacy, yet their responses altogether revealed that they were not confident in their own knowledge and competences. However, more than half of the respondents had used television as a babysitting tool (Vodopivec, 2011).

Parents were also included in Nassar and Al Zein's study of the negative effects of television advertising on children in Middle Eastern countries. The results of the

study revealed the concerns of the parents, who confirmed by the end of the projective test that they should pay more attention to what commercials their children watched (Nassar & Al Zein, 2012).

Savina and colleagues discuss the effects of digital media consumption on young people's physical and mental health, attention and cognition from the viewpoint of school psychologists, parents and children. Their findings highlight that like children, adults are also living in the world of interactive media and are becoming increasingly immersed in technology, which can be particularly dangerous. To address this, the authors make recommendations for school psychologists on how to incorporate information on digital media into their work with parents, teachers and young people to promote healthy digital media use (Savina et al., 2017).

Research by Davis and colleagues confirms that teachers and parents play a key role in mediating the digital world for the benefit and protection of young children. However, parents must work together as partners to access quality resources and professional development (Davis et al., 2019).

Downes and colleagues also examined the role of parents as mediators. They found significant associations between parents and children's use of online technology. According to this study, parents' use of digital devices is an extremely powerful determinant of children's digital habits (Downes et al., 2020).

Tomczyk and Potyrała (2021) demonstrated that children's behaviour and safety in online spaces is closely related to parents' digital competence. Competency was measured using a test developed by Cyfrowo Bezpieczni. The sample of 514 parents revealed that parents' self-assessment of their knowledge of e-threats was directly related to the results of the competency test. However, the Dunning-Kruger effect was also detected, as parents who self-reported a remarkably high level of digital literacy did not score very well on the competency test.

Overall, however, it can be concluded that parents are extremely concerned about their children's online safety. The literature confirms the view that the primary agent of socialisation is the most influential on children's digital behaviour, and therefore it is parents who need to set rules for their own digital activity (Tomczyk & Potyrała, 2021).

Table 2. *Characteristics of the studies included in the review*

Authors	Journal metrics (04/05/2022)	Level of education	Target group	Method	Year of publication	Country or region
Arrow and Finch	Q1	ISCED3	Parents/caregivers, children and teachers	quantitative	2013	New Zealand
Brito et al.	Q1	ISCED1	Parents/caregivers and children	qualitative	2018	Portugal
Davis et al.	Q1	ISCED0	Parents/caregivers and teachers	qualitative	2019	UK
Downes et al.	Q1	ISCED1, ISCED2	Parents/caregivers and children	mixed	2020	USA
Ebbeck et al.	N.B.	ISCED0	Parents/caregivers and children	quantitative	2016	Singapore
Grant	N.B.	ISCED2, ISCED3	Parents/caregivers and children	quantitative	2019	USA
Nassar and Al Zien	N.B.	ISCED0, ISCED1	Parents/caregivers, children and teachers	qualitative	2012	Middle East
Steinfeld	Q1	ISCED2, ISCED3	Parents/caregivers and children	mixed	2021	N.A.
Tomczyk and Potyrała	Q2	ISCED2	Parents/caregivers and children	quantitative	2021	Poland
Topaloğlu and Karahan	N.B.	ISCED1, IDCED2	Parents/caregivers, children and teachers	qualitative	2021	Turkey
Vodopivec	N.B.	ISCED0	Parents/caregivers and teachers	quantitative	2011	Slovenia
Yelland and Neal	Q1	ISCED1, ISCED2, ISCED3	Parents/caregivers and children	mixed	2013	Australia

Note: N.B.= Not ranked in quartiles in Scimago; ISCED: correspondence to the ISCED levels established in 2021-22

Steinfeld's study focuses on adolescent children's habits of Internet use in Israel, and the strategies parents apply to inform their children about Internet-related activities and the dangers of the behaviours they engage in. Her research shows that active mediation by parents promotes the self-regulation and autonomy of students' online activities, which results in increased time spent using the device. Conversely, over-regulation by authoritative parents has a negative impact on the time spent online, resulting in lower digital skills for these children, hindering the development of their problem-solving skills and autonomy. It can also be observed that the children of strict parents have insufficient self-regulation skills, which keeps adolescents exposed to online risks. The results suggest that restrictive parenting attitudes are the most effective in educating

adolescents to be aware of and consider online risks. However, despite restrictive parenting, it is not certain that children will always be cautious in the online environment, so it is crucial that they are aware of the risks they face. Active mediation is much more effective than prohibition and restriction, and the children of restrictive parents are more likely to find themselves in risky situations. This suggests that a balance of restrictive and active mediation will bring about the best parenting outcomes for the child (Steinfeld, 2021).

Opinions and evaluations of the digital world and devices. Parental digital attitudes are primarily shaped by parents' views on the digital world and devices, which is the focus of several studies in our review.

Ebbeck and colleagues (2016) studied the use of technology and parent/caregiver opinions on technology

use among Singaporean children under the age of seven. Their results revealed that the majority of parents/caregivers believed that touchscreen devices posed the biggest threat to children's intellectual and physical development. They were most concerned about the risk of addiction. Nevertheless, parents/caregivers also believed that touchscreen devices had the potential to help children in their intellectual development, for example through the use of various educational applications. Overall, Ebbeck and colleagues (2016) confirmed divergent parental views on digital devices.

Brito, Dias and Olivier (2018) seek to answer the question as to how smart devices (such as smart toys) are being handled by families with young children in Portugal (Brito et al., 2018). Their research was conducted by means of interviews with parents and their children aged 6-8 years. They studied families that were digitally literate and where both children and parents had access to such tools. Their results show that while smart toys are available in shops and familiar to children, they are not widespread in families. Children are enthusiastic and open to toys with human interaction capabilities, but their parents are not, and are therefore reluctant to buy such devices for their children. One reason for this is that parents fear that too much use of digital devices could have a detrimental effect on their children (addiction, socialisation problems). In addition, they believe they are too expensive, relative to the fact that children do not play with smart toys very much (Brito, Dias & Olivier, 2018).

Downes and colleagues (2020) investigate the beliefs of primary school children's parents about the use of technology, which has been made even more topical by the pandemic. Their work reaffirms the dichotomy of parental opinions about digital devices, namely that overall, the vast majority of parents support the use of technology in schools; however, they fear that their children will share some personal information with others through technology.

In their case study, Topaloglu and Karahan (2021) aimed to investigate the underlying causes, outcomes and effects of internet addiction. In the study, which was conducted in Turkey, parents received special attention, but teachers' and students' perceptions and digital literacy were also examined. The semi-structured interviews revealed that parents claimed to be aware of conscious internet use in order to protect their children from harmful online content and to benefit positively from the internet, but this study also concluded that parents had limited digital competences.

Sociodemographic factors in parenting

In education research, it is indispensable to examine parents' socioeconomic status as it has a proven impact on academic achievement and advancement. In digital education, we can also observe tendencies that can be identified based on the socio-economic status of parents.

Vodopivec (2011) laid special emphasis on the sociodemographic analysis of parents. Her analysis confirmed the assumption in the literature that parents with higher educational attainment feel more effective in digital education. She also found age differences between parents: having compared under-35 and over-35 groups, she concluded that those in the latter group were more likely to have concerns about their own digital competences (Vodopivec, 2011).

Arrow and Finch have observed that literacy development through traditional means (e.g., reading printed texts) is most common in families of lower socio-economic status, while families of higher socio-economic status show a trend towards reading texts around them (environmental print) (Arrow and Finch, 2013).

Yelland and Neal examined digital social inequalities in connection with a large-scale project (The Tech Packs Project) in which families in low socio-economic areas of Australia were provided with computers and internet access. The primary aim was to support disadvantaged families to participate in a range of digital activities. The authors collected data over the three-year project, which included pre- and post-project surveys with parents and students, interviews with programme managers and data collected from focus groups of parents. The intervention helped to improve students and parents' participation in digital activities, resulting in the development of digital competences (Yelland & Neal, 2013).

Grant's study attempts to apply the tool-will-skill model to find out how the frequency of teenagers' internet use is impacted by the components of the model. The study is significant for us because it also incorporates the importance of socioeconomic factors, finding that parents' socioeconomic status, including their income, predicts children's access to the internet and smart devices (Grant, 2019).

Downes and colleagues (2020) examined digital education with respect to both the socioeconomic status of parents and age. Further associations were found between parents' use of social media and children's beliefs about using technology at home. It was found that the children of the 20-39 age group tended to spend

the most time in front of the television, ranging from 1 hour to 13 hours a week. In addition, the comparison of parents by age regarding the measured variables revealed that it was typically people over 40 who used online technologies for leisure activities. Significantly more parents with tertiary and doctoral level education used technology to find information or read news.

The results presented by Tomczyk and Potyrala show that parents with a university degree living in large cities have the highest level of digital literacy. Their findings also revealed that it was parents with higher socioeconomic status who scored higher in the competency test. Those parents were more aware than parents with lower scores of the need to set limits to their children's use of digital media in terms of both time and devices (Tomczyk & Potyrala, 2021).

CONCLUSION

In our systematic literature review, we set out to examine studies that explore parental involvement in digital education. To this end, we searched the EBSCO research database. In our review and analysis of the studies, we were able to distinguish two distinctive research approaches. One approach focused on parents as mediators, while the other focused on the socio-economic status of parents and its relationship with children's digital competence.

The interpretation of parents as mediators, however, was not consistent, which allowed us to divide the studies into two further groups. In 9 out of the 12 papers, we identified some kind of fear on the part of parents. Concerns related to addiction, pornographic content and sexual harassment were frequently reported (Brito et al., 2018; Davis et al., 2019; Downes et al., 2020; Ebbeck et al., 2016; Nassar & Al Zien, 2012; Steinfeld, 2021; Tomczyk & Potyrala, 2021; Topaloğlu & Karahan, 2021; Vodopivec, 2011). More than half of the studies reviewed also reported a lack of parental knowledge about their children's activities with digital devices (Arrow & Finch, 2013; Downes et al. 2020; Ebbeck et al., 2016; Steinfeld, 2021; Topaloğlu & Karahan, 2021; Vodopivec, 2011; Yelland & Neal, 2013). Subsequently, we identified five studies in which both parental anxiety and knowledge deficit were observed and even correlated (Downes et al. 2020; Ebbeck et al, 2016; Steinfeld, 2021; Topaloğlu & Karahan, 2021; Vodopivec, 2011). At the same time, the studies also reported parents' positive perceptions of the impact of digital tools on skill development (Downes et al., 2020; Ebbeck et al., 2016). Finally, parents' need for help in

digital education by teachers was also mentioned in five studies (Downes et al. 2020; Ebbeck et al, 2016; Steinfeld, 2021; Tomczyk & Potyrala, 2021; Vodopivec, 2011). Another recurring research finding was that parents usually try to educate their children by setting time limits to the use of digital devices, which is indicative of a very narrow range of parenting techniques (Benedetto & Ingrassia, 2021).

Research on the socio-economic status of parents has confirmed what we already know from the literature. With regard to access to the internet and devices, children from families with higher educational attainment and income still have an advantage (Downes et al., 2020; Grant, 2019; Tomczyk & Potyrala, 2021). In addition, well-educated parents, due to their high-level digital competence, are more effective in digital parenting (Downes et al, 2020; Tomczyk & Potyrala, 2021; Vodopivec 2011). Being aware of the digital divide, we tried to consider parents' age in the analysis of the studies, but there were only two studies that analysed this factor in some depth. From their results, we can draw a conclusion that goes against the literature: a higher number of parents in the older age group reported concerns about their own digital competences, but it was the children of younger parents who spent more time using digital devices (Downes et al., 2020; Vodopivec 2011).

In summary, during the categorization of the studies, we found that their results were consistent and did not contain any sharp contrasts. We confirmed the fact that parental attitudes and behaviour have a strong impact on children's use of digital devices, which supports the idea that, compared to setting direct rules, parents' digital habits have a much greater educational power, as children primarily adopt their parents' habits (Bandura, 1977). A recurrent finding was that parents are uncertain about their children's digital education, which may cause a discrepancy in their parenting practices. Moreover, parents' beliefs about digital devices were found to be just as instrumental. Parents' opinions about digital devices are not clear-cut, but rather ambivalent, as both positive and negative opinions are present. Finally, our results on the socio-economic status of parents largely mirror previous research, but the results on generational status do not seem as sharp as initial research suggested. It is to be noted that this area is very under-researched with little international literature on the subject. Our results showed that parental involvement in digital education is still in its infancy. Epstein's (2001) types of parental involvement were often missing from the studies reviewed, as evidenced

by the meagreness of parental tools and methods, which cannot necessarily be compensated for by higher socio-economic status. When the subject of a study was a school-based initiative, it mostly focused on improving parents' digital literacy, a category that falls into communication and home learning in Epstein's typology. Against this background, the key message of our paper is to raise awareness among schools and teachers of the need for parental involvement as a possible solution to one of the most pressing educational challenges of our time.

Limitations

As a limitation, it is important to point out that some of the relevant studies on this topic were not found during the search process, which highlights one of the drawbacks of systematic literature reviews.

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