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Frameworks for Assessing Digital Parenting Competence: A Review of Global Standards and Their Applicability in Contemporary Technological Environments

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Abstract

The increasing incorporation of digital technologies into home environments has rendered parental digital competence an essential determinant of children's effective and safe participation in the digital environment. This paper examines and contrasts prominent international frameworks for measuring digital competence-most significantly the JISC Digital Capabilities Framework and the European DigComp Framework-against their utility for digital parenting. Central areas like information and data literacy, digital communication, content production, safety, and problem-solving are examined in terms of the roles of parents. The review identifies both the merit and demerit of these frameworks when they are applied to parent-offspring relationships, such as their scope of necessary skills, suitability in a variety of socio-cultural environments, and reactivity to changing concerns of online living. Recommendations are provided for fine-tuning testing instruments to best assist parents in developing digital resilience, critical thinking, and ethical technology use by children in current technological settings.

Keywords: Digital Parenting; Digital Competence; Digital Literacy; Child Online Safety

1. Introduction

The digital transformation process of society has impacted family relationships considerably, positioning parents in the middle as intermediaries of their children's relationships with technology (Mascheroni et al., 2016). With the increasing intensity of children's use of digital media, online learning spaces, and social media, the call for parents to acquire significant digital competence is becoming more urgent (Livingstone & Byrne, 2015). Digital competence, as defined in such frameworks as the European

Commission's DigComp, is critical, confident, and responsible use of digital technologies for learning, professional, and civic aims, combining knowledge, skills, and attitudes across a broad range of areas (European Union, 2022; European Commission, 2019).

Evidence always shows that digitally literate parents are better able to guide, support, and protect their children online, and hence to shape not only their children's digital skills but also their digital safety and well-being (Livingstone et al., 2015; Saçkes et al., 2011; Pons-Salvador et al., 2022). For instance, parents who show higher levels of digital competence are more likely to engage in active mediation—i.e., discuss digital risk and encourage healthy use of technology—while also being better able to handle problems such as cyberbullying, online privacy, and excessive screen use (Cabello-Hutt et al., 2018; Kalinina et al., 2018). On the other hand, limited digital competence among parents can weaken their capacity to supervise, instruct, and empower children to navigate opportunities and risks on the digital platform (Balakrishnan & Charania, 2023; Kalmus et al., 2015).

Socio-demographic factors like parental education level and economic status have been found to impact parental digital competence and the quality of mediation practices, with more educated parents having higher levels of participation and more competent guidance (Livingstone et al., 2015; Tran et al., 2020; Ermakov et al., 2021; Zhang et al., 2024). Parental expectations and regular media use in the home environment play a crucial role in shaping how children learn digital literacy and competence in the home (Mascheroni et al., 2016; Chaudron et al., 2018).

In response to such challenges, several broad frameworks have been constructed to describe, evaluate, and improve digital competence. The DigComp Framework, used extensively throughout Europe and beyond, deconstructs five general domains—information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving—each containing certain competencies pertinent to everyday digital activities (European Union, 2022; European Commission, 2019). The JISC Digital Capabilities Framework also provides a rational method for analysing and developing digital skills in both educational and domestic settings (JISC, 2019). These frameworks have been used across different stages of education and levels of proficiency, highlighting the shift from elementary to advanced digital competencies (European Schools, 2020).

Yet, their relevance and suitability for evaluating digital competence specifically in parents—and for use in the context of current, technology-oriented family settings—are subjects of ongoing research and evolution (UNICEF, 2020; European Union, 2022). With the continuous development of digital technologies, the need to upgrade these models and testing tools arises in order to enhance parents' ability to assist children as digital mediators and coaches (Balakrishnan & Charania, 2023). This article offers an overview of major international frameworks intended to assess digital competence, particularly highlighting their flexibility and applicability with regard to digital parenting. Based on a critical examination of the different domains, strengths, and limitations of these frameworks, the review aims to inform the development of more effective instruments and methods to help parents cope with their evolving roles in a digital society.

2. Overview of Global Digital Competence Frameworks

The rapid development of digital technologies has required the creation of large-scale frameworks for the purpose of defining, assessing, and developing digital proficiency at individual, institutional, and societal levels. These frameworks serve as valuable reference points for education policy, vocational training, and more and more for the support of families in the management of digital settings (Ferrari, 2013). Mentionable are the European DigComp Framework and the JISC Digital Capabilities Framework as the most prominent, both offering structured models for the understanding and measurement of digital proficiency across settings (Vuorikari et al., 2016; JISC, 2019).

2.1 The European Digital Competence Framework

The European Digital Competence Framework for Citizens (DigComp) was originally developed by the European Commission but is now utilized as a broad standard for thinking about digital competence (European Commission, 2019). DigComp specifies five areas of competence as central: information and data literacy, communication and collaboration, creation of digital content, safety, and problem-solving. These are further broken down into particular competencies and levels of proficiency, from foundation to higher levels of ability (Vuorikariet al., 2016). DigComp's modular design makes customizing possible in many situations, including education, employment, and lifetime learning (European Union, 2022). For example, the safety area addresses issues like cybersecurity, privacy, and digital well-being, while the information and data literacy area relate to the ability to find, evaluate, and manage digital information (European Commission, 2019). The flexibility of this framework has made it a part of most national school curricula and training programs, with recent revisions highlighting the use of digital literacy and resilience in family and community contexts (European Schools, 2020).

2.2 The JISC Digital Capabilities Framework

The JISC Digital Capabilities Framework, which was created in the United Kingdom, is a comprehensive framework of digital capability of individuals and organizations, specifically in the education sector (JISC, 2019). The framework is comprised of six areas: ICT skills, information, data and media literacies, digital creation, problem-solving and innovation, digital communication, collaboration and participation, digital learning and development, and digital identity and wellbeing (JISC, 2019). In contrast to DigComp, with its citizen perspective, the JISC model is specifically intended to assist both students and teachers in further and higher education but can be readily modified for use in family and parenting environments (Beetham, 2015). The addition of digital identity and wellbeing is particularly useful to parents since it addresses the necessity of controlling online presence, privacy, and digital health—concerns that are becoming more pertinent to families with children (JISC, 2019).

2.3 Other Important Frameworks

Apart from DigComp and JISC, there are many other frameworks that contribute importantly to the international understanding of digital competence. The UNESCO ICT Competency Framework for Teachers emphasizes the need to include digital skills within the domains of teaching and learning (UNESCO, 2018). The ISTE Standards for Students and Educators focus on preparing both students and educators to thrive in a connected world (ISTE, 2017). Even though these frameworks are primarily for educational practitioners, their underlying principles can also be useful in informing parental guidance and mediation practices, especially in promoting the development of children's digital literacy (UNESCO, 2018; ISTE, 2017).

Comparative examination identifies that, although all frameworks contain shared areas—such as information literacy, communication, and safety—they differ in scope, target audience, and emphasis. DigComp has a modular, citizen-focused approach that is adaptable to parental application, whereas JISC has a more extensive approach with an emphasis on well-being and identity management (Vuorikari et al., 2016; JISC, 2019). The flexibility of these frameworks is paramount in meeting the different and constantly changing needs of families in the modern technological landscape (European Union, 2022).

3. Mapping Parenting Roles to Framework Domains

While global digital competence frameworks like DigComp and JISC were initially created for mass audiences, their scopes can be useful to map to the particular tasks and duties of digital parents (Livingstone et al., 2015). Mapping them not only suggests which digital parenting topics are most important to enable effective digital parenting but also gives practical suggestions for promoting children's safe and productive use of technology (Mascheroni et al., 2016).

3.1 Digital Safety and Wellbeing

Digital safety—privacy, cybersecurity, and wellbeing—is likely the most important area for parents. Protecting personal information, managing digital risks, and the formation of good digital habits are all priority areas, states JISC and DigComp (European Commission, 2019; JISC, 2019). As parents, this includes the use of parental controls, teaching cyberbullying and online fraud, and demonstrating balanced technology use. For example, a parent could review privacy settings on a child's social media accounts regularly and have a conversation with them about the risks of sharing personal details online (Cabello-Hutt et al., 2018).

3.2 Communications and Collaboration

Another important parental duty is assisting children with safe and effective online communication. The communication and collaboration areas of the frameworks include educating children about good online manners, monitoring involvement in online communities, and promoting good habits of communication (Vuorikari et al., 2016; JISC, 2019). An example would be a parent assisting a child in handling group text messages or educating a child on how to report offensive messages (Chaudron et al., 2018).

3.3 Creating Digital Content

Encouraging creativity through responsible content sharing is most vital to the content-creating community. Parents can help children make digital projects, such as videos or presentations, and teach them about copyright, digital footprints, and how their future online sharing impacts them (European Commission, 2019; Kalmus et al., 2015). For instance, a parent might watch a child's YouTube video before uploading and investigate what can be shared on the internet.

3.4 Information and Data Literacy

Helping children to find, evaluate, and use information in the right way is digital parenting. Both models list critical thinking and information evaluation as essential (JISC, 2019; European Union, 2022). In practice, a parent may assist a child in finding something on the internet to do homework on, teaching them how to spot good sources and eliminate misinformation (Livingstone & Byrne, 2015).

3.5 Problem-Solving and Innovation

Parents are frequently relied upon to figure out digital products, learn how to use novel technologies, and help children apply problem-solving in daily life. The frameworks' focus on change and adaptability resonate with how parents assist kids in experimenting with educational apps or debugging technical woes (JISC, 2019; Saçkes et al., 2011). A parent can collaborate with a child, for instance, in solving connectivity issues while taking part in an internet class or developing novel learning networks.

Table 1: Practical Mapping Table

Framework Domain	Parenting Role/Responsibility	Example Scenario
Digital Safety & Wellbeing	Protect, educate, and model healthy digital habits	Setting parental controls, discussing cyberbullying
Communication & Collaboration	Guide and supervise online communication	Helping with group chats, explaining privacy settings
Content Creation	Support creative and responsible digital production	Reviewing videos before posting, discussing digital footprints
Information/Data Literacy	Guide critical evaluation and use of information	Assisting with online research, teaching source credibility
Problem-Solving/Innovation	Troubleshoot and encourage adaptive technology use	Solving device issues together, exploring new educational apps

By linking these spaces to actual parenting situations, digital competence models can then be employed to offer parents-practical advice to ensure that digital parenting is effective as well as evidence-based (Livingstone et al., 2015; European Union, 2022).

4. Relevance to Contemporary Technological Environments

The applicability and usefulness of models of digital competence in parenting must be evaluated against the backdrop of fast-changing technological environments. Contemporary family settings are becoming more typical of smart technology integration, widespread internet access, and the omnipresent availability of digital platforms committed to learning, communication, and entertainment (Chaudron et al., 2018). Under such conditions, the validity of models such as DigComp and JISC depends on their ability to solve the pragmatic issues and possibilities encountered by parents and children in digitally constructed homes (Livingstone et al., 2015).

4.1 Intelligent Homes and Networked Appliances

The arrival of home automation systems, networked devices, and voice assistants added new dimensions to the craft of digital parenting. These new technologies require a parent to acquire not only key digital skills but also digital health, device safety, and data protection in addition to safe use of technology (Mascheroni et al., 2016). Required tools like DigComp and JISC provide advice on information security and digital well-being; however, continuous adaptations are required in order to cope with the complexity brought by smart environments (European Union, 2022).

4.2 Online Education and Online Learning

COVID-19 hastened the world to use online learning platforms and digital learning materials, and digital literacy became critical for children and parents (UNICEF, 2020). Parents have been attempting to manage virtual classrooms, coordinating digital homework, and assisting their children with distance learning—usually without adequate preparation or training (Livingstone & Byrne, 2015). While the DigComp and JISC models cover some of the subjects of some relevance to digital learning and collaboration, there is some need for a more direct inclusion of parental roles in helping children use educational technology (JISC, 2019).

4.3 Digital Communication and Social Media

Children's social media use presents a unique challenge for parents, including moderation of online relationships, monitoring of online trails, and managing cyberbullying incidents or exposure to objectionable material (Cabello-Hutt et al., 2018). Both models' communication and safety components offer key skills for parental mediation, but social media's fluidity requires continuous updating of guidelines and best practice (Kalmus et al., 2015). Additionally, parents must model responsible digital communication and help children grasp the ethical implications of sharing information online (Beetham, 2015).

4.4 Socio-Economic and Cultural Factors

The economic context, cultural beliefs, and technology availability determine the applicability of digital competence frameworks (Tran et al., 2020). For instance, parents and children in low-income or rural areas may be disadvantaged by limited access to digital tools or unstable internet connectivity, thereby impacting the digital competence of parents and children (Balakrishnan & Charania, 2023). Successful use of such frameworks necessitates taking into account such context, thus ensuring assessment tools and interventions are inclusive and equitable (UNICEF, 2020).

4.5 Shifting Frameworks to Parenting Contexts

While DigComp and JISC present a good foundation for measuring digital competence, applying them in parenting contexts needs adjustment. These are the development of parent-focused indicators, the development of real-life situations, and the provision of materials that reflect the actuality of contemporary family life (European Commission, 2019; JISC, 2019). Synergy among educators, policymakers, and technology developers is essential to ensure that these frameworks remain relevant and helpful to parents across various technological contexts (European Union, 2022).

5. Advantages and Disadvantages of Current Frameworks

International digital competence frameworks like DigComp and JISC have played a vital role in digital education policy-making and steering skill development in all sectors (Vuorikari et al., 2016; JISC, 2019). Their organized processes provide a number of benefits to the evaluation and advocacy of digital competence, but they also have some disadvantages in being used directly within the context of parenting.

5.1 Benefits

- One of the key benefits of these models is that they offer a wide range of digital competences coverage. Both DigComp & JISC have a wide range of topics, ranging from information and data literacy, digital communication, content creation, safety, to problem-solving (European Commission, 2019; JISC, 2019). This ensures that users are not only provided with technical skills but also critical thinking, ethical sensitivity, and flexibility, all those abilities needed to cope with today's digital world (Beetham, 2015).
- Another significant strength is their modular and flexible design. The frameworks are flexible, with the ability to be adapted to various contexts, levels of proficiency, and target groups (European Union, 2022). For instance, DigComp provided levels of progression from elementary to high advanced skill, promoting lifelong learning and career advancements (Vuorikari et al., 2016). This adaptability

renders these frameworks viable for use in national curricula, work-based training, and community learning schemes (European School, 2020).

- Furthermore, the emphasis on digital safety and wellbeing is particularly relevant to family parenting. Both models possess areas that encompass privacy, cybersecurity, and digital health, which are vital in families to cope with children's vulnerability to online threat (JISC, 2019; European Commission, 2019). The explicit consideration of digital identity and wellbeing by the JISC model also adds to its family context relevance (Beetham, 2015).

5.2 Limitations

- Despite these advantages, there are some limitations of using these frameworks to assess parental digital competence. One of them is their generic use; most of the frameworks are designed for large groups—citizens, students, or employees—rather than being particularly designed for parents (Livingstone et al., 2015). Therefore, the majority of skills and indicators can perhaps not fully understand the specific challenges and roles of digital parenting, including children's one-of-a-kind online mediation or addressing family-specific digital issues (Mascheroni et al., 2016).
- One such limitation is insufficient contextual and cultural sensitivity. Even though the models are flexible, their intrinsic format might fail to capture well the varied reality that families might encounter in dissimilar socio-economic or cultural environments (Tran et al., 2020). For instance, availability of technology, digital media attitudes by parents, and societal norms for privacy and communication could be different everywhere, thereby impairing the usefulness and validity of standardized evaluation measures (UNICEF, 2020).
- Also, there is a lack of emphasis on real-life parenting situations. There are frameworks available that focus more on discrete digital skills for the individual and less on the intergenerational, collective, and informal learning of digital skills among family members (Kalmus et al., 2015). The frameworks can also be seen as neglecting modeling desirable digital behavior, encouraging open communication, and promoting children's digital resilience (Cabello-Hutt et al., 2018).

Table 2: Strengths and Limitations

Framework	**Strengths**	**Limitations**
DigComp	Comprehensive domains, modular, adaptable, safety focus	Generalized focus, limited parenting-specific indicators, cultural sensitivity issues
JISC	Holistic (includes wellbeing), adaptable, education-oriented	Not tailored to parenting, limited practical family scenarios

In conclusion, although international digital competence frameworks offer worthwhile starting points for evaluating and developing digital competencies, more adaptation and contextualization is necessary to respond to the unique needs of parents in modern technological settings (European Union, 2022; Livingstone et al., 2015).

6. Recommendations

6.1 Develop Parent-Specific Digital Competence Frameworks

Most available frameworks today are citizen-, teacher-, or professionally-oriented but not parent-specific (JISC, 2019; European Commission, 2019). Such frameworks should be tailored such that they capture domains and indicators with clear applications to digital parenting, like parental mediation strategies, co-use, enabling and restrictive mediation, and a trade-off between digital opportunity and internet security (Livingstone & Byrne, 2018). Frameworks, by way of illustration, should integrate competences that involve orienting children's computer use, aiding open discussion around digital life, and demonstrating digital habits (Cabello-Hutt et al., 2018).

6.2 Place in Context to Address Socio-Cultural and Economic Diversity

Parents' digital literacy is influenced by socioeconomic status, cultural values, and access to technology (UNICEF, 2020; Tran et al., 2020). Frameworks need to be adaptive to respond to these variations, providing differential pathways or modules for parents within contexts (e.g., urban/rural, high- vs. low-income contexts). Local adaptation, translation, and cultural sensitivity will help frameworks to become more relevant and accessible (UNESCO, 2018).

6.3 Incorporate Practical Scenarios and Self-Assessment Tools

For increasing usability, scenarios may be enriched with self-assessment tools to cover actual parenting situations—such as managing screen time, preventing cyberbullying, or enabling children's education in the online world (Cabello-Hutt et al., 2018; OECD, 2023). Tools have the potential to offer individualized feedback and learning resources for improvement, thus improving parents' competence and confidence in digital mediation (Beetham, 2015).

6.4 Take Advantage of Technology for Continued Support and Learning

Digital platforms and apps can be created to provide parent-specific digital skill tests, provide personalized suggestions, and connect parents with current sources and peer networks (JISC, 2019; OECD, 2023). The strategy facilitates continuous learning and adjustment with developments in technology to keep parents up on continuously to deal with emerging digital challenges (Livingstone & Byrne, 2018).

7. Conclusion

This review has highlighted the value of strong digital competence frameworks in preparing parents to steer and advise their children towards secure and effective technology use. The DigComp and JISC frameworks are good examples of this, providing good coverage of important domains—everything from information and data literacy to digital communication, content creation, safety, and wellbeing—that are all very applicable to the digital parenting realities. Although these frameworks are flexible and component-based, generalized in focus as they are, they do not adequately address the unique challenges and role of parents in today's technology-saturated family settings. A strong need exists for the establishment of parent-focused digital competence frameworks that include realistic parenting situations, mediation techniques, and

culturally tailored modifications to more effectively serve diverse families. Practice and policy must ensure that parents are engaged in digital literacy programs, family-centered digital tool design, and the incorporation of parental digital literacy into national policy. By doing so, parents will be enabled to be good digital mediators and mentors and to ensure children use technology responsibly, resiliently, and productively.

In the future, more research is needed to further develop and apply digital competence models to parenting environments. There should be future work to create tested assessment instruments specific to the needs of parents and incorporating authentic online parenting dilemmas, as well as ensuring they are inclusive across socio-economic and cultural backgrounds. Educators, technologists, policymakers, and researchers will have to work together to develop dynamic resources and training packages that can keep up with technological evolution and ultimately help families deal with the intricacies of digital life and foster sustainable digital citizenship among young individuals.

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