MASTER THESIS

Financial inclusion and digitalisation: a qualitative research into organisational solutions for financial and digital literacy

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Abstract

Financial inclusion is a crucial tool towards achieving the sustainable development goals (SDGs). The access to a bank account, saving, borrowing and investing opportunities ensure a better financial empowerment of the population which will result in a higher economic growth, reduced poverty and reduced socio-economic inequality, and therefore the achievement of the SDGs. In the last years, the financial sector has become increasingly technology-driven. The rise of digital finance and FinTech positively influence financial inclusion through resolving several barriers to financial inclusion. Therefore, digital finance is a promising opportunity to increase the financial inclusion of the world population, and therefore it can indirectly contribute to the SDGs. However, the financial illiteracy and digital illiteracy of vulnerable customer segments remain barriers that retain people from using (digital) financial services. To support financial inclusion, the negative effects of these barriers should be diminished. The research objective of this research is to discover new insights from MFIs and FinTech organisations about how they address the challenges of financial literacy and digital literacy in their (digital) financial services when striving towards inclusive finance. To fulfil this research objective, an inductive qualitative research has been performed. 12 MFIs and FinTech organisations located in Europe and the United States have been interviewed and the data is analysed based on the Gioia method (Gioia, Corley, & Hamilton, 2013). From the data analysis, it is concluded that the MFIs and FinTech organisations perform teaching, informing and explanation activities to address the challenges of financial literacy and digital literacy. Based on this research and the existing literature, it is concluded that the solutions to improve the financial literacy of the customers are: financial education; easy and personalised information provision and explanation; and the support team. The solutions to address the customers' digital literacy are: the support team; information provision and explanation; and the user experience. This research advises to the MFIs and FinTech organisations to implement these solutions to appropriately address financial literacy and digital literacy to support financial inclusion. Furthermore, this research elaborates upon practical recommendations, research limitations and future research recommendations.

Key words: financial inclusion; digital finance; FinTech; financial literacy; digital literacy; SDGs.

Acknowledgements

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1. Introduction

Even in nowadays society, there are still communities that face everyday deprivations as poverty and inequality. Solving these deprivations through sustainable development is one of the key priorities of the United Nations and the world (Arner, Buckley, Zetzsche, & Veidt, 2020). In the 2030 Agenda for Sustainable Development, the United Nations have constructed 17 Sustainable Development Goals (SDGs) and strategies towards a world with peace, prosperity and growth for all people (United Nations, 2015).

The deprivations for those who are excluded from the financial system can be even worse. Being financially excluded implies that one does not have the ability to access financial services in an appropriate way (Carbo, Gardener, & Molyneux, 2007). In 2017, 31% of the world population did not have a bank account at a formal financial institution, and in the European Union still 9% of the population did not have a bank account (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2018). *Appendix 1* provides more statistics on financial inclusion. Financial exclusion causes the inability to save, borrow, and invest money, and it is a key source for inequality and social exclusion (Carbo et al., 2007; Corrado & Corrado, 2017). Financial exclusion therefore has detrimental outcomes. Its opposite, financial inclusion, can bring several positive outcomes. Financial inclusion can be defined as having access to financial services at affordable terms to all parts of society (Arner et al., 2020; Corrado & Corrado, 2017; Fernández-Olit, Martín Martín, & Porras González, 2019). Financial inclusion can result in a higher economic growth, reduced poverty and reduced socio-economic inequality (Corrado & Corrado, 2017; Demir, Pesqué-Cela, Altunbas, & Murinde, 2020; Ozili, 2018). Her Majesty Queen Máxima, she is special advocate for inclusive finance and development, stated that "access to a wide variety of financial services - such as loans, savings, insurance, payments and remittances - helps to shelter people from the unexpected, generate income, and build assets."(Royal House of The Netherlands, 2010). With these positive outcomes, including underserved communities in the financial system underlies success in several SDGs, examples are 'SDG 1: no poverty', 'SDG 8: decent work and economic growth', and 'SDG 10: reduced inequalities'. Financial inclusion can therefore bring a crucial contribution to sustainable development and it can reduce the deprivations of everyday life (Arner et al., 2020). Increasing financial inclusion has therefore a high priority on the agendas of microfinance institutions, governments and the United Nations (Arner et al., 2020; Mushtaq & Bruneau, 2019; United Nations, 2015).

A development of the last years that has a positive effect on financial inclusion is the rise of digital finance and FinTech. Digital finance and FinTech are innovations that moved the traditional financial sector towards a more digital-driven sector (Gomber, Koch, & Siering, 2017). In the European Union, already 87% of the population has made or received digital payments, and 47% has used their mobile phone or the internet to access financial services, the world averages are respectively 52% and 25%, these percentages are expected to increase the coming years (Demirgüç-Kunt et al., 2018) (*Appendix 1*). With the use of mobile and internet technologies, digital finance and FinTech have the ability to increase the outreach of and access to financial services and diminish several barriers that underserved communities face in becoming financially included (Arner et al., 2020; Demir et al., 2020; Demirgüç-Kunt et al., 2018; Ozili, 2018). Digital finance and FinTech therefore can positively influence financial inclusion, and therewith these innovations have the opportunity to indirectly reduce poverty and inequality, stimulate economic growth and contribute to the SDGs (Arner et al., 2020; Demir et al., 2020).

However, to benefit from the opportunities of digital finance for financial inclusion, its users have to be able to understand and use the new digital financial services. The ability to understand and use digital financial services depends on one's financial literacy and digital literacy (Grohmann, Klühs, & Menkhoff, 2018; Hu, Ding, Li, Chen, & Yang, 2019; Radovanović et al., 2020; Shen, Hu, & Hueng, 2018). Financial literacy can be defined as someone having the knowledge, skills, and ability to make appropriate financial decisions (Arner et al., 2020; Shen et al., 2018). Digital literacy concerns the knowledge and ability to appropriately manage information through digital devices and networked

technologies (UNESCO, 2018). In the European Union, 48% of the population is financial illiterate and 41,7% of the population is digital illiterate (European Commission, 2020; Klapper, Lusardi, & Van Oudheusden, 2015) (*Appendix 1*). For financially excluded people, both financial illiteracy and digital illiteracy can be a barrier to becoming financially included (Arner et al., 2020; Corrado & Corrado, 2015; Demirgüç-Kunt et al., 2018; Fernández-Olit et al., 2019). Because a large part of the population is financially illiteracy and/or digital illiterate which has an impact of financial inclusion, it is essential that these challenges are addressed by financial institutions to minimize their potential negative effects for financial inclusion.

Nevertheless, few is known about the solutions that can be implemented by financial institutions to diminish the negative effects of financial illiteracy and digital illiteracy. The objective of this research is therefore to discover new and useful insights from microfinance institutions (MFIs) and inclusive FinTech organisations about how they address the challenges of financial literacy and digital literacy in their digital financial services. MFIs and inclusive FinTech organisations are selected in the sample because MFIs aim for increasing financial inclusion through offering microfinance to underserved communities (Chen, Chang, & Bruton, 2017; Corrado & Corrado, 2017; Mushtaq & Bruneau, 2019) and FinTech organisations are the forerunners in digital finance developments and make use of disruptive innovative technologies (Gomber et al., 2017). Through a qualitative research the following research question will be answered:

How do MFIs and FinTech organisations address the challenges of financial illiteracy and digital illiteracy in their digital financial services with the aim of inclusive finance?

This research contributes to the existing literature. In earlier research, the relationship between digital finance and financial inclusion has been researched and explained (Arner et al., 2020; Demir et al., 2020; Mushtaq & Bruneau, 2019; Ozili, 2018) and the importance of MFIs for the increase of financial inclusion has been elaborated upon (Chen et al., 2017; Mushtaq & Bruneau, 2019). However, few literature has elaborated upon what inclusive finance organisations (i.e., MFIs and inclusive FinTech organisations) can do to strengthen the relationship between digital finance and financial inclusion by addressing the topics of financial literacy and digital literacy. The research concerning improving financial literacy and digital literacy that has been conducted has not yet matured and mixed findings have been concluded (Fernandes, Lynch Jr, & Netemeyer, 2014; Meyers, Erickson, & Small, 2013; Stolper & Walter, 2017). By researching this topic and proposing solutions to the challenges of financial illiteracy and digital illiteracy, this research will extend the knowledge on financial literacy and digital literacy, their impact on financial inclusion, and the possible solutions to these challenges. Furthermore, this research contributes to the SFIDE project (Strengthening Financial Inclusion through Digitalisation in Europe) conducted by among others the University of Twente.

This research also has practical contributions. This research provides new and useful insights in the challenges of financial literacy and digital literacy, and how this affects financial inclusion. From these insights, practical solutions and recommendations to improve financial literacy and digital literacy will be discussed. Inclusive finance organisation can use these practical and operational recommendations to improve their practices regarding financial literacy and digital literacy to better support financial inclusion.

The continuance of this research paper is as follows. The next chapter concerns the theoretical framework which reviews the existing literature about, financial inclusion, digital finance, financial literacy, and digital literacy. The third chapter concerns the methodology used for the qualitative research and explains how the data is collected and analysed. Chapter four discusses the results from the research. In chapter five these results will be discussed and recommendations and limitations will be stated. Lastly, the research will be ended with a conclusion that will answer the research question.

2. Theoretical Framework

At first, the literature on financial inclusion, and the relationship between digital finance and financial inclusion is reviewed. This literature review functions as background information to understand the dynamics of the main concepts of this research. The literature on financial literacy and digital literacy are reviewed thereafter.

2.1. Financial Inclusion

Financial inclusion and financial exclusion are binary terms referring to one's access to financial services (Fernández-Olit et al., 2019). Financial exclusion can be defined as the inability to access financial services in an appropriate form (Carbo et al., 2007). Whereas, financial inclusion is defined as having access to financial services at affordable terms to all parts of the society (Arner et al., 2020; Corrado & Corrado, 2017; Fernández-Olit et al., 2019). Financial inclusion roughly consists of the following dimensions: account ownership, savings, borrowings, and insurances at formal institutions (Demirgüç-Kunt et al., 2018; Diriker, Landoni, & Benaglio, 2018; Grohmann et al., 2018).

Around the world, it is researched that those who are poor, unemployed, less educated, women, elderly, living in rural areas, or belonging to ethnic or religious minorities are less likely to be financially included (Carbo et al., 2007; Corrado & Corrado, 2015; Demirgüç-Kunt et al., 2018). The most prevalent reasons why people with these social and economic characteristics are more likely to be financially excluded are: financial illiteracy, the costs of financial services and the requirements posed by financial institutions. Being financially illiterate implies that someone has difficulties in appropriately understanding and using financial services (Corrado & Corrado, 2015). The inability to understand financial services is a barrier to financial inclusion because this demotivates and retains people from using financial services (Arner et al., 2020; Ozili, 2018). The costs of financial services are another barrier to financial inclusion. The underserved communities might not have the resources to pay for the costs of financial services, caused by for example low incomes, and therefore they remain unbanked (Corrado & Corrado, 2015; Demirgüç-Kunt et al., 2018). Furthermore, the requirements posed on opening a bank account or acquiring a loan by the financial institutions can be a barrier to financial inclusion. Financial institutions prioritize maximizing the shareholder value and profits, which causes that underserved communities are less attractive to be served by the financial institutions because these segments result in lower marginal profits (Carbo et al., 2007). The customer segmentation towards higher profit segments therefore causes exclusions in marketing, access requirements and unfavourable conditions to financial services for underserved communities (Carbo et al., 2007). When the underserved communities do not fulfil the requirements of the financial institutions, examples are credit checks, document requirements and a minimum income, then access to these financial services will be rejected (Corrado & Corrado, 2015; Demir et al., 2020). Other explanations for financial exclusion are a lack of an appropriate financial infrastructure, distrust in financial institutions, convenience in cash and voluntary financial exclusion (Corrado & Corrado, 2015; Demir et al., 2020).

Financial exclusion and financial inclusion both have a different impact on a person's well-being. Financial exclusion implies the inability to save, borrow and invest money, and to get an insurance, which can result in poor financial management and financial distress. This can cause difficulties in integrating in the society, both socially and economically, and it is a key source for inequality, social exclusion and poverty (Carbo et al., 2007; Corrado & Corrado, 2017).

The impact of financial inclusion on peoples' well-being is more beneficial. At first, the ability to save money at a financial institution makes people more resilient to macroeconomic shocks because their savings can compensate as a safety net in times when, for example, an income loss is experienced (Carbo et al., 2007). Furthermore, savings provide opportunities to make investments in education or pensions, which has impact on someone's long-term financial planning (Arner et al., 2020; Ozili, 2018). Second, being able to borrow from financial institutions facilitates opportunities to invest in education

or to set up an own business with which income can be generated. Borrowings therefore stimulate the educational opportunities and entrepreneurial activities of underserved communities (Arner et al., 2020; Demir et al., 2020; Ozili, 2018). Third, underserved communities, who are highly vulnerable, can get an insurance when they are financially included. This ensures that people can better handle and stabilise macroeconomic shocks and it is an opportunity to diversify long-term risks (Arner et al., 2020).

From the opportunities of financial inclusion as mentioned above, is can be concluded that financial inclusion has the power to create job opportunities, boost incomes, create educational opportunities, handle macroeconomic shocks, diversify risks, and build pensions. On the long-term, these outcomes will result in higher economic growth, reduced poverty, lower socio-economic inequality, and improved financial well-being, both on the individual- and macro-level (Arner et al., 2020; Corrado & Corrado, 2017; Demir et al., 2020; Ozili, 2018). Therefore, financial inclusion can be seen as a key driver towards the achievement of the SDGs (Arner et al., 2020; Demirgüç-Kunt et al., 2018).

2.2. Digital Finance and Financial Inclusion

In the last years, many innovations towards digitalisation and the use of technologies have occurred in the financial sector. The development towards digital finance and FinTech is perceived as an opportunity that can be beneficial on the road towards financial inclusion and sustainable development (Arner et al., 2020; Demir et al., 2020; Mushtaq & Bruneau, 2019; Ozili, 2018).

Digital finance is a broad umbrella term that encompasses the widespread digitalisation of the financial industry and it can be defined as "all products, services, technology and/or infrastructure that enable . . . access to payments, savings and credit facilities via the internet (online) without the need to visit a bank branch" (Ozili, 2018, p.330). This ranges from credit cards and ATMs to home banking and mobile app services (Gomber et al., 2017). The digitalisation of the financial industry is an ongoing development. New innovations are regularly introduced and digital financial services are increasingly transforming the financial sector. The newest innovative technologies within digital finance that have disruptive potential are often called FinTech solutions. FinTech, the abbreviation of financial technology, can be defined as the connection of new and innovative internet-related technologies with established financial services to offer these financial services in innovative ways (Gomber et al., 2017; Lee & Shin, 2018). Examples of technologies are blockchain, NFC, Big Data, machine learning and open banking (Gomber et al., 2017; Lee & Shin, 2018).

Research has been conducted to discover the effects of digital finance on financial inclusion and the SDGs. Ozili (2018) researched the relationship between digital finance and financial inclusion, Arner et al. (2020) and Demir et al. (2020) both analysed the effect of FinTech on financial inclusion and respectively its effect on income inequality and the SDGs. Mushtaq and Bruneau (2019) researched the relation between ICT, mainly mobile phone penetration, on financial inclusion and inequality. These papers all concluded that digital finance, which encompasses FinTech and mobile phone penetration, has a positive effect on financial inclusion, and that digital finance has an indirect effect on the achievement of the SGDs and the reduction of poverty and income inequality through its positive effect on financial inclusion. However, the strength of these relationships is contingent upon the country, income level, degree of income inequality and economic development. These relationships indicate that digital finance is an important opportunity towards financial inclusion and the achievement of the SDGs (Arner et al., 2020; Demir et al., 2020; Mushtaq & Bruneau, 2019).

The Global Findex of 2017 also underpinned the opportunity of digital technology for financial inclusion, they state that "mobile phones and the internet could go a long way toward helping to overcome some of the barriers that unbanked adults say prevent them from accessing financial services" (Demirgüç-Kunt et al., 2018, p.91). Digital finance can overcome several barriers to financial inclusion. First, digital finance makes is possible to access financial services via a digital device with internet access, this increases the outreach and availability of financial services to everyone with internet access (Demir et al., 2020; Mushtaq & Bruneau, 2019; Ozili, 2018). This substantially decreases

the distance between the people and their financial services from the nearest financial institution to one's mobile phone or personal computer. Therefore, digital finance diminishes the barrier regarding the distance to the financial institutions. Second, the costs of making and receiving payments decreases when digital finance is used, this limits the barrier of restraining from financial services due to the costs (Demirgüç-Kunt et al., 2018; Ozili, 2018). The costs of financial services are decreased by among others increased efficiency and automation and reduced paper work. Third, digital finance has the ability to provide convenience to the users as the efficiency and speed of making payments is increased as this can be done with one's own digital device at any time of the day (Demirgüç-Kunt et al., 2018; Ozili, 2018). Also, digital finance can improve the security of making payments because there will be less cash circulation and therefore less 'bad money' and corruption (Demirgüç-Kunt et al., 2018; Ozili, 2018). The improved convenience and security of the financial services can increase peoples' trust in financial institutions.

Apart from the positive outcomes, there is also a risk that can arise due to the increasing influence of digital finance. When digital financial services are implemented, it is required that the users have the appropriate skills to understand and use the new technologies (Demirgüç-Kunt et al., 2018). When people are not able to understand or use the digital technologies due to, for example, the complexity of the technology or low numeracy skills, then the users are digital illiterate (Demirgüç-Kunt et al., 2018; Mushtaq & Bruneau, 2019; Ozili, 2018). Digital illiteracy will withhold underserved communities from using digital financial services. Digital illiteracy will therefore, even as financial illiteracy, be a barrier towards financial inclusion, especially when an increasing number of financial services are arranged digitally (Demirgüç-Kunt et al., 2018; Ozili, 2018).

2.3. Client-Knowledge Challenges to Financial Inclusion

As can be concluded from the previous chapters, financial illiteracy and digital illiteracy are two client-knowledge barriers (i.e., inherent to the users of financial services) that arise due to a lack of peoples' knowledge about financial services and digital technologies. To achieve the best results out of digital financial services for the increase of financial inclusion, the digital financial services have to be tailored to the needs of underserved communities (Demirgüç-Kunt et al., 2018). Therefore, it is important that the barriers experienced by underserved communities (i.e., financial illiteracy and digital illiteracy) are addressed by financial institutions to gain the best benefits from digital finance for financial inclusion. In the sections below, the concepts of financial literacy and digital literacy are further elaborated to point out their importance and role in digital and inclusive financing.

2.3.1. Financial Literacy

Financial literacy can be defined as the knowledge, skills and ability to independently make informed financing decisions about financial planning, wealth accumulation, and debt and pension issues resulting in financial well-being (Arner et al., 2020; Lusardi & Mitchell, 2014; Shen et al., 2018). Financial literacy not only concerns the understanding of financial services, but also includes one's ability and confidence to use their financial knowledge to make financial decisions (Huston, 2010).

Whether someone is financially literate is often indicated by one's knowledge and understanding about risk diversification, inflation, compound interest and numeracy related to interest rates (Klapper et al., 2015; Lusardi & Mitchell, 2014; Stolper & Walter, 2017). To appropriately use financial services, one should have at least a basic knowledge on all these four dimensions of financial literacy. At first, understanding risk diversification implies understanding the risk differences between, for example, investing in one stock and investing in a portfolio of stocks. Inflation knowledge implies understanding the effects of price and income increases on buying power. To understand compound interest, one should understand the effect of cumulative interests on savings. Lastly, numeracy related to interest rates concerns the ability to calculate interest payments on loans (Huston, 2010; Lusardi & Mitchell, 2014).

There are several antecedents of financial literacy. Someone's demographic, socio-economic, personal and cultural characteristics have influence on the degree of financial literacy (Goyal & Kumar, 2021; Lusardi & Mitchell, 2014). Especially age, gender, ethnicity, income, employment status and geographical characteristics have effect on financial literacy (Lusardi & Mitchell, 2014).

On the other side, someone's level of financial literacy has impact on their day-to-day financial management skills (Lusardi & Mitchell, 2014). A low financial literacy, but making use of financial services, can cause high cost borrowings, less accumulated wealth, costly credit card behaviour and insolvency, which is caused by wrongly decision making and will result in financial distress (Klapper et al., 2015; Lusardi & Mitchell, 2014). A higher level of financial literacy has a positive influence on financial planning decisions, borrowing decisions, investment decisions, and financial well-being, facilitated through the knowledge on the dimensions of financial literacy (Goyal & Kumar, 2021).

As explained in the chapters above, financial illiteracy can be a barrier to financial inclusion, because the lack of knowledge demotivates and restrains people from using financial services (Arner et al., 2020; Corrado & Corrado, 2015; Demirgüç-Kunt et al., 2018; Fernández-Olit et al., 2019; Ozili, 2018). Several researchers have concluded that financial literacy has a positive influence on financial inclusion (Grohmann et al., 2018; Shen et al., 2018). Grohmann et al. (2018) researched the effect of financial literacy on financial inclusion. The research took into account different levels of financial depth, which concerns the available financial infrastructure. This research found that financial literacy has a positive effect on financial inclusion at all circumstances, controlling for financial infrastructure, financial institutional characteristics and country. At the lower levels of financial depth, financial literacy functions as a substitute of the financial depth, while at higher levels of financial depth, financial literacy becomes a complementary factor (Grohmann et al., 2018). Shen et al. (2018) also discovered the positive relationship between financial literacy and financial inclusion. Next to researching the effect of financial literacy on financial inclusion, they also analysed the effects of digital financial product use, which is the use of digital financial services, and internet usage, on financial inclusion. This research concluded that digital financial services and internet usage together mediate the positive relationship between financial literacy and financial inclusion. This can be explained by internet usage promoting the use of digital financial services through its power to increase the outreach of digital financial services, and digital financial services being the means by which people become financially included (Shen et al., 2018).

All in all, it can be concluded that a higher financial literacy will result in a higher financial inclusion. This positive effect can be explained by an increased knowledge and consciousness about financial behaviour which is necessary for appropriate financial decision making and the use of financial services (Grohmann et al., 2018; Oggero, Rossi, & Ughetto, 2020). Therefore, financial literacy is essential for appropriate financial behaviour and financial decision making. Financial literacy should, for that reason, be increased to stimulate higher financial inclusion and improved financial management (Goyal & Kumar, 2021; Grohmann et al., 2018; Shen et al., 2018).

2.3.2. Digital Literacy

Digital literacy is defined as "the ability to access, manage, understand, integrate, evaluate and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life" (UNESCO, 2018, p.21). Individuals lacking the skills to appropriately understand and use digital devices and networked technologies are digital illiterate.

To have a basic level of digital literacy, one has to have at least a basic understanding on all four digital competencies dimensions: information processing skills, communication skills, problem solving skills and software skills for content manipulation (Eshet-Alkali & Amichai-Hamburger, 2004; European Commission, n.d.-a). The information processing skills refers to one's ability to identify, locate, organise and analyse digital information based on its relevance and purpose. Communication skills refer to the ability to communicate, interact, and share resources with communities in digital environments. Problem solving skills concerns one's understanding and skills in identifying digital needs and resources, making informed decisions and solving conceptual problems through digital

means. Also, the creative use of technologies, solving technical problems, and improving one's competencies comply to the problem-solving skills. Lastly, software skills for content manipulation concern the ability to create and edit new content, produce creative expressions, media outputs and programming, and deal with intellectual property rights (European Commission, n.d.-b).

Someone's digital skills are strongly influenced by socio-demographic characteristics, for example age, educational level and employment status (European Commission, 2020). But also, numeracy skills of users and the complexity of the technology have influence on one's digital skills (Demirgüç-Kunt et al., 2018; Mushtaq & Bruneau, 2019; Ozili, 2018). The differences between digital knowledge have caused a digital divide between the people that are able and people that are not able to access technology, which increases the inequality between communities (Radovanović et al., 2020). Improved digital literacy of people and communities is necessary to bridge this digital divide. Improved digital literacy contributes to improved digital inclusion, meaning that more people will use technology and digital devices, and it therefore indirectly improves peoples' social empowerment (Radovanović et al., 2020).

Digital finance is crucial for an appropriate understanding and use of digital technologies (Demirgüç-Kunt et al., 2018; Mushtaq & Bruneau, 2019; Ozili, 2018). Due to the development in the financial industries, financial services are more and more facilitated through the use of digital finance. Therefore, a basic level of digital literacy becomes increasingly important to understand and use digital financial services and to make appropriate financial decisions (Demirgüç-Kunt et al., 2018; Gomber et al., 2017; Mushtaq & Bruneau, 2019). Thus, digital literacy becomes more important on the road towards financial inclusion through digital financial services.

2.4. Conceptual Framework

From *2. Theoretical Framework*, it can be concluded that digital finance has a positive effect on financial inclusion. Two challenges that influence this relationships are the customers' financial literacy and digital literacy.

The objective of this research is to discover new and useful organisational solutions that inclusive finance organisations (i.e., MFIs and FinTech organisations) can implement to improve the financial literacy and/or digital literacy of underserved communities for the sake of increasing financial inclusion. These solutions should diminish the negative consequences that financial illiteracy and digital illiteracy can have on the relationship between digital finance and financial inclusion. To fulfil this research objective, inductive qualitative research will be conducted that aims to discover the organisational solutions to financial literacy and digital literacy.

Figure 1 visualises the conceptual framework including relationships concluded from the *2. Theoretical Framework* and the research model for the empirical researcg. In *3. Methodology*, the methodology of the empirical research will be explained. The sample, data collection, operationalisation and data analysis will be elaborated upon.
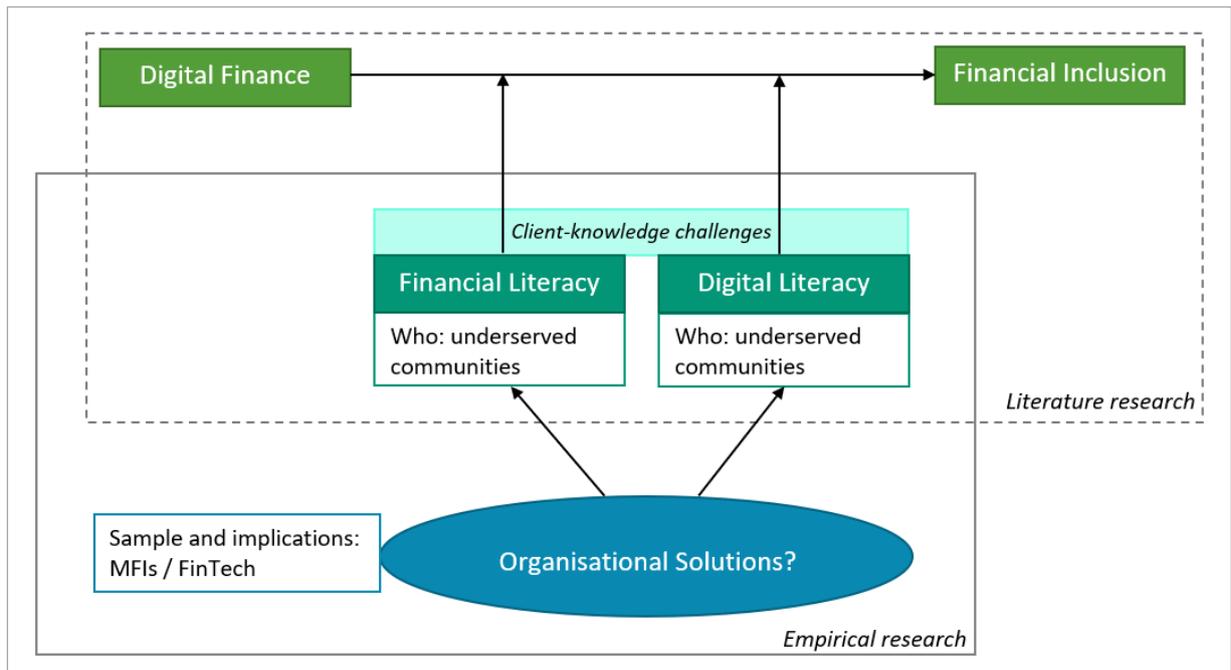
Figure 1: *Conceptual framework and research model*

3. Methodology

3.1. Sample

The data is collected from a sample existing of 12 inclusive finance organisations, of which the headquarters are located in 8 different countries. In total, 20 organisations have been reached out to, the response rate towards scheduling an interview is 60%. The selected sample exists of 7 MFIs and 5 inclusive FinTech organisations, at each organisation, one interview with a representative of the organisation has been conducted. **Table 2** gives an overview of the sample. No company names et cetera are mentioned that can link the data back to the interviewed organisation, because the data collected from the inclusive finance organisation are all treated as confidentially.

Microfinance institutions (MFIs) are included in the sample due to their important contribution to increasing financial inclusion. MFIs provide microfinance, which concerns the provision of small amounts of credit and inclusive financial services, specifically to people who are ignored by the commercial banks (Diriker et al., 2018; Mushtaq & Bruneau, 2019). The main financial services that MFIs in Europe provide are business loans, personal microloans, SME loans, and savings products (Diriker et al., 2018). Next to financial services, two-third of the MFIs also offer non-financial support to guide their clients in their development (Diriker et al., 2018). With the financial and non-financial services, MFIs increase the financial inclusion of underserved communities and stimulate people to perform more entrepreneurial and income generating activities, and it therefore has the opportunity to boost incomes, generate economic growth, and contribute to sustainable development (Chen et al., 2017; Mushtaq & Bruneau, 2019).

Furthermore, FinTech organisations are included in the sample because they are often seen as the forerunners for digital finance. Inclusive FinTech organisations use disruptive and innovative technologies to offer their financial services and strive for an inclusive goal (Gomber et al., 2017; Lee & Shin, 2018). Because the FinTech organisations have the opportunity to transform the financial industry, it is expected that interesting insights can be extracted from the FinTech organisations regarding the use of digital finance and their activities towards financial literacy and digital literacy.

The MFIs and FinTech organisations that are included in the sample (as presented in **table 2**), are selected because these organisations adhere to the selection criteria that were set up before determining the sample. The selection criteria (**table 1**) are developed to ensure that the sample aligns with the topic and goals of this research. For example, it is important that the sample strives to inclusive goals, offer financial services to businesses or individuals, serve underserved communities (MFIs) or make use of innovative technologies (FinTech). The inclusive finance organisations selected in the sample comply with the selection criteria, and are therefore suitable to research for this paper.

This qualitative research takes an overarching point of view in analysing the experiences of the sample regarding the key concepts of this research to analyse the status quo of the inclusive finance industry and to extract recommendations towards the challenges of financial illiteracy and digital illiteracy. Therefore, the sample is selected to present a broad range of inclusive finance organisations in order to extract diverse solutions to the challenges of financial literacy and digital literacy. For that reason, the organisations in the sample are located in different countries and the division between MFIs and FinTech organisations is almost equal.

Table 1: Selection criteria for MFIs and FinTech organisations

Sample	Selection criteria
The MFIs should:	target underserved communities as their customer segment;
	focus on increasing the financial inclusion of underserved communities;
	strive to sustainable and social outcomes;
	provide borrowing, savings, investment and/or bank account financial services, either for personal and/or entrepreneurial outcomes.

The FinTech organisations should:	target individual consumers or small enterprises;
	prioritize the customer by, for example, striving to ease the use of financial services for the customers;
	strive to social and/or inclusive goals, or strive towards the SDGs;
	provide financial services related to borrowings, savings, investments, provision of bank accounts, and/or financial management;
	offer their financial services to the customers digitally and with the use of innovative technologies. The customers make use of these technologies to access and use the financial services.

Table 2: Overview of selected sample of inclusive finance organisations

No.	MFI / FinTech	Country of HQ/ representative	Financial services
1.1	MFI	Romania	Business microloans for small enterprises.
1.2	MFI	Greece	Business microloans for entrepreneurs and non-financial support.
1.3	MFI	Bosnia and Herzegovina	Business and personal microloans to consumers.
1.4	MFI	Romania	Microloans to farmers and small businesses.
1.5	MFI	The Netherlands	Business microcredit to SMEs, and non-financial support.
1.6	MFI	France	Microcredit and micro-insurance to entrepreneurs and individuals, and non-financial support
1.7	MFI	Italy	Business loans, personal loans, and insurances to entrepreneurs and families/individuals.
2.1	FinTech	United Nations / United Kingdom	Invoice financing platform for SMEs.
2.2	FinTech	United States	Data-driven financial management tools for SMEs.
2.3	FinTech	Sweden / The Netherlands	Open banking platform with data-driven user experience solutions to financial institutions.
2.4	FinTech	The Netherlands	Data-driven financial management tool for personal usage.
2.5	FinTech	The Netherlands	Easy money investing through the app for consumers.

3.2. Data Collection

The goal of the data collection is to collect information from the inclusive finance organisations included in the sample about the concepts visualised in the research model (**figure 1**) to formulate an answer to the research question.

The data is collected by conducting semi-structured interviews with the representatives of the MFIs and FinTech organisations. Semi-structured interviews are perceived as an appropriate form for the data collection of this research for the following reason. The aim of this research is to discover diverse and new insights about how MFIs and FinTech organisations address financial illiteracy and digital illiteracy in their digital financial services. To achieve this, a flexible data collection method is required in which a broad range of topics can be discussed. A qualitative semi-structured interview is a data collection method that allows dialogue and spontaneous answers from the respondents, this facilitates gaining new and surprising insights that can be used to answer the research question (Kallio, Pietilä, Johnson, & Kangasniemi, 2016). Furthermore, the questions of semi-structured interviews guide the data collection towards the main themes, but leave space for other discussion points (Kallio et al., 2016). Therefore, semi-structured interviews allow for flexible data collection, which fits with the aim of the research.

The semi-structured interviews will be conducted based on a qualitative interview protocol, which is a procedural guide for the interview process to ensure rigorous and trustworthy qualitative data collection (Jacob & Furgerson, 2012; Kallio et al., 2016). The interview protocol will include communication guidelines prior to the interview, a script for the beginning and the end of the interview, and the predetermined interview questions. The interview protocol is developed based on *2. Theoretical Framework*, the research model and the papers of Jacob and Furgerson (2012) and Kallio et al. (2016). The interview protocol is included in *Appendix 2*.

The predetermined interview questions (**table 3**) concern the main concepts of the research, which are elaborated upon in section *3.4. Operationalisation of Concepts*. The interview questions are open-ended and expansive to give the respondent freedom in responding to the questions. Next to the interview questions, some prompts are stated to keep the interview on the right track (Jacob & Furgerson, 2012). Follow-up questions will be determined and asked ad hoc to deepen the conversation and to gain more clarification and information (Kallio et al., 2016). In this way, the interview protocol facilitates freedom for the respondent in answering the questions as such that many interesting topics can be discussed, but on the other side, the interview protocol ensures that the interview is guided to all important concepts for complete and thorough data collection. After the first couple of interviews, the interview protocol will be evaluated and revised where necessary to improve the data collection of the interviews.

3.3. Operationalisation of Concepts

The operationalisation determines how the concepts of this research will be measured during the data collection. The concepts are operationalised by the interview questions (**table 3**), which are developed based on the definitions and dimensions of the concepts conceptualised in *2. Theoretical framework*. The interview questions are developed with the aim to collect all data that is necessary to answer the research question.

The operationalised concepts are: the business model, financial inclusion, digital finance, financial literacy, digital literacy. The operationalisation of these concepts is elaborated upon in the next sections, and **table 3** displays the pre-determined interview questions and the pre-determined prompts. Between the MFIs and FinTech organisations, there are some minor differences in the interview questions based on the relevancy of the concepts, these differences are indicated in **table 3**.

3.3.1. Business Model

The business model of an organisation states what the goals of an organisation are, which problems it is solving, what products or services are offered, how value is created and how money is generated (Osterwalder, Pigneur, & Tucci, 2005). In the interview, some questions will be asked about the problems the organisation is solving, the products or services that are offered, the value proposition, the customer segments, and the strategy and mission. These questions are asked gather information about the activities that are performed, and why and how this is done. The other elements of the business model, for example the cost and revenue structure, are not asked about due to a lower relevance for this research.

3.3.2. Financial Inclusion

The questions on financial inclusion are asked to collect information about how the MFIs contribute to the increase of financial inclusion. The interview questions are therefore arranged to gather data about how the products or services of the organisation contribute to or affect the financial inclusion of the customers segments. These questions are only asked to MFIs, because the FinTech organisation do not necessarily have to focus on financial inclusion.

3.3.3. Digital Finance

The interview questions on digital finance aim to collect information about the technologies used on the customer-side of the organisation. These questions are asked to determine the degree of

digitalisation in the organisations and to gather data about the role of digital technologies in providing financial services. The data should explain how the technologies work, how the customers interact with the technologies and how the technologies effect the usage of financial services.

3.3.4. Financial Literacy

The interview questions regarding financial literacy are asked to understand how the organisations address the challenges of financial literacy and to extract organisational solutions to financial illiteracy. These interview questions are directed to the activities undertaken by the organisations to either: improve the customers' understanding of financial services, ease the use of financial services, or limit the negative effects of financial illiteracy. The interview questions also aim to discover the connection of financial literacy to digitalisation and financial inclusion.

3.3.5. Digital Literacy

The data collection regarding digital literacy is directed on collecting information about the activities undertaken by the organisations to improve the digital literacy of the customers or to ease the use of digital technologies. Further, the interview questions aim to discover the relationships between digital literacy and digital finance and financial inclusion. These questions are asked to collect insights about the solutions implemented by the organisations to address the customers' digital literacy.

Table 3: *Interview questions and prompts for MFIs and FinTech organisations*

Concepts	Interview questions and prompts	Sample
1. Business model	What products and services does the organisation offer to their customers to create and deliver value? o Product usage; o Customer segments; o FinTech: customer problem statement.	MFIs and FinTech
2. Business model	What are the strategy and mission of the organisation? o Goals the organisation strives for.	MFIs and FinTech
3. Financial inclusion	How do the services offered by the organisation contribute to increasing financial inclusion? o Dimensions of financial inclusion.	MFIs
4. Financial inclusion	What (other) activities and initiatives are offered by the organisation to increase financial inclusion? And how?	MFIs
5. Digital finance	What technologies are implemented/used by the organisation that are used or experienced by the customers? o Customer interaction; o Functionalities of the technologies; o FinTech: innovative technologies.	MFIs and FinTech
6. Digital finance	How are these technologies related to the financial services that the organisation offers to the customers? o Connection between financial services and technologies.	MFIs and FinTech
7. Financial literacy	What activities are undertaken by the organisation to increase the financial literacy of their customers? And how? o Activities to improve or support the financial knowledge/ understanding of the customer; o Activities to ease the use of financial services; o Connection to financial services; o Knowledge gained by the customer through these activities.	MFIs and FinTech
8. Financial literacy	What is the role of technology in the activities of the organisation to increase financial literacy? And how?	MFIs and FinTech
9. Digital literacy	What activities are undertaken by the organisation to increase the digital literacy of their customers? And how?	MFIs and FinTech

	o Activities to improve or support the financial knowledge/ understanding of the customer;	
	o Activities to ease the use of financial services;	
	o Connection to financial services;	
	o Knowledge gained by the customer through these activities.	
10. Digital literacy	What is the role of technology in the activities of the organisation to increase digital literacy? And how?	MFIs and FinTech

3.4. Data Analysis

The data analysis of this research is conducted based on the Gioia method (Gioia et al., 2013). The Gioia method is an inductive qualitative research method with which rigorous qualitative research can be conducted (Gioia et al., 2013). This method includes the development of a data structure concerning first order concepts, second order themes, and aggregate dimensions. The themes and dimensions extracted from the data are presented in a graphical model that visualises the dynamic relationships between the themes, dimensions and key concepts of the research (Gioia et al., 2013).

The Gioia method is perceived as a suitable data analysis method because the purpose of the Gioia method aligns with the aim of this research. The Gioia method is an inductive research method that aims to develop new concepts that provide new and interesting insights into the topic that is researched (Gioia et al., 2013). This research aims to discover insights about the challenges of financial literacy and digital literacy and the organisational solutions that can be recommended to inclusive finance organisations. Therefore, the data analysis method of this research should allow discovering and researching new insights, which aligns with the Gioia method.

For the data analysis based on the Gioia method, several steps have to be undertaken (Gioia et al., 2013). At first, all the interviews are transcribed, i.e., the recordings are transformed into text. The data is then coded, which is done by highlighting quotations in the transcript and connecting a code, existing of a couple key words, to the quotations. Thereafter, the extensive list of initial codes is reviewed on, among others, relevance and duplicates. After merging, deleting or renaming some codes, the first order concepts are concluded, which are a broad range of concepts that adhere to the terms of the representatives. The next step is searching for similarities and differences among the first order concepts to determine the second order themes. The second order themes indicate the topics that are discussed in the interviews. With the set of second order themes, it is investigated how these themes can be further distilled in aggregate dimensions. The aggregate dimensions describe and explain the main topics that are observed and discussed in the data collection. The concepts, themes and aggregate dimensions are presented in a data structure that presents the data in a graphical manner, and which visually explains how the raw data is transformed into themes and dimensions.

After developing the data structure, a graphical model will be developed regarding the organisational solutions to financial literacy and digital literacy. This model is a 'boxes-and-arrows' representation of the interrelationships between the second order themes, aggregate dimensions and key concepts of the research. This model makes the relationships transparent and describes the phenomenon of interest (Gioia et al., 2013).

The data structure and graphical model are presented in *4. Results*, together with an explanation of the results extracted from the data collection and data analysis. Thereafter, the data will be connected to the existing literature in *5. Discussion* to formulate an answer to the research question and to fulfil the research objective.

4. Results

Based on the data collection and data analysis, the data structure presented in **figure 2** is developed. The first order concepts have been distilled to 30 second order themes and 12 aggregated dimensions. In the subparagraphs of this chapter, the data structure will be explained and elaborated upon to present the results of the data collection and analysis. The aggregated dimensions guide the main story, but are complemented by the second order themes, first order dimensions and quotations to provide a complete story on the results. The subparagraphs concern: the business model and financial inclusion; digital finance; financial literacy; and digital literacy.

4.1. Business Model and Financial Inclusion

In this section, the customer segments, problem statements, value propositions and financial services of the inclusive finance organisations are elaborated upon (**figure 2**). Also, the contribution of the MFIs to financial inclusion is stated. The MFIs are discussed at first, thereafter the FinTech organisations.

The MFIs in the sample target customer segments that are financially excluded, vulnerable and/or in financial need. These customer segments range from new and existing entrepreneurs, SMEs and farmers to minority groups, individuals in financial distress, and individuals with a low income.

The MFIs state one main problem that these customer segments are facing. For the commercial banks, the small amounts of loans and borrowings of the underserved customer segments are not financially feasible, because of the profit maximalisation focus of the commercial banks. The costs of granting a loan of €100.000 or €10.000 are equal, the revenues of granting small loans then do not outweigh the costs. Therefore, the commercial banks do not target these customer segments and have set access requirements in place, for example track records, positive revenue and risk scoring, which result in these customer segments not being qualified for the financial services, and therefore being excluded (**quote 1**). This constraint is also recognized in the existing literature (Carbo et al., 2007; Corrado & Corrado, 2015; Demir et al., 2020). Other causes of financial exclusion mentioned by the MFIs are convenience in cash, especially in rural areas, and distrust against (digital) financial services.

> **Quote 1** (MFI 1.2): "The mainstream banking system does not provide any financial instruments for financial needs up to €25.000. So, if there is even an existing organisation who wants a small working capital loan of €20.000, they will be rejected by the mainstream banking system. So, there is absolutely no alternative for small amounts to be serviced in the economy. There is absolutely no other alternative financial instrument, let alone, the banks do not have such small loans on their radar."

The MFIs are established to solve the problem of financial exclusion by providing an alternative to the underserved customer segments. By providing access to financial services to the customer segments that are financially excluded, the MFIs strive to financial inclusion (**quote 2**) and stimulate people to generate additional income, either through job creation, self-employment, or becoming an entrepreneur (**quote 3**). On the aggregate level, the mission of the MFIs is to create positive economic and social impact for and financial empowerment of the vulnerable groups of the population.

> **Quote 2** (MFI 1.7): "The mission is to reach as many unbankable as possible and let them reach social inclusion throughout financial inclusion."

> **Quote 3** (MFI 1.6): "The mission is to make entrepreneurship available for those who have an idea but do not necessarily have the diplomas or the financial means to do so."

The MFIs achieve these value propositions through offering their financial services to underserved and financially excluded customer segments. All MFIs in the sample offer business microloans that can be used to develop or grow a business, which generates additional revenue. To a lesser extent, the MFIs also provide (1) personal microloans to improve the quality of life or to generate additional income; (2) micro-insurances, which are connected to the microloans; and (3) non-financial services to educate people about financial services and business development.

| First order concepts	Second order themes	Aggregate dimensions
Problem statement Solution Value proposition Customer outcomes	Organisational value proposition	Business model and financial inclusion – Goals of the inclusive finance organisations
Mission Strategy	Organisational mission	
Banking system exclusion Exclusion in rural areas Exclusion through distrust	Financial exclusion – Causes	
Importance of financial inclusion Financial inclusion – Minority segments Financial inclusion – Opportunities in banking system	Financial inclusion – Outcomes	
New and existing entrepreneurs People in financial distress Minority groups	Customer segments	Business model – Financial services offered to the customer segments
Bank account Business loans Personal loans Insurances Investing	Financial services – Financial inclusion dimensions	
Financial management Open banking Invoice financing	Financial services – Financial management tools	
Digital finance importance Digital finance opportunities Digital finance solutions	Digital finance – Opportunity	Digital finance – Different stages of digitalisation
Use of traditional financial services No platform / app access	No use of technology	
Digital finance – Work in progress Digital literacy – Work in progress	Work in progress	
Platform App / desktop interface Dashboard Client account	Digital finance – Customer access	Digital finance – Customer interaction tools
Chatbot Mail / WhatsApp Social media	Digital finance – Customer contact	
Accounting integration Electronic signature Digital legitimation	Digital finance – Tools for the customer	
Back-end technologies Data collection technology	Digital finance – Back-end technologies	Innovative technologies – Back-end technology tools
Algorithms and Big data Integrated systems; cloud Machine learning	Innovative technologies – Tools	
Open banking API and PSD2	Innovative technologies – Open banking system	

Figure 2: Data structure

First order concepts	Second order themes	Aggregate dimensions
Financial literacy – How does it work Financial literacy – What do people learn Customized loan offer	Financial literacy – Outcomes	Financial literacy – Knowledge outcomes
Onboarding – Support team Onboarding – Coaching Onboarding – Digital contact Education – Financial education Education – Trainings Education – Coaching/ mentoring	Financial literacy – Onboarding process Financial education	Financial literacy – Financial education
Online information Providing data insights Digital notifications Easy language Contract clarity Blogs / Storytelling Testimonials Video tutorials Webinars Presentations	Financial literacy – Providing digital information and insights Financial literacy – Easy documentation Financial literacy – Information provision and explanation Financial literacy – Customer interaction and explaining	Financial literacy – Easy and personalised information provision and explanation
Customer contact centre Financial literacy – Support team Digital literacy – Support team	Support team	Support team
Digital illiteracy Constraints in digitalisation No responsibility People have basic digital skills	Digital illiteracy – Challenges Digital literacy – Organisation is not responsible	Digital literacy – Out of scope
Explaining digital technology Online information provision Educational program	Digital literacy – Providing information and explanation Digital literacy - Education	Digital literacy – Easy information provision and explanation
UX – Ease of use UX – Transparency UX – Providing data insights High tech vs. Human Touch	Customer / User experience High tech vs. Human Touch	Customer / User experience

Figure 2: (continued)

The value propositions of the inclusive FinTech organisations are more diverse than those of the MFIs, therefore, the five FinTech organisations are separately described. The first FinTech organisation has developed an invoice financing platform targeted at SMEs to finance their invoices to make their cash flows more sustainable. The second FinTech organisation offers a financial management tool in which SMEs can get real time insights in and control over their financial situation, can access a business loan, and make use of invoice financing. This FinTech organisation also provides digital financial advice to improve their customers' financial management. Another FinTech organisation also developed a financial management tool, but for individuals in financial distress due to debt or low incomes. This app gives people insights in their financial situation and advises them in their budgeting to resolve financial distress and to financially empower them. Further, one of the FinTech organisations is an open-banking platform which delivers technology solutions to financial institutions with the goal to improve the user experience of the end user through better data-driven financial services. The last FinTech organisation offers investing services through their app in an easy manner to make investing accessible to everyone. These FinTech organisations have in common that they either strive to make their financial services available to everyone who would normally not be able to use these financial services, or they strive to financially empower their customer segments through the use of innovative technologies. In both cases, the FinTech organisations prioritize that the financial services are easy and sustainable in their usage.

4.2. Digital Finance

This section states the status quo of the use of digital finance within the sample of inclusive finance organisations. Next to that, an elaboration is given upon the digital customer interaction tools and innovative technologies used by the inclusive finance organisation that make use of digital finance (**figure 2**).

The degree of digital finance used by the inclusive finance organisations ranges from the FinTech organisations being fully technology-driven to some MFIs barely making use of financial services (**figure 3**). The MFIs are in different stages of the digitalisation process. Some MFIs still arrange almost everything manually and are working towards standardized email procedures, while other MFIs have a digital application process and are developing an online platform. The differences in digitalisation can be explained by several constraints recognized by the MFIs, which are the national digital ecosystem, resistance to change, digital illiteracy and distrust (these are further explained in *5. Discussion*). Apart from the constraints, the MFIs do recognize the importance and opportunities of digital finance, especially during the COVID-19 pandemic. Some MFIs see their external environment becoming more digital and recognize that they also have to change to remain competitive. Other MFIs see the digitisation as an opportunity to extend the outreach of their financial services throughout the country (**quote 4**). Therefore, all MFIs indicate that they will continue working towards digitalisation.

Quote 4 (MFI 1.2): "And now with all this surfacing of digital tools, we can actually give access to finance and training to everybody in the country."
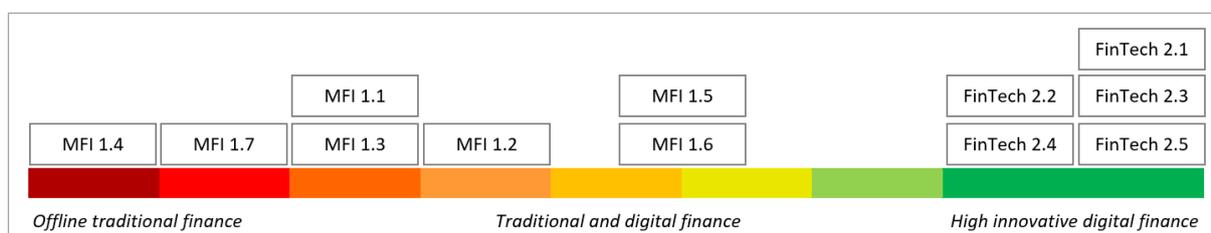

Figure 3: Degree of digital finance within the inclusive finance organisations

When analysing the inclusive finance organisations that make use of innovative technologies and digital finance, several digital tools are discovered through which the customers can access and interact with their financial services. The FinTech organisations stated that the customers can get insights in their financial services through a platform or portal. The customers can access this platform

through logging in with their client account on an app or desktop interface. Because the platform is based on automated processes facilitated by open-banking, big data and algorithms, real-time insights in the financial services are available. These financial insights are presented in a dashboard together with contract information and educational information (**quote 5**). Furthermore, the platform can be used by the customers to manage their financial services.

> **Quote 5** (FinTech 2.4): "What the app displays is actually just: what is your budget for the month, what is your budget per day to the end of the month? And what are your fixed charges? And what is your income? There are of course a lot of things around that, to present that nice, as such that the user can always see this."

As an example, FinTech 2.2 of the sample offers their financial management tool for SMEs through a platform. Through this platform, the customers can access a dashboard in which they can see the money coming in, the money going out, their invoices, business loans, and contract information. The customers can also easily manage their finances through the platform, they can for example manage their invoices or request a loan. Furthermore, the FinTech organisation sends push notifications when, for example, money comes in or when an invoice if being paid, as such that the customers have clear insights in their financial situation.

Two MFIs in the sample have already developed an online platform for their customers. Through this platform, the customers can apply online for a microloan, get information about the status of the microloan, manage their reimbursements, schedule trainings, and access educational information (**quote 6**). The other MFIs do only have a portal containing educational information or do not have any log-in options at all. These MFIs have indicated that they want to develop an online platform in the near future. With the platform, the MFIs want to give the customer the opportunity to get online insight in their financial situation and training courses, and to digitally apply for a loan (**quote 7**). Until then, the customers can reach out to the loan officer or the support team through the regular contact channels, which are mail, social media, SMS, WhatsApp.

> **Quote 6** (MFI 1.6): "So when the client once has the loan, they can log in to a personal platform, and then they can see, for example, where they stand in their reimbursements, if there is an event in their area, for example, they can get access to the event and they can know when it takes place. They can also pay down one reimbursement of the loan via credit card through this platform."

> **Quote 7** (MFI 1.2): "We will have soon a portal for our customer base to check up on the status of the loan, to see future trainings, et cetera"

The digital finance implemented by the inclusive finance organisations, for example a platform or a digital loan application, is facilitated through the use of innovative technologies in the back-end models. These innovative technologies used by the FinTech organisations and some MFIs, can be aggregated to: cloud computing, big data, algorithms, machine learning, and open-banking. Cloud computing is used for internal use, this facilitates easy access to documentation, and updates can be made in a lean manner. Big data concerns bringing all data collected from accounting integrations, financial transactions, customer data, credit bureaus, et cetera together, which will then be analysed with the use of algorithms to determine, for example, the risk scoring or the 'know your customer' analysis of the customer. The algorithms automate processes and facilitate real time data insights and personalised information. The machine learning ensures that the algorithms learn and become better. Furthermore, through open-banking, the FinTech organisations can connect the bank account of the customer to their platform. This facilitates fast onboarding, real time financial insights, and the ability for the customer to manage their finances through the platform. Open-banking is facilitated through an API, which is the connection between the platform and the bank account, and the PSD2 regulation, which ensures that only organisations with a licence can make use of open-banking for the sake of data protection. Furthermore, upcoming innovative tools that directly interact with the customer are digital legitimation and electronic signature, which are already being implemented by some MFIs. Both tools facilitate that the loan application process can be arranged digitally.

4.3. Research Model including Outcomes

The activities undertaken by the inclusive finance organisations to address the challenges of financial literacy and digital literacy are presented in **figure 4**. This figure presents the research model including the discovered solutions to the challenges of financial literacy and digital literacy, together with the relationships between the organisational solutions and client-knowledge challenges. This figure is developed based on the data structure (**figure 2**). In the subparagraphs *4.4. Financial Literacy* and *4.5. Digital literacy*, these activities are elaborated upon.
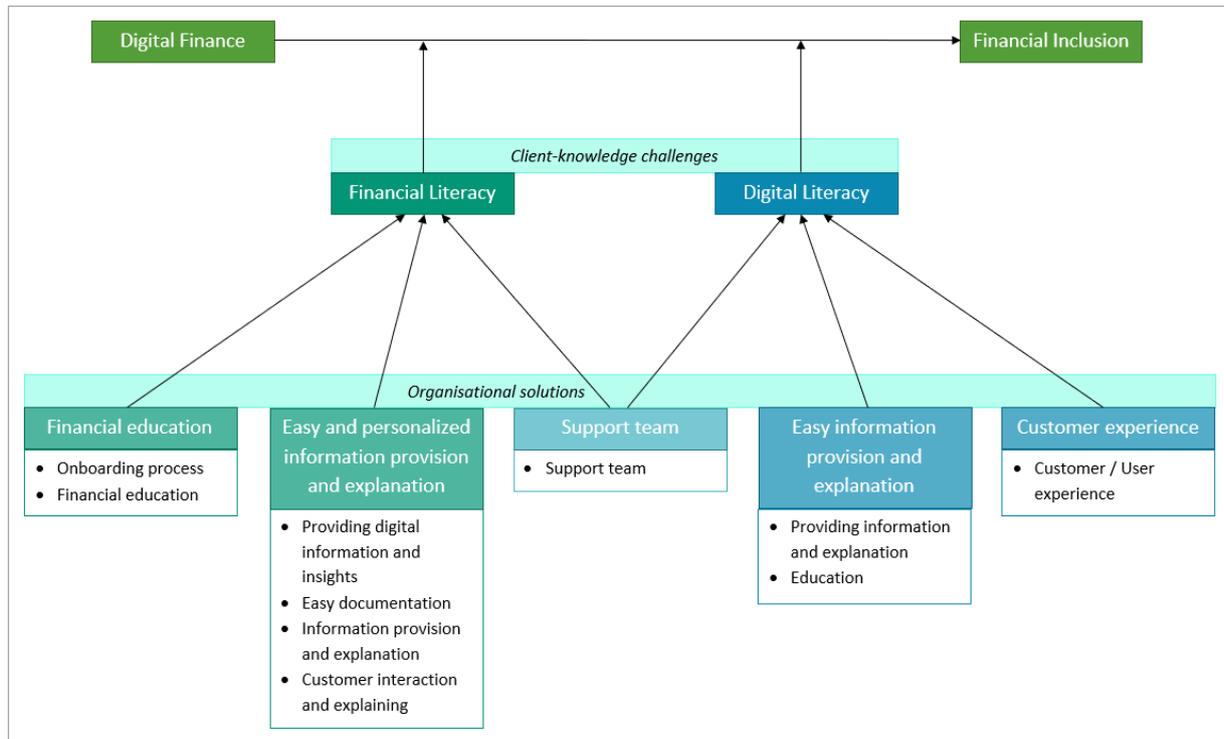
Figure 4: *Research model including the outcomes from the research*

4.4. Financial Literacy

The inclusive finance organisations stated in the interviews that a basic level of financial literacy is essential for an appropriate understanding and use of the financial services. Customers of, for example a microloan, should be fully aware of what a microloan is, its purpose, implications, and repayment. It is also crucial that the customers agree on a microloan that they can afford and that will support them. To ensure appropriate financial literacy of the customers, transferring all necessary knowledge towards the customers to ensure appropriate understanding of the financial service is a key activity (**quote 8 and 9**). The activities undertaken by the inclusive finance organisations towards financial literacy can be aggregated to the following solutions: financial education; easy and personalised information provision and explanation; and the support team (**figure 4**). These aggregated dimensions elaborated in the sections below, and **table 4** presents selected quotations to support the text.

> Quote 8 (MFI 1.1): "It is customary to explain and discuss with the client all implications of the loan contract: when is the payment due? What does it imply? What happens if they do not pay in due time? What happens if they pay earlier? What happens if they want to withdraw from the loan contract?"

> Quote 9 (MFI 1.2): "So by the time somebody actually takes up a loan, they do understand totally what it means to have a microloan, what the impact is in the personal budget, in the business budget, et cetera."

4.4.1. Onboarding Process and Financial Education

The aggregate dimension of financial education exists in this research of the onboarding process, training courses and coaching.

At first, all MFIs indicated that the onboarding process is an important tool for ensuring financial literacy of the customers, because this is the first contact between the inclusive finance organisation and the customer before entering the financial service. At most MFIs, the loan officer gets in contact with the potential customer right after the application process in a one-to-one physical meeting, which can be seen as a financial literacy training. During this meeting, the loan officer will explain what a microloan entails, what the purpose and implications of the loan are, how the loan should be used and repaid, et cetera. The direct contact with the loan officer facilitates that all questions of the customers can be easily answered. The goal of this meeting is to ensure that the customer has full knowledge about the loan and that a microloan is agreed upon that the customer can pay back without getting in financial distress. When the customer is sufficient financial literate regarding the microloan, only then the loan will be granted.

The onboarding process of the FinTech organisations is fully digital and conducted when the app or platform is being installed. The onboarding process of the FinTech organisations is often a step-by-step process in which all information necessary to understand the financial service is provided. The FinTech organisations prioritize a digital onboarding that is very easy and can be done in a short time frame. Open banking is one way in which the FinTech organisations make their onboarding faster, as data can be automatically extracted from the customers' financial transactions.

Apart from the onboarding process, several MFIs offer non-financial services to teach the customers about financial literacy and business development, which strengthen the skills of the customers. The non-financial services concern training courses and coaching.

Three MFIs offer training courses to the customers. These training courses are mainly given in a physical group setting, although during the COVID-19 pandemic training courses were mainly given digitally. The training courses are voluntary, but the MFIs recommend the customers to conduct some hours of training per semester, because this improves the knowledge of the customers and will strengthen their businesses. The MFIs offer a wide array of training courses, ranging from developing a business model to setting up a marketing campaign. Also training courses regarding financial education are given to improve the financial literacy and financial management of the customers.

The coaching services concerns one-to-one mentoring between the customer and an appointed coach or a coach specialised in the challenge of the customer. In the coaching sessions, the coach functions as a buddy that supports the entrepreneurs in growing or developing their businesses. The coaching is tailored to the needs of the customer, therefore a wide range of topics relevant for the customer can be discussed. Financial management can, for example, also be discussed to improve the customer's financial skills.

4.4.2. Information Provision and Explanation

From the data analysis can be extracted that easy and personalised information provision and explanation is important for a well understanding of the financial services. The inclusive finance organisations use diverse tools to inform their customers.

At first, the FinTech organisations provide information through digital notifications, which are push notifications and information boxes, which can be actively send to the customers via the app, platform, or mail. The digital notifications give information about the financial services to support the financial knowledge of the customers and to make the customers more conscious about their financial situation. The information boxes can, for example, contain explanation of the financial services, personalised tips and tricks, or interesting articles about the topic. The information provision through the app or platform facilitates the opportunity to personalize the information to the customers' situation based on algorithms. Furthermore, the real time insights in the financial services offered by

the FinTech organisations, are beneficial for financial literacy, because the customers then become more conscious about their financial situation.

Other ways to provide information and explanation about the financial services are through storytelling, testimonials and video tutorials. Storytelling can be done through blogs, brochures and articles. With storytelling, the MFIs and Fintech organisations publish articles about the financial services, financial education or topics of interest to the customers. The goal of storytelling is to support the financial knowledge of the customers and to engage the customers in their financial management. Furthermore, testimonials and video tutorials can be shared on the website or social media. The testimonials provide success stories of existing customers to indicate the value of the financial service for these customers. The video tutorials explain how the financial service should be used to support the financial literacy of the customers. Tools that inform the customers which also include customer interaction are webinars and presentations. Through webinars and presentations, the organisations can provide information and explanation and the customers can ask their questions.

To ensure that that information provision and explanation can be easily understood by the customers, the inclusive finance organisations state that difficult language or legal terms should be avoided because this can be difficult to interpret. The language in all documentation and the contacts should be simple, easy and non-legal. The contracts should also be transparent as such that all information regarding the financial service is accessible. For example, one of the FinTech organisations mentioned that their contracts are actually an aggregate summary with all information about the loan presented in an easy overview that clearly expresses what the customer complies with.

4.4.3. Support Team

The support team of the inclusive finance organisations is discovered as a solution to the financial literacy and digital literacy of the customers. The support team exists of the customer service centre and the loan officers, who can be contacted by phone, mail, WhatsApp or social media. The customers can ask a wide range of questions to the customer contact centre to resolve their challenges in using (digital) financial services and to improve their financial and digital knowledge. The questions can range from someone forgotten their password to someone requesting information about the loan repayment to questions about the use of digital tools. Furthermore, when the customers have an appointed loan officer, then the customer can always contact the same person with questions and for support. In that case, the loan officer will function as a contact person and mentor for the customer.

Table 4: Selected quotations on financial literacy

Aggregate dimension	Second order theme	Quotations
Financial literacy – Financial education	Financial literacy – Onboarding process	o MFI 1.2: "I would say, the first meeting that we have with every prospect is a small training of about an hour, about financial literacy, about what is a microloan, what it entails, what are the characteristics, how a micro loan will accelerate the dream, but also what are the specific points that they should be very cautious about." o MFI 1.6: "The loan officer really explains to the client, what does having a loan mean, what's the purpose of the loan, and also explains to aspiring or existing clients that the purpose of the loan is not to put them in difficulty." o FinTech 2.1: "I think one of the things we did when we onboard the clients is, we make it very easy for them, so it's not very intrusive. They just basically have to fill in a few taps and turn on the accounting or put in their financial data. But feedback from my clients has been very positive that it's frictionless. So, it's not very difficult."
	Financial education	o MFI 1.5: "When you are customer at [company name], you can make use of training courses and coaching, to ensure that you as an entrepreneur are going to render optimally."

		o MFI 1.6: "We provide group training for those who come to our branches and are willing to create a business, but they're not sure on how to start."
		o MFI 1.6: "And then the individual coaching, the topics can be really different, they range from helping clients in order to deal with admin issues related to their business, or how to adapt the marketing strategy, how to change their strategy, how to deal with financial issues."
Financial literacy – Easy and personalised information provision and explanation	Financial literacy – Providing digital information and insights	o FinTech 2.2: "And so these windows here are examples of push notifications that we can proactively send to customers to show them what's going on in their business when we see a major change in activity." o FinTech 2.5: "But we mail a lot of exchange updates, that kind of business, not that they get something every day, but we try to send per month two or three mails to keep you engaged and to keep you talking."
	Financial literacy – Easy documentation	o FinTech 2.4: "Financial words are sometimes quite difficult and people do not always understand that. But we try to at least ensure that all language is B1 language in the app" o FinTech 2.2: "And so we developed this Smart Box, and this Smart Box is presented at the end of the customer experience. And so going through the whole customer experience, we're telling the customer exactly what's going on here to say, look, here's the total amount that you're going to qualify for. Here is what the fees are. Here's how long you want to select on this loan. Here's what that's going to look like for your monthly payments. And then we sum it up in this very US legal looking document. But that's actually quite useful."
	Financial literacy – Information provision and explanation	o FinTech 2.5: "And we have a blog in which we cover a couple themes. We have there for example interviews and just stories about money." o FinTech 2.1: "There's also an introductory video that helps them for their financial literacy."
	Financial literacy – Customer interaction and explaining	o FinTech 2.1: "What we also have been doing lately is doing webinars, live webinars, where we walk through as a question and answers. So, any company wanting to understand it can then come and understand how the program works." o MFI 1.6: "We organize lots of webinars for our entrepreneurs on different topics, and you can find them all online. You can find online like a sort of calendar for all the webinars."
Support team	Support team	o FinTech 2.2: "And so we have two tiers of customer service representatives, really basic, like, hey, I logged myself out of my account or I forgot my password. And then more advanced stuff, which is really people that know how businesses work." o MFI 1.1: "They have a dedicated loan officer. It is a loan officer to look into their business and prepare the documents and that they can address any question that they feel like."

4.5. Digital Literacy

As stated earlier, some of the MFIs in the sample make barely use of digital finance, these MFIs do therefore not consider the digital literacy of the customers. Other MFIs and FinTech organisation in the sample indicated that the challenge of digital illiteracy is not their responsibility, and they therefore do not provide any digital literacy support (**quote 10**) It is also mentioned that the organisations assume that their customers have a basic level of digital literacy skills (**quote 11**).

> **Quote 10** (FinTech 2.3): "I think, when it comes to the generation of digital illiterate people, let me put it this way, ehm yes, I think that that is a problem that we [the organisation] actually cannot solve."

> **Quote 11** (FinTech 2.2): "We work with a set of people that at some level have basic digital literacy skills, right, where you can access through all different means, mobile, tablet, computer."

On the other side, there are inclusive finance organisations that recognize the challenge of financial illiteracy and they have implemented tools to support the customers' digital literacy, which can be aggregated to: the support team; information provision and explanation; and the user experience (**figure 4**). These will be elaborated in the next sections and **table 5** presents selected quotes about these solutions.

4.5.1. Information Provision and Explanation

From the data analysis, it can be extracted that information provision and explanation is important for achieving a sufficient digital literacy of the customers, this was also discovered as essential to improve the customers' financial literacy. In *4.4.3. Support team* is already explained that the support team can take an important role in supporting the customers with their challenges about digital financial services, and it can therefore contribute to improving the customers' digital literacy. Providing information and explanation about the digital technologies, the benefits, data storage and data protection will support peoples' understanding and trust in digital financial services. This should be done through complete and transparent information provision, as such that all needed information is accessible to the customers. The information provision and explanation can be done through similar channels as discussed in *4.4.2. Information Provision and Explanation* concerning financial literacy.

4.5.2. User Experience

Furthermore, the Fintech organisations and some MFIs indicated the importance of the user experience (UX). The user experience concerns how the customers use and experience the digital financial service throughout the whole digital customer journey. The organisations strive towards an intuitive, easy and effortless user experience in which there is awareness for the customer and which ensures that people with basic digital skills can understand and use the digital financial services. Within the user experience, the ease of use, transparency and real time data insights are prioritized.

At first, the ease of use is very important for the user experience. The goal is to make the user experience simple, fast, easy and effortless in usage. When this is the case, then the customers are not required to have a high level of digital skills because the easy user experience will guide them through the process. The ease in use should be displayed throughout the whole customer journey and can be facilitated through, among others, automation, open-banking, and easy language.

Also, the transparency within the user experience is prioritized. This implies that the organisation in open and transparent in sharing all the information about the financial service to the customers that is necessary to understand, use and trust the digital financial service. Informing contributes to an intuitive user experience, because the customers will then better understand how to use the digital financial service. The digital information provision can, for example, be done through digital notifications and information boxes.

Furthermore, the platforms of the FinTech organisations give real time insights in the financial situation of the customers. An user experience with an intuitive and simple overview of the customers' financial situation will ensure that the digital financial services can be easier understood by the customers. This results in a higher financial consciousness and a better financial management of the customers. An intuitive financial overview can, for example, be created by developing a user-friendly front-end.

Table 5*: Selected quotations on digital literacy*

Aggregate dimension	Second order theme	Quotations
Digital literacy – Easy information provision and explanation	Digital literacy – Providing information and explanation	○ FinTech 2.2: "We try to educate people around what are the protocols, what are the different things that we're doing with our commitments to trust and transparency behind that." ○ MFI 1.3: "many of our clients are not, I mean, still prefer direct contact, and we need to teach them how to use those products that technology allows them, and that our costs will be lower, their costs will be lower, and also interest rates will be lower even if we are able to improve our operational efficiency on that way." ○ FinTech 2.5: "Ensure that the information that you need at that moment, is accessible."
Customer (UX) experience	Customer/ user experience	○ FinTech 2.3: "But I think more important is that they are searching for ways to improve the user experience and how to make their digital services more intuitive and easier." ○ FinTech 2.2: "And it's all done with a simple link on mobile to make it as easy to pay on time as possible. And so we're helping them automate that as well. And so all of that is kind of blending that experience that we're going to do everything for you. But the customers don't necessarily have to be like super tech savvy to do this. That's kind of the whole point of the UX." ○ FinTech 2.5: "We try to take you by the hand, inform you well on the moment that the exchange goes down, we stimulate you to not withdraw, because that is part of the deal. So, because almost nobody has invested earlier, it is very important that the information provision is well." ○ FinTech 2.3: "Yes, we try to increase the financial knowledge and insights by their users."

5. Discussion

5.1. Discussion of the Results

In this section, the results from the research will be further discussed. In the subparagraphs, the activities mentioned by the inclusive finance organisations to address financial literacy and digital literacy are interpreted and discussed with the support of existing literature. Based thereon, the solutions to the challenges of financial illiteracy and digital illiteracy are concluded, which will formulate the answer to the research question, which will be elaborated upon in *6. Conclusion*.

5.1.1. Financial Literacy

The MFIs and FinTech organisations recognize that financial literacy is a challenge that needs to be addressed to achieve financial inclusion. A higher financial literacy positively influences the financial consciousness, financial management and financial inclusion of the customers, in the end this will results in a better financial well-being and sustainable development (Goyal & Kumar, 2021; Grohmann et al., 2018; Oggero et al., 2020; Shen et al., 2018). Due to the importance of financial literacy, the inclusive finance organisations undertake several activities to teach and inform the customers to ensure a full understanding of the financial services. To recall, the activities undertaken to address financial literacy can be aggregated to: (1) financial education; (2) easy and personalised information provision and explanation; and (3) the support team (**figure 4**).

First, the goal of financial education is to teach and inform the customers about the financial service and their financial management to ensure that the customers fully understand how to use the financial services. How financial education improves financial literacy can be explained as follows. The offline onboarding process of the MFIs contributes to financial inclusion because the onboarding process teaches and explains the customers on all aspects of the financial service to ensure a full understanding of the financial service, before using the financial service. The digital onboarding process of the FinTech organisations contributes to financial literacy because the intuitive and effortless user experience and the provision of information during the onboarding make it easy for the customer to understand the financial service. Furthermore, the training courses and coaching can improve peoples' financial literacy, because the customers are then being taught on their financial knowledge and financial management skills, which will inherently improve their financial literacy.

When reviewing the existing literature about financial education and financial literacy, it is found that there are mixed findings on the effect of financial education on financial literacy. Research pointed out that the relationship between financial education (taught within school programmes) and financial literacy is such a small effect that it is almost neglectable (Fernandes et al., 2014; Hastings, Madrian, & Skimmyhorn, 2013; Stolper & Walter, 2017). These papers explain that the small effect can be caused by a decay of knowledge over time, not well prepared and unknowledgeable teachers, and the possibilities of reverse causality and omitted variable bias. Although, the literature did not discover a convincing positive effect of financial education (within school programmes) on financial literacy, the opinion that financial education has a positive impact remains alive (Hastings et al., 2013; Stolper & Walter, 2017). Some research has recommended improvements for financial education to become more effective in supporting financial literacy. First, the financial education should be tailored to the specific needs of the target groups, because one size of financial education does not fit all (Lusardi, 2019; Lusardi & Mitchell, 2014). Furthermore, "just-in-time" financial education is advised, which implies that financial education is tied to a particular financial decision of the customer to ensure high relevance and minimal knowledge decay (Fernandes et al., 2014). Fernandes et al. (2014) also recommended coaching as an effective tool for improving financial literacy because "coaching has the advantage of high relevance, low propensity for forgetting between information receipt and behavior, and opportunities to learn from feedback." (Fernandes et al., 2014. p.1974). Lastly, Stolper and Walter (2017) indicated that financial advices from an expert can be an opportunity to improve the customers' financial literacy.

Although that the existing literature points out that there are mixed findings on this research topic and that the effects of specific forms of financial education on financial literacy are still unknown (Fernandes et al., 2014; Stolper & Walter, 2017), this research concludes that the financial education of the inclusive finance organisations, i.e. the onboarding process, trainings courses, and coaching, is an appropriate and effective solution to the challenge of financial illiteracy. This can be argued by the financial education being "just-in-time", as advised by Fernandes et al. (2014), and therefore being highly relevant and preventing knowledge decay. Further, the one-to-one onboarding and coaching through expert advice is highly customized to the needs of the customers, as advised by Lusardi (2019), Lusardi and Mitchell (2014), Fernandes et al. (2014) and Stolper and Walter (2017).

Second, easy and personalised information provision an explanation is discovered as a solution undertaken by the inclusive finance organisations to address financial literacy. Information provision and explanation can be done through various channels, the FinTech organisations make use of digital notifications and providing real time financial insights, whereas the MFIs make use of storytelling, video tutorials and webinars. Providing information and explanation ensures that all information necessary to (better) understand the financial service is available. An improved understanding of the financial services translates into an improved financial literacy.

When analysing the existing literature about improving financial literacy, the financial education and financial advice come forwards as the leading tools to improve financial literacy (Fernandes et al., 2014; Hastings et al., 2013; Migliavacca, 2020; Stolper & Walter, 2017). The information provision and explanation as discovered in this research are, to my best knowledge, not yet recognized in the existing literature. Because the information provision and explanation are mentioned several times by the inclusive finance organisation, it is concluded that this is a solution to the challenge of financial literacy. This solution has not been discovered before, which also indicated that the research on this topic has not yet matured. However, the exact effect of information provision and explanation on financial literacy remains quite unknown, therefore future research to this solution is recommended.

Third, the inclusive finance organisations have installed a support team to resolve the challenges of the customers. Trough providing support and answering questions, the support team will improve the customers' knowledge on financial services, this will positively influence the financial literacy of the customers.

The research of Migliavacca (2020) concluded that the effect of financial advisors on financial literacy is significant and positive, which implies that a financial advisor, when taking an educational role, can improve the financial literacy of the customer. This effect becomes larger when there is an independent financial adviser due to a lower agency problem, and when there is a long-lasting relationship between the financial advisor and the customer (Migliavacca, 2020). The positive effect of financial advisors on financial literacy can be explained by a high expertise of the financial advisor, relevant and customized financial advice, and "just-in-time" financial support (Fernandes et al., 2014; Migliavacca, 2020; Stolper & Walter, 2017).

Several MFIs indicated that their coaches are volunteers and therefore operate independently from the MFI. Also, most MFIs appoint a loan officer that support the customers during their whole time of being a customer. Both comply with the advices of Migliavacca (2020) regarding an independent financial advisor and developing long-lasting relations. Therefore, it is concluded that the coaching, an appointed loan officer, and the support team of the inclusive finance organisations are suitable solutions to the challenge of financial illiteracy.

In essence, all solutions strive towards increasing the financial literacy of the customers through informing, explaining and teaching the customers about the financial services and financial management. The activities towards financial literacy differ between the MFIs and the FinTech organisations. These differences can be derived back to the different degrees in digitalisation. The MFIs focus more on offline solutions with a personal touch. This is implemented through the offline and

customized financial education, and the information being provided through the loan officer and on their websites and social media. The FinTech organisations address financial literacy through digital processes and innovative technologies. Because everything is arranged digitally, the user experience should be intuitive and effortless to make the use of the financial service as easy as possible.

5.1.2. Digital Literacy

Digital finance has a positive effect on financial inclusion through resolving some barriers, and therewith digital finance has an indirect effect on achieving the SDGs and decreasing poverty and socio-economic inequality (Arner et al., 2020; Demir et al., 2020; Mushtaq & Bruneau, 2019; Ozili, 2018). The adoption of digital finance differs across the inclusive finance organisations that are included in the sample. The FinTech organisations are totally technology-driven, whereas some MFIs barely use digital tools and some MFIs have for example a digital application process. The adoption of digital finance differs also among the countries included in the sample. From the data analysis, it is concluded that Western-European countries have a higher adoption of digital finance than the countries in Eastern-Europe, where digital finance is still barely used.

The different degrees of digital finance adoption can be explained by the constraints and opportunities that the inclusive finance organisations face in the digitalisation process. Constraints in the digitalisation process that are extracted from both the existing literature and the data analysis are: the national digital ecosystem, resistance to change, distrust and digital illiteracy (Demirgüç-Kunt et al., 2018; Mushtaq & Bruneau, 2019). First, the national digital ecosystem should enable the digitalisation of the inclusive finance organisation. When the digital ecosystem is not yet well-developed, implementing digital technologies will be difficult because the digital ecosystem does not support the new technologies and therefore the customer would not be able to use this. Second, resistance to change holds back the digitalisation. Especially customers in rural areas are used to traditional financial services and are therefore hesitant to digitise their financial services. Resistance to change is also caused by a lack of trust in the digital technologies. Furthermore, digital illiteracy is recognized as a challenge. Some MFIs indicated that the people do not have a high level of digital skills and therefore prefer offline tools. On the other side, the inclusive finance organisations also indicate that digital finance has several opportunities, such as an increased outreach of the financial services, lower costs of the financial services and real-time insights in the financial situation. Therefore, all MFIs indicate that in the near future more developments in the digitalisation process will be made.

However, the opinions regarding the challenge of digital illiteracy differ. Some inclusive finance organisation state that the problem of digital illiteracy is not their responsibility and that this should be solved by the government. Some FinTech organisations indicated that they assume that their customers have basic digital literacy skills. On the other side, there are inclusive finance organisations that indicated digital illiteracy as a barrier to the digitalisation process. From the data analysis, it seems that the different opinions towards digital literacy are connected to the national adoption of digital technologies. In other words, in countries with a high adoption and trust in digital technologies, digital illiteracy is perceived less as a challenge, and vice versa. Although that the opinions about digital literacy differ, solutions to address digital literacy are discovered, which concern: (1) the support team, (2) information provision and explanation, and (3) the user experience (**figure 4**).

First, the support team, as addressed also for financial literacy, is a solution to improve the digital literacy of the customers through answering the questions of the customers to ensure that they understand how to use the digital tools. For the same reasoning as for financial literacy, it is concluded that the support team, existing of the customer service centre and the loan officers, can support the customers' digital literacy. Within a totally digital process, the support team facilitates some personal touch that helps the customers with their challenges in using the digital financial services.

Second, from the data analysis, it can be concluded that information provision and explanation is an activity performed mainly by the MFIs to address digital literacy. Information provision and explanation contributes to the customers' digital literacy because it explains the customers how the

digital technologies work and should be used. A better understanding of the digital technologies will translate in a better digital literacy, which will result in a better usage of digital finance services.

The existing literature state that digital literacy has a growing importance in an economy that becomes increasingly digital-driven (Martin & Grudziecki, 2006; Meyers et al., 2013). The teaching of digital literacy is mainly done at elementary schools and high schools where students learn about digital technologies through training courses and learning-by-doing (Martin & Grudziecki, 2006). The paper of Meyers et al. (2013) advises to teach digital literacy also at informational educational locations complementary to the education at schools. Informal education locations, for example community organisations, after-school programmes, mobile platforms and YouTube, can improve peoples' digital literacy because digital literacy workshops can be given and it is a place for creativity and personal development (Meyers et al., 2013).

The inclusive finance organisations can be seen as an informal space where the customers can develop their digital skills, next to their financial literacy skills and business development skills. Improving the customer digital skills can be done through coaching, support of a loan officer, the possibility to ask questions and having access to information. This will complement the customers' knowledge on digital technologies that is learnt during their education. Therefore, it is concluded that information provision and explanation is a solution to the challenge of digital illiteracy. However, a large part of peoples' digital literacy relies on education, therefore the national government and educational system have a responsibility in addressing this challenge.

Third, the FinTech organisations mentioned that the digital user experience should be easy, intuitive and effortless to ensure that everyone, also people with low digital skills, can easily use the digital financial services. The user experience does not teach people on how to use digital technologies, but rather aims to make the use of technologies as easy as possible.

According to the existing literature, the adoption and use of technology is determined by the technology acceptance model (TAM) and the user experience (UX) (Liébana-Cabanillas, Muñoz-Leiva, Sánchez-Fernández, & Viedma-del Jesús, 2016). The TAM implies that the acceptance and use of a technology is determined by the perceived usefulness and perceived ease of use of the technology (Davis, 1989). The UX model describes "the experience of using interactive products, the consequences of those experiences, and the ways experiences and consequences are connected" (Liébana-Cabanillas et al., 2016, p.33:2). The paper of Liébana-Cabanillas et al. (2016) concludes that the customers' attitude towards using a digital technology is determined by several constructs of the TAM and UX model, namely: the perceived usefulness, perceived ease of use, social influence and experience of use. To stimulate the adoption and use of digital financial services, the inclusive finance organisations should develop a user experience that considers these constructs. Therefore, the user experience should be useful, easy to use and ensuring enjoyment and satisfaction to attract the people with low digital literacy skills to adopt the digital financial service (Liébana-Cabanillas et al., 2016). Thus, the user experience has influence on peoples' adoption of digital financial services and it makes the use digital financial services easier.

The MFIs have made one remark on digitalising the whole customer journey, they advocate for a balance between the use of technology and a personal touch (**quote 12 and 13**). The MFI state that digital finance is a great opportunity to make their financial services more effective, but that technology should not replace all personal contact. Remaining a personal touch is desired because the loan officers, coaches and support team facilitate personalised support to the customers that strengthen the customers in their business development, financial empowerment and digital skills. Therefore, a balance between high tech and a human touch is an important consideration in the digitalisation process of the MFIs. The MFIs also indicated that, during the digitalisation process, it is important to ensure that the customer can keep up with the pace of the digitalisation (**quote 14**). On the other side, the FinTech organisations focus on a totally technology-driven financial service. This different consideration between technology and a personal touch can also be recognized between the solutions implemented towards financial literacy and digital literacy. For example, regarding digital

literacy, the MFIs focus on information provision and explanation, whereas the FinTech organisation focus on optimizing the user experience.

> **Quote 12** (MFI 1.1): "But we don't have to forget that digital is not everything. We still have to, you know, have the human personal touch."

> **Quote 13** (MFI 1.2): "We will continue offering all these online services, but, of course, we will go back to the physical interaction with the prospects and entrepreneurs. So, that will be also one of the biggest battles to have the optimum balance between digital and non-digital interactions with our customer base."

> **Quote 14** (MFI 1.1): "It is obvious that we have to make sure that our clients keep the pace with us, so we do not want to have digital tools that our clients cannot use because they don't know how to."

5.2. Practical Recommendations

Several practical recommendations for the MFIs and FinTech organisations can be extracted from the solutions to financial literacy and digital literacy that are discovered in this research. First, some recommendations are stated for the MFIs about the solutions they can implement to improve the customers' financial literacy and digital literacy in their digitalisation process. Thereafter, a take-away for the FinTech organisations is stated.

Many MFIs can still make many steps in the digitalisation process, therein it is advised that the MFIs digitalise their loan application process and develop a platform through which people get insight in their financial situation, pay reimbursements, get information about financial education, and get personalised notifications. However, it is advised to the MFIs to remain a balance between the use of technology and the personal touch through the support team, loan officers and coaches. To optimally address the financial literacy and digital literacy in this digitalisation process, the following recommendations for each discovered solution are extracted from this research:

- o **Financial education**: to improve the customers' financial literacy, it is recommended to remain the onboarding process, training courses and coaching an offline practice. The reason therefore is that the customers benefit from personalised financial education in which they gain relevant and "just-in-time" knowledge and have the opportunity to ask questions and receive feedback.

- o **Information provision and explanation for financial literacy**: information provision and explanation through storytelling, video tutorials and webinars are advised to be complementary to the financial education. Because, on its own, the information provision and explanation would not be sufficient to improve financial literacy, but it will support the financial education through the easy access to information. When the MFIs have developed a digital platform, it is advised to provide the information and explanation within the platform. This can be done through sending digital notifications with financial and educational information and articles. Withing all documentation, it is recommended to use easy and simple language.

- o **Support team for financial literacy and digital literacy**: the personal touch is also recommended to be translated into an appointed loan officer or coach that supports the customers during the whole period of using the financial services. This will create a long-term relationship, which facilitates a better learning process of the customers regarding financial literacy and business development. The customer service centre should also be available to answer the questions regarding business development, financial literacy and digital literacy.

- o **Information provision and explanation for digital literacy**: it is recommended to also install tools for information provision and explanation regarding digital literacy. This can be done through digital notifications, video tutorials and articles. Furthermore, the support team and

loan officers should be available to answer the customers' questions regarding digital technologies to improve their digital literacy.

o **User experience**: when digitalising the financial services, it is essential that the user experience is easy, intuitive and effortless. When the user experience is easy and useful, the customers will be more willing to adopt the technologies and the challenges of digital illiteracy will be minimised because the customers require less digital skills to be able to appropriately use the digital financial service.

Then, one point of attention for the FinTech organisations will be stated. From the research can be concluded that the MFIs strive to remain a balance between the technology and the human touch, because the human touch is beneficial for the learning process of the customers. Because the FinTech organisations are totally technology-driven, the FinTech organisations are recommended to evaluate their balance between technology and a personal touch. The FinTech organisations should evaluate whether more offline educational activities would yield a better financial literacy of the customers than a fully digital process.

Lastly, one recommendation is made towards the national governments and the European Union. It is recommended to take the challenges of financial literacy and digital literacy serious and install appropriate educational activities to improve the financial literacy and digital literacy of the population for the sake of financial empowerment, economic growth and the achievement of the SDGs.

5.3. Research Limitations

The sample of this research existed of 12 inclusive finance organisations. This small sample size is the main limitation of this research. With this small sample size, it cannot be guaranteed that the sample is representative for the whole inclusive finance industry. In other words, it might be possible that the same research with another sample would result in different findings. The small sample size was selected because this research is a qualitative research based on interviews to gain in-depth knowledge about the research topic. This type of research generally includes smaller sample sizes due to a more time-consuming data collection and analysis. To overcome this limitation in future research, a larger sample size should be selected that will be more representative for the whole industry.

The collected qualitative data has been analysed based on the Gioia method (Gioia et al., 2013). With this research method, a rigorous and trustworthy qualitative research can be conducted. However, no quantitative research can be conducted and no hypotheses can be tested, because statistics on the research topic are not collected. This implies that the significance of the relationships between the concepts that have been discovered in this research cannot be determined and therefore causality is difficult to investigate. To be able to statistically check the findings, a quantitative research should be conducted regarding this research topic. Therefore, a larger sample size should be selected and the data should be collected and analysed based on quantitative research methods.

Furthermore, a bias that might have occurred within the interviews is the interviewer bias. This bias implies that the statements, opinions, tone of voice and question order of the interviewer can influence the reaction of the respondent. For example, when the interviewer makes a suggestion for a certain solution, then the respondent might tend to confirm or agree with this. This bias can cause that the collected data do not fully present the true representation of the sample, and therefore different results might be concluded. To minimise the influence of the interviewer on the respondent in this research, the interview protocol has been developed to ensure that the same questions are asked in each interview in the same sequence. Also, the open-ended questions minimised the influence of the interviewer. However, it is difficult to fully eliminate this bias when conducting interviews.

5.4. Future Research Recommendations

The existing literature on improving financial literacy and digital literacy has not yet matured and some mixed findings have been concluded in earlier literature. Therefore, further research is necessary to gain more knowledge on this research topic. Based on this research, a couple recommendations for future research are stated.

The first recommendation is to expand this research to a larger European sample. With a larger sample, the solutions to financial literacy and digital literacy addressed by inclusive finance organisations can be further researched to develop a more complete review of this research topic. To conduct this research in a larger sample, the same research methodology can be used as in this research. However, surveys can also be conducted to collect the data in a more time efficient manner. Future research can consider to include the customers of the inclusive finance organisations in the sample. The customer perspective on the solutions to financial literacy and digital literacy is expected to provide interesting insights, which will be useful when customizing the solutions to the customers' needs.

The second recommendation for future research is to select one solution to financial literacy or digital literacy that is discovered in this research, and research this solution more in-depth. Then, the effects of this solution on financial literacy and digital literacy can be better researched and defined. This research can be conducted through quantitative research, which can investigate the significance and causality of the relationships. The qualitative research can be executed through a time-series study, where financial literacy or digital literacy is measured before or after the treatment, or through treatment and control groups, where one group is exposed to a treatment while the other group is not. In both cases, it is advised to include the customers in the sample.

Lastly, future research can focus on the digitalisation process of the MFIs by developing a step-by-step guideline for the optimal digitalisation process for MFIs. A guideline towards digitalisation will support the MFIs in adopting digital finance and transforming their business processes. This research can, for example, investigate how the user experience of the digital financial services should be designed for optimal adoption and easy usage. This research can be conducted through a qualitative research including interviews with MFIs and FinTech organisations. Including both MFIs and FinTech organisations will create the opportunity to investigate how FinTech solutions can complement microfinance and how this combination might result in greater contributions towards financial inclusion.

5.5. Contributions to Existing Literature

This research has several contributions to the existing literature. First, this research extends the literature about digital finance and financial inclusion, because it provides new insights in the perceptions to, adoption of, and outcomes of digital finance. The research collected and analysed data from the inclusive finance organisations regarding digital finance and financial inclusion. The data analyses explain what the opinions of the inclusive finance organisations are regarding digital finance, and provides an overview of the current adoption and usage of digital finance by the inclusive finance organisations. Also, the data analysis explains how the use of digital finance contributes to financial inclusion and the value propositions of the interviewed organisations. All these insights provide further explanation on the relationship between digital finance and financial inclusion from the perspective of the inclusive finance organisations, which has rarely been explored before.

Further, the research contributes to the existing literature about financial literacy and digital literacy by discovering solutions to these challenges. The existing literature on financial literacy and digital literacy has not yet matured and mixed findings have been concluded. The solutions to the challenges of financial literacy and digital literacy discovered in this research will result in a better knowledge on how peoples' financial literacy and digital literacy can be improved. On one side, this research discovered new solutions to these challenges, for example the storytelling or easy user

experience. The discovery of these new solutions add onto the literature by proposing new promising activities for the improvement of financial literacy. On the other side, solutions have been discovered that have been described in earlier research (however, often in a different setting). These findings contribute to the existing literature through delivering new data that explains the effect of these solutions on financial literacy and digital literacy. The analysis of these solutions therefore add onto the review of these solutions, which creates the opportunity to further conclude the impact of these solutions to peoples' financial literacy and/or digital literacy.

Lastly, researching the topic of financial literacy and digital literacy from the point of view of the inclusive finance organisations has been rarely done. This point of view explains the perceptions and opinions of the inclusive finance organisations regarding the challenges of financial literacy and digital literacy. But is also provides practical solutions to financial literacy and digital literacy which are perceived as effective by the inclusive finance organisations.

6. Conclusion

Financial inclusion, which implies access to bank accounts, saving, borrowing and investing opportunities, is crucial for a better financial empowerment of the population, which will enable higher economic growth, reduced poverty, reduced socio-economic inequality, and the achievement of the SGDs. Nowadays, the financial sector is transforming more and more towards a digital-driven industry. The rise of digital finance and FinTech represents an unique opportunity to increase the financial inclusion around the world. However, barriers to the use of digital financial services remain. For instance, both the financial literacy and the digital literacy of the underserved customer segments can retain people from using the financial services. These barriers should be diminished to support financial inclusion. Therefore, the research objective of this study was to discover new insights from inclusive finance organisations (i.e., MFIs and FinTech organisations) about how they address financial literacy and digital literacy in their digital financial services. From these insights, practical solutions to the challenges of financial illiteracy and digital illiteracy are recommended. The research question belonging to this research objective is:

How do MFIs and FinTech organisations address the challenges of financial illiteracy and digital illiteracy in their digital financial services with the aim of inclusive finance?

After performing an inductive qualitative research, an answer to this research question can be concluded. In essence, the inclusive finance organisations support financial literacy and digital literacy by teaching, informing and explaining the financial services to the customers. From this research, it can be concluded that the solutions to the challenge of financial illiteracy are: (1) financial education in the form of an onboarding process, training courses, and one-to-one coaching; (2) providing easy and personalised information and explanation through data insights, storytelling, webinars and easy language; and (3) the support of the customer service centre and loan officers. The solutions to address the challenge of digital illiteracy are: (1) information provision and explanation through the support team and information sources; and (2) facilitating and easy, intuitive and effortless user experience. Inclusive finance organisations are advised to implement these solutions to address the challenges of financial literacy and digital literacy. Within these solutions, the customer needs are prioritized and a balance between the use of technology and a human touch has to be remained.

With these solutions, the inclusive finance organisations strive to improve the financial literacy and digital literacy of the customers, which support increasing the financial inclusion of the population through digital financial services. The increased financial inclusion of the population will contribute to improved financial empowerment of the customers which will result the achievement of the SDGs.

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8. Appendices

8.1. Appendix 1: Statistics on the Research Topic

In this appendix, an overview is given on the statistics on the financial inclusion, digital finance usage, financial literacy and digital literacy of the countries in the European Union, including the United Kingdom. Furthermore, the financial inclusion of the European Union is compared to the financial inclusion of the world.

Financial inclusion: The Global Findex Database: Measuring Financial Inclusion and the FinTech Revolution of the World Bank (Demirgüç-Kunt et al., 2018) presents the most recent situation regarding the financial inclusion around the world. In **table 6**, the financial inclusion averages of the world and the European Union are presented concerning having a bank account, savings and borrowings (Demirgüç-Kunt et al., 2018). These measures concern the percentages of the total population (aged above 15). The data on the European Union is calculated by averaging the data concerning the member states of the European Union, including the United Kingdom.

From the numbers stated in **table 6**, is can be analysed that the European Union scores above the world average on financial inclusion measures. The percentage of the population having a bank account is in the European Union 91%, whereas the world average is 69%. **Figure 5** visualises the levels of bank account ownership in the European Union member states, where Denmark scores highest (99,9%) and Romania scores lowest (57,8%).

Table 6: Financial inclusion data around the world and in the European Union. In percentages of the adult population. Data retrieved from Global Findex Database of 2017 (Demirgüç-Kunt et al., 2018)

		World	European Union
Having a bank account		69%	91%
Having a bank account – individual characteristics	Women	65%	90%
	Adults belong to poorest 40%	61%	87%
	Adults out of the labour force	59%	84%
	Adults living in rural areas	66%	90%
Savings	Saved any money	48%	62%
	Saved at a financial institution	27%	44%
Borrowings	Borrowed any money	48%	48%
	Borrowed from a financial institution	23%	37%
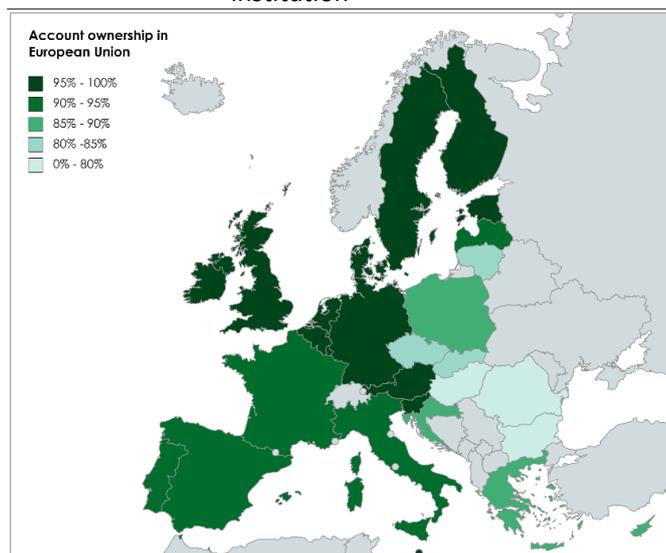
Figure 5: Account Ownership in European Union in 2017. In percentages of adults in population. Data retrieved from Demirgüç-Kunt et al. (2018)

Financial literacy: In 2014, only 33% of the world population was financial literate, in the European Union, 52% of the population is financially literate (Klapper et al., 2015). In **figure 6** the percentages of financial literacy of the adult population per member state of the European Union in 2014 are visualised. In the European Union, Denmark and Sweden score highest (71%) and Romania scores lowest (22%).
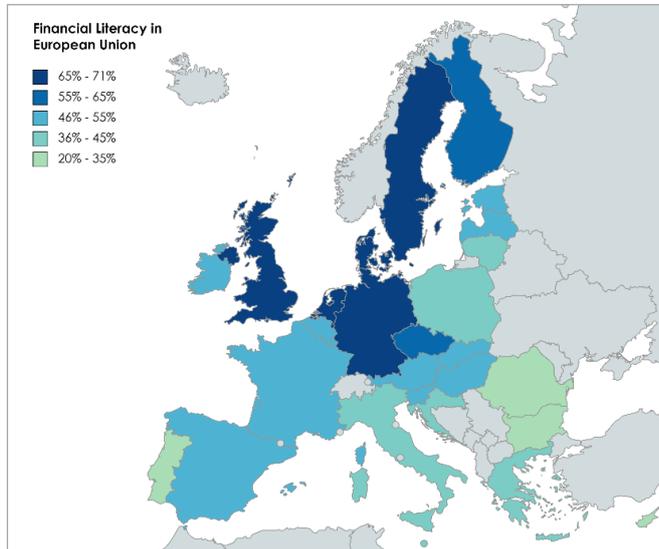
Figure 6: Financial Literacy in European Union in 2014. In percentage of adults in population. Data retrieved from Klapper et al. (2015)

Digital finance: In the European Union, 87% of the population has made or received digital payments, 47% of the population used a mobile phone or the internet to access their account, and 74% made a payment using a debit or credit card. For the world average, these percentages are respectively 52%, 25% and 33% (Demirgüç-Kunt et al., 2018). **Figure 7** visualises the percentages of the adult population in Europe that has made or received digital payments in 2017, which is an indicator for digital finance usage. The highest percentage is 99,4% for Denmark and 47,2% for Romania.
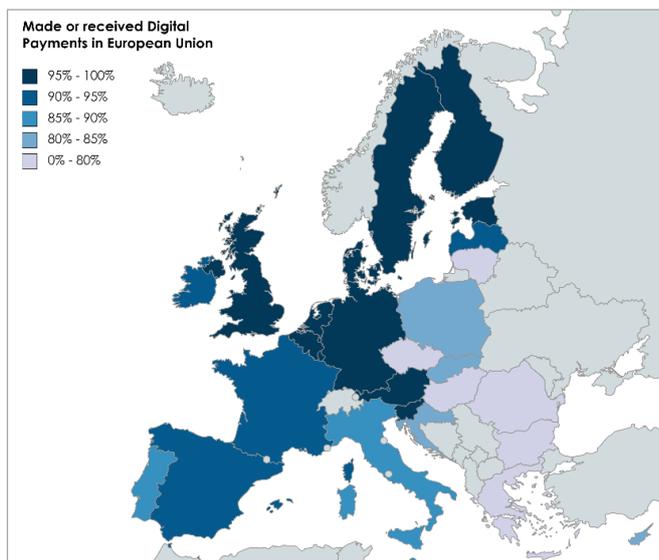
Figure 7: Made or received Digital payments in European Union in 2017. In percentages of adults in population. Data retrieved from Demirgüç-Kunt et al. (2018)

Digital literacy: In **figure 8**, an overview of the digital literacy in the European Union is given, the data is extracted from the Digital Economy and Society Index (DESI) of the European Commission in 2020, the numbers concern the percentage of adults that have at least basic digital skills which is comparable to a basic level of digital literacy (European Commission, 2020). The average digital literacy in the European Union is 58,3%. The highest scoring country are The Netherlands with 79,4%, the lowest scoring country is Bulgaria with 29,4%.
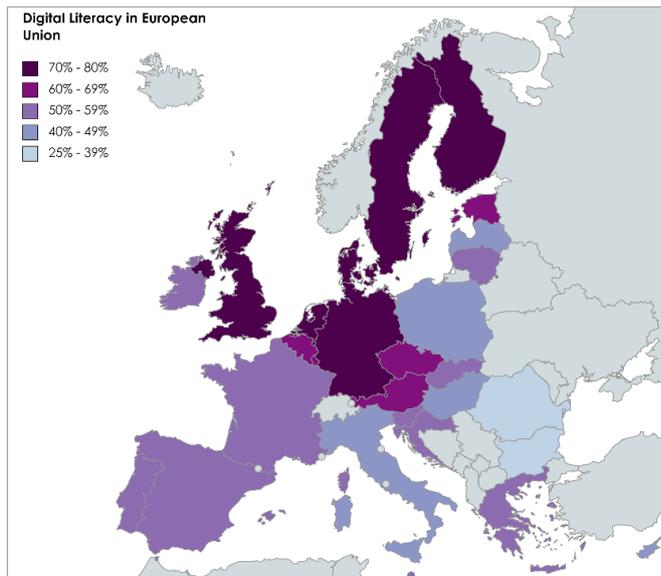
Figure 8: *Digital Literacy in European Union in 2020. In percentages of adults in population. Data retrieved from European Commission (2020)*

8.2. Appendix 2: Interview Protocol

8.2.1. Contact prior to interview

Request for interview – 1st Email

Dear Sir/Madam **[or name of respondent]**,

My name is Amber Bokkens, I am a master student in Business Administration at the University of Twente in The Netherlands. I am working on my master thesis on the topic of financial inclusion and digital finance. For the data collection, I will interview European microfinance institutions and FinTech organisations. I am sending you this email because I am very interested in interviewing **[company name]**.

Massimo Preziuso proposed to contact you for my research. Massimo has interviewed **[company name]** earlier about inclusive and sustainable business models for the SFIDE project (Strengthening Financial Inclusion through Digitalisation in Europe) of among others the University of Twente.

My research is related to the SFIDE project. In the attachment, you can find an overview that explains the topic of my research.

I would like to conduct one interview of approximately one hour with you or a representative of the organisation. In this interview, we will discuss what **[company name]** is doing to make the use and understanding of the financial services and digital technologies easier for your customers. The data from the interview will be analysed and used confidentially and anonymously, and the data handling will align with the guidelines of the GDPR.

For **[company name]** this is an opportunity to discuss their best practices related to the products and services offered to the customers, which will be (anonymously) used for academic research.

I would like to know if you are interested in scheduling an (online) interview with me about this topic.

When you have any questions, please do not hesitate to contact me.

I am looking forward to your response.

Kind regards,

Amber Bokkens

University of Twente

Information about the interview – 2nd Email

Dear **[name representative]**,

Tomorrow at **[time of the interview]** we have scheduled the interview about financial inclusion **and FinTech** for my master thesis. With this email, I want to give you some additional information about the interview.

In the attachment (which I also added to my previous mail) you can find an overview of my research topic. The goal for the interview is to gather information about the activities **[company name]** undertakes to improve the customers' understanding of financial services and/or digital technologies, or the activities undertaken to ease the use of financial services and/or digital technologies. When you have any questions regarding my research, we can discuss these during the interview, or feel free to send me an email.

During the interview, I will ask questions concerning the following topics. First, I want to get some general information about **[company name]** and its business model. Thereafter we will discuss how **[company name]** contributes to **financial inclusion** and how **digital finance** is playing a role in the organisation. Then we will discuss what activities the organisation undertakes to improve the financial and digital literacy of the customer. In other words, what activities the organisation undertakes to improve the understanding of financial services and/or digital services of the customers, or how the organisation eases the use of financial services and/or digital services.

Then I would also like to give you some information about the data handling. The interview will take approximately one hour. When you agree, I would like to record the interview. The recording of the interview will be only accessible to me, and will be stored in line with the GDPR guidelines. The recording will ultimately be deleted directly after I finished my master thesis. Furthermore, the data extracted from the interview will be anonymized, therefore no names and company names will be mentioned in the data analysis nor the master thesis.

During the interview, I would like to ask you to take place in a quiet room with a good internet connection. And when you have any questions or remarks prior to the interview, please do not hesitate to contact me.

I am looking forward to meeting you tomorrow!

Kind regards,

Amber Bokkens
University of Twente

Attachment of both emails

*See **figure 9** on the following page.*

Figure 9: Attachment of emails – Informing poster about research topic

8.2.2. Interview

Script for beginning interview

At the beginning of the interview, information should be provided about the research, the interview, and the data management policies in order to ensure clarity about the data collection procedures for the respondent. The following point will be discussed prior to discussing the interview questions:

- o Asking for consent for recording the interview, and starting the recording when this is approved.

- o Mentioning the schedule for the interview, which is at first providing some information about the research and the data management procedures, then discussing the interview questions.

- o Shortly introducing myself and the representative

- o Providing some information about the research and the goal for the interview, and asking whether the representative has questions.

- o Giving some information about the data handling procedures. This concerns the access to and deletion of the recording, the anonymizing of the data, and data storage in line with the GDPR. Further, mentioning that the representative is not obliged to answer a question and is allowed to quit the interview.

- o Asking for consent for participating in the interview.

After discussing these points, the interview can be started.

Interview questions and prompts

*See **table 3** on page 17.*

Due to the confidentiality of the interviews, the transcripts of the interviews are not presented in this research.

Script for ending interview

After discussing the interview questions, the interview will be ended with the thanking the representative with participating in the interview, and closing the interview.