Literature Review: The impact of digital money on children and young people's financial education

Dr Marcel Lukas and Julia Lukas

July 2024

Contents

Acknowledgement

We would like to thank the MaPS CYP team for their helpful input, especially Sarah Brenig-Croft, Lisa Davis, Ipek Noel, Peter Bailey and Helen Pitman. We also thank our expert participants, Adele Atkinson, Louise Hill, Stewart Perry and Leon Ward for their time and insights.

1. 1. Executive summary

This literature review, commissioned by the Money and Pensions Service (MaPS), explores the impact of digital money on the financial education of children and young people in the United Kingdom. It aims to understand the current landscape of financial literacy among the younger generation in the context of increasing digitisation of money.

To support MaPS' statutory duty, MaPS undertakes research and tests interventions with a view to improving the financial capabilities of children and young people. This review aims to add to this evidence base and will be used to inform future policy and research decisions at MaPS, as well as to help those who design, deliver or otherwise influence the financial education of children and young people, whether at home, in educational settings or in the wider community.

Findings

The review explored the literature on how children can learn about money in a digital age, what interventions exist that seek to teach children about digital money, and identified gaps in knowledge and how future research might address them.

What literature exists on how children learn about money in a digital age?

The review reveals that the digitisation of financial transactions has profound implications for children's financial education. While it offers benefits such as greater financial inclusion, new earning opportunities, and the potential for enhanced financial management through digital tools, it also presents significant risks. These include exposure to online fraud, cyber security threats, and the normalisation of financial risk-taking through the gamification of digital financial platforms. The rise of 'kidpreneurship', where children monetise their digital skills and online presence, highlights the need for financial education that addresses these emerging trends.

The way children learn about money has evolved in the digital age, with digital platforms and peers playing an increasingly influential role alongside traditional family financial socialisation. Children's understanding of money and value is being shaped by their interactions with digital financial systems, necessitating a re-evaluation of financial education approaches.

The review also highlights the importance of tailoring financial education to the needs of specific groups of children and young people, recognizing the diverse experiences and challenges they face in the digital financial landscape.

What interventions teach children about digital money or influence their online financial behaviour?

Several interventions aimed at enhancing children's digital financial literacy were identified, ranging from classroom-based programmes to digital campaigns and applications. However, evidence of their long-term effectiveness in changing financial behaviours is limited, underscoring the need for more rigorous evaluation and a greater focus on practical, real-world skills.

Expert interviews complemented the literature review, providing valuable insights into the challenges and opportunities in delivering effective financial education in a digital age. The expert interviews provided examples of successful programmes and highlighted the need for collaboration between educators, financial institutions, and policymakers to develop effective interventions.

What gaps in knowledge require further research?

The review reveals significant gaps in the current evidence base, highlighting the need for further research in several key areas:

1. There is a need for a common definition and measures of digital financial literacy, to facilitate the development of targeted interventions and the evaluation of their impact.
2. A deeper understanding of the fintech landscape for children and young people is required, including the benefits and risks associated with emerging

technologies such as digital currencies and blockchain.

3. More comprehensive research is needed on children and young people's online financial behaviours, knowledge, and attitudes, to inform the design of effective digital financial education interventions.

To address these gaps, future research should adopt a multidisciplinary approach, combining quantitative and qualitative methodologies to provide a holistic understanding of the complex dynamics of digital financial literacy. This could include in-depth studies on the fintech landscape, analysis of children's online financial behaviours, and investigations into how digital interactions and parental influence shape their financial knowledge and attitudes.

Conclusion

This literature review underscores the urgent need for financial education at home, in school and in the community to adapt to the realities of the digital age, equipping children and young people with the skills and knowledge necessary to navigate an increasingly complex digital financial landscape.

MaPS has a crucial role to play in driving this agenda forward, by commissioning and disseminating research, informing policy, and supporting the development and evaluation of effective digital financial education interventions. By working in partnership with educators, policymakers, and the financial services industry, MaPS will encourage more opportunities for children and young people in the UK to develop the financial capabilities they need to thrive in the digital age.

2. 2. Introduction

a. 2.1 Background

MaPS has a statutory duty to develop and coordinate a national strategy to improve the provision of financial education for children and young people.

In an era where digital transactions are becoming the norm, MaPS is committed to developing and coordinating a national strategy aimed at enhancing financial education for children and young people across the UK. With the ambitious goal set by the UK Strategy for Financial Wellbeing for 2 million more children and young people receiving a meaningful financial education by 2030, it is essential to understand the current landscape of financial literacy among the younger generation, particularly in the context of the increasing digitisation of money. This literature review aims to explore the impact of digital financial transactions on children and young people's learning experiences, attitudes towards money, and the broader implications for effective financial education. By scrutinising the existing body of research and evaluating the effectiveness of various interventions, this study seeks to highlight the pathways through which digital money is reshaping financial education practices and outcomes.

b. 2.2 Research context and objectives

The advent of digital money, accelerated by the COVID-19 pandemic, has fundamentally altered the manner in which financial transactions are conducted, from everyday purchases to interactions with banking institutions. This shift towards digital payments, coupled with the increasing role of online banking and e-commerce in the financial lives of the younger population, underscores the urgent need for a re-evaluation of traditional financial education paradigms. Through an examination of academic and grey literature from both the UK and international contexts, this review will address critical questions regarding the impact of digital money on learning about financial concepts, the effectiveness of current financial education interventions in this new digital age, and the future directions for research and policy-making in financial education.

The review explores the questions below. After initial consultation with MaPS, these were slightly refined to focus specifically on how children learn about digital money and digital financial transactions.

3. What research literature exists on how children can learn about money, specifically in a digital age? How many studies are there? How wide-ranging are the studies?
    a. What are the implications for children's financial education of the increased digitisation of money and financial transactions?
    b. Is there evidence to suggest that the way in which children learn about money has changed since digital money has become a more important component of our spending and saving habits?
    c. What can we learn from wider research about how children learn, which might be transferrable to learning about money concepts?
4. What interventions exist that seek to teach children about digital money or seek to influence children's online financial behaviour such as spending or saving (either as its main focus or as one of the elements of a wider intervention)? Is there any evidence on their effectiveness?
5. What further primary research might need to be conducted in order to fill the gaps in knowledge about the above?

a. 2.3 Methods

The search for relevant literature was conducted across several databases and sources to capture a broad spectrum of research, including peer-reviewed journals, reports by think tanks, publications from financial services institutions, and materials from charities and public sector bodies involved in financial education. The databases included, but were not limited to, JSTOR, PubMed, Scopus, Web of Science, and Google Scholar, alongside specific searches on the websites of relevant organisations.

Initial screening of the literature highlighted a significant gap of evidence that was highly relevant to the research questions, particularly in the academic evidence base. Search terms were broadened in agreement with MaPS to include wider relevant concepts such as online gaming and gambling, online shopping, financial and economic socialisation in relation to digital contexts. A full list of search terms can be found in the Appendix. Where possible, evidence was limited to children and young people aged 17 and under, however due to the limited evidence available the review was expanded to include studies with populations of young people up to 25 years.

To ensure a thorough evaluation of research and interventions related to digital financial literacy among children and young people, a detailed set of evaluation criteria was established. These criteria focused on assessing the relevance, research orientation, methodological approach, the specific age group of participants, and whether the study or intervention addressed the digitalisation of money and financial transactions.

Relevance was rated on a scale from 1 (not relevant), 2 (marginally relevant) to 3 (highly relevant) in relation to the research objectives, with further analysis based on the depth of content review. For studies rated 2 and 3, the research orientation was categorized into empirical studies, commentaries, policy reports, frameworks, and systematic reviews, each with distinct methodological approaches—qualitative, quantitative, or mixed methods. The age group criterion ensured the focus remained on the defined target demographic, while the examination of content related to digitalisation aimed to pinpoint interventions directly tackling issues like online payments, digital currencies, and cybersecurity. This structured approach facilitated a nuanced analysis of the evidence, highlighting interventions that significantly contribute to the understanding and enhancement of digital financial literacy and behaviours among young individuals.

After initial screening, 204 pieces of evidence were included in the long list, focusing on those published since 2013. While most studies had a focus on the UK, the review also includes international evidence. Based on initial screening of abstracts, 21 pieces of evidence were rated as highly relevant, 71 pieces of evidence were rated as marginally relevant, and 112 pieces of evidence were rated as not relevant. Due to the limited amount of highly relevant literature, pieces of evidence rated highly, or marginally relevant were screened in detail to highlight implications that were relevant for the present research context.

In the next phase of our project, we engaged in four expert interviews to complement and deepen the insights gained from the literature review. The selection process aimed to ensure a diverse range of perspectives and expertise relevant to our research focus. These interviews were designed to provide in-depth, practical perspectives to augment our understanding of how children learned about money in the digital age.

The final stage of the methodology involved synthesizing the findings from the literature review and expert interviews to draw conclusions about the impact of digital money on financial education, highlighting key insights, gaps in the current knowledge base, and directions for future research and policy development in financial education.

Appendix 1 provides a more detailed account of the methodology, the review protocol, and a full list of concepts and definitions have been included in the Appendix.

b. 2.4 Significance and Expected Outcomes

This literature review aims to make a contribution to the field of financial education by highlighting the challenges and opportunities presented by the digitalisation of money. By synthesizing insights from a wide range of sources, including academic research, think tanks, financial services institutions, and financial education charities, the review offers a comprehensive overview of the state of financial education amidst the digital transformation. The findings of this review will not only inform MaPS' policy and research decisions but also serve as a valuable resource for educators, policymakers, and financial service providers aiming to foster financial literacy and wellbeing among children and young people in the digital era.

6. 3. Main findings

a. 3.1 Children and young peoples’ learning about money in a digital age

i. 3.1.1 Overview of literature

The literature review aimed to explore the existing research on how children and young people learn about money in the digital age. While the review revealed valuable insights, it also highlighted the limited nature of the current literature on this specific topic.

Based on the initial screening of abstracts, 21 pieces of evidence were rated as highly relevant to the research questions, while 71 pieces were considered marginally relevant. Among the evidence rated 2 (marginally relevant) and 3 (highly relevant), there was a diverse range of research orientations. The breakdown included 41 pieces of empirical evidence, 21 systematic reviews, 19 policy reports, 2 policy frameworks, 7 intervention evaluation reports, and 2 commentaries. This distribution suggests a mix of original research, syntheses of existing literature, and policy-oriented documents.

In terms of interventions, 50 were screened for their relevance to teaching children about digital money or influencing their online financial behaviour. Of these, 8 interventions were rated as highly relevant, containing content specifically focused on the digitalization of money and financial transactions. An additional 8 interventions were rated as marginally relevant, with 4 of them including some content related to digital money or financial transactions.

It is important to note that the age ranges of children and young people referenced in the literature were not standardized and varied across studies. Where available, the specific age ranges were mentioned in the insights throughout the report and documented in the review protocol for each study. This lack of consistency in age categorization posed a challenge in summarizing the target populations of the reviewed literature.

Overall, while the review process yielded valuable insights, it also revealed the scarcity of highly relevant literature on the topic of children's learning about money in the digital age. The majority of the evidence was only marginally relevant, and the age ranges studied were inconsistent across the literature. These findings highlight the need for more targeted research in this area to better understand the implications of digitalization on children's financial education and to inform the development of effective interventions.

ii. 3.1.2 Implications for children’s financial education

The first research sub-question we address is:

“What are the implications for children's financial education of the increased digitisation of money and financial transactions?”

Given that this is the main focus of this report, this chapter is separated into several sections, we first introduce evidence for increased digitisation of financial transactions, then discuss benefits, opportunities and risks. Based on these insights, we summarise implications for digital financial education.

Evidence for increased digitisation

The advent of FinTech and digital financial services has marked a significant transformation within the financial sector, driven by digital innovations such as big data, artificial intelligence (AI), and blockchain technology. These advancements aim to enhance financial services and customer experience, incorporating strategies like digital nudging—persuasive algorithms and software design intended to influence user attitudes and behaviours towards specific goals, including increased purchases. Koskelainen (2022) provides a systematic review of the literature, highlighting the emergence of

FinTech as a core aspect of modern financial interactions.

Concurrently, the landscape of financial transactions among children and young people in the UK is undergoing a notable shift towards digitalization, as evidenced by the 2022 MaPS UK Children and Young People Financial Wellbeing Survey. This survey reveals several key findings:

- The shift to receiving pocket money as a digital payment (e.g., bank transfer) rather than cash starts quite young. Whilst 68% of 7-year-olds receive all of their pocket money in cash, less than half (46%) of 11-year-olds do.
- Overall, only 57% of children aged 7-17 now always or mostly use cash. Amongst older children (aged 16-17), only 27% do so.
- A high proportion of children with a bank account are now reviewing their accounts online, particularly amongst those aged 16 to 17. In 2016, only 31% of children with a bank account were reviewing their bank accounts online; now, 57% are doing so.
- The shift towards the use of digital payments is also seen in the proportion of children who are paying for goods and services online, such as apps, games, or music. Overall, 71% of children aged 7 to 17 are paying for goods and services online themselves, rising to 91% of 16- to 17-year-olds. This represents a large increase since 2016. Of these children who have bought online, 67% have done so at least rarely without adult supervision, and 31% have done so most of the time.

Remarkably, when asked, "If you needed advice about money, where would you go or who would you ask?" 7% of children mentioned online sources or social media, with 4% specifically referring to online/social media created by experts (e.g., Money Savings Expert, Citizens Advice) and 3% citing online/social media created by individuals (e.g., influencers on YouTube, TikTok, Instagram). This indicates the growing influence of digital platforms on the financial information-seeking behaviours of the younger generation.

This trend is further illustrated by spending patterns within popular online games, as reported by GoHenry (2022), a financial technology company that provides prepaid debit cards and financial education apps for children aged 6-18 in the UK and US. According to their data, which is based on transactions from 587,590 UK GoHenry members aged 6-18, children spent £2.1 million on Roblox, £931,000 on Fortnite, and £3,160 on Minecraft. This data reveals not only significant engagement with virtual currencies across different gaming platforms but also varying trends in spending behaviours, including a notable decrease in average spend on Fortnite by 23% from the previous year, while spending on Minecraft's Minecoins increased by 31%. It should be noted that these findings are specific to GoHenry users and may not be representative of the entire UK population, as the demographic profile of GoHenry users may differ from the national average.

Moreover, a survey on UK children's wellbeing in a digital world by Internet Matters (2024) highlights an increase in children's digital consumption and time spent online, noting that children easily spend money online without realizing the implications, underscoring concerns about screen time balance and the role of parental guidance. Additionally, the Child Financial Harms Consortium (Parentzone, 2023) published a report revealing that nearly all young people aged 13-18 in the UK engage in online economic activities, with 96% making purchases and 61% using their own debit cards for transactions, suggesting a significant degree of financial autonomy and digital engagement among these young individuals. The report also addresses issues related to accidental purchases, scams, and the normalization of lawbreaking among young digital consumers.

Ofcom's report on children's media use and attitudes (2023) indicates that 89% of children aged 3-17 in the UK played video games, with the majority motivated by the social connections afforded by these platforms. Barclays (2022) further adds that around 22% of children now receive their pocket money via bank transfers instead of cash, demonstrating a shift towards digital means of money management.

While the focus on digital financial services has predominantly analysed the drivers of adopting online financial services such as mobile banking, with limited emphasis on children and young people (CYP) (Koskelainen, 2022), the Global Findex Database by the World Bank (Demirgüç-Kunt et al., 2022) underscores the growth of digital payments in developing economies, indicating a global trend towards digital financial transactions.

These findings collectively highlight the profound implications of digitalization on children and young people's financial education and behaviours. As digital financial management and transactions become increasingly prevalent, there is a pressing need to adapt financial education frameworks to ensure they effectively foster financial literacy and capability among the younger generation, equipping them to navigate the complexities of the digital financial landscape. The next section will explore the specific implications in more detail.

Benefits and opportunities

The digitisation of financial transactions and services has ushered in numerous benefits that are reshaping children's financial education and their interaction with money. This transformation, primarily facilitated by advancements in FinTech, is not only changing how transactions are conducted but also enhancing financial inclusivity, offering new avenues for earning, and broadening learning opportunities for the younger generation.

A significant benefit of digital financial services is their potential to overcome barriers to financial inclusion for youth. The OECD (2020) notes that digitalisation provides convenient, secure, and customized financial services that are particularly accessible to young people.

According to the study by Kass-Hanna et al. (2022), digital financial literacy (DFL) initiatives were found to have significant positive impacts on several key resilience-building financial behaviours among youth aged 15 and older in South Asia and Sub-Saharan Africa:

- Saving behaviours: A one standard deviation increase in the digital literacy index was associated with an 11.32 percentage point increase in the likelihood of currently saving, an 8.17 percentage point increase in formal saving with a bank, and a 5.59 percentage point increase in informal saving.
- Emergency fund behaviours: Digital literacy was positively associated with the ability to come up with emergency funds and the availability of an emergency fund to cover unplanned expenses.

Interestingly, the study found that the impacts of digital literacy on these behaviours were often larger than those of traditional financial literacy. This underscores the critical role digital platforms and digital literacy can play in fostering healthy financial habits and inclusion among youth. The findings were generally consistent across the countries studied, although some regional variations were noted between South Asia and Sub-Saharan Africa.

Moreover, the ability for children to earn money online opens up opportunities that were previously unavailable. In 2022, GoHenry highlighted that 18% of UK GoHenry member children were earning money through online gaming, a statistic that underscores the diverse ways in which digital platforms can facilitate income generation. Beyond gaming, children and young people are finding creative avenues to monetize their skills and interests, from game reviews and tutoring to testing and leveraging their digital expertise in areas like website design and social media promotion for brands. These opportunities not only provide financial benefits but also valuable experiences in entrepreneurship and digital literacy.

The transition towards digital means of receiving money, such as bank transfers, presents additional learning opportunities for children. The Bank of England (2022) points out that using pocket money apps and the potential to earn interest on savings are experiences that extend beyond the traditional piggy bank savings method. These digital interactions can introduce children to concepts of banking, interest rates, and financial planning at an early age, laying the foundation for a deeper understanding of financial management.

Collectively, these benefits highlight the transformative impact of digital financial services on children's financial education. By facilitating greater inclusivity, providing new avenues for earning, and expanding learning opportunities, digitisation is playing a crucial role in preparing the younger generation to navigate the complexities of the digital financial landscape. As financial transactions and interactions continue to evolve, adapting financial education frameworks to incorporate these digital advancements will be key to fostering a financially literate and capable generation.

Risks

The transition to digital financial services, while offering enhanced access and opportunities for financial inclusion, also exposes youth to new forms of financial harm and exploitation (CFH/E), necessitating a nuanced understanding and strategic approaches to mitigate these risks. Emerging FinTech's present a promise for greater financial inclusion, with digital payments leading as the most widely used service, yet it may also widen the digital financial literacy gap, particularly in the context of risks like online fraud and cyber security (Morgan, 2021).

Parentzone and the Child Financial Harms Consortium's commissioned report (Parentzone, Public, 2020) serves as a cornerstone in mapping the current landscape of online CFH/E, identifying key areas of immediate challenge, and outlining long-term initiatives to address these issues. Among the immediate opportunities highlighted are addressing the limited parental understanding of online risks, the need for access to financial and digital literacy resources tailored to CFH/E, and regulatory grey areas that encompass unregulated but risky online engagements. The report underscores the evolving scale of AI-generated CFH/E, such as automated online fraud, pointing to the necessity for future-proofing policies that strategically align efforts without stifling innovation.

Another evidence review on cyber criminality conducted by CC-DRIVER involving surveys with 7,974 children across Europe, including the UK (Davidson et al., 2022), reveals concerning statistics: one in five children has engaged with illicit gambling platforms, one in eight in money muling activities, and one in eleven has been involved in cyberfraud, identity theft, and phishing.

Moreover, UK Finance (2023) found that nearly half of young adults aged 18-24 had been approached by scammers impersonating others, with a significant proportion of those targeted sharing personal details or transferring funds despite their confidence in scam recognition abilities.

In response to the rising trend of young adults becoming money mules, Cifas (2017) and Cifas and UK Finance (2023) launched the "Don't Be Fooled" campaign, offering educational resources to highlight the legal and financial dangers associated with money muling. This initiative emphasizes the critical role of awareness and education in preventing criminal exploitation of young people, particularly through social media channels.

Another risk is that of increased impulse buying behaviour among Generation Y and Z[1] through the influence of perceived interactivity and visual appeal of E-wallets (Lee et al., 2023). A study examining young adults' impulse buying behaviour in an online environment (Nyrhinen et al., 2024) also suggests that low self-control fosters positive attitudes towards targeted advertisements and impulsiveness within social networks, further enabling impulsive purchases.

The gamblification of gaming (Delfabbro & King, 2023) presents another layer of risk, blending

[1] Generation Y (also known as Millennials) refers to individuals born between 1981 and 1996 (aged 27-42 in 2023), Generation Z refers to individuals born between 1997 and 2012 (aged 11-26 in 2023) according to the Pew Research Center's definition.

gaming, gambling, and speculative investment into activities that potentially normalize financial risk-taking among youth. The UK Gambling Commission (2023) finds that of 11 to 17 year olds found that 0.7 percent were problem gamblers, 1.5 percent at-risk gamblers, and 23 percent non-problem gamblers. While 74 percent did not actively gamble in the past year, this still indicates a notable prevalence of gambling issues among British youth. Several studies further highlight a stable prevalence of gambling among children, with a notable increase in online gambling activities and a subset of adolescents developing gambling disorders, influenced by various factors including low self-esteem and reduced parental supervision (Emond & Griffith, 2020). Additionally, research suggests a strong link between purchasing loot boxes in video games and increased gambling behaviours and problem gambling among young adults (Rockloff et al., 2021; Kristiansen & Severin, 2020; Wardle & Zendle, 2021).

The findings from these studies not only show the compelling nature of digital transactions in gaming, such as loot boxes that encourage impulsive spending, but also highlight the inadequacy of current parental controls and the complexity of managing digital purchases (Ash et al., 2022; Mills et al., 2024). These studies call for broader regulatory measures, the establishment of an independent gaming regulator, and enhanced financial literacy among children to mitigate the risks associated with the digitization of money, especially within gaming contexts.

There is growing recognition in the literature of the crucial role parents play in mediating their children's interactions with digital platforms. Research indicates that children's smartphone use and online behaviours are significantly influenced by parental practices and the home environment (Terras & Ramsay, 2016). However, despite increased awareness of their influence, parents often struggle to translate this knowledge into effective supervision strategies. The review highlights a gap between parents' concerns about their child's technology use and their own problematic digital behaviours and excessive phone use at home. This discrepancy underscores the need for greater efforts to enhance parental awareness of their impact on internet safety and to support the adoption of sound digital literacy practices that provide a positive model for children.

However, the challenge of overseeing children's myriad online and financial accounts is increased by many parents' unfamiliarity with digital platforms. This often leads to the removal of safety measures, despite concerns over in-game purchases and other online financial transactions. Parents find themselves in a delicate balancing act, weighing the need for protection against the benefits of social engagement that gaming and other digital platforms offer (Ash et al., 2022).

Furthermore, Ofcom's report on children's media usage and parental oversight (2022) reveals a nuanced picture of parental supervision across different age groups. Direct supervision of children’s online activity notably decreases as children grow older, with 65% of parents supervising their child by sitting beside them at ages 4-5, compared to only 45% at ages 5-7. This trend suggests a gradual loosening of oversight, potentially as a response to the growing independence of children and their increasing proficiency with digital technologies. However, it also highlights the critical window for instilling safe online habits and financial literacy in early childhood when parental influence is most direct and impactful.

The evolving dynamics of digital engagement present both opportunities and challenges for children's online safety and financial behaviour. As such, there is a pressing need for targeted strategies to enhance parental awareness and capabilities in supervising their children's digital lives. This includes not only the adoption of good digital literacy practices but also an understanding of the nuanced ways in which digital platforms can impact children's financial habits and overall wellbeing.

Implications for digital financial education

These synthesized findings show the various risks associated with the digitization of financial transactions and the urgent need for strategic, aligned efforts to address financial education in a digital context. The synthesis of recent academic findings and policy discussions below highlights the evolving field of digital financial literacy (DFL), underscoring its significance in contemporary financial education.

A bibliometric analysis spanning the literature on financial technology from 2010 to 2023 reveals that financial inclusion, fintech, mobile money, and financial literacy have emerged as key research themes. This analysis, conducted by Afjal (2023), underscores the impact of technology on financial education, with digital finance and mobile banking identified as pivotal areas underscoring the role of technology in this sector. Similarly, Goyal & Kumar (2020) identify digital financial literacy as a new area for research, further emphasizing the need to integrate digital finance into educational programmes to adequately prepare young individuals for modern financial environments.

The concept of digital financial literacy is still nascent in academic discourse, with researchers like Zaimovic et al. (2023) highlighting the importance of this area yet noting a gap in research specifically addressing children and young people's DFL. Lyons & Kass-Hanna (2021) advocate for the integration of digital literacy (DL) into digital financial literacy (DFL), proposing methodological approaches to assess these concepts and their impact on financial outcomes.

Although there is a lack of academic research in this space, policy makers have taken initial steps to address this issue as outlined in the following section.

In response to the risks associated with increased digitization, policymakers have recognized the need for enhanced digital financial education. Following consultations with the G20, the OECD working group on digital financial literacy developed guidance for policymakers to design and implement digital financial literacy initiatives. These initiatives emphasize data collection, stakeholder coordination, the development of core competency frameworks, effective delivery of financial education, and the evaluation of these programmes to improve the digital financial skills of consumers and entrepreneurs (OECD, 2018).

The OECD's PISA evaluation in 2021 and subsequent reports have further highlighted the fundamental shift in literacy due to digital technologies, pointing to the necessity of critical reading and digital skills. Recent initiatives, such as the "Learning in a Digital World" framework launched by the OECD in 2023 and the development of a "Financial Competence Framework for Children and Youth in the European Union" (OECD, 2023), aim to assess and enhance students' capacity to engage with computational tools for knowledge building and problem-solving. This is the most comprehensive framework addressing digital financial literacy topics (integrated with overall financial capability) for children and young people, covering a range of topics from digital payment methods to online data protection and cyber risks across different age groups. However, several risks identified through the literature review remain to be included, as detailed in the gap analysis section.

These findings underscore the pressing need for strategic, aligned efforts to address the implications of digital financial transactions for financial education. By integrating digital financial literacy into educational programmes and policy initiatives, there is a potential to equip young individuals with the necessary skills and knowledge to navigate the complexities of the digital financial world, ensuring financial inclusion and safeguarding against the risks of the digital age.

iii. 3.1.3 Changes in CYP learning about money and financial socialisation

The second sub-question this report addresses is:

"Is there evidence to suggest that the way in which children learn about money has changed since digital money has become

a more important component of our spending and saving habits?”

To answer this question, we will discuss in detail how financial socialisation is playing a key role in the way CYP learn about money and how this is changing in a digital space. This section will cover five key areas: 1) financial socialisation, 2) knowledge and attitudes, 3) spending behaviour, 4) earning behaviour, and 5) needs of specific groups.

As the fabric of financial transactions evolves with the increasing importance of digital money, the mechanisms through which children learn about money are also undergoing a transformation. This section examines the changes in children and young people's (CYP) learning about money in the context of digitalisation, drawing on recent research and emerging trends.

MaPS Research (Clarke & Ghezelayagh, 2018) on CYP financial capability provides a foundational understanding by categorising financial capability into behaviours such as money management and saving, alongside enablers and inhibitors including ability, connection, and mindset. This framework underscores the critical roles of mindset and parental influence in shaping financial behaviours, with discussions between parents and children about online advertising being notably relevant in the digital age. However, demographic factors, while having a lesser direct impact, are still pertinent in identifying support needs.

A review of the financial socialisation evidence base serves as another basis for this section of the review (see LeBaron & Kelley, 2020, for a review). Financial socialization can be defined as the process by which individuals develop the necessary values, attitudes, norms, knowledge, and behaviours for financial health and personal wellbeing. This area of study has significantly grown over the past decade, highlighting the pivotal role of families, particularly parents, in shaping financial behaviours from an early age.

Central to this field is the theory by Gudmunson and Danes (2011), which states that parental influence on children's financial knowledge and practices has a lasting impact on their financial wellbeing throughout their lives. Emphasizing the critical period of childhood and adolescence, this theory suggests that financial education and behaviours instilled before the age of 18 form a foundation for later financial outcomes, positioning the family as a key agent in financial socialization.

This section highlights the influence of digitalisation on 1) family financial socialisation and consumer socialisation, 2) other socialisation agents such as peers or online media, 3) financial socialisation outcomes in relation to attitudes and knowledge, spending and earning behaviours and 4) needs of specific groups.

In relation to financial socialisation behaviour outcomes, it is worth noting that there is limited evidence on the spending and earning money online, with no evidence available on other behaviours such as day-to-day money management and saving.

Financial socialisation and consumer socialisation

Despite the foundational role of family in financial socialisation, a systematic review by LeBaron et al. (2021) points to a gap in research concerning digital aspects of financial socialisation. Similarly, Sigirci et al. (2022) highlight a significant gap in understanding how advancements in digital technology have altered children's consumer socialization practices. Dastane & Haba (2023) note an increase in research on digital natives, primarily focused on education and technology, yet a critical gap remains in understanding their consumer behaviour and entrepreneurial aspirations within marketing and management sectors. By broadening our research scope, several pieces of evidence were included and highlighted below to shed light on this emerging field.

Studies such as Thaichon (2017) indicate that children aged 8-11 and 12-15 develop distinct skills and knowledge related to financial transactions, security, and privacy through online shopping experiences. These experiences are shaped by parental guidance, social networks, peer influence, and the gap in Internet knowledge between children and their parents, highlighting the emergence of reverse socialization where children's superior knowledge of the Internet influences family purchases.

Further research, such as that by Williams & Willick (2023) and Ayadi & Muratore (2020), demonstrates the evolving role of children as influencers in the e-commerce landscape. This includes co-shopping experiences online where parents employ strategies such as promising, negotiating, and educating to shape their children's influence on e-commerce purchases, and children's proactive influence on their parents' online grocery shopping, enhancing their understanding of shopping lists, prices, discounts, and brands, as well as practical skills like using digital devices and entering credit card information.

These findings point towards a significant shift towards digital financial socialisation, underscoring the need to broaden our understanding of how advancements in digital technology have altered traditional consumer socialisation practices. As financial transactions increasingly move online, it is imperative to address these gaps in research and education, ensuring that children and young people are equipped with the necessary skills and knowledge to navigate the complexities of a digital financial world.

Other socialisation agents

Emerging evidence suggests the growing importance of other socialization agents beyond the family, such as peers, media, workplaces, school-based financial education, and financial literacy programmes and workshops, particularly through the digitalisation of money and financial transactions. This broadening of influence sources aligns with MaPS's 2023 findings, which showed that when children aged 7-17 were asked "If you needed advice about money, where would you go or who would you ask?", 7% mentioned online sources or social media. Specifically, 4% said they would go to "Online/social media created by experts, for example, Money Saving Expert, Citizens Advice," and 3% said they would consult "Online/social media created by individuals, for example, influencers on YouTube, TikTok, Instagram." This indicates the rising influence of digital sources and 'fin-fluencers' as potential sources of financial advice for children.. Despite the uncertainty surrounding the specific impact of 'fin-fluencers', the pervasive influence of social media influencers on young people's behaviours is well-documented (De Veirman et al., 2019).

Moreover, research by Wohn (2014) on social factors and online purchasing behaviours reveals a correlation between the trading of virtual items, a greater number of friends, and an increased likelihood of spending real money. This suggests a nuanced interplay between social interactions and financial decisions in digital spaces.

The Ofcom report on children's media usage (2023) further shows how children's consumption of information, including their understanding and attitudes towards money, has shifted towards digital platforms like social media sites. The report underscores a critical gap in children's ability to discern real from fake content online, highlighting a discrepancy between their confidence and actual ability.

A review commissioned by MaPS (Graham & Brady, 2021) on young people's use of online information and advice emphasizes the popularity of online sources for seeking advice while acknowledging the challenges in finding reliable and trustworthy information. Despite young people's assumed digital savviness, significant gaps in their financial and digital skills persist.

These findings collectively illustrate the evolving landscape of CYP learning about money, emphasizing the need for accessible, comprehensive, and independent advice across various platforms, including digital. As digital financial transactions become increasingly integral to our spending and saving habits, involving young people in designing effective services and enhancing their financial and digital literacy becomes imperative. This approach not only addresses the complex needs of today's youth but also equips them with the necessary skills to navigate the digital financial world effectively.

Knowledge and attitudes

As the mechanics of financial socialisation change through the digitisation of money and financial transactions, so do the outcomes. While the evidence is limited, this section provides an overview about studies that analyse changes in children and young people's financial attitudes, knowledge and behaviours.

Research by Castiglioni et al. (2023) in Italy on Generation Z's relationship with money illustrates a significant departure from previous generations' attitudes towards cash. This cohort perceives virtual money as more tangible and effective for financial management, citing a greater sense of control and self-regulation with digital transactions over physical cash, which they view as outdated. This generation's comfort with technology may suggest their preference for digital payment methods, contrasting sharply with Baby Boomers' potentially nostalgic attachment to cash as "real money."

Further insights from a co-design study by Yip et al. (2023) underscore the integral role of digital platforms and tools in shaping children's perceptions of money. Children are developing varied mental models of money influenced by modern financial mediums like credit cards, digital currencies, and cryptocurrencies. This shift highlights the need to address potential confusions among children regarding the nature and value of money in an increasingly digital financial landscape (Yip et al., 2023, Castiglioni et al., 2023 and He et al.,2024).

He et al. (2024) observe a growing familiarity and preference among Chinese children aged 5-6 for digital payment methods over traditional cash transactions. This change indicates a broader trend of digital financial socialisation starting from an early age, with positive attitudes towards digital payments being influenced by observed emotional responses in adults during mobile transactions. While this study provides valuable insights into the early digital financial socialization of children in China, further research is needed to determine whether similar trends are evident among children and young people in the UK.

However, concerns regarding security, privacy, and payment safety remain prevalent among both children and their parents. Studies highlight children's apprehensions about online transactions and the influence of parental attitudes towards digital payments on children's perceptions (Thaichon, 2017; He et al., 2024). Meanwhile, generational differences emerge in attitudes towards cashless payments, with Generation X viewing mobile payments as riskier than Generation Z, who show less concern over the risks of digital transactions (Agardi & Alt, 2022).

Attitudes towards fintech credit products among young consumers aged 18-35 are shaped by factors like affordability, flexibility, structural assurance, trust, and perceived usefulness, pointing towards a nuanced understanding of fintech services like Buy Now Pay Later (Behara & Dadra, 2023).

Spending Behaviours

Insights on the change in CYP's behaviours through digitalisation is very limited and therefore largely drawn from the online gaming and gambling evidence base. Research by Delfabbro & King (2023) analyses the increasing prevalence of loot box purchases, microtransactions, and the use of digital currencies such as NFTs and cryptocurrencies within gaming environments. They suggest that these practices are linked to problematic behaviours, normalizing spending and financial risk-taking among the youth, which could lead to greater financial harm and altered attitudes towards digital money and payments.

A comprehensive qualitative study by Ash et al. (2022) analyses how digital games' paid reward systems, including chance-based mechanisms and in-game currencies, affect children and young people's interactions, understandings, and experiences. These systems have been found to cause both financial and emotional harm, including compulsive spending and negative emotions like shame and frustration, exacerbated by a lack of understanding of the mechanics and probabilities involved. The difficulty in monitoring spending within digital games often leads to underestimation of total expenses, as in-game currency dissociates from real-world monetary value, fuelling impulsive purchasing decisions.

Moreover, their research suggests that digital items, perceived as highly desirable and collectible, encourage repeated purchases through loot boxes and chance-based mechanisms. Despite these mechanisms not meeting the legal definition of gambling, the value placed on these items by children and young people drives continuous engagement and purchases, revealing a discrepancy in how digital items' worth is recognized legally versus their actual value to young users.

The design of in-game paid reward systems, which emulate regulated gambling techniques and use visual and auditory cues to increase spending, poses ethical concerns and may lead to unfavourable decision-making conditions for vulnerable groups, such as children. These game design practices, coupled with the utilization of temporal rhythms in internet-connected digital games, manipulate purchasing decisions and integrate gaming into the daily routines of young players, affecting their engagement and financial decisions.

Parents find themselves in a dilemma, balancing the protection of their children from the potential harms of in-game spending with the recognition of gaming's social benefits. Despite observing problematic purchasing behaviours and the emotional impacts of loot boxes and similar mechanisms, parents must navigate these challenges.

Furthermore, engagement in massively multiplayer online role-playing games (MMORPGs) fosters virtual retail shopping behaviours through in-game purchases, influenced by gender-specific desires for achievement and social status (Hota & Derbaix, 2016). This highlights the complexity of digital gaming environments and the need for better financial literacy and control mechanisms within these spaces to safeguard young users from potential financial harms.

A study on cryptocurrency among 18-24 year olds (Alomari & Abdullah, 2023) suggests that awareness, performance expectancy, effort expectancy, security, and social influence plays a crucial role in? the behavioural intention to use cryptocurrencies. Financial literacy plays a crucial role, moderating the impact of perceived benefits, security concerns, and social influence on the intention to engage with cryptocurrencies.

Moreover, the findings from the Child Financial Harm Consortium (Parentzone, 2023) reveal a concerning trend towards engaging in activities that breach legal boundaries, with a significant proportion of young people aged 13-18 perceiving illegal online activities as common among their peers. This perception underscores a shift towards digital financial activities and raises concerns about the normalization of lawbreaking in online spaces, indicating a broader challenge in adapting traditional legal and educational frameworks to address the complexities of digital financial literacy and ethical online behaviour effectively.

Earning Behaviours

The concept of 'Kidpreneurship' is reshaping the landscape of financial socialization among children and young people (CYP), marking a significant shift towards the monetization of digital engagements. As detailed by Public, Parent Zone (2023), this trend encompasses children leveraging accessible technology to generate income, employing streaming gameplay, avatars, NFTs, and cryptocurrencies, alongside engaging in play-to-earn models and creating user-generated content. This burgeoning digital economy enables children to utilize their digital skills in areas such as website design, video gaming, and social media promotions, often securing sponsorships or payments from brands.

Reflecting on this emerging trend, and as mentioned previously in Section 3.1.2, GoHenry's

2024 report highlights that 18% of kids are already capitalizing on online gaming as a source of income. This report also illuminates the diverse ways in which children are exploring online opportunities to earn money, including game reviews, tutoring, testing, and leveraging their expertise in digital domains for financial gain.

Furthermore, the 2022 MaPS CYP Financial Wellbeing survey also highlights that 4% of children aged 7 to 17 are taking part in financial activities such as content creation on social media, taking online surveys, and selling items online, though it does not cover gaming or skin trading specifically. This gap in research points to an unexplored area of children's financial behaviours in the digital age, highlighting the necessity for further investigation into the breadth and impact of online earning opportunities for CYP.

This evolution towards digital entrepreneurship among children indicates a pivotal change in how they engage with money, underscoring the importance of incorporating this financial behaviour in financial capability and financial literacy concepts.

Needs of specific groups of children and young people

The financial socialization and education needs of children and young people (CYP) are not uniform, with certain groups facing unique challenges and risks in the context of digital financial interactions. While not an exhaustive list, the following groups have been identified as potentially having greater needs in terms of financial education.

An analysis by Griffith & Ghezelayagh (2018), commissioned by the Money and Pensions Service (MaPS), identifies specific groups of CYP who might be in greater need of financial education, though it did not specifically delve into digital inclusion or exclusion.

The rise of fintech products for CYP brings challenges, including exposure to financial misinformation on social media, encouragement to engage with crypto assets, and the potential creation of a disadvantageous digital footprint. Additionally, there are concerns about the accessibility of digital educational tools for children from less affluent backgrounds, as some fintech products designed for financial education come at a cost, potentially causing barriers to access (Bank of England, 2022).

As the use of social media among young children intensifies, those under seven are increasingly at risk of identity theft and subsequent fraud (Javelin, 2022). This risk points to the necessity of incorporating digital safety into financial education from an early age. Additionally, children from lower socioeconomic backgrounds are identified as particularly vulnerable, facing additional financial pressures and often possessing fewer financial skills, thereby becoming more susceptible to exploitation (Anders et al., 2023).

The literature on gambling and gamblification activities suggests that a specific subgroup of younger individuals, characterized by impulsivity or financial risk-seeking behaviours, may be more vulnerable to these practices. Delfabbro & King (2023) note an overlap between gaming and gambling populations, with those engaged in cryptocurrency transactions also more likely to participate in gambling activities. Furthermore, young adults purchasing loot boxes in video games are considered at high risk for developing gambling issues (Wardle & Zendle, 2021), indicating a need for targeted financial and digital literacy efforts.

Buenestado-Fernández et al. (2023) uncover obstacles to digital financial literacy among young Mexicans, including both voluntary exclusion, driven by distrust in digital finance and negative banking experiences, and involuntary exclusion, due to the complexity of financial services and limited access to digital resources. These barriers are especially pronounced among students from public institutions and upper secondary education, underscoring the importance of educational interventions tailored to address socio-economic disparities and improve the usability of financial services for younger audiences.

Research by MaPS on developing a financial literacy scale for children aged 4-6 (Jay et al., 2022) revealed difficulties with the concept of receiving change in transactions not involving cash, such as mobile payments. While older participants were somewhat more comfortable with online purchases, younger ones often misconceived these as free, indicating gaps in understanding digital transactions.

Furthermore, Baudat & Henchoz (2023) highlight the significance of tailoring financial education programmes to diverse groups of emerging adult consumers based on their level of engagement in digital economic practices. This approach is especially crucial for targeting occasional users with fewer digital skills from less privileged backgrounds, emphasizing the need for financial education that is responsive to the varied experiences and challenges faced by different groups of CYP in a digital age.

These insights collectively highlight the necessity of a nuanced approach to financial education, one that accounts for the specific needs and vulnerabilities of diverse groups of CYP in the face of increasing digitalization of financial activities. This could inform any future curricula developments to ensure they sufficiently reflect digital financial literacy. Tailoring educational interventions to address these unique challenges is crucial for fostering financial literacy and resilience among young people navigating the complexities of the digital financial landscape.

iv. 3.1.4 Research about learning of money concepts

The third sub-question this report answers is:

"What can we learn from wider research about how children learn, which might be transferrable to learning about money concepts?"

A systematic review by Drever et al. (2015) spans developmental psychology, consumer finance, and education to offer developmentally appropriate focuses for financial capability interventions across different age groups. This review underscores the importance of executive function development for pre-elementary students, financial socialization for elementary and middle school children, and financial skill-building for adolescents and young adults, providing a continuum for nurturing financial literacy and capabilities from an early age.

Explorations into the integration of technology within early childhood education (ECE) by Luo et al. (2023) and studies on Gen Z's learning preferences by Ameen et al. (2023) highlight the potential for enriched learning experiences through digitalization. These studies point towards a preference for interactive, tailored educational experiences that incorporate real-world issues, with a focus on sustainability and health, suggesting that digital technologies like AI and the metaverse can significantly enhance learning environments. Moreover, a systematic review by Torres et al. (2021) advocates for the design of interactive physical-digital play technologies that bolster self-monitoring, collaboration, decision-making, problem-solving, and physical activity in children aged 0 to 12, achieved through performance feedback, play interdependency, joint object accessibility, bounded choices, and the integration of problem-solving and physical activities into play.

Physical-digital play technologies aim to bridge the gap between digital and physical learning by facilitating the application of knowledge and skills acquired in one domain to the other. For example, providing information about a child's own performance during play can facilitate their self-monitoring. Making play interdependent between players or ensuring joint accessibility to play objects can promote collaboration. Offering specific choices of pathways towards set play goals can guide decision-making. Integrating problem-solving or physical activity as necessary actions to play or progress in the game can directly encourage the practice of these skills. The review emphasizes the importance of designing technologies that promote active engagement, social interaction, and the development of critical thinking and motor skills in young children.

There are various implications for CYP's learning about money concepts:

The OECD's development of the PISA 2025 "Learning in a Digital World assessment" further emphasizes the need to evaluate students' abilities to engage with digital tools, highlighting social constructivist learning, computational problem-solving, and self-regulated learning processes as key components. This approach underlines the importance of active learning facilitated by digital technologies and the integration of these competencies into assessment structures.

Kumpulainen et al. (2020)'s qualitative exploration into the digital practices of Finnish children highlights the multimodal and socioculturally embedded nature of their engagement with technology. This engagement, interwoven with daily routines and family dynamics, fosters both autonomous and collective learning experiences, though it reveals a gap in critical digital literacy. The study points to a significant role for parents and educators in bolstering critical engagement with digital content, emphasising the need for a balanced approach to digital literacy that nurtures creative, operational, and critical competencies from an early age.

The research by Gelman & Echelbarger (2019) demonstrates that from a young age, children possess an innate ability to perceive the value of objects based on non-visible qualities, such as category membership (essentialism) and individual history, rather than solely on visible features. This sensitivity extends across various domains, including natural kinds, artifacts, foods, and even ideas. However, their work focuses primarily on concrete objects and does not specifically address digital objects or money.

The authors suggest that this early-emerging conceptual framework may influence how objects attain psychological and monetary value for children. They also note that although these sensitivities emerge early, the scope and influence of hidden features, as well as the incorporation of additional factors (e.g., market forces), increase as children get older.

Based on their findings, we may infer the importance of introducing children to the conceptual underpinnings of digital money, as their innate sensitivity to non-visible qualities may facilitate their understanding of the intangible aspects of financial value in the digital realm. However, the specific age at which children can grasp the value of abstract concepts like digital money is not directly addressed in their work and would require further research. However, while Gelman & Echelbarger's (2019) work provides a foundation for understanding children's perception of object value based on non-visible qualities, the link to digital money and the specific age at which children can understand abstract financial concepts is an extrapolation that would benefit from additional research.

Furthermore, Jerome et al. (2023) demonstrates that children aged 3 to 5 can comprehend the principle of saving abstract tokens for future gains, reflecting the essential notion of digital currencies and online transactions. This finding suggests the capacity of young minds to understand abstract financial concepts, advocating for the inclusion of digital financial literacy in early education.

However, it is essential to consider perspectives that emphasize the importance of concrete, experiential learning at this developmental stage. Studies such as Ponari et al. (2018a) and Ponari et al. (2018b) highlight that young children typically acquire abstract concepts more effectively when they are emotionally embedded in familiar, tangible experiences. These insights challenge the readiness of very young children to grasp purely abstract financial concepts without tangible or emotional anchors, suggesting a gradual integration of abstract and concrete learning experiences in early education.

There is little research analysing CYP attitudes and preferences towards digital money concepts. The few available studies suggest a preference for modern, technology-enhanced educational approaches. Buenestado-Fernández et al. (2023) and an exploratory study by Zhang (2021) indicate that young people favour training modalities that incorporate digital resources, underscoring the potential of using emerging technologies and digital nudges to improve financial inclusion and digital financial literacy.

These insights collectively highlight the need for financial education that leverages digital tools and resources to cater to the developmental stages and learning preferences of CYP. Several key learning points can be highlighted:

Digital and Interactive Learning Platforms: Similar to the ways touchscreen technology and AI enhance learning experiences, these technologies can be used to create engaging, interactive platforms for teaching money concepts. Applications and games that simulate real-life financial scenarios can help children learn the value of money, budgeting, saving, and spending responsibly. AI can tailor these experiences to the child's learning pace and style, making complex concepts more accessible and engaging.

Progression, Personalisation and Real-World Relevance: Drever et al. (2015) emphasise the progression of financial literacy needs from executive function development in pre-elementary ages, through financial socialisation in elementary and middle school, to financial skill-building in adolescence. Additionally, drawing from Ameen et al.'s (2023) findings, learning about money can be made more appealing to children by integrating it with their interests and real-world issues. For example, sustainability can be tied into lessons about money by teaching children about ethical spending and investing in green technologies. AI can help personalise these lessons to include topics that each child finds engaging, thereby deepening their understanding and interest in financial literacy.

Interactive Physical-Digital Play: Torres et al. (2021) suggest that physical-digital play technologies promote skills like decision-making and problem-solving. These can be adapted for financial education through interactive tools that encourage children to engage in physical activities linked to earning and managing digital currency. For example, completing a puzzle on financial literacy could reward children with digital coins they can allocate towards savings goals or spend in a virtual store, thereby teaching them about budgeting and the consequences of financial decisions.

Global Connectivity and Collaboration: Learning about money in today's globalised world should include understanding different currencies, exchange rates, and the basics of international trade (e.g., OECD (2018). Using digital platforms that allow children to collaborate on projects with peers from around the world can introduce them to these concepts in a practical and engaging manner, highlighting the importance of financial literacy in a connected world.

Co-Design: The study by Yip, et al. (2023) highlights the opportunity of using principles from the field of Human Computer Interaction (HCI) to engage children in the design of digital financial literacy applications. There is a potential benefit of devising more studies using similar principles to evaluate children's knowledge, skills, needs and expectations from digital financial literacy applications, including parental involvement and support principles.

Addressing the Digital Divide: It's crucial to develop these educational tools with accessibility and inclusion in mind to ensure that children from all backgrounds have the opportunity to learn about money. This could involve offering low-cost or free access to digital learning platforms, creating offline versions of financial education games, and partnering with schools and libraries to provide access to the necessary technology. Additionally, collaboration with charities and specialized learning providers is essential to tailor educational materials to diverse learning needs, ensuring that these resources are universally accessible and effective for children with different cognitive, developmental, and physical abilities. This holistic approach supports a more inclusive learning environment that acknowledges and addresses various barriers to education.

b. 3.2 Interventions

What interventions exist that seek to teach children about digital money or seek to influence children's online financial behaviour such as spending or saving (either as its main focus or as one of the elements of a wider intervention)? Is there any evidence on their effectiveness?

The landscape of interventions aimed at enhancing children and young people's (CYP) digital financial literacy and influencing their online financial behaviours encompasses a variety of programmes and initiatives. Despite a broad focus on financial education, the integration of digital money concepts varies significantly among these interventions. Using the review by Harrison et al. (2023) as a basis, which examined 52 interventions related to CYP financial capability, this analysis seeks to identify those that specifically address digital money and evaluate their effectiveness.

Out of the 52 interventions reviewed, only 13 explicitly include elements related to digital money, indicating a nascent but growing interest in addressing this critical area. The extent to which these interventions comprehensively cover digital money aspects, including digital payments, online fraud, and cryptocurrency, varies. For instance, "Your Money Matters" (2020) encompasses topics on digital payments and online fraud but lacks a causal test of its impact on CYP's behaviour.

Another prominent example is the KickStart Money Programme, a coalition of 19 savings and investment firms aiming to provide high-quality and effective financial education to primary school children. The programme, delivered by the charity MyBnk, has proven the benefits of early financial education, with two out of three participants working towards a savings goal after receiving lessons, nearly double the national average.

MyBnk also offers a separate programme called "The Money House," which focuses on preparing young people for independent living by teaching them essential financial and digital skills. The Money House includes practical exercises on budgeting, online banking, bill payments, and comparing products and services online, while adapting content to participants' varying familiarity with digital elements and online transactions. The programme aims to reduce the risk of rent arrears and eviction among young people, particularly those in social housing, by providing them with the necessary skills to manage their finances effectively.

The evaluation of these interventions (39 out of 52) primarily relies on measures such as attitude or knowledge changes, with a scarcity of analyses on behavioural outcomes. This approach raises questions about the efficacy of these programmes in effecting tangible changes in financial behaviour, particularly in the context of digitalisation. Notably, Chapman and Rich (2018) assess the impact on confidence in managing finances, avoiding fraud, and navigating online financial transactions.

According to the analysis by Chapman and Rich (2018), a substantial percentage of participants reported improved awareness and confidence regarding financial risks online, which suggests some level of behavioural change. Similarly, Harrison et al.'s (2023) review indicates that interventions particularly effective at enhancing financial behaviours include those that are experiential and incorporate peer learning elements, leading to improved financial decisions and risk awareness among youths. These findings underline the potential of tailored financial education programmes to foster significant behavioural changes, paving the way for discussing global examples of similar successful initiatives.

In addition to the interventions highlighted by Harrison et al. (2023), the broader literature review points to several other initiatives incorporating digital content, although their scope and impact require further investigation and the list is likely not exhaustive. These include:

- The Bank of England's econoME resource introduced a new lesson on 'saving, borrowing, and protecting my money' in an online environment, featuring case studies on financial frauds and activities designed to teach primary children about loans and fraud awareness (Bank of England, 2023).

- The Alliance for Financial Inclusion (AFI), a policy leadership alliance owned and led by member central banks and financial regulatory in developing countries, developed a toolkit and guidelines aimed at DFL, emphasizing the importance of children and young people within DFL interventions across multiple countries (Alliance for Financial Inclusion, 2021b).
- The Bank of Russia launched cybersecurity campaigns targeting high school students with online lessons and tests on cyber threats and fraud prevention, engaging over 200,000 students in 2019 and introducing a specialized online test for schoolchildren aged 12-17 in 2020 (Alliance for Financial Inclusion, 2021a).
- Fundación Capital's LISTA program, reaching over 400,000 individuals through digital tools like WhatsApp, focuses on education regarding savings, budgeting, and investment for vulnerable groups, including children in Latin America, Asia, and Africa (Alliance for Financial Inclusion, 2021a).
- The Central Bank of Portugal initiated a digital financial education campaign in 2018, aiming to heighten young people's awareness of the necessary precautions when using digital financial services, utilizing platforms like Instagram and conducting educational sessions in secondary schools (OECD, 2021).

These interventions, spanning from structured educational programmes to digital campaigns and applications, underline the evolving landscape of digital financial education. However, the effectiveness of these interventions, particularly in terms of long-term behavioural change and the integration of digital skills applicable to real-world financial tools, is an area for further research and development.

c. 3.3 Insights from Expert Interviews

To complement the findings from the literature review, expert interviews were conducted with Stewart Perry (Director of The Centre for Financial Capabilities), Leon Ward (CEO MyBnk), Louise Hill (Founder and CEO, GoHenry) and Adele Atkinson (Professor of Practice, University of Birmingham), who are experts in the field of financial education. These interviews aimed to gather practical insights and perspectives on how children learn about money in an increasingly digital world. The interviews were conducted via video call and lasted approximately 30 minutes each.

The interviewees were asked a series of questions covering five main areas: 1) key trends in children's use of digital payments and online banking; 2) primary challenges in providing financial education in a digital age; 3) gaps and areas for future research in financial education in a digital age; 4) successful interventions integrating digital money concepts; and 5) the future of financial education in a digital age. The questions were designed to elicit insights based on the experts' experiences and knowledge, providing a practical context to the findings from the literature review. The full interview guide can be found in the appendix.

Key Trends in Children's Use of Digital Money

All interviews highlight the rapid shift towards digital financial transactions among children and young people. Stewart Perry notes that children today are growing up as digital natives, with digital payments being the standard way of managing money. Leon Ward echoes this sentiment, emphasizing the increasing use of digital banking, open banking, and banking apps, while cash is becoming less common. Digital payment options like credit cards and online payment systems are now prevalent for children's financial transactions. Both Atkinson and Hill highlight the rapid shift towards digital financial transactions among children and young people. Hill notes that children today are growing up as "cashless natives," with digital payments being the standard way of managing money. Drawing on GoHenry's data, she underscores that this trend has been accelerated by the pandemic, with parents adopting digital financial tools for their children at increasingly younger ages. Atkinson adds that while the modality of transactions has been shifting over the past 15-20 years, the core principles of financial education remain largely unchanged.

Primary Challenges in Providing Financial Education in a Digital Age

The interviews underscore the challenges educators face in providing effective financial education in a digital world. Perry stresses the need for education to keep pace with technological advancements and be digital-first to remain relevant. Ward points out the difficulty in teaching financial concepts when money becomes abstract and less tangible due to digitalization. All interviewees highlight the complexity of delivering practical, real-world financial education as money becomes increasingly digital. Hill for example points out the difficulty in teaching financial concepts when money becomes abstract and less tangible due to digitalization.

Perry also raises concerns about the lack of regulation and misinformation surrounding digital financial products, such as cryptocurrencies, which can pose risks if children and young people follow ill-advised information.

Some of the interviewees expressed scepticism about the viability of incorporating financial education into already strained school curricula, suggesting alternative delivery methods like social media may be more effective. Highlighting potential risks around digital financial transactions for children, such as online bullying to make purchases.

Gaps and Areas for Future Research in Financial Education

All interviewees identify critical areas for future research. Perry emphasizes the need to understand the relationship between overall digital literacy and financial literacy, and how they influence each other. He also highlights the importance of researching how children and young people may interact with artificial intelligence (AI) to make financial decisions and seek advice, considering both the potential benefits and risks. Similarly, Ward suggests exploring how children and young people currently use AI tools, like chatbots and virtual assistants, to learn about money and access financial information. These insights could guide the development of future educational interventions.

Atkinson suggests the need to better understand children's spending priorities in a digital world, which may differ from traditional assumptions.

Hill notes the lack of long-term impact data as a key evidence gap for digital financial education interventions, with a focus on the differences between various digital platforms.

In general, the interviewees highlighted that additional evidence is required on how financial behaviours are formed in the digital space and that insights from prior studies on financial behaviours and habits might need to be updated.

Successful Interventions Integrating Digital Money Concepts

The interviews provide examples of successful interventions that integrate digital money concepts. Perry highlights MyBnk, supported by TCFC, which keeps its content relevant by incorporating the latest money trends and input from young people. GoHenry is another example of a digital money management product that integrates financial education into its app, making learning accessible in a digital format.

Ward proposes introducing digital banking and online safety concepts at the high school level and providing opportunities for children to practice using digital financial tools in a safe, educational environment. He also suggests collaborating with financial institutions to develop tailored digital financial education content for children and young people.

Hill highlights GoHenry's Money Missions feature as a successful intervention that integrates digital money concepts. This feature incorporates financial education into their app, making learning accessible in a digital format.

Atkinson suggests that alternative delivery methods like social media may be effective for reaching children with financial education content in a digital age.

Assessing the Effectiveness of Financial Education Interventions

Perry suggests building on existing frameworks, like the Money and Pension Service's financial wellbeing outcomes framework and adapting it to a digital context as a starting point for assessing the effectiveness of interventions. However, he acknowledges the complexity of determining the most appropriate methods to evaluate the impact of digital financial skills interventions, emphasizing the need for further exploration.

The Future of Financial Education in a Digital Age

All interviewees stress the importance of financial education evolving to keep pace with the digitization of money and equip children with the necessary skills to navigate an increasingly digital financial landscape.

Perry and Ward emphasize the need for collaboration between educators, financial institutions, and policymakers to develop evidence-based approaches that address the unique challenges and opportunities presented by the digital age. They also highlight the importance of leveraging digital tools and platforms to make financial education more engaging, interactive, and relevant to children's lives.

Hill envisions the continued rise of digital financial services, making it imperative that children receive robust financial education from a young age. Similarly, Atkinson emphasizes the importance of grounding this education in enduring principles of financial literacy while also addressing the unique opportunities and risks presented by an increasingly cashless society.

In conclusion, the interviews provide valuable insights into the rapidly evolving landscape of children's financial education in the digital age. As the digitization of money and financial services accelerates, it is crucial to address the identified challenges, gaps, and opportunities to ensure that future generations are equipped with the knowledge and skills needed to thrive in an increasingly digital financial world.

d. 3.4 Gaps in available evidence

The need for three main areas of enquiry and data emerged from the literature review:

1. Development of a common definition and measures
2. Understanding children's online financial behaviour as well as knowledge of and attitudes to engaging with digital money
3. Understanding long term impact of digital financial literacy programmes

Addressing the gaps in knowledge surrounding digital financial literacy (DFL) for children and young people (CYP) necessitates comprehensive primary research efforts aimed at refining existing frameworks and understanding the multifaceted nature of financial interactions in the digital age.

i. 3.4.1 Common Definition and Measures

The literature reveals a lack of consensus on what constitutes effective digital financial literacy (DFL), presenting challenges such as inconsistencies in educational content, difficulties in assessing learning outcomes, and barriers to developing universally applicable educational tools. A pivotal step towards achieving this is the development of a common definition and taxonomy for DFL that encapsulates the diverse experiences and challenges faced by CYP. This endeavour should build on the groundwork laid by existing research and frameworks, such as the EU/OECD "Financial Competence Framework for Children and Youth in the European Union," which currently offers the most comprehensive outline for digital financial literacy identified in literature so far.

To further refine these frameworks, reviewing the existing MaPS model of what drives good financial capability in children and young people will help to identify which of the digital financial literacy elements asked in the Children and Young People's Financial Wellbeing Survey, are strongly correlated with good financial capability/behaviour. Incorporation of the 'digital competencies' highlighted in the EU framework into the measures covered in the MaPS Children, Young People and Parents Outcomes Framework (as well as potentially the Young Adults Outcomes Framework) is a critical first step. Additionally, integrating basic digital literacy components, specific knowledge on gaming and gamblification, awareness of digital nudging practices, recognition of money muling activities, various online earning methods or 'kidpreneurship', and fintech literacy could significantly enhance the framework's comprehensiveness and applicability.

Moreover, this review highlights a clear need for standardized and validated scales for measuring DFL among CYP. Despite some efforts in this direction, notably by Lyons & Kass-Hanna (2021), the field lacks a unified approach to testing the validity and reliability of a DFL scale across diverse CYP populations. Research efforts should aim to test individual financial literacy and digital literacy scales and their outcomes on financial capability, or consider testing composite measures to capture the nuanced relationship between these literacies and financial capability more accurately.

ii. 3.4.2 Understanding the fintech landscape and its implications for CYP

Research should focus on understanding the evolving fintech landscape and its implications for CYP, taking into account the rapid advancements in technology and the emerging risks associated with these digital financial services.

The fintech sector, characterized by innovations such as big data, AI, and blockchain, has significantly enhanced financial services and customer experiences, as detailed by Koskelainen (2022). However, alongside these advancements, new risks including security, privacy, and market challenges, as well as ethical concerns such as digital nudging—where persuasive algorithms and software designs influence consumer behaviours towards specific outcomes like increased purchases—have emerged (Koskelainen, 2022). These practices, while common, highlight the need for careful consideration of their impact on young consumers.

Despite the growing body of research on fintech, there remains a notable gap in evidence concerning technologies tailored specifically to CYP, such as pocket money apps, child-friendly bank accounts, and money management applications. The current literature largely focuses on areas like online gaming and gamblification, with particular attention to risky features like chance-based mechanisms or the use of temporal rhythms to influence spending. This indicates a critical need for more research aimed at understanding the benefits and risks of fintech innovations designed for CYP. Such research should not only identify the advantages of these technologies in promoting financial literacy and independence among young users but also address potential risks such as digital profiling and the consequences of digital nudging.

A key trend in the development of future education offerings, as indicated in the literature but also during the expert interviews, could be the role of AI in personalizing financial education. Although the review suggests that AI can help personalize financial education by tailoring lessons to children's interests and learning styles, there is limited research on how AI can be effectively integrated into digital financial literacy programmes. Future studies should explore the potential benefits and challenges of using AI for personalized financial education, as well as the ethical considerations involved.

Importantly, there is limited evidence on strategies to address the digital divide in financial education. The review highlights the importance of addressing the digital divide to ensure that all children have access to digital financial education opportunities.

However, there is limited evidence on the effectiveness of specific strategies, such as providing low-cost or free access to digital learning platforms, creating offline versions of financial education games, and partnering with schools and libraries. Research is needed to identify and evaluate the most effective approaches to bridging the digital divide in financial education and ensuring equal access for all CYP.

Furthermore, it's essential to consider the ethical implications and potential regulatory responses needed to protect CYP within the digital financial ecosystem. Investigating these aspects will provide a well-rounded understanding of how fintech can be developed and regulated to effectively cater to the needs of young users while ensuring their protection from potential harms. This comprehensive approach to researching the fintech landscape for CYP is crucial for developing frameworks and interventions that support safe and informed engagement with digital financial services in an increasingly digital world.

iii. 3.4.3 Financial capability research

In the digital age, understanding digital financial literacy (DFL) among children and young people (CYP) is paramount. This necessitates targeted primary research to refine frameworks and grasp the comprehensive nature of financial interactions today. Future research should target the two main areas below; understanding online financial behaviour and how digital money and digital interactions influence knowledge and attitudes towards money.

Understanding Children's Online Financial Behaviours

Current literature, such as the work by Ash (2022) and Koskelainen (2022), provides a foundational understanding of CYP's engagement with online media and specific digital activities like gaming and shopping behaviours. However, there remains a critical need for comprehensive studies that analyse the intricacies of how CYP interact with digital financial services, including the nuances of mobile banking and the emerging trend of 'kidpreneurship' or using online platforms for economic gains (Public, Parent Zone, 2023; GoHenry, 2024). Notably, the impacts of digitalisation on financial socialisation processes, particularly in terms of parental oversight and the potential reverse socialisation effect identified by Williams & Willick (2023), present an underexplored avenue for investigation.

Attitudes, Financial Knowledge and Behaviour

The advent of digital platforms has undeniably altered the landscape of financial education, with digital items in gaming environments (Ash et al., 2022) and diversified perceptions of money among CYP (Yip et al., 2023) highlighting the need for a revised approach to understanding value in the digital age. Moreover, the increasing role of social media as a primary information source (Ofcom, 2023), including for financial knowledge, points towards a potentially significant shift in how CYP gain financial knowledge. The change in parental guidance and supervision should be taken into account, as well as the influence of 'Finfluencers' and the broader implications of cashless economies on CYP's conceptualisation of money and value.

The digital domain may also have changed the way and nature that attitudes are formed, for example through the concerns over online transaction security (Thaichon, 2017) and the psychological impact of digital gaming practices necessitating a focused research lens. Furthermore, the legal and ethical considerations emerging from digital financial interactions, as highlighted by the child financial harm consortium (Parentzone, 2023), underscore the transformative effect of digitalisation on financial behaviour, necessitating a nuanced understanding of these evolving dynamics.

The review showed the potential benefits of using Human Computer Interaction (e.g., Yip et al., 2023) principles to engage children in the design of digital financial literacy applications. However, there is a lack of research on the effectiveness of co-designed approaches in improving CYP's engagement with, and learning from, digital financial literacy tools. More studies are needed to evaluate the impact of involving CYP in the design process and the impact this has on their financial knowledge, skills, and attitudes.

To fill these gaps discussed in 3.4.2 and 3.4.3, a multidisciplinary approach combining quantitative and qualitative methodologies is essential. This approach should integrate both primary research and comprehensive desk research to cover a broad spectrum of data sources and perspectives, this includes:

- In-depth studies on the fintech landscape specifically catering to CYP, examining both the opportunities for enhancing financial literacy and the risks associated with digital profiling and nudging.
- Analysis of CYP's online financial behaviours to understand the nuances of digital transactions, the rise of online earnings, and the evolving dynamics of financial socialisation in the digital era.
- Investigations into how digital interactions mould CYP's financial knowledge and attitudes, focusing on the influence of digital content and the psychological effects of transitioning to digital financial ecosystems.

Challenges in this area, as indicated by academics such as Zendle et al. (2023), stem from data constraints—such as reliance on self-reported metrics and the limited agility of horizon scanning research to respond to evolving societal issues—and methodological hurdles that include the necessity of exploring systemic causality and addressing issues of data availability. Overcoming these challenges requires innovative research methodologies and approaches that can accurately capture and assess the complex dynamics of online digital financial behaviours, thereby informing effective interventions and educational programmes.

iv. 3.4.4 Evidence Gaps in Interventions

The review of the evidence base related to digital financial literacy interventions reveals significant gaps in our collective knowledge and approach to these programmes. While some interventions, such as MyBnk's "The Money House," have begun to address aspects of digital financial literacy, there remains a lack of comprehensive coverage and rigorous evaluation of their impact on young people's behaviour. These gaps not only highlight the necessity for more targeted research but also underscore areas where existing frameworks could be refined to better accommodate the realities of financial interactions in the digital age.

The majority of studies examining the effectiveness of DFL interventions lean heavily on evaluating changes in attitudes or knowledge, often not testing the crucial aspect of behaviour. This observation points to a broader issue within the field: a lack of comprehensive understanding regarding the medium and long-term efficacy of these educational efforts. The OECD (e.g., OECD (2020a); OECD (2023)), has called for more in-depth research to shed light on the lasting impact of digital financial literacy programmes, a sentiment echoed across the sector. Initiatives like the KickStart Money Programme show promise with positive initial outcomes (e.g., Harrison et al., 2023), yet the translation of these results into sustained financial behaviours is still unclear.

A critical examination of the content of these interventions raises questions about the specificity of digital skills being taught. There's a growing consensus on the need to ensure that these skills are not only relevant but directly applicable to the financial tools and platforms that young individuals engage with daily. This alignment is essential for fostering meaningful digital financial competencies that can be actively applied in real-world contexts.

The digital financial landscape is notably broad, encompassing a wide range of payment systems, digital currencies, and online investment platforms. However, it's uncertain whether current interventions adequately cover this diversity or if they are predominantly focused on more traditional aspects of financial education. This gap highlights the need for interventions to evolve in tandem with the rapidly changing digital financial sphere.

Scalability and adaptability of these interventions are also areas lacking in detailed evaluation. Understanding how these programmes can be effectively scaled up or adapted to suit different cultural or socio-economic contexts is crucial for their widespread implementation.

Given the increasing prevalence of digital financial crimes, there's a pressing need for interventions to comprehensively address how to navigate and avoid scams and frauds, particularly for demographics identified as vulnerable, such as potential money mules highlighted by Cifas. Data privacy and security in financial transactions have become increasingly important with the digitization of financial services. Yet, there's an evident gap in whether current interventions sufficiently cover these critical aspects, underscoring a need for a more pronounced focus on teaching children about safeguarding their financial data online.

Lastly, comparing the effectiveness of digital versus non-digital interventions could offer valuable insights into the added value of digital methodologies in financial education. This comparative analysis could inform future strategies for developing more effective digital financial literacy programmes.

7. 4. Conclusions

The rapid digitisation of money and financial transactions has transformed the landscape of financial education, presenting both opportunities and challenges for equipping children and young people with the skills and knowledge they need to navigate an increasingly complex financial world. This literature review, commissioned by the Money and Pensions Service (MaPS), has provided a comprehensive overview of the current state of research on the impact of digital money on financial education in the UK, highlighting key findings, gaps in knowledge, and directions for future research and practice.

The review has demonstrated that the shift towards digital financial transactions has profound implications for how children and young people learn about and interact with money. While the digitisation of money offers potential benefits, such as greater financial inclusion, new earning opportunities, and the ability to develop digital financial management skills from an early age, it also presents significant risks. These include exposure to online fraud and scams, the normalisation of financial risk-taking through gamification, and the challenges of navigating an increasingly complex digital financial landscape. The expert interviews reinforced these findings, emphasizing the need for financial education to keep pace with technological advancements and be digital-first to remain relevant. The interviews also highlighted the difficulty in teaching financial concepts when money becomes abstract and less tangible due to digitalization.

The interviews further suggest grounding financial education in enduring principles of financial literacy while also addressing the unique opportunities and risks presented by an increasingly cashless society. The participants highlighted the importance of early financial education covering online safety, interest rates, fees, and responsible spending to prepare children for the digital financial world. In addition, they noted the lack of long-term impact data as a key evidence gap for digital financial education interventions, emphasizing the need for more longitudinal studies to understand the effectiveness of these programmes.

The way in which children and young people learn about money has evolved in the digital age. Traditional family financial socialisation remains important, but digital platforms, peers, and 'fin-fluencers' are playing an increasingly influential role in shaping children's understanding of money and financial behaviours. The emergence of 'kidpreneurship', where children monetize their digital skills and online presence, highlights the need for financial education that addresses these new realities. The expert interviews provided further insights into these trends, with both Perry and Ward noting the rapid shift towards digital financial transactions among children and young people, and the prevalence of digital payment options like credit cards and online payment systems.

The review identified a range of interventions aimed at enhancing children's digital financial literacy, from classroom-based programmes to digital campaigns and applications. However, the evidence of their long-term effectiveness in changing financial behaviours is limited, underscoring the need for more rigorous evaluation and a greater focus on practical, real-world skills. The expert interviews provided valuable examples of successful interventions, such as those created by MyBnk and GoHenry, which integrate digital money concepts and make learning accessible in a digital format. The interviewees also emphasized the importance of collaboration between the financial education sector, educators, financial institutions, and policymakers to develop evidence-based approaches that address the unique challenges and opportunities presented by the digital age.

Despite the growing recognition of the importance of digital financial literacy, the review has revealed significant gaps in the current evidence base. There is a need for a common definition and measures of digital financial literacy, to facilitate the development of targeted interventions and the evaluation of their impact. A deeper understanding of the fintech landscape for children and young people is also required, including the benefits and risks associated with emerging technologies such as digital currencies and blockchain. Moreover, more comprehensive research is needed on children and young people's online financial behaviours, knowledge, and attitudes, to inform the design of effective digital financial education interventions. The expert interviews highlighted additional areas for future research, such as understanding the relationship between overall digital literacy and financial literacy, and exploring how children and young people may interact with artificial intelligence (AI) to make financial decisions and seek advice.

To address these gaps, future research should adopt a multidisciplinary approach, combining quantitative and qualitative methodologies to provide a holistic understanding of the complex dynamics of digital financial literacy. This could include in-depth studies on the fintech landscape, analysis of children's online financial behaviours, and investigations into how digital interactions shape their financial knowledge and attitudes. Collaboration between researchers, educators, policymakers, and the financial services industry will be essential to ensure that research findings are translated into effective practice.

The findings of this review have significant implications for policy and practice in financial education. They underscore the urgent need for financial education to adapt to the realities of the digital age, moving beyond traditional approaches to incorporate the skills and knowledge that children and young people need to navigate the digital financial landscape safely and effectively. This will require a concerted effort from the financial education sector, policymakers, educators, and the financial services industry to develop and implement evidence-based interventions that address the unique challenges and opportunities presented by the digitisation of money.

By working in partnership with the financial education sector, educators, policymakers, and the financial services industry, MaPS will encourage further research and evaluation in this area, and inform policy development with the aim of generating more opportunities for children and young people in the UK to develop the financial capabilities they need to thrive in the digital age. These insights should strengthen the resolve of the financial education sector to ensure that, by 2030, we see a significant increase in the number of children and young people receiving this vital learning and developing their digital financial literacy.

Based on the evidence presented in the literature review, the strongest findings relate to the increased digitization of financial transactions among children and young people, and the associated risks and opportunities this presents for their financial education and wellbeing. The 2022 MaPS UK Children and Young People Financial Wellbeing Survey provides compelling data on the shift towards digital payments, online banking, and unsupervised online purchases, particularly among older children (aged 16-17). This trend of children's evolving financial behaviours in the digital age is further highlighted by services like GoHenry, which provide parents with tools to monitor and manage their children's online spending, including within popular video games. While such services offer parental oversight, the evidence suggests that children's financial learning is being shaped by digital influences beyond the traditional family context, such as online platforms, peers, and 'fin-fluencers'. The rise of 'kidpreneurship', where children and young people monetize their digital skills and online presence, underscores the importance of adapting financial education to these new realities.

In terms of age groups, the evidence indicates that the shift towards digital financial transactions starts quite young, with a notable decline in the use of cash for pocket money among 11-year-olds compared to 7-year-olds. However, the impact appears to be most pronounced among teenagers, particularly those aged 16-17, who exhibit the highest levels of engagement with online banking, unsupervised online purchases, and exposure to financial risks such as fraud and scams.

In conclusion, this literature review, complemented by expert interviews, has highlighted the profound impact of digital money on financial education and the urgent need for a coordinated, evidence-based response. By addressing the gaps in knowledge identified in this review and working collaboratively to develop and implement effective interventions, we can equip children and young people with the skills and knowledge they need to navigate the digital financial landscape with confidence and resilience. Doing so will not only contribute to their individual financial wellbeing but also lay the foundations for a more financially literate and inclusive society in the digital age.

8. 5. References

Afjal, M. (2023). Bridging the financial divide: a bibliometric analysis on the role of digital financial services within FinTech in enhancing financial inclusion and economic development. Humanities and Social Sciences Communications, 10(1), 1-27.

AFI (2021). Digital Financial Literacy. Available at: https://www.afi-global.org/wp-content/uploads/2021/05/AFI_Guideline45_Digi_Finance_Literacy_aw5.pdf

AFI (2021). Digital Financial Literacy Toolkit. Available at: https://www.afi-global.org/publications/digital-financial-literacy-toolkit/

Agárdi, I., & Alt, M. (2022). Do digital natives use mobile payment differently than digital immigrants? A comparative study between generation X and Z. Electronic Commerce Research.

Agasisti, T., Cannistrà, M., Soncin, M., & Marazzina, D. (2022). Financial Education during COVID-19 - Assessing the effectiveness of an online programme in a high school. Applied Economics, 54(35), 4006-4029.

Alomari, A. S., & Abdullah, N. L. (2023). Factors influencing the behavioral intention to use Cryptocurrency among Saudi Arabian public university students: Moderating role of financial literacy. Cogent Business & Management, 10(1), 2178092.

Amagir, A., Groot, W., Maassen van den Brink, H., & Wilschut, A. (2018). A review of financial-literacy education programs for children and adolescents. Citizenship, Social and Economics Education, 17(1), 56-80.

Amagir, A., Maassen van den Brink, H., Groot, W., & Wilschut, A. (2022). SaveWise: The impact of a real-life financial education programme for ninth grade students in the Netherlands. Journal of Behavioural and Experimental Finance, 33, 100605.

Ameen, N., Hosany, S., & Taheri, B. (2023). Generation Z's psychology and new-age technologies: Implications for future research. Psychology & Marketing, 40(10), 2029-2040.

Anders, J., Jerrim, J., & Macmillan, L. (2023). Socio-Economic Inequality in Young People's Financial Capabilities. British Journal of Educational Studies, 71(6), 609-635.

Bank of England (2021). EconoMe: decisions matter. Available at: https://www.bankofengland.co.uk/education/econome

Bank of England (2022). Financial education in a digital world. Available at: https://www.bankofengland.co.uk/quarterly-bulletin/2022/2022-q1/financial-education-in-a-digital-world

Barclays (2022). Piggybank Boost: Kids Set To Receive Pocket Money Pay Rise In 2022. Available at: https://home.barclays/news/press-releases/2022/01/piggybank-boost--kids-set-to-receive-pocket-money-pay-rise-in-200/

Batty, M., Collins, J. M., O'Rourke, C., & Odders-White, E. (2020). Experiential financial education: A field study of my classroom economy in elementary schools. Economics of Education Review, 78, 102023.

Behera, C. K., & Dadra, R. (2023). Understanding young consumers' attitude formation for new-age fintech credit products: an SOR framework perspective. Journal of Financial Services Marketing.

Buenestado-Fernández, M., Ramírez-Montoya, M. S., Ibarra-Vazquez, G., & Patiño, A. (2023). Digital competency as a key to the financial inclusion of young people in complex scenarios: A focus groups study. Citizenship, Social and Economics Education, 22(1), 48-62.

Castiglioni, C., Sesini, G., Pinel, H., & Lozza, E. (2023). Psychology of Money and New Methods of Payment. Generational Differences Towards a Cashless Society. Micro & Macro Marketing, 32(2), 311-336.

CEA (2024). Financial Capability. Available at: https://ccea.org.uk/learning-resources/financial-capability

Cifas (2017). Don't be fooled – A campaign to deter students from becoming money mules. Available at: https://www.moneymules.co.uk/wp-content/uploads/2020/09/Dont_Be_Fooled_toolkit_FINAL.pdf

Cifas (2023). Cifas and UK Finance launch lesson plans to prevent young adults from becoming money mules. Available at: https://www.cifas.org.uk/newsroom/cifas-ukfinance-lessonsplans-moneymules

Clarke, T. & Ghezelayagh, S. (2018). Measuring Financial Capability in Children and Young People: What drives financial behaviour? https://webarchive.nationalarchives.gov.uk/ukgwa/20230827063237mp_/https://maps.org.uk/wp-content/uploads/2021/03/cyo-composite-measures-technical-appendices.pdf

Dare, S. E., van Dijk, W. W., van Dijk, E., van Dillen, L. F., Gallucci, M., & Simonse, O. (2020). The effect of financial education on pupils' financial knowledge and skills: Evidence from a Solomon four-group design. The Journal of Educational Research, 113(2), 93-107.

Dastane, O., & Haba, H. F. (2023). The landscape of digital natives research: a bibliometric and science mapping analysis. FIIB Business Review, 23197145221137960.

Davidson et al. (2022). CC-DRIVER 2021 European Youth Survey. Available at: https://www.ccdriver-h2020.com/_files/ugd/0ef83d_622d9f44dd7345cd80314333a92d74f1.pdf

De Veirman, M., Hudders, L., & Nelson, M. R. (2019). What is influencer marketing and how does it target children? A review and direction for future research. Frontiers in psychology, 10, 2685.

Delfabbro, P., & King, D. (2023). The evolution of young gambling studies: digital convergence of gaming, gambling and cryptocurrency technologies. International Gambling Studies, 1-14.

Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19. World Bank Publications.

Drever, A. I., Odders-White, E., Kalish, C. W., Else-Quest, N. M., Hoagland, E. M., & Nelms, E. N. (2015). Foundations of financial well-being: Insights into the role of executive function, financial socialization, and experience-based learning in childhood and youth. Journal of Consumer Affairs, 49(1), 13-38

Emond, A. M., & Griffiths, M. D. (2020). Gambling in children and adolescents. British Medical Bulletin, 136(1), 21-29.

European Union / OECD (2023). Financial competence framework for children and youth in the European Union. Available at: https://finance.ec.europa.eu/document/download/7540153e-7d3b-4d81-8bed-0cf8a80be53b_en?filename=230927-financial-competence-framework-children-youth_en.pdf.

FCA (2023). Financial watchdog blocks thousands of misleading ads. Available at: https://www.fca.org.uk/news/press-releases/financial-watchdog-blocks-thousands-misleading-ads

Frisancho Robles, V., Herrera, A., & Prina, S. (2021). Can a budget recording tool teach financial skills to youth? Experimental evidence from a financial diaries study (No. IDB-WP-1275). IDB Working Paper Series.

Gelman, S. A., & Echelbarger, M. E. (2019). Children, object value, and persuasion. Journal of Consumer Psychology, 29(2), 309-327.

GoHenry (2023). How to make money as a kid in 2024 {Ultimate guide}. Available at: https://www.gohenry.com/uk/blog/financial-education/how-to-make-money-as-a-kid

GoHenry (2023). Kids are one step ahead with digital currencies. Available at: https://www.gohenry.com/uk/blog/bread/kids-are-one-step-ahead-with-digital-currencies

Goyal, K., & Kumar, S. (2021). Financial literacy: A systematic review and bibliometric analysis.

International Journal of Consumer Studies, 45(1), 80-105.

Graham, B. & Brady, L.-M., (2021). Young people and money: a review of young people's use of online information and advice. Available at: https://maps.org.uk/en/publications/research/2021/young-people-and-money-a-review-of-young-peoples-use-of-online-information-and-advice

Griffiths, A. & Ghezelayagh, S. (2018). Children and Young People and Financial Capability: Needs Analysis. Available at: https://www.ymcageorgewilliams.uk/sites/default/files/CYP_Needs_Analysis_final.PDF

Gudmunson, C. G., & Danes, S. M. (2011). Family financial socialization: Theory and critical review. Journal of Family and Economic Issues, 32(4), 644–666.

Harrison, T., Shaw, K., & Ansell, J. (2023). Developing children and young people's financial capability: Evidence review. Available at: https://maps.org.uk/en/publications/research/2023/developing-children-young-people-financial-capability

Hota, M. and Derbaix, M. (2016). A real child in a virtual world: Exploring whether children's participation in MMORPGs transforms them into virtual retail shoppers. International Journal of Retail & Distribution Management, 44(11), 1132-1148.

Internet matters (2024). Children's Wellbeing in a Digital World Year Three Index Report 2024. Available at: https://www.internetmatters.org/hub/research/childrens-wellbeing-in-a-digital-world-index-report-2024/#full-report

James, A., Gordon, R., & Mills, S. (2022). Between gaming and gambling: Children, young people, and paid reward systems in digital games. Loughborough University. Report. https://hdl.handle.net/2134/21640190.v1

Javelin (2022). Child Identity Fraud: The Perils of Too Many Screens and Social Media. Available at: https://javelinstrategy.com/child-identity-fraud-study

Jay, T., Rashid, S., Xenidou-Dervou, I., & Moeller, K. (2022). Measuring Financial Literacy of Children Aged 4 to 6 years: Design and small-scale testing.

Jerome, E., Kamawar, D., Milyavskaya, M., & Atance, C. (2023). Preschoolers' saving: The role of budgeting and psychological distance on a novel token savings task. Cognitive Development, 66, 101315.

Kalmi, P., & Rahko, J. (2022). The effects of game-based financial education: New survey evidence from lower-secondary school students in Finland. The Journal of Economic Education, 53(2), 109-125.

Kass-Hanna, J., Lyons, A. C., & Liu, F. (2022). Building financial resilience through financial and digital literacy in South Asia and Sub-Saharan Africa. Emerging Markets Review, 51, 100846.

Khan, M. T. I., Liew, T. W., & Lee, X. Y. (2023). Fintech literacy among millennials: The roles of financial literacy and education. Cogent Social Sciences, 9(2), 2281046.

Koskelainen, T., Kalmi, P., Scornavacca, E. & Vartiainen, T. (2023). Financial literacy in the digital age–a research agenda. Journal of Consumer Affairs, 56, 1-23.

Kristiansen, S., & Severin, M. C. (2020). Loot box engagement and problem gambling among adolescent gamers: Findings from a national survey. Addictive behaviors, 103, 106254.

Kumpulainen, K., Sairanen, H., & Nordström, A. (2020). Young children's digital literacy practices in the sociocultural contexts of their homes. Journal of Early Childhood Literacy, 20(3), 472-499.

LeBaron, A. B., & Kelley, H. H. (2021). Financial Socialization: A Decade in Review. Journal of Family and Economic Issues, 42, 195–206.

Lee, Y. Y., Gan, C. L., & Liew, T. W. (2023). Do E-wallets trigger impulse purchases? An analysis of Malaysian Gen-Y and Gen-Z consumers. Journal of Marketing Analytics, 11, 244–261.

Luo, W., Yang, W., & Berson, I. R. (2024). Digital Transformations in Early Learning: From Touch

Interactions to AI Conversations. Early Education and Development, 35(1), 3-9.

Lyons, A. C., & Kass-Hanna, J. (2021). A methodological overview to defining and measuring "digital" financial literacy. Financial Planning Review, 4(2), e1113.

Lyons, A. C., & Kass-Hanna, J. (2021). A multidimensional approach to defining and measuring financial literacy in the digital age. In The Routledge handbook of financial literacy (pp. 61-76). Routledge.

Mills, S., Ash, J., & Gordon, R. (2024). Children and Young People's Experiences and Understandings of Gambling-Style Systems in Digital Games: Loot Boxes, Popular Culture, and Changing Childhoods. Annals of the American Association of Geographers, 114(1), 200-217.

Morgan, P. J. (2021). Fintech, financial literacy, and financial education. The Routledge Handbook of Financial Literacy, 239-258.

Normawati, R. A., S. M. Rahayu, and S. Worokinasih. (2022). Financial Satisfaction On Millenials: Examining the Relationship between Financial Knowledge, Digital Financial Knowledge, Financial Attitude, and Financial Behavior. Jurnal Aplikasi Manajemen, 20(2), 354–365.

Nyrhinen, J., Sirola, A., Koskelainen, T., Munnukka, J., & Wilska, T. A. (2024). Online antecedents for young consumers' impulse buying behavior. Computers in Human Behavior, 153, 108129.

OECD (2020a). Advancing the digital financial inclusion of youth. Available at: https://www.oecd.org/finance/advancing-the-digital-financial-inclusion-of-youth.htm

OECD (2020b). Personal Data Use in Financial Services and the Role of Financial Education: A Consumer-Centric Analysis. Available at: www.oecd.org/daf/fin/financial-education/Personal-Data-Use-in-Financial-Services-and-the-Role-of-Financial-Education.pdf

OECD (2021). G20/OECD-INFE Report on supporting financial resilience and transformation through digital financial literacy. Available at: www.oecd.org/finance/supporting-financial-resilience-and-transformation-through-digital-financial-literacy.htm

OECD (2022). Toolkit for measuring financial literacy and financial inclusion. Available at: https://www.oecd.org/finance/financial-education/toolkit-for-measuring-financial-literacy-and-financial-inclusion.htm

OECD (2023). PISA 2025 Learning in the Digital World. Available at: https://www.oecd.org/pisa/innovation/learning-digital-world/

OECD Publishing. (2021). 21st-century readers: Developing literacy skills in a digital world. Organisation for Economic Co-operation and Development OECD. Available at: https://www.oecd.org/publications/21st-century-readers-a83d84cb-en.htm

Ofcom (2023). Children and parents: media use and attitudes report. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0027/255852/childrens-media-use-and-attitudes-report-2023.pdf

Parentzone (2023). A problem hiding in plain sight? Children spending, making and losing money online. Available at: https://parentzone.org.uk/sites/default/files/2023-11/A%20problem%20hiding%20in%20plain%20sight%20-%20PZ%20report%20Nov%202023.pdf

Parentzone (2023). Online Child Financial Harms/Exploitation Research Final Report May 2023 (Unpublished).

Pippa Lord, Kerry Martin, Sally Bradshaw and Ben Styles. (2018). Randomised Controlled Trial Evaluation of The Money Charity's Workshops in Schools. The National Foundation for Educational Research. Available at: https://www.nfer.ac.uk/media/o14gn5np/randomised_controlled_trial_evaluation_of_the_money_charity_s_workshops_in_schools.pdf

Ponari, M., Norbury, C. F., Rotaru, A., Lenci, A., & Vigliocco, G. (2018a). Learning abstract words and concepts: Insights from developmental language disorder. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *373*(1752), 20170140.

Ponari, M., Norbury, C. F., & Vigliocco, G. (2018b). Acquisition of abstract concepts is influenced by emotional valence. *Developmental science*, *21*(2), e12549.

ScotCen Social Research. (2022). Talk, Learn, Do in Scotland, Final Evaluation Report. Available at: https://maps.org.uk/content/dam/maps-corporate/en/our-work/talk-learn-do/talk-learn-do-in-scotland-may-2022.pdf

Terras, P and Ramsay J, (2016) Family Digital Literacy Practices and Children's Mobile Phone Use. Front. Psychol. 7:1957.

Thaichon, P. (2017). Consumer socialization process: The role of age in children's online shopping behavior. Journal of Retailing and Consumer Services, 34, 38-47.

Tim Jay, Sara Rashid, Iro Xenidou-Dervou, Korbinian Moeller (2022). Measuring Financial Literacy of Children Aged 4 to 6 years: Design and small-scale testing. Available at: https://maps.org.uk/content/dam/maps-corporate/en/our-work/uk-strategy-for-financial-wellbeing/maps-measuring-financial-literacy-age-4-to-6-testing-2022.pdf

UK Finance (2023). Gen Z More Likely To Be Tricked By Criminals And Fall For Impersonation Scams. Available at: https://www.ukfinance.org.uk/news-and-insight/press-release/gen-z-more-likely-be-tricked-criminals-and-fall-impersonation-scams

UKFIU (2023). Money Mules Special Edition. Available at: https://www.nationalcrimeagency.gov.uk/who-we-are/publications/675-sars-in-action-issue-22/file#:~:text=Figures%20released%20in%20July%20by,bear%20the%20hallmarks%20of%20muling.

UK Gambling Commission (2023). Young People and Gambling 2023. Available at: https://www.gamblingcommission.gov.uk/report/young-people-and-gambling-2023

Wan Nawang, W. R., & Abdul Syukor, S. (2023). Digital Financial Literacy Among Young Adults in Malaysia. International Business Education Journal, 16(2), 115–126.

Woods, H., & Odell, H. (2021). Financial Education for 16 and 17 Year Olds: Pathfinder Evaluation. Trust Impact. Available at: https://maps.org.uk/content/dam/maps-corporate/en/our-work/maps-financial-education-16-to-17-yrs-pathfinder-2021.pdf

Woods, H. (2018). Family Finance Project – Evaluation. Available at: https://masassets.blob.core.windows.net/fincap-cms/files/000/000/438/original/Gingerbread_WWF_Family_Finance_Project.pdf

Your Money Matters An Evaluation: The impact in secondary schools of the UK's first ever financial education textbook Your Money Matters (2020). Judith Staig, Content Write. Available at: https://www.young-enterprise.org.uk/wp-content/uploads/2020/06/Your-Money-Matters-An-Evaluation-FINAL.pdf

6. Appendix

a. 6.1. Methods

i. 6.1.1. Initial research questions

The review explores the questions below. After initial consultation with Maps, these were slightly refined to focus specifically on how children learn about digital money and digital financial transactions.

1. What research literature exists on how children can learn about money, specifically in a digital age? How many studies are there? How wide-ranging are the studies?
    a. What are the implications for children's financial education of the increased digitisation of money and financial transactions?
    b. Is there evidence to suggest that the way in which children learn about money has changed since digital money has become a more important component of our spending and saving habits?
    c. What can we learn from wider research about how children learn, which might be transferrable to learning about money concepts?
2. What interventions exist that seek to teach children about digital money or seek to influence children's online financial behaviour such as spending or saving (either as its main focus or as one of the elements of a wider intervention)? Is there any evidence on their effectiveness?
3. What further primary research might need to be conducted in order to fill the gaps in knowledge about the above?

ii. 6.1.2.Review process

The process for selecting literature included the development of inclusion and exclusion criteria in collaboration with MaPS to identify relevant parameters; defining and recording search terms and keywords; identifying a range of sources, datasets, and libraries for search, including suggestions from MaPS; discussing alternatives with MaPS if the material directly related to the research questions was insufficient, which might include broadening the search criteria or contacting key agencies and informants in the field. Reference lists in relevant journal articles and reports were hand-searched for additional material, and abstracts and summaries that matched the search criteria were evaluated for relevance, ranked by pertinence in relation to the research questions and quality in terms of methodological robustness.

For grey literature, which lacks abstracts, a more thorough review of the entire report was often necessary to determine relevance and suitability. High-quality sources were then identified for full text retrieval. Finally, the material was summarised and synthesised into a framework matrix to highlight key themes and issues related to the research questions.

iii. 6.1.3. Evidence base

Our research spanned across several academic databases. The Web of Science served as a primary source to capture a wide range of high-impact, peer-reviewed articles that cut across various disciplines, providing a multidisciplinary perspective. Google Scholar complemented this by offering broader access to scholarly literature, which included not only peer-reviewed articles but also theses, books, and conference papers, giving us a comprehensive view of existing research.

Major academic journals were screened as well, specifically in the areas of Economics (e.g., American Economic Review), Psychology (e.g., Cognition), Finance (e.g., Journal of Finance), and Marketing (e.g., Journal of Consumer Psychology).

Grey literature refers to materials that are not published through traditional peer-reviewed channels, such as academic journals or books. This includes reports from government bodies, the voluntary sector, and community organisations, as well as other online resources.

In relation to grey literature, we conducted a comprehensive analysis of materials from a variety of influential organisations, think tanks, research institutes, educational and financial institutions, and reviewed interventions by various entities in the financial sector. We reviewed existing evidence from the MaPS' website and the Financial Wellbeing Evidence Hub, Organisation for Economic Co-operation and Development (OECD), the World Bank, the Alliance for Financial Inclusion. We also reviewed programmes and initiatives from financial services institutions, FinTech companies, and charities, examining reports from major banks such as the Bank of England, Barclays and GoHenry.

For interventions, we used the interventions identified in the evidence review on developing children and young people's financial capability (2023) to identify and evaluate interventions in relation to content on digitalisation of money and digital transactions.

iv. 6.1.4. Search terms

Search terms and keywords included combinations of the following, refined to ensure relevance to the research questions:

- Children OR youth OR adolescent OR young people OR gen* z OR " OR gen* alpha
- financial education / financial literacy / financial capability / financial capabilities / personal finance
- Online shopping / purchasing
- Online advertising
- Online payment / mobile payment
- Online banking / mobile banking
- Digital financial transaction (DFS)
- Gamification
- Gambling
- loot boxes
- Financial socialisation
- Economic socialisation
- digital / online / virtual

v. 6.1.5. Inclusion criteria

The methodology for selecting studies to inform our research on digital financial literacy (DFL) among children and young people (CYP) was guided by specific inclusion criteria designed to ensure relevance, methodological integrity, and comprehensive coverage of the subject area:

1. **Relevance to Research Questions:** All selected studies had to be directly relevant to our research questions, addressing the core aspects of digital financial interactions, financial education, and the behavioural impacts of digital financial literacy within the defined scope.
2. **Methodological Soundness:** For academic research, we included publications that provided full methodological details, ensuring that the studies' approaches were thoroughly documented and assessed for soundness. This criterion aimed to ensure the reliability and validity of the findings presented.
3. **Publication Date:** The review focused on evidence published since 2013. This timeframe was chosen to capture the most recent developments in digital financial technologies and their implications for financial literacy, reflecting the rapidly evolving nature of the field.
4. **Age Range of Participants:** The primary focus was on studies involving children and young people aged 3-17 years. However, to address potential gaps in the literature, we expanded our criteria to include studies involving individuals up to 25 years of age and populations of all age ranges that included children and young people where evidence

specifically pertaining to the younger age group was limited.

5. **Language:** We included publications in English and German, allowing for a broader collection of studies across different geographical contexts. This decision was made to encompass a wide range of educational systems and cultural perspectives on digital financial literacy.
6. **Study Type:** Our review did not limit inclusion based on the type of study, incorporating both qualitative and quantitative research to ensure a comprehensive understanding of the topic. However, we excluded purely conceptual studies that lacked empirical evidence, focusing instead on research that provided insights based on data collection and analysis.

vi. 6.1.6. Evaluation criteria

To rigorously evaluate the studies and interventions relevant to our investigation into digital financial literacy among children and young people, we established a comprehensive set of evaluation criteria. These criteria were designed to assess the relevance, research orientation, methodological approach, targeted age group, and specific focus on the digitalisation of money or financial transactions. By systematically applying these criteria, we ensured a structured and objective analysis of the collected evidence.

1. Relevance Rating:
    - **1 (Not Relevant):** Studies or interventions that do not directly address or contribute insights to the core themes of digital financial literacy or behaviour among children and young people, based on a review of the abstracts.
    - **2 (Marginally Relevant):** Studies or interventions that touch upon the themes of interest but only tangentially or in a limited capacity. Relevant insights were included from a high level content review.
    - **3 (Highly Relevant):** Research that directly and substantially contributes to understanding digital financial literacy, behaviours, or the impact of digitalisation on financial education among the target age group. Relevant insights were included from a full level content review.
2. **Research Orientation:** We categorised the collected evidence based on its primary focus, including:
    - **Empirical:** Research based on observed and measured phenomena, presenting original findings.
    - **Commentary:** Discussions or opinions on existing research or trends, without new empirical data.
    - **Policy Report:** Analyses or evaluations of specific policies or programmes, potentially including recommendations.
    - **Policy Framework:** Guidelines or strategies proposed for policy development in digital financial education.
    - **Systematic Review:** Comprehensive reviews of literature synthesising findings from multiple studies.
3. **Research Method (where applicable):** To understand the methodological foundation of empirical studies, we distinguished between:
    - **Qualitative:** Studies employing methods such as interviews, observations, or content analysis to gather non-numerical data.

- Quantitative: Research utilising statistical, mathematical, or computational techniques to analyse numerical data.
   - **Mixed Methods:** Studies integrating both qualitative and quantitative approaches to provide a more comprehensive understanding of the research question.
4. **Age Group:** We noted the specific age range of participants in each study or intervention, ensuring a focus on children and young people as defined by our inclusion criteria.
5. **Content on Digitalisation:** For interventions specifically, we assessed whether they included content on the digitalisation of money or financial transactions. This evaluation helped identify programs explicitly addressing the nuances of digital financial literacy and behaviour, such as online payments, digital currencies, cybersecurity, and navigating digital financial platforms.

b. 7.1. Expert Interviews – Methodology

In the past phase of our project, we engaged in expert interviews to complement and deepen the insights gained from the literature review. These interviews were designed to provide in-depth, practical perspectives to augment our understanding of how children learned about money in the digital age. The interviews, kept reasonably short (less than 30 minutes), provided an initial overview of the subject rather than detailed discussions.

i. 7.1.1. Selection of Participants

For selecting interview participants, a set of criteria focused on expertise in key areas relevant to our research was employed. The ideal candidates were academics and professionals with extensive knowledge and experience in financial education, digital money, and the application of educational technology. A diverse panel representing a broad spectrum of perspectives in these fields was aimed for.

Participants who were interviewed are:

- Stewart Perry – Director of The Centre for Financial Capability
- Leon Ward – CEO MyBnk
- Louise Hill – Founder and CEO GoHenry
- Adele Atkinson – Professor of Practice in Financial Literacy and Wellbeing, University of Birmingham

ii. 7.1.2. Preparation for Interviews

To ensure effective and meaningful interviews, a semi-structured interview guide based on key themes and questions identified from the literature review was developed. The guide outlined below included open-ended questions allowing for in-depth discussions while covering all relevant topics.

iii. 7.1.3. Background

- Digital money's prominence has significantly increased, especially post-pandemic, becoming the main method for transactions in shops, online, and with banks.
- The 2022 Children and Young People Financial Wellbeing Survey reveals changes in how UK children use cash and digital payments, noting a trend towards digital payments from a young age.
- Key findings include a decrease in cash use among children, with a notable shift to digital pocket money, increased online banking among teenagers, and a rise in online purchases without adult supervision.
- This shift raises questions about the impact of digital money and technology on children's financial learning and the effectiveness of current financial education.

- The lack of extensive research in this area prompts a need to explore available studies from both academic and grey literature in the UK and internationally.
- The review aims to enhance MaPS's evidence base, inform future policies and research, and assess the need for a potential Rapid Evidence Review.

c. 8.1. Interview Questions

1. What are the **key trends** in how children's use of digital payments and online banking is evolving, and how does this impact their financial education needs?
    a. Examples that can be used for deeper discussion:

Money & Currencies: Understanding of forms and value of digital money, digital ways of storing/accessing/handling money

Purchases & Payment: Using digital tools for comparing purchase options, digital payment options (eg buy now pay later)

Financial planning & management:

Using digital tools for comparing financial products / insurance / credit options, planning, budgeting, saving

Awareness of digital finance concepts awareness such as gamification and crypto-assets

Scams & Fraud: Risks of identity theft, rights to personal data protection, usage of security measures

External influences: Identification and understanding influence of advertisements, social media, (f)influencers

2. Could you elaborate on the **primary challenges** you have identified in providing financial education to children in a digital age, particularly regarding the shift from cash to digital transactions?
3. Considering the rapid advancement of digital technologies and their impact on financial transactions, what are the most critical **gaps and areas of focus for future research** in financial education?
    a. Deeper discussion: Are there **specific research questions** that researcher could focus on that would support making financial education in a digital world more effective?
4. What successful **interventions** or programmes have you observed or designed that effectively integrate the concept of digital money into financial education for young people?
    a. Specific programmes:
        i. (*Your organisation*) Supports (*a specific programme*) to children and young people. To what extent does this programme consider the digitalisation of finances?
        ii. Are there any **other plans** for the (your organisation) collaborate with educational institutions, government bodies, and the private sector to enhance the financial education of children and young people, considering the shift towards digital financial transactions?
    b. Are you aware of **programmes from other institutions or other countries** that have successfully incorporated digital financial education into their curriculums? What lessons can be learned from these examples?
    c. How do you **assess the effectiveness** of financial education interventions, especially those aimed at teaching digital financial skills, in

improving children's financial wellbeing?

5. How do you envision the **future of financial education evolving** in response to the continued digitisation of money and financial services?

Post-Interview Process
Upon completion, the interviews were automatically transcribed verbatim. Confidentiality and ethical treatment of the information gathered were ensured throughout, with strict data protection protocols in place to secure all information and access limited to authorized team members only. Participant consent was obtained for the use of their information.

d. 8.2. Definitions

In addition to the concepts and terms defined in the introduction, the literature review highlighted a number of relevant concepts in the context of the digitalisation of money:

Child Financial Exploitation and Abuse (CFE/A): Child Financial Exploitation and Abuse (CFE/A) includes any harm in which finances are used to facilitate child harm, exploitation or abuse by perpetrators. (Public, Parent Zone, 2023).

Child Financial Harm (CFH): Child Financial Harm (CFH) includes any harm caused to a child through the direct loss of money, reputational damage, and/or introduction to financial behaviours which put children, their family or acquaintances at risk. (Public, Parent Zone, 2023).

Children and Young People**:** This term refers to individuals aged 7 to 17 years, and up to 25 years where limited evidence was available. This population spans the late Generation Z and early Generation Alpha cohorts. These age groups are targeted to understand the evolving nature of financial education needs from early years through adolescence. However, the ages and age categorisation varied according to the literature being quoted. Precise age ranges have been included in the review protocol where available.

Co-Shopping: Co-shopping has evolved from a concept of mothers shopping with children to encompass any pair or group shopping together, now extended to online social shopping that enhances interaction, participation, and satisfaction, and can occur non-contemporaneously as individuals take different actions at different times (Williams & Willick, 2023).

Digital Convergence: The enhanced integration and convergence of various activities facilitated by technological advancements, leading to their increased accessibility and interconnection through single platforms or devices (Delfabbro & King, 2023)

Digital Financial Education & Literacy: A subset of financial education that specifically addresses learning about managing finances in a digital world. This includes understanding digital money, using digital tools for financial management, and navigating online financial transactions safely and effectively.

Digital Financial Inclusion: Digital Financial Inclusion refers broadly to the use of digital financial services to advance financial inclusion through the deployment of digital means to reach financially excluded and underserved populations with a range of formal financial services suited to their needs, delivered responsibly at a cost affordable to customers and sustainable for providers (OECD, 2020)

Digital Financial Transactions: Any exchange of money between two or more parties in a digital context. In the context of this review, these may include online purchases, electronic transfers, and mobile payments. The focus is on how the nature of these transactions impacts financial education and learning outcomes.

Digital items: Digital items in games, obtainable through gameplay or purchase, include downloadable content (DLC) for game expansions, emotes for character expressions, and skins to alter character or weapon appearances, blending free and paid options to enhance the gaming experience (Ash et al., 2022).

Digital Natives: Digital natives, primarily consisting of Generation Z and the latter part of millennials, are individuals born between 1995 and the present (which may differ based on the source), distinguished by their inherent familiarity with digital technology from an early age. Characterized by their adeptness at creating, managing, and exchanging digital content, these individuals exhibit preferences for visual communication, instant gratification, and multitasking, and they display significant artistic and technological sophistication, driving research and business strategies to cater to their unique consumption patterns and technological expectations. (Dastane & Haber, 2023)

Digital nudging: Digital nudging leverages persuasive algorithms and software design within digital technologies to influence user attitudes and behaviours towards achieving specific goals, such as healthier lifestyles, greener energy use, or increased purchases. While it offers significant benefits for service providers in shaping consumer behaviour, it also presents a paradox by potentially conflicting with the users' interests, highlighting the dual nature of value creation for both companies and customers (Koskelainen et al., 2021)

Digitisation of Money: Refers to the shift from physical to digital forms of money management and transactions. This includes, but is not limited to, the use of online banking, digital wallets, mobile payment systems, and other electronic payment methods. Digitisation of money encompasses both the tools and platforms used for managing, spending, and saving money digitally.

Fintech: FinTech can be defined as the usage of technology for providing financial services, which includes 1) credit, deposit, and capital raising services; 2) payment, clearing, and settlement services, including digital currencies; 3) investment management, covering trading; and 4) insurance; Blockchain technology forms a crucial part of fintech's technological infrastructure (Thakor, 2020).

FinTech Literacy (FTL): FTL describes the capacity of individuals to recognize fintech products and accurately comprehend and interpret their fundamental functions (Khan et al., 2023)

Gamblification: The incorporation of gambling-like features into gaming, occurring affectively through emotional engagement or normalization, and effectively through the direct addition of gambling behaviours. (Delfabbro & King, 2023)

Loot Boxes: Loot boxes are in-game features that can be earned or purchased, allowing users, often young, to spend money on uncertain outcomes to acquire valuable items, which, if tradable for real money, nearly meet the legal criteria for gambling (Delfabbro & King, 2023)

Impersonation scam: An impersonation fraud occurs when a fraudster approaches an indivudal, masquerading as a trusted individual or entity, and deceiving them into revealing personal and financial details to gain money (UK Finance, 2023).

Kidpreneurship: Kidpreneurship refers to the trend where children leverage accessible technology—such as streaming gameplay, avatars, NFTs, and cryptocurrencies—along with play-to-earn models and user-generated content, to monetize their interests. Utilizing digital skills in website design, playing video games, and obtaining sponsorships or payments from brands for social media promotions, children are increasingly generating income through their digital engagements (Public, Parent Zone, 2023).

Microtransactions: Microtransactions refer to in-game payments for digital items or extra content, with prices ranging significantly for loot boxes and skins, indicating that such transactions can sometimes be substantial. (Ash et al., 2022)

Money Mule: A key mechanism to cash-out the proceeds of fraud against individuals in the public and private sectors is money mule activity. Money mule activity refers to a money laundering process in which proceeds of crime (POC) are moved and transferred through personal and/or business bank accounts (UKFIU, 2023)

Online gaming versus online gambling: Online gambling encompasses regulated casino-style games such as slots, poker, and roulette, where players can deposit, bet, and withdraw real money and which are regulated by the UK Gambling Commission, distinctly separate from the gambling-style mechanics in digital games (for example loot boxes). (Ash et al., 2022)

Online Financial Behaviour: Refers to the actions or practices of children and young people related to managing their finances using digital platforms. This behaviour can include saving, spending, investing, or monitoring financial activities through online banking, shopping online, using financial apps, or participating in online financial communities.

Paid reward systems: Paid reward systems in digital games encompass chance-based loot boxes with randomised in-game items, battle passes offering content through gameplay, season passes with instant access to new items, and in-game currency, both purchasable and earned, affecting gameplay and item acquisition. (Ash et al., 2022)

Reverse socialisation: Research now recognises reverse socialization, where children significantly influence their parents' consumption knowledge, skills, and attitudes, with an increasing focus on the role of children in e-commerce co-shopping decisions, highlighting a shift towards examining intergenerational influences in digital retail environments. (Williams & Willick, 2023)

Social Casino Games: Social casino games simulate traditional gambling activities like poker or slot machines, offering play for credits and rankings while permitting monetary purchases for additional gameplay or features. (Delfabbro & King, 2023)

Money & Pensions Service

Bedford Borough Hall,

138 Cauldwell Street,

Bedford, MK42 9AP

01159 659570

moneyandpensionsservice.org.uk

Money & Pensions Service