



Erasmus+



Game Based Learning

Financial Literacy Project



FİNANSAL OKURYAZARLIK UYGULAMALI EĞİTİM PROJESİ

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Game based Learning - Financial Literacy

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Foreword

When most people hear the word "literacy," they likely think of a person's ability to read and write at least one language. But in fact, there are many different types of literacy.

The understanding of literacy that we possess is often related to our educational background and experiences. Those of us in the field of education know that there are several types of literacy, all of which help us navigate life and fully engage in our society. At present, perhaps the most widely known are digital literacy, media literacy and multicultural literacy. But one type of literacy that is vitally important to everyone, and not depends on a country, culture, religion, education, age, gender, etc. is financial literacy.

Today we live in a rapidly changing, complex world. These globally accelerating changes has many names: financial crises, trade wars, climate change, technological advances and digitalisation of global networks, urbanization, migration, and social problems such as poverty, exclusion, and inequality. All these changes also have their clear economic aspects, which have a clear and significant impacts at both the state and the household / individual levels.

Because individuals do not live isolated from the society around them, financial literacy has both a social and an individual dimension. Although the arguments put forward to improve financial literacy are most often based on an individual's own financial management perspective, this connection with the wider economic environment cannot be unilaterally ignored. Perhaps terminologically, it could be more appropriate to use the term financial education to describe this wider financial literacy.

But financial literacy has also assumed greater importance in most societies as the result of the increasing complexity of financial products, comprising greatly varied elements even to the point of real-life incongruity. At the same time, financial markets around the world have become increasingly accessible to the 'small investor,' as new products and financial services have spread widely, partly even as a result of nonspecific marketing. Most motley financial products, including payday loans, pawn shops, flexible credits, and various funds, with different products names, capital guaranteed investments, ETFs, derivates and similar hybrid-type financial products have also become widespread.

It is therefore understandable that there is more and more talk about consumer protection concerning financial services and products. And not just for young people, many adults, including the seniors, need more financial literacy to cope with present financial environment.

Financial literacy is an essential skill for the 21st century. Financial literacy is an important element of economic and financial stability, both for the individual and the economy.

In this book financial literacy is seen as the ability to use knowledge and skills to manage financial resources efficiently and to make sound financial decisions for the lifecycle of financial wellbeing. Improving financial literacy is a long-term behavioural change initiative. It requires a multi-faceted approach and sustained action over time to bring about gradual improvement. In addition, a lack of financial literacy may contribute to seemingly "irrational" behaviour that complicates solid functions of financial markets and causes instability to public finance.

It is great pleasure and honour for me to thank and appreciate for their efforts of Mr. Ferhan Kaptan and Mr. Aatos Hallipelto.

Dr. Tevfik Altınok

President

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ABOUT THE PROJECT

Project Objectives

The key objective of this Project is to increase the knowledge and the skills of the young generation, helping them to make smart decisions for brighter financial future. The secondary objective of the Project is to cooperate young university students to develop the game. This process will help them to understand the real-life works, combining with the importance of the financial literacy. The process of the development and implementation will provide opportunities to the partners, to work for the common goal and to understand the different cultures to increase the opportunities of networking, the exchange of best practices and between academics and civil society organizations from the EU and Turkey, and finally to enhance awareness of the opportunities and challenges of Turkey's accession to the EU.

Financial literacy is a combination of awareness, knowledge, skill, attitude, and the behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing, according to the OECD. Similar to literacy, it can be viewed as an expanding set of knowledge, skills and strategies, which individuals build on throughout life, rather than as a fixed quantity. Consumer understanding of financial concepts and ability to correctly interpret financial data is what is generally referred to as financial literacy in the field of consumer finance.

The Project has been designed in line with the notion of financial literacy and its significance on the financial inclusion of young people and improvement of entrepreneurial skills of young entrepreneurs through finance in a technological and innovative pattern. A number of international surveys and PISA tests have evidenced a rather low level of understanding of financial matters and of basic economics among the average financial consumer.

Even relatively straightforward financial products can appear quite complex to the average citizen who has little or no financial education. The lack or low level of financial literacy exposes the citizens to the risk of falling into debt, and of experiencing difficulties in the event of some unexpected adverse circumstance. It also makes it harder for individuals to ensure a satisfactory standard of living in retirement. So, from the designed project view, the financial education is all about improving the financial well-being of individuals and society. By the general acceptance, from the project view, also it is essential to promote financial education amongst students and youths from an early age, as the knowledge and skills acquired by them at that stage will serve them in good stead as they progress through life. In this sense, the main objective of the Project is to develop a curriculum for financial literacy learning and implement this by scenarios to an innovative instrument, game-based learning tool, to improve the financial literacy competences of young people in Turkey and Spain, and develop a curriculum based on exploitation of serious game in financial literacy training and education.

The Project also aims at enhancing the European context of using technology and innovation in training and education in full accordance with the EU 2020 Strategy in general and the EU Agenda 2020 for Entrepreneurship in particular. The target group of the project is 1.000 young people from between ages 15-25 from different background in Turkey and Spain.

Alongside with them, stakeholders representing universities, Ministry of Education, private and public institutions from financial sector will also be expected to participate in the project activities and beneficiaries of the project. Moreover, through the dissemination of the project via online instruments such as website and social media accounts, it is expected that the project will be able to reach out about 10,000 people. Within the project, a series of activities will be held including development phase through which the Turkish and Spanish games will be developed; transnational meetings of the partners at which the issues of the projects will be discussed, production of intellectual outputs, and

multiplier events to disseminate the project outputs and results. A methodology titled 'Strategic and Operational Management' will be used to carry out the project from managerial point of view. Within the production of the game, a specific and advanced technological algorithms and software development systems will be used by the experts. At the end of the project, it is expected that the financial competences of young people will improve, hence, their participation in the financial decision-making processes will be increased and more young entrepreneurs will enter into the world of entrepreneurship. Moreover, financial literacy education and training, currently, held within conventional methods, in Turkey and Spain will be technology based.

Last and not least, the European added value within the sector and through the cooperation of partners from Finland, Spain and Turkey will be strengthened, and the project will make contributing to the relations between Turkey and the EU through financial literacy that is included within the Chapter 9 Financial Services of the Acquis.

Project Partners

The Lead Applicant and Administrator of the Project is the Turkey-Europe Foundation (Türkiye Avrupa Vakfı - TAV). Other Partners in the Project are OKAN University (OU, Turkey), two Turkish companies BAREM and DK Bilgi Teknolojileri, Finnish company FINLIT Partners Oy, Valencia Polytechnic University (UPV, Spain) and the Association of Young Entrepreneurs of Valencia (AJEV, Spain).

Game base Learning - Financial Literacy

CHAPTER I – WHAT IS FINANCIAL LITERACY?

1 Understanding the Concept

1.1 Some existing definitions

Many concepts and terms are used within the definition of financial literacy. Conceptual and functional heterogeneity complicates issues and makes studies and discussion difficult. The terms, such as financial literacy, financial knowledge and financial education often are used interchangeably in the literature and popular media. In some contexts, the term *consumer education* is also used. It is useful to notice, that using the term education in the definition describes a process (of education), rather than an outcome.

Hung, A. et.al. (2009)ⁱ defined financial literacy as the knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial wellbeing. According to Delavande, Rohwedder and Willis (2008)ⁱⁱ financial knowledge is a type of capital a person has accumulated in life, developing the skill to manage his financial resources. According to Atkinson and Messy (2012)ⁱⁱⁱ, for a person to be financial literate, it is necessary some basic knowledge of key financial concepts. Robb, Babiartz and Woodyard (2012)^{iv} used the definition as follows: the ability to understand financial information and make effective decisions, by using this information.

During the last decade, definition of financial literacy has evolved from merely being knowledgeable on financial matters to the ability to make use of such literacy on day-to-day financial decisions. However, in literature the terms financial literacy, knowledge and financial education have been used interchangeably. For instance, Fernandes, Lynch Jr and Netemeyer (2014)^v used financial literacy and financial knowledge interchangeably. On the other hand, e.g. Huston (2010)^{vi} and Potrich et al. (2016)^{vii} argued both these terms are conceptually different.

In the literature has been a debate on the importance of financial capability and financial literacy. In some studies, the importance of financial capability over literacy has been emphasised on, while in some others the applicability and usefulness of financial literacy over financial capability has been argued. In this context, the concept of financial capability has been criticised for dictating the best behavioural guideline that is applicable to all (so called "one size fits all" -approach). Instead, financial literacy acknowledges that individuals are unique in their own ways and are responsible for their own decisions. Therefore, and what concerns especially financial education, financial literacy emphasises on the need for empowering individuals than dictating one' best financial behavioural that would be applicable for everyone.

Huston (2010)^{viii} presented that financial literacy has two dimensions: "understanding" and "use". Financial knowledge belongs to 'understanding' while application of such knowledge is the 'use'. Understood in this way, the knowledge that contributes (savvy) financial decision-making, is what constitutes financial literacy, which then consists of dimensions of understanding and use. If we understand that the term "use" covers or includes in the term "behaviour," we may use the term "financial behaviour" synonymously.

And further, according to Huston (2010) a financially literate person has the confidence and ability to use such knowledge, and to make personal financial decisions (Lusardi & Mitchell, 2014).^{ix} In other words, financial literacy allows a person to make informed decisions with confidence and project the financial impact of their day-to-day choices. From this perspective, it can also be said that financial capability is not only a question of financial knowledge and skills, but also a feeling of being able to control a person's own finances. A significant safeguard is the individual's own experience of managing

one's own finances and managing it with even low incomes. However, some other aspects need to be considered.

One is "*difficultatem facit doctrina*". Financial literacy is based not only on personal characteristics but also on available financial information. Not all information may be objective or unambiguous. Although a financially literate person can search for and understand different type of financial information he or she has obtained, for example, when selecting an investment instrument, a part of information available may also be contradictory and/or uncertain, and thus not directly provide a clear basis for decision-making. And secondly, if we assume that "knowledge" is not the only basis for certain behaviour as such, the motivation for the certain behaviour must also be considered. So, as a part of, or in the behind of, acceptable financial behaviour is that a person understands the value of such behaviour, which depends on his or her attitudes. This, in turn, leads to a concept of "financial attitudes". The concepts of "financial behaviour" and "financial attitude" are discussed in more detail in later chapters.

In order to enhance comparability in measurement of financial literacy and to improve consistency in financial education, concepts must be clearly defined. However, as happens in many other topics too, different organisations, researchers and educators have defined financial literacy in many different ways. And the words have different meanings and nuances in different languages.

But in 2020s focusing on basic or "traditional" financial concepts in financial literacy is not enough. The financial technology (fintech industry) is rapidly changing our thinking and behaviour in financial environment. Financial technology, i.e., using software, applications, and digital platforms to communicate and deliver financial services to consumers and businesses through digital devices such as smartphones or pads, has become an inevitable trend. Also, digital technology can make financial services borderless, meaning it allow people to easily access financial products and services in other countries, or practically anywhere. This rapid growth of the fintech industry and the impacts that these technologies are having on the way people make financial decisions such as money transactions, savings, spending etc. does not only bring benefits to consumers and businesses, but also brings requirements to improve digital financial literacy among the public.

As a conclusion, improved and easy access to financial services with the help of fintech requires higher levels of digital financial literacy to make effective use of them, but also to avoid misusing, such as frauds and unwanted behavioural issues like excessive borrowing. Digital financial literacy is likely to become an increasingly important aspect of financial education for the Digital Age. These topics are further discussed in later chapters.

1.2 Definitions in OECD/PISA studies

As seen, financial literacy's concept has been interpreted differently by different researchers and organisations in the past decades. Because here we try to avoid misconceptions, a widely used understanding about what financial literacy is contributes best the purpose of this book. It follows the concept of The Organization for Economic Co-operation and Development (OECD) that sees financial literacy as a combination of awareness, skills, knowledge, attitude, and behaviour necessary to make financial decisions and attain individual financial wellbeing.

The definition of financial literacy in the PISA^x Financial Literacy Assessment Framework refines the definition used for adults to make it relevant for 15-year-old students. The definition also incorporates students' ability to use financial knowledge and skills to meet challenges in the future. According to OECD definition

"financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective

decisions across a range of financial contexts, to improve the financial wellbeing of individuals and society, and to enable participation in economic life.” (OECD 2014)^{xi}.

This definition has two parts. The first refers to the kinds of thinking and behaviour that characterise the domain. The second part refers to the importance of developing the particular literacy. In PISA, “literacy” refers not only to the capacity of 15-year-old students to apply knowledge and skills in key subject areas, but also to students’ ability to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. Therefore, in this definition the terms “skills”, “knowledge”, “understanding” and the notion of applying these talents (“effective actions”) are key elements. But also, such individual attributes as motivation and confidence are needed.

Lusardi (2015)^{xii} states that there are four innovative aspects of this definition that should be highlighted. First, financial literacy does not refer simply to knowledge and understanding, but also to its purpose, which is to promote effective decision making. — This is understandable, because ultimately it is a question of economical decision-making, to make choices between the different options for the best result. In this process, money only works as of a commensurate, better or inferior, factor.

Second, the objective of financial literacy is to improve financial well-being, not to affect a single behaviour, such as increasing saving or decreasing debt. — However, this remark will lead us to ask, what is financial wellbeing, which in turn may turn out to be difficult as it is the sum of many different factors. Some of factors are given, others can be influenced by individuals themselves. Applied to the concept of health, which is also part of wellbeing, it can be said that financial wellbeing is more than just the amount of money available.

Third, financial literacy has effects not just for individuals but for society as well. — In fact, this observation partly contradicts the reasoning in the previous paragraph. On the other hand, it is quite clear that society consist of individuals and the market is born by individuals' decisions in their different roles.

Fourth, financial literacy, like reading, writing, and knowledge of science, enables young people to participate in economic life. — There is a broad consensus that in modern societies financial literacy is as important as literacy or numeracy. But the need for financial literacy is not limited to young people. We have to be aware of the fact, that demographic changes have significant implications, almost in every sector, globally. Aging population and increasing life expectancy form challenges for the adult population, also financially. These are related, inter alia, financial planning especially long-term saving and investment, e.g. for retirement, supporting access to related financial and insurance products and services, observing the role of technology to support financial inclusion, and protecting the elderly from financial abuse and fraud.

1.3 Linguistic translation difficulties

In Finnish term “taloudellinen osaaminen” or “talousosaaminen” is rather widely in use in public discussion. This concept consists of two words, “talous” and “osaaminen”. The Finnish word “talous” can be translated as finance or economy, but the scope of the economy is not revealed. The term “osaaminen” can be defined as the (human) capital of the individual and everyone has a unique own profile.

In English there are many different concepts that can be used to describe individual's “osaaminen”, such as know-how, capability, knowledge, competence, expertise, skills or aptitude. Know-how is often difficult to define unequivocally but it can be considered to consist of knowledge (both tacit and visible), skills, experiences, attitudes, and networks. Knowledge accumulates e.g. during studies and skills through practice. Expertise is often thought to be work experience, but life experience and e.g.

hobbies also produce expertise or special knowledge. Networks helps staying up-to-date and following issues in society.

Know-how can also be defined by its type. Sometimes know-how is very practical in nature and related to a specific topic. Practical know-how is acquired through making it easy to apply to real-life situations. Sometimes knowledge is more general and conceptual, that is, abstract and formal. Formal knowledge is theoretical that consists of concepts and models and can be acquired, for example, by reading. Knowledge can also be metacognitive, whereby it is based on the individual's own actions and guidance. All domains of knowledge are equally important and valuable, but in today's modern society there is a growing need for the capability to harness knowledge, interact with others, be flexible, learn, influence, reflect, act entrepreneurially, and organise.

One skill is rarely enough to produce top performances. Other skills are needed alongside. Knowledge of issues' substance will only come to fruition once a person has developed his or her social and emotional skills. Knowledge also involves tacit knowledge, which is often an unconscious and subjective understanding and interpretation that cannot always be outsourced.

Consequently, to describe the Finnish term "osaaminen", we can use the English term capability. And understand it simply as the ability to do something, to perform a specified task. Individuals have capabilities (and so do organisations).

Capability building is a constructive process, as is learning. Capability refers to the issues related to people's behavioural practice. Capability is therefore nearer the application of skills and knowledge in a social context (e.g. in a work organisation).

The following diagram describes the components of capability building.

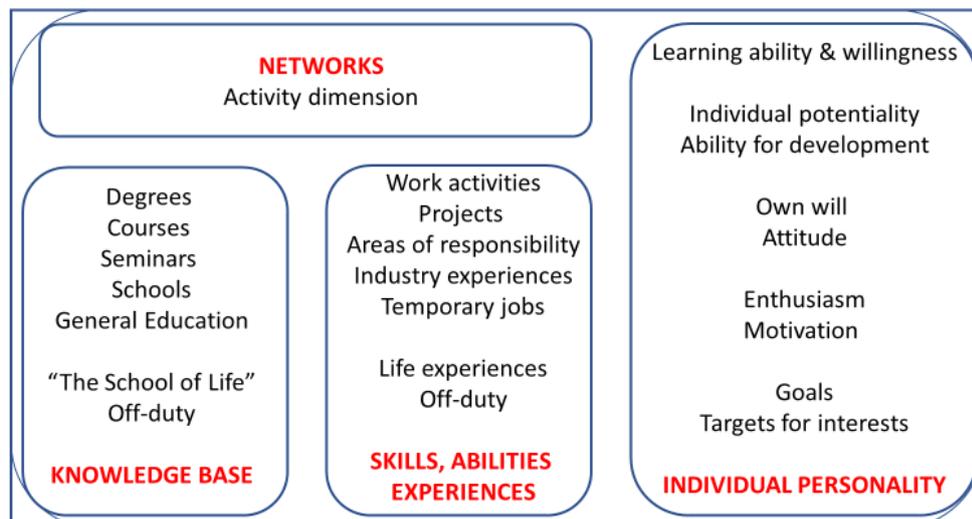


Diagram 1 Components of capability building^{xiii}

Some Finnish researchers prefer the concept of financial capability. According to their study^{xiv}, financial capability is a broader concept than literacy in the economy. An economically capable person can use literacy in the economy with a good understanding of his or her own resources and financial situation and can apply the knowledge he or she has acquired in changing situations.

Functional skills are manifested in a person's behaviour. The development of young people's financial skills strongly involves building up their knowledge and skills and directing their activities so that they are able to take proper account of their changing life situations in their activities. Based on international literature and research, financial literacy, by virtue of its content and scope, is as

important as financial ability. However, ability is a difficult term in Finnish and that is why the researchers decided to use capability instead.^{xv}

In the international studies and literature, the definitions of financial literacy are different and vary in scope. Comprehensive table, which summarizes these definitions can be found, inter alia, in Finnish Centre for Consumer Society Research publications 3/2011.^{xvi}

Without further exploring the historical, linguistic, or social background and meaning of words, and although the term “osaaminen” (financial capability) is justified in Finnish financial environment, the common international term financial literacy is used in this book as the basic definition.

1.4 New perspectives for the 2020s

1.4.1 Relativity is relative

The fact that different individuals may have different financial needs (by age, gender, socio-economic and personal finance status, immigrant background, country, culture, surrounding economic environment, etc.) leads to the assumption that financial literacy is a relative concept. It means also that personal capability building around financial literacy concept - as well as assessment tools - cannot be established on "one size fits all" -approach.

Consequently, understanding the concept of financial literacy and its key components (knowledge, skills, attitude, motivation, etc.) requires a review of the concept itself and its components, mainly based on previous different definitions and measurement studies of financial literacy. Comparison of different perspectives can be used to provide a framework for game-based learning financial literacy and how this learning process can be intensified.

But financial literacy is also a relative concept in terms of content dimensions. There are different views on the material or conceptual dimension of financial literacy. Much of the current literature and studies focuses on personal finance skills and knowledge. In contrast, the societal aspects of financial literacy are often not addressed, except through the functioning of the financial system and the over-indebtedness of citizens. This perspective often also highlights macroeconomic aspects.

Some scholars emphasize that teaching financial literacy should focus on how, for example, our own consumption patterns and investment decisions are related to the global exploitation of people and nature, because it would be crucial to address the wider inequalities and effects by global economy.^{xvii}

It is difficult to assess how "relative" the concept of financial literacy in terms of content dimensions actually is. But, if we limit the concept of financial literacy only to personal finance issues, we forget the important role of the consumer in the economy and the responsibility for the consequences of one's own consumption decisions. At the same time, we also ignore the concepts of responsible consumption and responsible investing, which are evolving into mainstream in many contexts of economic decision-making.

1.4.2 Changes in the financial environment

It is natural to think that at least two global development trends must be considered when looking at financial literacy to meet the requirements of the 2020s: *interdependence* and *digitalisation*. These are both partially overlapping and separate. In addition, it is conceivable that digitalisation has been a key force for change in increasing interdependence, especially in the financial sector.

The financial environment people are living today in is characterised by continuous change, complexity, and interdependence. Globalisation, without addressing its pros or cons, is a change in which people interact more and more world-wide. Globalisation is affecting the economy, culture,

transport, tourism, politics, and the quality of the environment. It is creating new forms of interdependence where actions are subject to economic influences and consequences that stretch well beyond the individual and the local community. Despite the present and future challenges facing the world, such as the pandemics or natural disasters, it is not credible that globalisation can be cancelled. Instead, governments will likely have more control over the extremes of globalisation.

Increasing interdependence leads to the need of more holistic thinking and competence. It is difficult to distinguish more and more phenomena unambiguously from the other phenomena that affect them, so there is a need to look more and more at the interdependencies between different phenomena, from the methods and perspectives of different disciplines - simultaneously.

The increase in interdependence in the labour market is reflected, among other things, in the growing demand for interdisciplinary expertise. It is precisely the thinking about competence based on a particular degree that may become questionable.

The need for lifelong learning is emphasised in an interdependent world where new connections and interactions are constantly being discovered. It is difficult to postulate that static knowledge learned early in a career could assume independence from a supposed discipline throughout a career. Therefore, questions about the responsibilities and costs of continuous competence development between society, the employer and the individual will certainly become more and more central topics of discussion.

The same phenomenon is also visible in business. The average life expectancy of companies has shortened. One key driver for this is often the rapid change and merging of industries brought about by technological developments. Companies that want to succeed in the long run can no longer focus solely on tracking their own industry. The most successful are those who identify the fastest opportunities to combine expertise across industries and be creating entirely new industries. The role of foresight and cross-sectoral foresight cooperation is emphasised.

If we recognise the fact that every financial decision has also its social consequences, explicitly or implicitly, and even when it looks like only as a matter of personal finance, it also helps us to understand how society and the economy work. This understanding does not in any way limit individual decision-making freedom as a consumer of financial products but broadens one's view of what the individual can influence. In an increasingly complex world and financial environment, this socio-financial awareness will form an important part of the financial literacy needed in the 2020s.

Socio-financial awareness means understanding the consequences of one's own financial choices as a part of societal consequences of financial decisions to climate change and other socio-economic issues. Although the core of the financial literacy domain is focused on personal finances, the societal context recognises that individual financial wellbeing is not only about personal or family money management and cannot be entirely separated from the rest of society.

It is therefore justified that the socio-financial awareness forms one part of a sixth and different domain of knowledge that plays an important role in understanding problems in each and every other domain. In this it is called socio-financial awareness, understanding "awareness" as a mindset (to be aware of something).

On the other hand, the question may be asked whether it is justified whether socio-financial awareness can be considered as an independent domain of knowledge in financial literacy, or whether socio-financial awareness should be integrated into all the financial literacy domains already mentioned above. However, from a learning perspective, it may be clearer that other domains of financial literacy form the basis on which socio-financial awareness can be built as an independent perspective with a help of examples and cases. The same goes for digital financial literacy.

Digitalisation leads to the concept of *digital financial literacy*. In short, digitalisation means the introduction of digital technology in every aspect of society. Digitalisation is a holistic factor in the transformation and development of business and societies. It is a cross-cutting phenomenon that diminishes the traditional importance of geography. The importance of distances is diminishing, and nationally controlled business operations are transformed into cross-border international activities where companies are located in the locations, they deem best. It is making the pace and the effects of global interdependence faster and more widespread.

The digitalisation of products and services is a direct continuation of consumer purchasing behaviour and culture. It affects everything we do, our way of acting, our thinking or our experience. Digitalisation has already changed consumer cultures and economic behaviour. Money has become invisible. In addition to managing our own finances, the challenge is to cope with global economic change and future uncertainty.

The rapidly evolving financial technology (later FinTech), such as digital financial services and open banking systems, new actors in the financial market, digital currencies, and similar phenomena, expand relativeness of financial literacy definition.

In the financial sector, digitalisation has created many new opportunities for easier and more efficient management of things that were previously unavailable, also including AI, RPA, IoT, blockchain technology and digital identity. But at the same time, financial decisions are increasingly incorporating environmental, social and governance considerations, too. The aim is promoting sustainable economic growth and increasing the awareness of the risks which may have an impact, not only on the sustainability of the financial system but also on personal financial wellbeing.

According to the definition used in the PISA studies, financial literacy should enable young people to, inter alia, "improve the economic wellbeing of individuals and society". In the study, the tasks of this category are related to situations where personal financial wellbeing affects and is affected by the local community, the nation, and even global activities. Examples may include being informed about consumer rights and responsibilities, understanding the purpose of taxes and local government charges, being aware of business commercial interests, and understanding the financial implications of personal actions on the society, economy, and environment at large.^{xviii} It is natural to assume that the environment at large also includes climate change, especially when it comes to research addressed to young people.

Although the core of the financial literacy domain is focused on personal finances, the societal context recognises that individual financial wellbeing is not only about personal or family money management and cannot be entirely separated from the rest of society. This justifies including socio-financial awareness as a sub-domain of financial literacy as well as digital financial literacy.

And finally, the developing education technology, EdTech, creates new kind of opportunities for teaching various subjects, such as math, history, languages, etc. One of EdTech' forms is *gamification*,^{xix} which provides interesting serious games^{xx} for learning financial literacy.

2 National strategies

2.1 National level perspectives

Within a fast-evolving economic and financial environment where rapid changes in digital financial and other services are made access to these services easier while more risks are being transferred to citizens, financial literacy has become a one of the key skills for individuals as well as micro and small businesses.

Financial education enhances financial literacy by increasing financial knowledge, skills and hopefully also attitudes. In turn, this can contribute to individuals' (including vulnerable and low-income persons) participation in financial, economic, and social life as well as to their financial wellbeing. Better financial literacy levels can also help bridge some of the existing socio-economic gaps and inequalities within a country, thus supporting to more inclusive society for all. As a complement to financial inclusion and financial consumer protection, financial education is also important to increase confidence and trust in financial markets, which in turn can support financial stability and economic growth.

From national perspective, financial education contribution to economy can be approached in two level:

- At a micro/personal level, higher levels of financial literacy will lead to improved financial wellbeing. Having the appropriate knowledge, behaviour and attitude helps the consumers to better plan their finances, make long-term savings, and avoid over-indebtedness, thus amplifying their personal financial stability and wellbeing.
- At the macro/national level, healthier financial behaviours of the population can lead to the improved functioning of the financial system. By being able to understand, estimate and evaluate the main macroeconomic indicators and complex financial products, consumers will also more easily understand the policies of central banks and the expectations of the market. In turn, this could influence consumption patterns in more predictable ways, as well as encourage individuals' to actively participate in the economy.^{xxi}

Financial literacy is an important element of the policy mix for financial stability, and is rightly considered alongside market regulation, supervision, and financial consumer protection. According to the OECD-GFLEC, the 2008 financial crisis clearly illustrated this by exposing three closely related realities:

- the stability of the financial system is intrinsically linked to the quality of decision-making at the individual level,
- the price tag of financial illiteracy is quite steep, and,
- poor financial judgment and speculation at an aggregate level can have devastating system-wide consequences for the entire world economy.^{xxii}

The combination of financial education and financial stability can be considered as a “win-win situation” for all stakeholders. For this reason, financial education is an important part of the national policy mix related to financial stability and is rightly considered as part of financial market regulation, supervision, and financial consumer protection. Financial education is on the agenda of central banks, too. With the primary responsibility for managing inflation and financial stability of the country, central banks use financial education as a tool to keep consumers informed and support their decision-making and behaviour in different ways.

However, though the benefits of improving financial literacy are clear, policymakers also recognise that financial literacy cannot function alone to support financial stability. Sound regulation and supervision, as well as macro prudential policies are important complements to a comprehensive approach.

A national strategy for financial education (hereinafter “National Strategy” or NS) is defined as “a nationally coordinated approach to financial education that consists of an adapted framework or programme, which:

- Recognises the importance of financial education – including possibly through legislation – and defines its meaning and scope at the national level in relation to identified national needs and gaps,

- Involves the cooperation of different stakeholders as well as the identification of a national leader or co-ordinating body/council,
- Establishes a roadmap to achieve specific and predetermined objectives within a set time period; and,
- Provides guidance to be applied by individual programmes in order to efficiently and appropriately contribute to the NS.”^{xxiii}

There is no one-size-fits-all model or detailed process for the development of a NS. The development process and the design of NS’s framework should address specific national challenges and be adapted to countries’ short- and long-term policy objectives. This means, the NS can be part of, or a complement to, a holistic approach aimed at empowering consumers, financial institutions, and other relevant stakeholders through enhanced access to a range of regulated financial services and appropriate financial inclusion, and improved consumer protection framework, in financial related issues. And in national level, promoting the development of stable and well-functioning financial markets and supporting financial stability.

In 2009, as an integral part of the OECD project on financial education, the work on national strategies for financial education was launched. It was a complement to financial consumer protection and inclusion measures with a goal to strengthen financial stability and development. This work was particularly meant as a new policy tool to counter some of the lasting effects of the 2008 global financial crisis, while offering solutions to governments designing and implementing financial education policies.

In 2012 the OECD and its International Network on Financial Education (INFE) conducted research and developed tools to support policy makers and public authorities to design and implement national strategies for financial education.^{xxiv} In 2015 OECD/INFE published the handbook on national strategies for financial education, which is follow up to the previous publication, which dealt with the high-level principles for financial education.

The substantial increase in the number of governments which have adopted nationally coordinated approaches to financial education testifies to its significance. According to Policy Handbook^{xxv} 59 economies worldwide have implemented national strategies (in 2015) by using guidance from the principles, compared to a few countries in 2009.

A significant group of countries were in the process of revising their initial strategy and/or implementing a second national strategy based on their experience and the evaluation of the outcome of the first national strategy. The following table (Table 1) shows the status of national strategies (NS) in in different countries in 2015.

Status of the national strategy	Number	Countries and territories
A NS IS BEING REVISED OR A SECOND NS IS BEING IMPLEMENTED	11	Australia; Czech Republic; Japan; Malaysia; Netherlands; New Zealand; Singapore; Slovak Republic; Spain; United Kingdom; United States
A (FIRST) NS IS BEING IMPLEMENTED	23	Armenia; Belgium; Brazil; Canada; Croatia; Denmark; Estonia; Ghana; Hong Kong, China; India; Indonesia; Ireland; Israel; Korea; Latvia; Morocco; Nigeria; Portugal; Russian Federation ³ ; Slovenia; South Africa; Sweden; Turkey
A NS IS BEING ACTIVELY DESIGNED	25	Argentina; Chile; China (People’s Republic of); Colombia; Costa Rica; El Salvador; France; Guatemala; Kenya; Kyrgyzstan; Lebanon; Malawi; Mexico; Pakistan; Paraguay; Peru; Poland; Saudi Arabia; Serbia; Tanzania; Thailand; Uganda; Uruguay; Zambia
A NS IS BEING PLANNED	5	Austria; Former Yugoslav Republic of Macedonia (FYROM); Philippines; Romania; Ukraine; Zimbabwe

Table 1. Status of national strategies in 2015.

Source: National Strategies for Financial Education. Policy Handbook. OECD/INFE 2015

2.2 National strategies in EU Member States

When considering the most appropriate responsible level to design and implement a national strategy the national level is the most appropriate, and obviously also the most effective and efficient level for the delivery of financial education programmes. Therefore, the EU member states are in a key position by adopting and implementing national financial education strategies based on public – private partnership (PPP).

According to the European Commission the best way to increase the financial capability of consumers in the EU is by developing coordinated national strategies in member states. As education remains at national responsibility, The Commission's role is to encourage member states to tackle financial education issues and to facilitate the exchange of best practices. As such, it has also taken initiatives to organise expert meetings through the creation of an Expert Group on Financial Education (EGFE), to maintain a European database of financial education initiatives, to develop online tools for teachers and to provide support for events.

Although significant work is already underway in some European countries to implement national strategies for financial education, a lot is still to be done. Considering the economic importance of financial literacy for EU, further concrete actions are needed. A recommendation to encourage the adoption of national financial education strategies in EU member states and the incorporation of financial literacy components into school curricula, launched by The Commission, would be valuable.

According to table and data from the OECD^{xxvi}, some EU member states are implementing a first national strategy for financial literacy. Meanwhile, other member states are revising a current national strategy or implementing a second national strategy. Some other member states have reported that a national strategy is being planned or actively designed. Finally, it appears that there are a few Member States which have no national strategies for financial literacy to date or is even planned.

The number of countries that have a national strategy for financial education is gradually increasing globally. However, there are some collective challenges which need to be highlighted, including, inter alia, how to integrate financial education into other policies such as consumer protection and designing effective interventions to improve financial behaviour.

The following table (Table 2) illustrates the status of national strategies for financial education in EU Member States' (2018) according to four categories: (1) a national strategy is being revised or a second NS is being implemented, (2) a (first) national strategy is being implemented, (3) a national strategy is being actively designed, and (4) a national strategy is being planned.

Member State	A national strategy is being revised or a second NS is being implemented	A (first) national strategy is being implemented	A national strategy is being actively designed	A national strategy is being planned
Austria ⁷⁹				
Belgium		*		
Bulgaria				
Croatia		*		
Cyprus		*		
Czech Republic	*			
Denmark		*		
Estonia		*		
Finland				
France		*		
Germany				
Greece				
Hungary		*		
Ireland				
Italy				*
Latvia		*		
Lithuania				
Luxembourg				
Malta			*	
Netherlands	*			
Poland		*		
Portugal	*			
Romania				*
Slovakia	*			
Slovenia		*		
Spain	*			
Sweden		*		
United Kingdom	*			

79) various public and private initiatives active without a national strategy

Table 2: National Strategies for financial education in Europe

2.3 National strategy in Turkey

Many studies conducted on different segments of society, revealed that the level of financial literacy of the society in Turkey is low (Gundogdu, 2020). It can be seen that strategic planning related to financial literacy education is being carried out in Turkey within the framework of both these studies and international collaborations. The first national strategic plan announced in Turkey regarding financial literacy is considered to be the Istanbul Financial Center Strategy and Action Plan (Official Gazette, 2009). Briefly, one of the priorities of this plan, which was put forward in order to accelerate the IFC (IFS) project, is to determine and review “human resources and education policies in the field of finance.” Regarding this priority, actions laid between the core curriculum at the higher education level in the field of finance and the development of university-industry cooperation, increase of scholars and educators in the field of finance, elementary and secondary education courses at the level of basic curriculum finance. A more comprehensive strategic planning followed this plan.

As published in the Official Gazette 05.06.2014 with date 2014/10 and number 29021 approved by the prime ministry, “financial access, financial education and financial consumer protection strategy and action plan” entered into effect, financial education and financial stability monitoring and the coordination of the action plan to the committee was given. This committee consists of the Undersecretary of the Treasury and the presidents of the Central Bank of the Republic of Turkey, the

Banking Regulation and Supervision Agency (BRSA), the Capital Markets Board (CMB) and the Savings Deposit Insurance Fund.

The main purpose of this strategy is to spread financial products and services to all segments, to include people outside the financial system, to increase the quality and use of existing products and services. Within this framework, the aim is to increase the access to financial products and services and the use of financial products and services, as well as to take effective measures geared towards protecting the financial consumer under the leadership of relevant actors. According to the division of labor in this strategic plan, the monitoring and coordination of financial education plans is given to the Capital Markets Board.

With the expansion of financial education within the framework of the Financial Education Action Plan, it is expected that the economic well-being of individuals will increase in the short term, the investor base will expand, qualified labor will be provided to the financial sector, the financial markets will grow and work more effectively. Financial Education Action Plan covers the entire population including the families and the women, the primary and secondary education, the universities, the academic environment, the public and private sector employees, the financial sector, people with disabilities, seniors, unemployed young people. The key support of the financial education is to help people during the important turning points in life such as marriage, divorce, new born baby, losing your job. The action plan is a detailed document for all sectors that are specified when examined in the target groups for training, creation of training materials to increase awareness is done through the media, and educational researchers, trained, and as explained in actions such as projects, stakeholder organizations planned execution with all of these actions are observed.

However, the annual activity reports of the Capital Markets Board indicate that the only studies reported on this issue are the training organized for university students. According to the 2020 annual report, there are 39,712 applications for training that were conducted since 2009, but only 11,179 university students were awarded certificates.

Undoubtedly, the activities carried out within the framework of the action plan are not limited to this. Over the years, many more studies were conducted to raise awareness about financial literacy. In this direction, it is observed that the number of research and projects related to this topic increased. It is seen that many seminars, workshops were organized by financial institutions, non-governmental organizations and related ministries, and training was provided especially for young people. It is known that the work on the education of teachers was carried out in cooperation with the Ministry of National Education, which is one of the important stakeholders of the issue (Ministry of Education, 2017). Financial literacy in Turkey is not included as an independent course in primary and secondary education programs but is integrated with other courses (Güvenç, 2017). In this process, it was also revealed that in the programs of some courses, especially mathematics courses (Özkale 2008), arrangements were made regarding learning outcomes related to financial literacy.

To sum, Turkey has a very inclusive strategy and action plan related to financial literacy education. Although it was made in the regulations related to its implementation, it seems that there was not enough reporting on the level of realization of planned activities. On the other hand, a study shows that there is an upward acceleration in the financial literacy index of adults compared to previous years (TEB,2020).

With the gamification of learning process of financial literacy, we would like to provide a different, innovative approach to increase the financial literacy level of the society.

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2.4 National strategy in Spain

Spain is one of the countries that have already implemented a national financial education strategy under the OECD principles and recommendations. In 2008, the National Financial Education Strategy was launched - under the name of the Financial Education Plan (PEF) - through a collaboration agreement between the Bank of Spain and the National Securities Market Commission (CNMV), renewed successively for the periods 2008-2012, 2013-2017, and the current 2018-2021.

The Financial Education Plan has 30 collaborating institutions and promotes a Financial Education Program in more than 500 schools. In addition, it has a reference portal (www.finanzasparatodos.es), which aims to create a brand and improve the financial culture of citizens, providing them with the basic knowledge and tools necessary to manage their finances in a responsible and informed manner.

In the period between 2013 and 2017, numerous actions and projects have been carried out, including the following:

- Identification and coordination of financial education initiatives. It is concluded that the largest number of financial education initiatives are carried out by financial entities, universities, and associations. Initiatives are aimed at numerous segments of the population and mainly deal with savings, banking services and products, and the personal economy. It should also be noted that almost half of financial education initiatives have a social media presence, mainly Twitter.
- Recommended by OECD, Development of a Code of Good Practice for financial education initiatives has been carried out.
- The first Monday of October has been established as a Financial Education Day, where numerous activities take place throughout the national geography (such as workshops, courses, radio programs, stands at street level, conferences at universities, solidarity races, etc.), all of them having the purpose of making citizens aware of the importance of having an adequate level of financial culture to face the challenges they will face throughout the different stages of life.
- **Finance For All** Awards, to promote the quality, excellence and impartiality of the financial education initiatives developed in Spain and to promote the adequate and effective provision of these initiatives, also highlighting the best initiatives.
- Promotion and signing of new collaboration agreements
- Survey of Financial Competencies
- Increase in international activity
- Promotion of the Financial Education Plan, through Radio, Facebook and Twitter and specialized portals.
- Financial education in schools has been carried out, which is one of the priority lines through the School Financial Education Program, it is accessible and flexible portal for all schools. The program was also disseminated and evaluated, the results of which clearly show the differences between the schoolchildren who participated in the program and those who did not participate in the program. One of the most important successes of this period of the Financial Education Plan has been its contribution to the inclusion of financial education in the school curriculum (both in Primary and Secondary Education). This is an achievement promoted by the Ministry of Education, Culture and Sports with the active support of the Bank of Spain and the CNMV. Primary Education covers from 6 to 12 years old and there are 6 school years and Secondary Education covers schoolchildren between 12 and 16 years old.

The aims and actions that were planned for the period 2018 - 2021 were defined based on the experience acquired and priority was given to the following actions:

- Promotion of the brand already created: **Finanzas para Todos** (Finance for All) and its communication strategy giving it more visibility and diffusion
- Digitization and financial education

- Consolidation of the **Financial Education Day**
- Knowledge of the target group and their financial education needs, expanding this audience. If before they were 15-year-old schoolchildren, now was proposed to carrying out financial education initiatives aimed more specifically at groups between 18 and 34 years old, the elderly, low-income groups, women and people who have received only primary education.
- Reinforcement of the role of collaborators seeking to promote financial education among specific social groups.
- Promotion of financial education aimed at schoolchildren

In PISA 2012, which was the first large-scale international study, and which evaluated 18 countries, Spain obtained 484 points, being below the OECD average (which was 500 points).

In PISA 2015, 15 countries were represented, including Spain. These results are considered more reliable, since they were carried out digitally (compared to the previous evaluation that was carried out on paper). Spain obtained 469 points in financial competence, being significantly below the average for the group of participating countries and economies (481). The best scores were for the Regions of China (566), Belgium - Flanders (541) and Canada - Provinces (533).

In PISA 2018, where 21 countries participated, Spain was in position number 12, obtaining 492 points, again not reaching the average (505). Some 15% of students in Spain did not reach the baseline level of proficiency (Level 2) in financial literacy, compared to 15% on average across OECD countries and economies. At best, these students can identify common financial products and terms, recognize the difference between needs and wants, and make simple decisions on everyday spending in contexts that they are likely to have encountered personally. Over 90% of students in the Canadian provinces, Estonia, Finland, and Poland displayed at least Level 2 proficiency. And only 6% of students in Spain were top performers (Level 5) in financial literacy, compared to 10% on average across OECD countries and economies.

Mean financial literacy performance in Spain in PISA 2018 was similar to that observed in PISA 2012, but 24 points higher than that observed in PISA 2015.

In the evaluation of the Financial Education Plan carried out in 2019, which includes the results of the last 10 years of this plan, great advances are observed in its definition, but the lack of a complete image and a strategy, lack of clear and defined indicators that capture all the inputs and outputs of the actions undertaken. Experience also shows that results can only be expected in the long term, since financial education cannot be considered a goal, but rather a tool for achieving a better life level in general.

These results showed the clear need to intensify efforts in Financial Literacy from the Financial Education Plan. For this reason, the agreement between the Bank of Spain and the CNMV has been signed again, demonstrating the need and the opportunity to continue with a comprehensive financial education policy. This need is confirmed by the accumulated practice of these years and by that gathered in the initiatives carried out in other countries.

2.5 National strategy in Finland

So far, Finland has not had a national strategy on financial literacy. Despite the de-existence of national strategy, the financial literacy of Finns is on the average good, though there are differences between population groups. According to PISA 2018 survey of financial literacy, Finland's ranking was among the participants in the second place after Estonia and the scores of the five most successful countries were statistically significantly higher than the OECD average.

In Finland, however, the national strategy will be implemented in the near future. By the joint agreement of the Bank of Finland, the Ministry of Justice and some other key authorities, the Bank of Finland initiated in February 2020 the coordination of activities related to the promotion of financial literacy and based on this, prepared a proposal for a national strategy.

The Finland's national strategy for financial literacy is based on substantive facts and analyses. The strategy considers the starting level of Finns' financial literacy, the conditions prevailing in the market and the societal situation. The strategy was created in close collaboration with key researchers and actors in the field. This will promote the adoption of the strategy, commitment to it, and acting in accordance with it.

In addition, the OECD's International Network on Financial Education (INFE) guidelines, and examples from other countries have been utilised in the financial literacy strategy.

The strategy proposal includes a vision and mission. The vision is clear and ambitious: Finns' financial literacy will be the best in the world by 2030. The mission of Finland's financial literacy strategy is to make people understand the importance of finances in their own lives and to act in their own finances in an ethical and sustainable way.

According to the strategy proposal, reaching the target state calls for a change in operating methods. From the point of view of individuals, their ability to understand and anticipate their financial situation better is of key importance. Easily accessible low-threshold guidance and information services must be available which everybody can use. The proposal emphasises that citizens' better financial literacy produces well-being not only for themselves but also for the entire national economy. For private individuals, this means that they can make good financial decisions and avoid difficulties with their finances.

The elements of the Finnish national strategy for financial literacy are:

- Rationale for a national approach
- Specifying objectives
- Considering situational and circumstantial factors
- Identifying and reaching different target groups
- Preparing an action plan
- Strategy monitoring and research
- Sharing up-to-date information
- Governance, steering, coordination, and financing.

The main steering instrument of the strategy is a function to be established in Finland that will help coordinate the work of dozens of private and third-sector actors (NGOs) in Finland, which is currently fragmented and partly duplicated. Through coordination, the promotion of financial literacy will become more systematic and goal-oriented, and it will monitor changes in the financial environment.

The intention is to prepare a practical action plan for the strategy. Concrete operational goals must be defined in the plan in order to ensure the right direction, and the implementation of the goals must be measured regularly. Seamless cooperation with inter-disciplinary research is important in order to have an overview of the situation.

When financial literacy work is done in the future in line with the strategy, resources will be used more efficiently, good practices will spread to be utilised by more actors, cooperation and synergy will be improved between different actors, and the effectiveness of activities will be increased.

It has been proposed that a function in the administrative branch of the Ministry of Justice to support and coordinate field work be established. This proposal is interesting because one may ask whether the choice of ministry indicates that financial literacy is more a matter of consumer protection and legislation than a matter of education and training for young people and adults.

3 Financial Literacy in Europe

3.1 The initiatives taken by the EU on financial education

In many European countries a constant evolution in the economic, demographic and policy environment, an evolving and innovative financial environment together with high levels of household indebtedness, as well as gradual risk transfers to individuals, has made financial literacy an essential life skill, not only in Europe but also in other developed societies. New, digital, and sometimes complex, financial products and services developed by financial service providers and new market players, provides consumers, investors, and small businesses faster access to a variety of payment solutions, credit offers, long-term savings and investment instruments. However, at the same time, individuals must take responsibility for a widening range of financial risks. On the other hand, it is poorly reasoned that the individual should take greater responsibility for one's personal finance if society and education institutions do not provide the financial capability to do so.

This nearly contrafactual situation with multidimensional, rapid and in many ways unpredictable development poses new challenges to financial literacy education in all age groups of the population. It requires that individuals and small businesses are equipped with the know-how, competence and motivation to make key financial decisions to secure their financial future. Effective financial education, together with simultaneously and mutually reinforcing financial consumer protection, can successfully contribute to the financial wellbeing which in turn supports financial stability and inclusive growth.

These policies are particularly pertinent to Europe, given the sophistication of retail financial markets, pervading effects of ageing, high level on household debt and low economic growth.

The conference on "Increasing Financial Capability", hosted by the European Commission in 2007, was arranged for launching a wide debate on this topic. The conference highlighted that EU member states in a key position, particularly regarding inclusion of financial issues in the education curriculum. The conference presentations illustrated that much is being done in the EU to empower consumers to make appropriate financial decisions, but much more progress needs to be achieved. Later in the same year the Commission issued a communication on financial education in which it sets out the economic, societal, and personal benefits of increased financial literacy and gives an overview of the provision of financial education in the EU.

Next year (2008) DG MARKT set up an Expert Group on Financial Education (EGFE). It consists of public authorities and private stakeholders (national authorities, the financial industry, consumer associations, academia, etc.) In 2009, a dedicated database, The European Database for Financial Education (EDFE) was also set up.

Based on a survey conducted in 2007 to assess the level of financial literacy in the EU27, the European Commission defined principles to help national stakeholders in the definition of financial education programmes. In its 2012 Consumer Agenda, the Commission identified better consumer education, and financial education, as a key objective. Additionally, EU legislation also considers consumer information and protection, one example being the Directives on Consumer Credit (2014/17/EU) and another is Directive 2014/92/EU on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features. And Regulation (2014/1286/EU) on key information documents for packaged retail and insurance-based investment products is worth mentioning.

With regard to some other EU level initiatives, the Commission has set up a website in 2009 called “Development for On-Line Consumer Education Tools for Adults” (DOLCETA)^{xxvii}. Today European Consumers Union (ECU)^{xxviii} is focused on issues such as consumer rights, financial services and consumer education for teachers and financial literacy for teachers.

In European Parliament’s study^{xxix}, the Parliament noted that considerably more efforts and resources should be devoted by governments, the financial sector and civil society to financial education activities. Also, greater efforts to learn from the various programmes already implemented in different countries, especially regarding their effectiveness and efficiency, was called for. In addition, the Parliament resolutions have highlighted the crucial role of financial education and called on the EU and national authorities, as well as consumer protection organisations and companies, to enhance their efforts to improve financial education and literacy.

European Parliament, in its 2014 legislative resolution on payment accounts, highlighted that member states should promote measures that support the education of the most vulnerable customers by providing them guidance and assistance in the responsible management of their finances, adding that guidance from consumer organisations and national authorities to consumers is also necessary. In its 2013 legislative resolution on credit agreements relating to residential property, the Parliament stated that the directive in question should promote sustainable lending and borrowing and financial inclusion, and the importance of preventing practices such as tying of certain products, which may induce consumers to enter into credit agreements that are not in their best interest.

Since mid-2014, the EU has developed several policy initiatives aimed at improving the enforcement of consumer rights and of safety and compliance of products on the internal market. On financial services, in 2017 the European Commission published an action plan setting out a strategy to enable consumers to choose freely from a wide range of financial services available across the EU, while being confident that they are well protected. The action plan seeks specially to use the potential of digitalisation and technological developments (FinTech) to improve consumer access to financial services across the EU.^{xxx}

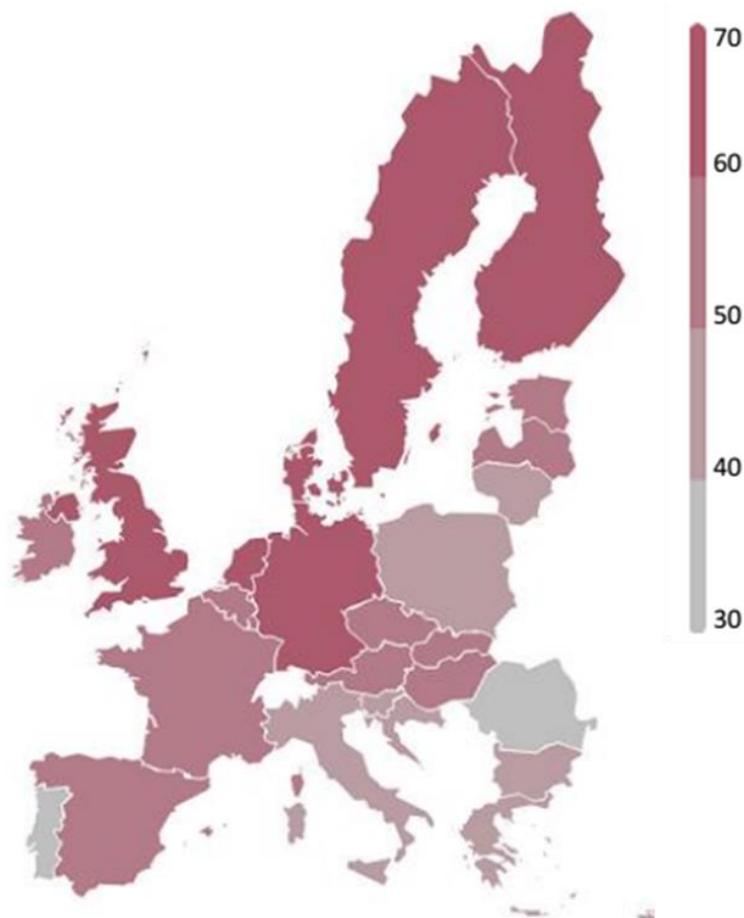
In addition, the Parliament called on the Commission to increase transparency in currency conversion, payments made abroad and ATM withdrawals, so that consumers can choose the best rates and be aware of additional costs, and in this way make it easier and more affordable for consumers to switch into retail finance.^{xxxi}

In 2018 the Commission began an evaluation of the Consumer Credit Directive to check if consumer rights in this field need to be strengthened. The Parliament has called for independent financial education of consumers to be widened and for the Commission to ensure that existing measures to improve financial literacy and awareness are fully implemented and that further measures are introduced to help consumers make informed decisions. It has also called on the Commission to set up an EU comparison portal covering the retail financial services market.^{xxxii}

3.2 Fragmented Europe

The Standard & Poor's Ratings Services Global Financial Literacy Survey^{xxxiii} is the world's largest, most comprehensive global measurement of financial literacy. It probes knowledge of four basic financial concepts: risk diversification, inflation, numeracy, and interest compounding. The survey is based on interviews with more than 150,000 adults in over 140 countries.

The questions of the survey measured the four fundamental concepts for financial decision-making. These concepts are basic numeracy, interest compounding, inflation, and risk diversification. According to the survey, financial literacy rates (% of adults who are financially literate) vary widely across the European Union (Map 1).



Map 1 Financial Literacy in EU, 2015

Source: Bruegel based on Standard & Poor's Global FinLit Survey. Note: Darker shade indicates better performance.

According to survey, many Europeans do not understand basic financial concepts, such as compound interest and diversification. On average, 52 percent of adults are financially literate, and the understanding of financial concepts is the highest in northern Europe. Denmark, Germany, the Netherlands, and Sweden have the highest literacy rates in the European Union, which means at least 65 percent of their adults are financially literate. On the other hand, financial literacy rates are much lower in southern Europe. For example, in Greece and Spain, literacy rates are 45 percent and 49 percent, respectively. Italy and Portugal have some of the lowest literacy rates in the south. Financial literacy rates are also low among the countries that joined the EU since 2004. In Bulgaria and Cyprus, 35 percent of adults are financially literate. Romania, with 22 percent financial literacy, has the lowest rate in the European Union.

This indicates that in global rankings of financial literacy, inside EU can be found some of the world's best performers (like Sweden, Denmark) as well as those that rank below global average (such as Romania, Portugal).

The 2015 OECD/INFE international survey on adult financial literacy^{xxxiv} covers thirty countries and economies, including 17 OECD countries, which participated to the survey by using the OECD/INFE toolkit to collect cross-comparable data. In total, 51,650 adults aged 18 to 79 were interviewed using the same core questions, in a total of 30 languages. The toolkit covers topics such as keeping track of finances, making ends meet, longer-term financial planning and choosing products. Product awareness and holding questions are also included to inform work on financial inclusion as well as several questions intended to capture aspects of financial wellbeing.

The study report contains descriptive text, tables and figures on financial knowledge, financial behaviours, and attitudes to longer-term financial planning (see table 3). It also reports an overall score for financial literacy for each country and provides exploratory analysis on selected aspects of financial inclusion. Last section of the report identifies policy lessons.

Results from the survey show that European citizens often lack the financial awareness and skills to face the demographic and social changes mentioned previously. As European governments face pervading effects of ageing together with low economic growth, and the needs to regulate the growth of public expenditure, like pensions, they are calling on their citizens to take a bigger role in retirement planning. However, the survey data suggest people in many European countries are not prepared for this. In Central and Eastern European countries, younger adults are under-saving for retirement and older adults lack the financial skills needed to cope with the financial challenges of retirement. In addition, only 47 percent, of those who do not save for old age, show understanding of basic financial concepts. This is hardly an encouraging figure.

These EU findings are consistent with those applicable to other advanced economies, namely that low-income and less-educated groups, women, and young people are generally consistently underperformers in financial literacy tests, and they score lower than the rest of the population.

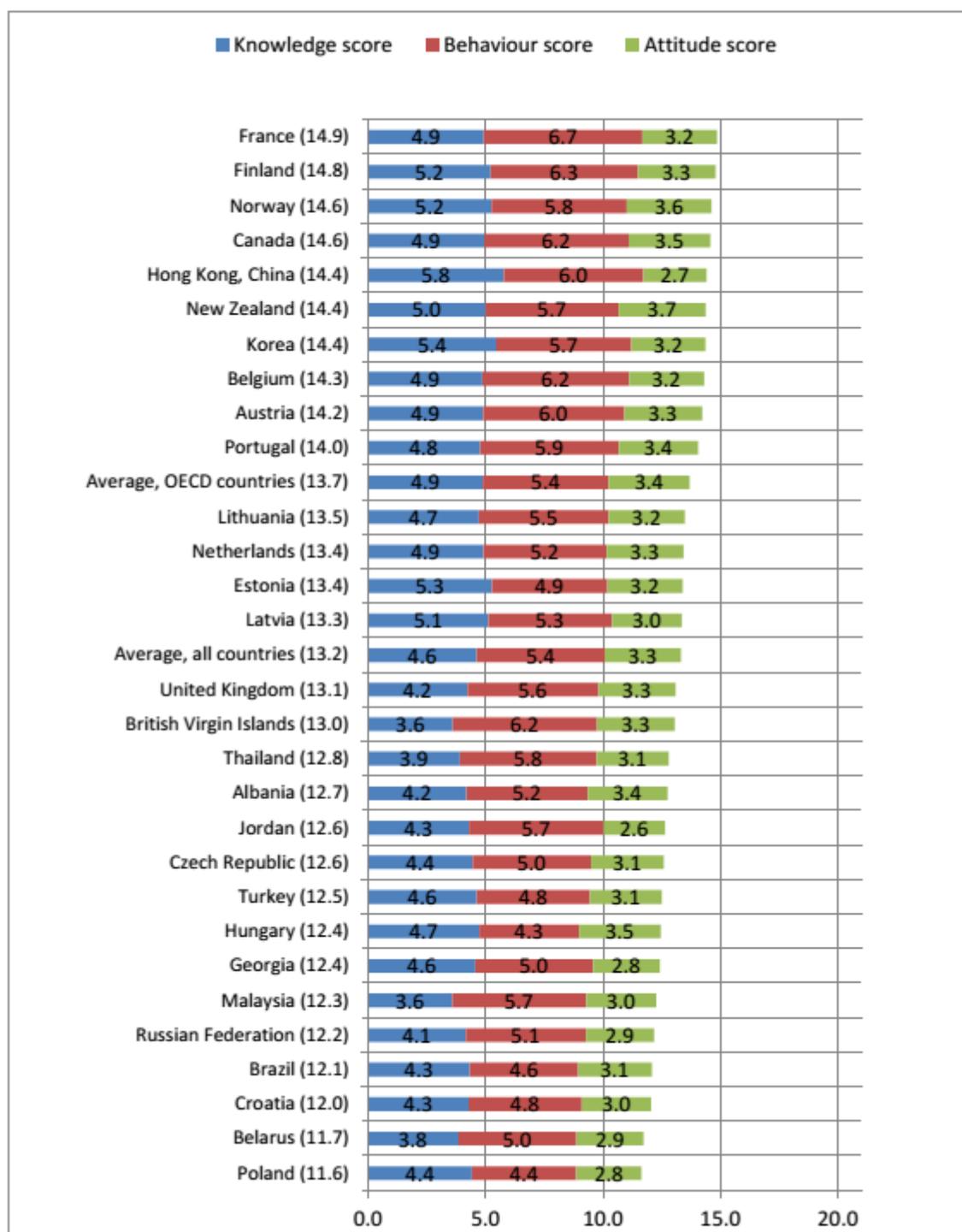


Table 3. Financial knowledge, attitudes, and behaviour (average scores). Stacked points (weighted data): all respondents, sorted by overall score (reported in parenthesis).

Notes: Average, all countries and Average, OECD countries report the mean of the country economy percentages. Each country/economy is therefore given equal weight.

Source: Ibid (OECD 2016)

3.3 Why financial literacy matters for EU?

The continuously increasing complexity of financial products and services together with digitalisation requires financial literacy to be an integral part of the research agenda and of comprehensive policy

making in every country. These four reasons are usually presented as reasoning, why financial literacy matters for EU:

- 1) **Ageing population.** The aging as a demographic phenomenon in Europe is characterised by a decrease in fertility, a decrease in mortality rate, and a higher life expectancy among Europeans. This causes, inter alia, the pressure on the pension system, what could be mitigated through shifting towards more occupational and personal pension insurance systems. At the same time, this shifts more responsibilities to the individuals, which in turn requires higher levels of financial literacy so they can improve their decision-making in retirement planning and other personal finance issues.^{xxxv}
- 2) **Household over-indebtedness** and the overheating of the housing market will often lead not only to personal problems, but also has harmful consequences in the national economy. During a rapid economic growth (expansion or boom), credit and housing market vulnerabilities will increase with strong consumer confidence to the economy. Optimistic expectations fuel the rise in house prices, indebtedness and excessive risk-taking. Expectations are largely based on recent developments that are expected to continue. In a downturn, households' financial uncertainty will increase. Loans taken in boom times may prove to be disproportionate to household income. In addition, the value of the flat or house can decrease or, in the event of a crisis, collapse. As a result, households reduce their consumption, which in turn weakens the profitability of businesses. Companies reduce their production and investment and lay off or eventually fire their employees. At its worst, the vicious circle continues as an adverse chain reaction to the whole economy.

According to a global debt monitor database, produced by the Institute of International Finance, the eurozone households' debt (% of GNP) fell to lowest level since 2006 in 2018^{xxxvi}. However, household debt is in relatively high level in some eurozone countries, like the Netherlands and Portugal. And in many EU member states the growth of over-indebted amount of people is an alarming phenomenon.

Understanding the effects of over-indebtedness, and how financial literacy can help prevent this from happening in the first place, is especially important for young households, first-time owners, and low-income people.

- 3) **Fragmented Europe.** In the EU, financial literacy is negatively associated with the main elements of inclusive growth, namely poverty, inequality, social exclusion, and social immobility.^{xxxvii} This is linked to the observation that there is a strong emphasis on consumer protection, social inclusion, and the prevention of frauds in EU legislation and policy recommendations.

Considering the percentage of financially literate populations that vary considerably between EU member states, it is understandable that recommendations on financial literacy entail starting of financial education and the promotion of programs tailored to the specific needs of single member states. Target groups are especially young people, women and low-income groups, and targeted financial education is aimed for people who are in front of important financial decisions, such as a first home loan, student loan, retirement investments or are vulnerable to financial frauds.

- 4) **Digital technologies** are increasingly integrated into the economy and are also having a significant impact on the financial sector through the introduction of new products and services. It also brings new financial service providers to the market. Digitalisation is affecting individuals and businesses globally, as the proliferation of mobile financial services is likely to increase along with the rise in mobile communications. These major changes will increase the need for effective financial

education, financial consumer protection and financial inclusion policies to adapt to a rapidly changing environment.

Results from the surveys show that European citizens often lack the financial awareness and skills to face the demographic, social and technological changes mentioned previously. As European governments face pervading effects of ageing together with low economic growth and the needs to regulate the growth of public expenditure will expand, they are calling on their citizens to take a bigger role in person's own financial literacy, like retirement planning. However, the survey data suggest people in many European countries are not prepared for this.

However, people's financial knowledge will not increase, and financial behaviour will not change primarily through directives, regulations, or national legislation. Although the national school system must provide adequate financial education for young people, a significant part of the adult population is excluded. This applies particularly to financially vulnerable groups such as poor households, uneducated people, migrants, and the elderly.

There is no justification for increasing people's responsibilities for their own finances if society does not provide the tools to do so.

The EU should increase the teaching of financial literacy and enhancing of financial inclusion to its agenda, not only from the consumer protection perspective but also from the point of view of financial stability, equality, and security for EU citizens (and countries). An effective way of doing this is to financially support NGOs in the Member States through the available existing financial channels.

At the same time, it is especially important to support more research into financial literacy, especially behavioural aspects of financial decision-making and increase private sector involvement in training, advisory and development of digital financial educational tools, like serious games.

3.4 PISA 2018 Assessment of Financial Literacy

3.4.1 General framework

The PISA 2018 assessment^{xxxviii} of financial literacy amongst 15-year-old students was the third of its kind. First assessment^{xxxix} was conducted in 18 countries and economies and the second assessment^{xl} covered 15 countries and economies.

In PISA 2018 around 117 000 students were assessed in financial literacy, representing about 13.5 million 15-year-olds in the schools of the 20 participating countries and economies including:

- 13 OECD countries and economies: Australia, seven Canadian provinces (British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario and Prince Edward Island; hereinafter “the Canadian provinces”), Chile, Estonia, Finland, Italy, Latvia, Lithuania, Poland, Portugal, the Slovak Republic, Spain and the United States
- 7 partner (non-OECD) countries: Brazil, Bulgaria, Georgia, Indonesia, Peru, Russia and Serbia.

This optional assessment explores how the financial literacy of students is associated with their competencies in reading, mathematics, and science, with their socio-economic status, and with their previous experiences with money. It also offers an overview of financial education in schools in the participating countries and economies and provides case studies.

In the PISA survey 2018, financial literacy is assessed from three different perspectives. These are a) content, b) process, and c) context.

The category "Content" consists of knowledge and understanding relevant to financial literacy. These content areas are:

- money and transactions
- planning and managing finances
- risk and reward (the term "reward" seeks to describe the concepts of return or benefit)
- the financial landscape (which could also be called financial environment or economic outlook)

The content category "money and transactions" includes questions to measure awareness of the different forms and purposes of money (including digital forms of money). These may include an understanding of national, foreign, and digital currencies, payment through various means such as online and mobile, understanding the value of money and using debit and/or credit cards, cheques^{xii} and bank accounts.

"Risk and reward" content category includes measurement of the ability to identify ways to assess and hedge from risks, the ability to manage financial uncertainty, and an understanding of potential gains or losses related to a range of financial contexts and products, such as a credit agreement, online credit, and investment products. In this context, two different types of risk are particularly considered. The first of these relates to financial losses against which an individual is unable to protect him/herself. These include, for example, some disaster situations. The second risk, on the other hand, is inherent in financial products, such as the possibility of a capital loss or low return on investment.

It is notable, the two key domains in financial literacy, i.e. saving/investing and loan/credit taking are included to both above-mentioned content categories as saving/investing, and loans/credits involve both financial planning and risk management.

The content of the "financial landscape" relates mainly to macro-economic and societal issues, such as knowledge of consumer rights and responsibilities in the financial market and within the general financial environment. Most broadly, this category includes an understanding of the effects of changes in the economic situation and social policy, such as changes in interest rates, inflation, taxation, sustainable development and environmental protection goals, or wellbeing goals for both individuals/households and for society.

Another perspective of financial literacy assessment is "Processes," which refer to cognitive processes aiming to describe students' ability to recognise and apply concepts relevant to the domain, and to understand, analyse, reason about, evaluate and suggest solutions.

The PISA study has identified four different process categories that are parallel, not hierarchical. These are:

- identifying financial information
- analysing information in a financial context
- evaluating financial issues
- applying financial knowledge and understanding.

"Identifying financial information" means that an individual search for and finds financial information and recognizes its significance. In a PISA survey, a document related can be, for example, an agreement, an advertisement, a figure, a table, a form, or an on-screen information, such as bank statement or message.

"Analysing information in a financial context" deals with the interpretation, comparison, and juxtaposition of financial matters, as well as aggregation and reasoning on the basis of existing information. In this category, it is essential to identify things that are not explicit. In the PISA survey, such a task may, for example, deal with the comparison of the terms of different telephone subscriptions.

In the context of “evaluating financial issues” it is essential to be able to identify and present financial arguments and explanations by applying relevant knowledge and understanding in a specific context. In PISA tasks, some of the information needed to solve a financial problem is presented in the task description, but the student must be able to combine this knowledge with previous knowledge and understanding of the subject. The task may concern, for example, things that need to be considered when deciding whether or not to buy some (not absolutely necessary) product.

The process category “apply financial knowledge and understanding” relates to tasks that involve making calculations and solving problems (effective actions). The defendant must also understand financial concepts. This task may be related to, for example, calculating the interest rate on the loan.

The "Context" category refers to the situations in which financial knowledge, skills and understanding are applied, ranging from the personal to the global. These diverse operational contexts are used to consider the wide range of different situations in which individuals may act. The focus may be on the individual, the family or peer group, the community, or even the world. Four "Contexts" related to assessment have been distinguished:

- education and work
- home and family
- individual
- societal.

"Education and work" are an important context for young people. These issues may be related to e.g. using one's own summer job or other earnings, making future educational choices and choosing a career. Tasks related to this context may address, for example, understanding payroll or the benefits and risks of taking out a student loan.

The "home and family" context deal with the costs of running a household, such as buying various food and other household items, and tracking family expenses. The theme is also related to budgeting as well as various consumption items prioritisation.

The context category “individual” focuses on the financial decisions that the individual makes for his or her own benefit, and the risks and responsibilities that the individual bears. The theme includes e.g. opening a bank account, buying consumer goods, or taking out credit or insurance related contractual matters.

The context category “societal” recognises that individual’s financial well-being cannot be completely separated from the context of society, but the individual, the local community, the state, and even global actions interact. It means that individuals’ financial decisions and behaviours can influence to the rest of society and vice versa. In this context, financial literacy means e.g. capability to understand consumer rights and responsibilities and the purpose of taxation.

The PISA 2018 survey also looks at non-cognitive factors related to financial literacy through surveys. Four factors have been separated: access to information and education, experience with money and means of payment, attitudes towards financial issues and self-confidence in economic affairs and consumption and saving behaviour.

Access to information and education involves the so-called economic socialisation, i.e. the process of acquiring financial skills. The young person's parents, friends and school plays an important role in this process. Financial literacy also involves experience with money and means of payment, following the presumption "experience is the best teacher". In this context, not only young people's experiences of money and the use of payment instruments such as payment cards, but also at how much consumption and saving decisions are discussed with parents will be studied. Attitudes towards financial affairs and self-confidence in financial affairs can also be related to economic behaviour and how economic information is used. For this reason, the PISA survey also asks students' perceptions of their own financial skills and self-confidence in financial matters. In terms of consumption and saving behaviour,

survey looks at, for example, how students make consumption-related decisions, such as comparing prices or making purchases that cost more than they intended to consume. It also examines whether young people make decisions alone or under adult guidance.

3.4.2 Results in brief

The average of the 13 OECD countries participating in the PISA 2018 financial assessment was 505 points, and the average for all participating countries was 478 points. The scores of the five most successful countries were statistically significantly higher than the OECD average. The average for a total of 12 countries, on the other hand, was statistically significantly below the OECD average.

Around one in four students in the 20 countries and economies that took part in the PISA 2018 test of financial literacy, and one in seven in the 13 OECD countries and economies, are unable to make even simple decisions on everyday spending.

Only one in ten students performs at the highest level of financial literacy, on average across OECD countries and economies. These students are able to make financial decisions in contexts that will only become relevant to them later in life.

Findings from earlier PISA assessments are also confirmed in PISA 2018: there is only a small gender gap in performance but gender differences in terms of attitude and behaviours. In addition, the more socio-economically advantaged a student is, the higher he or she is likely to perform in financial literacy.

Moreover, on average across OECD countries/economies, roughly one in two students hold an account at a financial institution and/or hold a payment or debit card. However, only roughly one in three students have the skills to interpret and evaluate a bank statement.

The PISA 2018 study went further than previous ones in examining various money-related aspects of students' lives, especially in describing their money-related attitudes and behaviours, and in examining digital financial activities. Many students, almost three in four students, on average across OECD countries and economies, had purchased something online (either alone or with a family member) over the twelve months prior to the assessment. Likewise, almost two in three students reported being confident in paying with a debit card instead of using cash, or in keeping track of their balance electronically.

Table 4 divides countries/economies into three broad groups: those whose mean scores are statistically around the OECD mean (highlighted in white), those whose mean scores are above the OECD mean (highlighted in blue); and those whose mean scores are below the OECD mean (highlighted in grey).

	Statistically significantly above the OECD average
	Not statistically significantly different from the OECD average
	Statistically significantly below the OECD average

Table 4 Comparing countries'/economies' mean performance in financial literacy.^{xlii}

Mean score	Comparison country/economy	Countries and economies whose mean score is not statistically significantly different from the comparison country's/economy's score
547	Estonia	
537	Finland	Canadian provinces
532	Canadian provinces	Finland
520	Poland	
511	Australia	United States, Portugal
506	United States	Australia, Portugal, Latvia, Lithuania
505	Portugal	Australia, United States, Latvia
501	Latvia	United States, Portugal, Lithuania, Russia
498	Lithuania	United States, Latvia, Russia
495	Russia	Latvia, Lithuania, Spain
492	Spain	Russia
481	Slovak Republic	Italy
476	Italy	Slovak Republic
451	Chile	Serbia
444	Serbia	Chile
432	Bulgaria	
420	Brazil	
411	Peru	Georgia
403	Georgia	Peru
388	Indonesia	

Estonia had the highest average score, followed by Finland, the participating Canadian provinces (British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario and Prince Edward Island), Poland and Australia.

The gap in performance of financial literacy between the highest- and lowest-performing OECD countries/economies was 97 points. The difference between the highest- and lowest-performing countries/economies between all countries/economies that took part in the PISA 2018 financial literacy assessment was over 60% larger (159 points). These gaps represent marked differences in the ability of 15-year-olds to make informed financial decisions. However, only 20 countries/economies participated in this assessment and provided valid, comparable data. Therefore, it is likely that these gaps would be even larger if more countries had been participated to test.

It should be noted, however, that there may be differences between countries in how students understand the meaning of a particular term in another (own) language or how it was translated for the test at all. And what comes to textbooks and other learning materials, which contains information on financial issues, these may vary greatly between countries as well as teaching practices. For these reasons, comparisons between countries need to be treated with caution and the question may be asked, what factors ultimately lead to success in PISA?

4 Aspects related to Financial Literacy

4.1 Financial inclusion

First of all, it is worth to be noted, that personal socio-financial awareness should not be confused with the term "financial inclusion", because in such a mindset (of being aware of something) the perspective is an individual, while in "financial inclusion" the perspective is institutional, i.e. financial sector and society in general.

The term "financial inclusion" has gained importance since the early 2000s, a result of identifying financial exclusion and it is a direct correlation to poverty. Financial inclusion is currently defined in various ways.

The G20 Global Partnership on Financial Inclusion and the International Network on Financial Education (INFE) subgroup on the role of financial education in financial inclusion have developed globally acceptable definitions. The agreed working definition of the INFE subgroup is as follows: “the process of promoting affordable, timely and adequate access to a range of regulated financial products and services and broadening their use by all segments of society through the implementation of tailored existing and innovative approaches including financial awareness and education with a view to promote financial wellbeing as well as economic and social inclusion”.^{xliii}

The World Bank Group considers financial inclusion a key enabler to reduce extreme poverty and boost shared prosperity and has put forward an ambitious global goal to reach Universal Financial Access (UFA) by 2020.^{xliiv} The United Nations defines the goals of financial inclusion as follows:^{xliv}

- Access at a reasonable cost for all households to a full range of financial services, including savings or deposit services, payment and transfer services, credit, and insurance.
- Sound and safe institutions governed by clear regulation and industry performance standards.
- Financial and institutional sustainability, to ensure continuity and certainty of investment.
- Competition to ensure choice and affordability for clients.

In short this means that individuals and companies, regardless of their personal net worth or company size, can access and use a range of appropriate and in responsible way provided financial services offered in a well-regulated environment.

Being able to have access to a transaction account is a first step toward broader financial inclusion since a transaction account allows people to store money and send and receive payments. A transaction account serves as a gateway to other financial services, which is why ensuring that people worldwide can have access to a transaction account is the focus of the World Bank Group’s Universal Financial Access 2020 initiative.^{xlvi}

Financial access facilitates day-to-day living and helps families and companies plan for everything from long-term goals to unexpected emergencies. As account holders, people are more likely to use other financial services, such as credit and insurance, to start and expand businesses, invest in education or health, manage risk, and weather financial shocks, which can improve the overall quality of their lives.

There is academic evidence that increased levels of financial inclusion – through the extension of savings, credit, insurance, and payment services – contributes significantly to sustainable economic growth and support the achievement of broader national development goals, because financial inclusion strives to remove the barriers that exclude people from participating in the financial sector and using these services to improve their lives. Digital finance alone could benefit billions of people by spurring inclusive growth that adds trillions to the GDP of emerging economies within a decade.

Financial inclusion is positioned prominently as an enabler of other developmental goals in the United Nations 2030 Sustainable Development Goals, where it is featured as a target in eight of the seventeen goals.^{xlvii}

4.2 Financial wellbeing

The role of education in providing a basis for human, social, technological, and economic development is crucial. Education has a major impact on labour productivity, poverty, trade, technology, health, income distribution and family structure. In short, it forms the basis on which much of current economic and social wellbeing is built.

Colloquially an input-output model is a model that represents an interdependencies between different stages, topics, or phenomena. Production, as an economic activity, uses inputs such as workers, workspace, machinery, equipment, and raw materials. Outputs are goods, semi-finished products,

services, or combinations of the above. Attached to this thinking, a process can be defined as a series of actions or steps taken in order to achieve a certain end, which is often defined with terms like a goal, target, or objective.

Similarly, a learning process is often described as a path where learning takes place and proceeds through different stages. It is goal-oriented, time- and step-by-step and pre-planned learning. And further, financial education is “the process by which financial consumers/students and other relevant stakeholders improve their understanding of financial products, concepts, and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of (financial) risks and opportunities to make informed choices, to know where to go for help, and take other effective actions to improve their financial well-being.”^{xlviii}

For the purpose of this book, the following definition can be considered sufficient and applicable: financial education is a process intended to increase the financial literacy level of people. With improved financial literacy, people can manage their personal finances better. In this way financial education helps people to improve their financial wellbeing, which as a goal is a part of personal wellbeing (ultimate goal).^{xlix}

The research on financial wellbeing is still at an early stage and is currently scattered over various disciplines. This has led to a lack of clarity in understanding what the term financial wellbeing means. One of the latest definitions of financial wellbeing defines it as the extent to which someone can meet all their current commitments and needs comfortably, and has the financial resilience to maintain this in the future.¹ Some other recent definitions describes economic well-being as the perception of being able to sustain current and anticipated desired living standards and financial freedom^{li}, or a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and is able to make choices that allow enjoyment of life.^{lii}

These definitions, although different terms are used, indicate that financial wellbeing should include following components: coping with current obligations, having comfortable financial status, and having financial resilience or freedom for the future. However, many human-related definitions, such as "wellbeing", are limited by, inter alia, location and socio-economic background. In addition to financial literacy/capability, financial well-being is also affected by socio-economic environment such as financial inclusion, appropriate consumer protection and regulation, macroeconomic environment, personal financial position, expense volatility, social relations, health, etc. Consequently definitions, that are applicable for high and middle-income countries are less meaningful in the poorest populations of low-income countries, where people are struggling with their day-to-day survival.

CHAPTER II – FINANCIAL EDUCATION

5 Financial Literacy is important more than ever

5.1 The Role of Education in promoting Economic Growth

The human mind makes possible all development achievements, from health advances and agricultural innovations to efficient public administrations and private sector growth. For developing countries to reap these benefits fully, they need to unleash the potential of the human mind. And there is no better tool for doing so than education. ^{liii}

The role of education in promoting economic growth is highly relevant, on several different levels and dimensions. Education provides a foundation for human, social, technological, and economic development. Education has a major effect on labour productivity, poverty, trade, technology, health, income distribution and family structure. In short, it forms a groundwork on which much of our present economic and social wellbeing is built.

There is strong evidence that the cognitive skills of the population are powerfully related to long-run economic growth. The relationship between skills and growth proves extremely robust in empirical applications. The effect of skills is complementary to the quality of economic institutions. Especially focus should be put on the role of *educational quality*. Quality, in this sense, means the focus needs to be re-headed and see education as an investment, with learning gains as the key metric of quality. Getting value for the education euro/dollar/Lira requires smart investments—that is, investments that prioritize and monitor learning, not schooling. It is essential to look behind traditional metrics, such as the number of teachers trained, or number of students enrolled. Different growth simulations reveal that the long-run rewards to educational quality are large, but also require patience.

Each country is responsible for its education and training system. However, the EU plays a key supporting role. It encourages cooperation and the exchange of good practice between member states, and supplements national efforts and reforms.

In general, there are at least two levels to review to fundamental effects of education to development: individual and national. Without neglecting other important aspects, such as social costs of inequality and poverty, national budgetary restrictions, or political considerations, the main focus in this section is to maintain an economic perspective to financial education, both individual level and national level.

These aspects are clearly defined in the following statement:

“Financial education, which would lead to increased financial awareness, is such a concept that each individual at any age and any income group needs to be involved in, so as to effectively manage investment and savings decisions and to be protected from possible losses.

It is quite clear that increasing financial literacy and consequently raising financial awareness by way of education should be given special importance and priority for the welfare of all nations.”^{liv}

5.2 Financial Literacy should be learned as a basic skill

Better knowledge and understanding of financial concepts and risks could help improve financial decision making amongst adults and young people, both now and in the future. As a result, financial literacy is now globally recognised as an essential life skill. Financial education is acknowledged as a complement to financial consumer protection, inclusion, and regulation, as a way to improve individual decision making and wellbeing, and as essential to financial stability and development.

Economic phenomenon and financial markets around the world have become increasingly complex, but at the same time accessible to the “average consumer”, as new products and financial services grow widespread. The consequences of the financial crisis in 2008, consumers over-indebtedness and

subprime mortgages are now become gradually forgotten. Instead, today, new financial challenges have emerged, of which one of the most important is the coronavirus pandemic (Covid-19). The indirect impact of the Covid-19 crisis on individuals' income and savings (both current and future) and heightened uncertainty in the economic and financial environment make financial literacy even more crucial for ensuring that consumers are financially resilient. Therefore, financial literacy is an even more important skill than ever.

Financial education, financial consumer protection and financial inclusion are recognized at the highest policy level as three essential ingredients for the financial empowerment of individuals and the overall stability of the financial system. Existing empirical evidence shows that young people and adults in both developed and emerging economies who have been exposed to good-quality financial education are subsequently more likely than others to plan ahead, save and engage in other responsible financial behaviours. This evidence suggests a possible causal link between financial education and outcomes and indicates that improved levels of financial literacy can lead to positive behaviour change.

Higher levels of financial literacy have been found to be related not only to asset building but also to debt management. More financially literate individuals choose for less costly loans and mortgages and avoid high interest payments and additional fees. In addition, financially literate consumers can make more informed decisions and demand higher-quality services, which can, in turn, encourage competition and innovation in the market.

Consumers, who can better protect themselves against income or expenditure fluctuations, are also less likely to default on credit commitments. This leads to a presumable conclusion that macro-level shocks are likely to have a lower impact in countries with financially literate population, because supposedly financially literate consumers are less likely to react to market conditions in unpredictable ways, are less likely to make unfounded complaints and are more likely to take appropriate actions to manage financial risks transferred to them. In addition to improved personal finance, all these factors can lead to a more efficient financial services sector and better macro-economic stability.

At national level, the school system plays an important role in teaching children and young people financial literacy, as basic skills are learned, and should be learned, at school. But in addition to this formal school system, the financial sector, companies, and NGOs can play an important role in promoting financial literacy.

As financial literacy is one of the cornerstones of social skills, it should be learned as a basic skill. The foundation of financial literacy will be established already at a young age. However, the need for learning is not limited to childhood and youth but continues throughout life when at different stages of life, different needs are emphasized. In this way financial literacy education is part of Lifelong Learning.

5.3 Toward new challenges

As it is obvious that the content and requirements of financial literacy are changing and increasing due to constant changes in societies and financial markets, this should also be reflected in financial literacy education. Therefore, at least the following three major trends in education and training of financial literacy in the 2020s, should have the strong focus of attention:

- (1) growing complexity of financial markets, services and products, and even easier access to these, sometimes even via aggressive marketing,^{lv} when more and more non-banking operators are entering into financial markets,
- (2) accelerating digitalisation of financial products and services, and
- (3) growing need to raise awareness of the consequences, including realisation of risks, related to many financial decisions among consumers and investors.

In the face of these new challenges, this means that instead of focusing only on basic financial topics in teaching financial literacy, the surrounding financial environment also needs to be considered. In particular, digitalisation has brought new challenges not only in terms of access to and use of totally new kind of financial services, but also in the form of abuses such as frauds and scams.

But the consequences of many financial decisions (e.g. consumption and investment decisions) are also related to challenges like the climate change, the use of child labour, inequalities, unhealthy working conditions, targeted interventions to reach vulnerable audiences and addressing the implications of demographic changes during slow economic growth. Even significant progress has been made globally on financial education, these and other socio-economic issues will form an increasing part of financial literacy in 2020s.

Financial market integration and technological developments have increased the opportunity for customers to select among wide range of financial services and their service provider. The range of products available in the financial markets is diverse, and there are increasingly more complicated products for customers to choose from. At the same time, the risks related to selecting a financial instrument and service provider have increased. Yet many of these widely available financial products – quickie loans, reverse mortgage loans, capital-protected investments, ETFs, index-linked bonds, investment insurance and pension insurance, etc. – have proven to be complex and difficult for financially unsophisticated consumers to master. So, while financial and pension developments have their advantages, by permitting tailored financial contracts and more people to access credit, they also have certain disadvantages.^{lvi} Most of disadvantages are related to risks and costs of financial products.

There are large differences between investment products and their risks, and no such thing as a fully risk-free product exists. If a high return is promised on the product, it also comes with higher risks. In assessing the risks, it is important to ascertain whether it is possible to lose both the return and the principal. Before making any decision, it is also advisable to check the costs related to the product. It is possible that other costs are deducted from the return besides fees and commissions directly charged to the customer. Such costs include commissions paid to asset managers, the broker, insurance company or bank. It is also worth checking how easily and fast investment is possible to turn into cash (liquidity of financial product). For customers, corporate executives, and even bankers, this all requires better financial knowledge and skills.

A lack of financial literacy contributes to ill-informed financial decisions, and these decisions could, in turn, have tremendous adverse effects on both personal finance and, ultimately, on national economy.

Technological innovations, such as mobile applications, web applications, and cloud-based services are fundamentally changing how people use financial products, make financial transactions and financial decisions in general. Over the last 2010s there has been a rapid multiplication of tools which promise to provide easier, quicker, and cheaper access to financial services to help people to make appropriate decision in issues such as saving and investing or avoiding unnecessary consumption or planning retirement. In this digital world, digital financial literacy is crucial to help consumers to cope with their every-day life. From consumers' point of view, digital literacy and visualization of virtual content are needed when new digital technology products, such as new payment methods, are launched in the market. Payments and point-of-sale transactions are some of the areas where to the fintech industry has concentrated so far. Mobile payments are becoming increasingly popular. Already for this reason, consumers need to know the basics of digital and virtual security and understand that legislation is not a guarantee for every step of the consumer's decisions.

The growing importance of financial literacy is widely recognised. However, this general conclusion calls for a more analysed thinking of the importance of financial literacy by asking to whom it is

important. At first, there are two levels to consider, both the individual and the societal. At the individual level, financial literacy and its importance for different age groups should be viewed more detail focused. The age group is one criterion, of course, but there are also other criteria, such as gender, educational level, occupational group, wealth level or nationality, and even personality.

Most children and youth have basic skills in digital literacy, but understanding the fundamentals of one's own finances, such as earning, saving, debt and paying, the transfer of money and the importance of the functioning of economy and society in general, are not so clear as a foundation of a good life. On the other hand, an aging generation understands "the value of money" and already have experience in managing own finances, but the challenge is the digital economy and management of these new channels and services.

At the societal level, the views of government on the one hand and the banking sector on the other may differ. But within the government, there may also be differences in perceptions of the importance of financial literacy, depending on whether these questions are asked, for instance, to the education, consumer protection, or public finance authorities.

Keeping in mind these different perspectives, individual level, and societal level, and many, sometimes even contradictory, multifaceted viewpoints inside these both levels, it helps to understand, for instance, that not all decisions made by policymakers do not appear the same at the individual level and may even lead to behaviours or situations, which are different than the original purpose.

5.4 Young people and young adults

It is difficult to give an exact age limits for terms "young person" and "young adult". Adolescence is the phase of life stretching between childhood and adulthood, and its definition has long posed a conundrum. Adolescence encompasses elements of biological growth and major social role transitions, both of which have changed in the past century. Earlier puberty has accelerated the onset of adolescence in nearly all populations, while understanding of continued growth has lifted its endpoint age well over 20 year. In parallel, delayed timing of role transitions, including completion of education, marriage, and parenthood, continue to shift popular perceptions of when adulthood begins. Arguably, the transition period from childhood to adulthood now occupies a greater portion of the life course than ever before. Nowadays unprecedented social forces, including marketing, digital and social media, are affecting young people's social-economic relations, health, and wellbeing across all these years. ^{lvii}

An expanded and more inclusive definition of adolescence is essential for developmentally appropriate framing of financial literacy, too. Rather than age 10–19 years, a definition of 10–24 years corresponds more closely to adolescent growth and popular understandings of this life phase and would facilitate financial literacy learning across a broader range of settings.

Instead, a "young adult" already manages or plans many elements in his or her life that are typically associated with adulthood, such as inception an own home, military service, job search and career planning and living in a relationship with a loved one. However, also studies and graduate are a part on young adult's life as well.

The term "young" as used in this book is intended to cover the age group of about 15-24 years and "young adults" refers to the age group of approximately 20-29. These limits are, of course, highly flexible and much dependent on the characteristics and life situation of an individual person.

Many young or young adult notices, that a transition to social and financial independence, outside from parents' support, often lead to a fall in living standards. Consumption can be difficult to adjust to financial boundaries. In many cases, a young persons' financial behaviour is also short-term,

unplanned, risk-taking, and flexible from financial management point of view. Because independent management of own finances is a new issue, so a young person often seeks help and guidance from others. The financial behaviour of young person is influenced by parents, school, media and reference groups.

At the same time, young persons' operational environment is constantly changing and challenging from the financial capability perspective. Young adults easily adopt new products and services and are a pursued target group for marketing and advertising. For example, a short-term credit is prominently marketed to young adults. Most young person use the internet and social media daily. Young adult buys digital products and services, make various contracts, and do banking online or on their smartphones.

In addition, the development of financial markets, the increasingly media and technology-centred lifestyle and the emphasis on one's own responsibility in financial decision-making create new kind of challenges for young people. Young people are often unable to make reasonable financial decisions, and this derives from attitudes, ignorance, and inexperience, among other things.

Especially among young adults, financial wellbeing has been found to affect many aspects of life: academic success, life satisfaction, and physical and mental health. And only a few have enough time and interest to plan financial aspects of retirement, although savings and investing as such may have some space in financial planning.

The recent economic recession has had important implications for young adults' lives. Several studies documented how the financial crisis 2008 and economic recession followed by this hit youth the hardest, as they experienced the largest increase in unemployment rates, which persisted long after the crisis. As a result of this, in many countries, the economic conditions of young adults have become worse during the past few years and compared to other age groups the young adult's incidence rate of payment defaults entries is on a high level, which in turn has a clear connection to the general rise of payment default entries. However, there are also other contributing factors, such as consumer behaviour changes, low educational level as well as unemployment and family relationships.

A payment default is registered when you fail to pay a bill or debt. The creditor is entitled to notify the credit information register of payment default so that it is available to other creditors, for instance. However, a mere late payment does not generate a payment default entry. The most common causes for payment defaults are consumer credits, verdict of default in payment demand issues and long-term distraint.

Getting the entry of payment default can make it impossible for a young adult to get consumer credit nor other kind of bank credit. At least it has negative impact on negotiations concerning many contract terms, banking, and insurance services. The entry of payment default effects also on renting a flat and getting specific jobs. This development chain easily forms a vicious circle from which detachment can be overwhelming for a young adult.

In some cases, the entry of payment default causes undue detriment to normal living for young adult (or any other person), especially if the default is small, single, and unintended. It is the benefit not only for consumers but also for financial sector, that the general knowledge of the entry of payment defaults will be improved, as separate actions, or as a part of financial literacy education.

The life situations of young people and a new kind of financial independence together with fast and strong changes in the operational (incl. financial) environment, such as aggressive marketing of consumer products, using of digital purchasing and payment services, quick and easy access to consumer credits, all of these issues together make financial literacy and capability building even more

important, especially among young people, but at the same time educational efforts are more challenging than ever.

Starting to manage one's own finances is a significant transition and a turning point in the life of a young adult. First time young people must take responsibility for his or her financial decisions and its consequences. This phase of life can also involve risks if a young person lacks the means to cope financially or is left without support networks that could help in a new situation. These "critical moments", also called "emerging adulthood", often trigger behavioural changes. It is therefore crucial that young people possess adequate financial capabilities and skills to live through this phase of their lives.

5.5 Adults and older adults

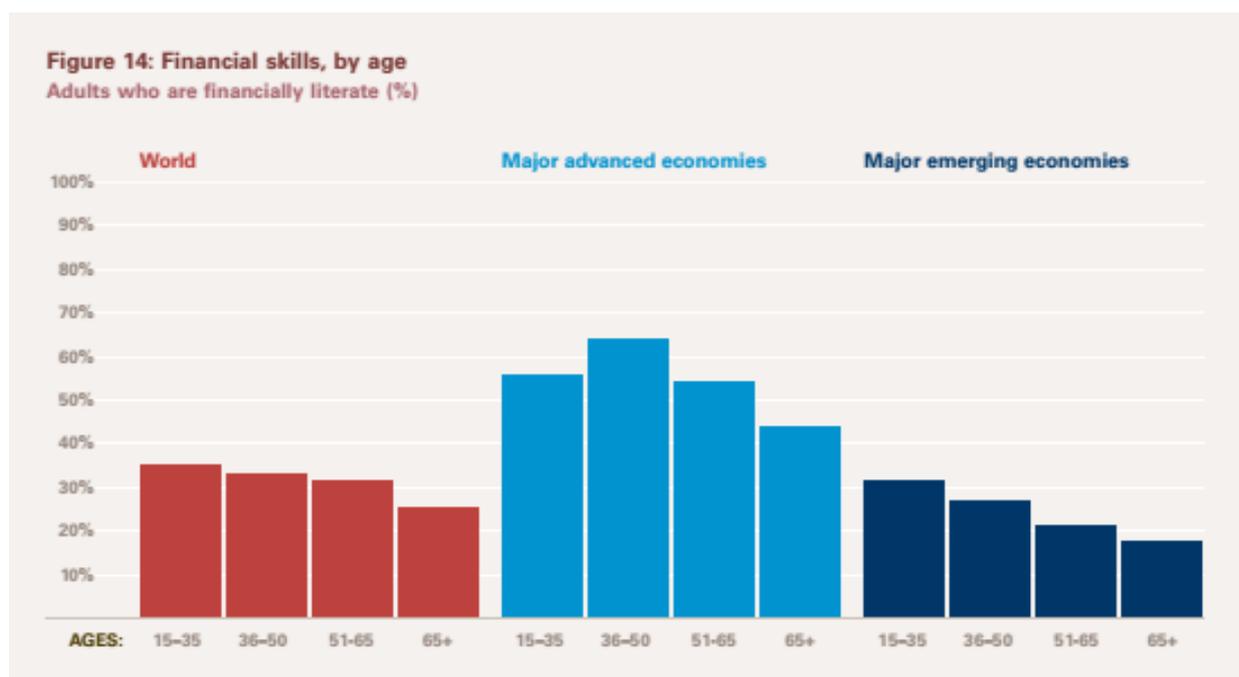
Adults usually have a wider range of experiences to draw on than young people. This also creates a valuable learning resource for them. For example, some may have experiences of financial mistakes or examples of where specific financial knowledge or skills have proven valuable.

In educational perspective this means, financial literacy teaching for adults, more or less, is capability building on top of learners' already existing knowledge. Most adults have at least basic knowledge about paying bills and managing expenses, which in turn forms a starting point for creating a more complex management skills for money and budget or for savings and debt planning. Adult people, likely more often than young people, may also have false, biased, or incomplete beliefs about their personal finances, which, for its part, can make it harder to adopt new information, products, and services, too.

When it comes to older adults, a certain amount of cognitive decline is a normal part of the aging process. Recognizing, that the ability to make financial decisions is also impaired, financial literacy is an important part of living in retirement and personal finance. In addition, the data ^{lviii} show that financial literacy rates in the major advanced economies are lowest among the youngest and oldest adults, suggesting that financial literacy peaks in middle age (see Figure below^{lix}). By contrast to young adults, new concepts, and especially new technology, that an older adult person has a little existing knowledge or experience about, may take more time to absorb and need more efforts to cope with. In addition, an older adult may receive care from people who have substance abuse, gambling, or financial problems, or mental health problems. Or an older adult may suffer for example from gambling addiction oneself. He may also be dependent on a family member, caregiver, or other person who can put pressure on them for money or who can control their finances.

As populations age and birth rates decline in many parts of the world, digital solutions have an important role to play in ensuring financial wellbeing for older adults. Globally, the number of people aged 60 years or over has more than doubled since 1980, and the share of older adults is projected to double again by 2050.

These facts indicate that training for financial literacy and financial inclusion of older adults is at least as important as educating young people for these skills keeping in mind, the barriers to financial literacy and inclusion for older adults are complex, interconnected and varied across regions and demographic groups.



Source: Klapper, Lusardi & Oudheusden (2015)

Note: Major advanced economies are Canada, France, Germany, Italy, Japan, the United Kingdom and the United States, and major economies are Brazil, China, India, Russian Federation and South Africa.

Financial illiteracy and financial exclusion present risks for older adults. Therefore, a strong and vigilant consumer protection is vital for safeguarding older adults. And strong consumer protections can make it safer for older people to use also digital financial services. However, digital financial services create new challenges as well as opportunities for older adults. Even, while promoting financial literacy and capability might limit these risks, effective government regulation – designed with older adults' needs in mind – is also vital. ^{ix}

Learning is a lifelong endeavour — especially when it comes to financial literacy. The good news is it's never too late to be financially literate. Financial literacy is a Lifelong Learning experience and a critical life skill no matter your age.

CHAPTER III – DOMAINS OF FINANCIAL LITERACY

6 Knowledge, behaviour, attitudes

As defined by the OECD, financial literacy consists of three domains, knowledge, behaviour, and attitudes.^{lxi}

If it is accepted that financial literacy knowledge consists of the above components, one may ask, how these components are involved in two global financial literacy studies: S&P Global FinLit Surveys^{lxii} and OECD /INFE International Survey of Adult Financial Literacy Competencies^{lxiii}. In the following, these studies are referred only in terms of the components' substantive scope compared to components of financial literacy mentioned above. The intention is not to evaluate these studies otherwise.

S&P Global FinLit Surveys is the world's largest, most comprehensive global measurement of financial literacy. The survey is based on interviews with more than 150,000 adults in over 140 countries. According to the report, a person is defined as financially literate when he or she correctly answers at least three out of the four question of financial concepts. In the report the use of this definition is justified by the statement "because the concepts are basic, and this is what would correspond to a passing grade".^{lxiv}

The survey measures knowledge of four basic financial concepts: risk diversification, inflation, numeracy, and interest compounding. The first three topics included one question and the fourth (compound interest) two questions. Three of these five question were related with investment and saving, one with loan and debt and one (inflation) was related to several components of financial literacy.

Compared to the definition of financial literacy described above and its various components, "savings and investments" component is over-represented in questions measuring financial knowledge. Knowledge and skills of financial literacy' other domains, such as money management, budgeting including earnings and spending, or loan and debt was not used as an approaching perspective. Also, financial literacy domains related to e-Safety and socio-economic awareness was not measured.

OECD /INFE International Survey of Adult Financial Literacy Competencies covers thirty countries and economies, including 17 OECD countries. In total, 51,650 adults aged 18 to 79 were interviewed using the same core questions, in a total of 30 languages. The survey used the OECD/INFE toolkit^{lxv} to collect cross-comparable data. According to the survey the use of a common instrument designed to be applicable in countries at different stages of economic development and with all population groups makes it possible to compare results across countries, and explore patterns by socio-demographic factors, too.

In the OECD /INFE Survey the financial literacy component of the questionnaire reflects the OECD/INFE definition of financial literacy as "a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing." The report is divided accordingly, and it contains 6 sections: (1) Financial knowledge, (2) Financial behaviours and (3) Attitudes to longer-term financial planning. Section 4 reports an overall score for financial literacy for each country and section 5 provides exploratory analysis on selected aspects of financial inclusion. Section 6 identifies policy lessons.

Section 1 address *financial knowledge*. The core questionnaire includes eight questions, one question was optional, and it was assumed for may be of most interest to countries with low levels of numeracy. The other seven questions were intended to be used in a score of financial knowledge.

The purpose of the first question was to test ability to undertake basic arithmetic (division) in a financial context. It was optional and not included in the 2016 score. For the other seven questions, the component of savings and investment was dominant in 5 questions, of which 3 questions was related to interest from different aspects, such as understanding of and ability to calculate (simple) interest, and awareness of additional benefit of compounding. The two other savings and investment questions dealt with inflation and contained issues of understanding typical relationship between risk and return, and awareness of the benefit in portfolio diversification.

Section 2 questions measure *financial behaviour* as a count of the number of “financially savvy” behaviours. The questions were relating to budgeting, active saving, avoiding borrowing to make ends meet, choosing financial products, keeping watch on financial affairs, striving to achieve long-term goals, making considered purchases and paying bills on time.

Section 3 is related to *financial attitudes*, which are measured by questions like “I tend to live for today and let tomorrow take care of itself”, “I find it more satisfying to spend money than to save it for the long term” and “Money is there to be spent”.

The whole questionnaire of the survey covers quite well components 1-5 of financial literacy, although some different views can be presented of their mutual emphasis. As noted earlier, the component of “savings and investment” was dominant in section 1. Because the purpose of the questions in sections 2 and 3 is to measure financial behaviour and attitudes, this angle of approach does not allow for a more accurate comparison of how the questions actually would cover components 1 to 5 of financial literacy. However, and like in the other referred survey, kind of new financial literacy domains related to digitalisation and socio-economic awareness were not included in the survey questionnaire.

With reference to both studies, at the time of the studies, especially the issues of digital financial literacy were not as clearly displayed as they are today. And in the future global surveys in general, when both the state of knowledge and the surrounding environment change rapidly, certain modifications, additions and deletions are necessary to make to create a questionnaire that can provide cross-comparable data but still securing the depth of information.

This has been noted by OECD/INFE. The promotion of digital financial literacy as a component of financial literacy is planned to include to the toolkit. According to the publication: “New questions and response options cover aspects of digital financial services and crypto-assets, trust, integrity and financial consumer protection.”^{lxvi} However, certain specific and important issues of socio-economic awareness, which are in connection with financial behaviour, like climate change and responsible investments, still appear to be missing. Although these are strongly related to responsible consuming.

7 Financial knowledge and skills for 2020s

7.1. Sub-domains of knowledge and skills

By viewing knowledge as a part of financial literacy, definitions, and material, that are often predominantly from the US, focus almost exclusively on the ability to effectively manage personal finance. Focus itself is admissible, but the content and narrow perspective are too modest to meet the challenges of 2020s. If financial knowledge will be limited only to knowledge of the content of a (financial) product or service and the main purpose is making personal finance decisions aiming individual success, without a broader view of the impact of the decisions, much of the 2020s’ financial literacy objectives and challenges remains missing.

However, there are some signs that perceptions related to the extent of the impacts of financial literacy are changing. According to OECD (2019) financially literate consumers are more likely to have long-term financial attitudes and to understand the implications of personal financial decisions on the society, the economy, and the environment.^{lxvii}

As addressed earlier and following OECD definition, financial literacy consists of three domains: knowledge, behaviour, and attitudes.^{lxviii} Financial knowledge can further be divided into the sub-domains. Therefore, financial literacy knowledge and skills for 2020s can be presented as follows:

Sub-domain 1: Know your finances and money management & manage your budget (short term planning)

- managing daily personal finance: bank account and bank services, invoices, purchases, etc.,
- ability to monitor own financials, e.g. income and expenditure, through a budget,
- understanding of financial agreements, risks included, and
- ability to use a wide range of payment products and services.

Sub-domain 2: Saving and investment & borrowing and debt

- understanding of contracts and terminology,
- finding and comparing information on loans and savings and investment products,
- having knowledge of costs and risks associated with financial products, and
- risk preparedness (insurances and certain debt-linked financial products).

Sub-domain 3: Plan your financial future (long-term planning)

- purposeful and targeted saving by using different investment products, including insurances like long-term care insurance,
- anticipation of unexpected costs that may be encountered in different life situations,
- understanding the effects of changes in inflation, interest rates, etc.
- understanding of taxes and benefits,
- understanding the effects of financial choices in the short and long term.

Sub-domain 4: Digital financial literacy and risk management

- improvement of digital literacy,
- knowledge of digital financial products and services,
- awareness and knowledge of financial risks,
- digital financial risks and risk control (e-Safety).

Sub-domain 5: Socio-financial awareness

- knowledge of consumer rights and protection,
- ability to seek support and advice in financial problems,
- understanding the consequences of one's own financial choices (including the consequences of entry of payment default) but also societal consequences of financial decisions related to issues like climate change and responsible consuming and business, and other similar socio-economic issues.

However, it should be noted that the boundaries of these sub-domains are not mutually exclusive but may also overlap.

A financially literate person has adequate understanding of commonly used financial concepts, terms and products to situations that are relevant to a person and appropriate to current situation. A person has the capability to apply this understanding, which in turn should lead to consider the consequences of financial decisions and allow to make financial plans and appropriate financial decisions in different contexts. A person can make straightforward interpretations of a range financial documents and can make a range of basic numerical operations, like calculating percentages. A financially literate person can choose the numerical operations needed to solve routine problems in relatively common financial

literacy contexts, such as budget calculations. And in addition, a person should have adequate digital literacy to be used in financial every-day contexts.

7.2 Digital financial literacy and risk management

Sub-domain “Digital financial literacy” consists of the following issues: improvement of digital literacy, knowledge of digital financial products and services and awareness and knowledge of digital financial risks and risk control (e-Safety).

Digital technology generally refers to:

- (1) scientific and technological knowledge relating to digital devices, methods, systems, etc., and
- (2) the production and practical use of digital devices, methods, systems, etc., developed through this research and knowledge. It also refers,
- (3) to the application of this information for practical purposes such as digital communication and social media.

Digital technologies are increasingly integrated into the economy and are also having a significant impact on the financial sector through the introduction of new products and services. It also brings new financial service providers to the market. Digitalisation is affecting individuals and businesses globally, as the proliferation of mobile financial services is likely to increase along with the rise in mobile communications. These major changes will increase the need for effective financial education, financial consumer protection and financial inclusion policies to adapt to a rapidly changing environment.

Digital technology continues to progress at breakneck speed. At the same time, legislation and regulations imposed by national and supranational bodies are introduced very slowly. This lag leads to a situation in which technology can impact to societies without there being ample regulatory safeguards in place.

The American Library Association (ALA) defines digital literacy as “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.”^{ix} This means a person who is digitally literate know how to find and consume digital content and has ability and knowledge how to create, communicate, and share this digital content.

Digital literacy consists of the following knowledge and skills:

- (1) *Comprehension* – a basic understanding of ideas, terms, and concepts of digital environment, "what it is" and "how to use it."
- (2) *Communication and social connection*, - "talking to others" means knowing about the different ways in which people can interact with others through digital technology.
- (3) *Interconnectivity* – how devices work together, for example, how are actions on a website then translated into a corresponding application on a mobile device or how to access stored data on different devices?
- (4) *Storage and retrieval* – save and retrieve information later How to store information and find it later, but what is important in this is how to store it in a safe and secure manner so that other people cannot use it without the permission of the person concerned.
- (5) *Creating* – making own content and presenting it. This may include something as simple as writing a word processing document, or some more complex operations such as building own functioning website or vlogs on social media.

Digitalisation is strongly reflected in the financial environment. According to forecasts for the coming years, the use of cash will continue to decline. FinTech is the use of digital technology and innovative business models in the provision of financial services. At its core, Fintech is utilised to help companies and consumers better manage their financial operations, processes, and lives by utilising specialised software and algorithms that are used on computers and, increasingly, smartphones.

Since the internet revolution and the mobile internet/smartphone revolution, financial technology has grown explosively. Previously financial technology used to be the back-office support function for bankers and traders. After that, there has been a shift to more consumer-oriented services and products. Today Fintech covers a broad variety of technological interventions into personal and commercial finance, such as money transfers, depositing with smartphone or applying for credit, raising money for a business start-up, or managing investments, all generally without the assistance of a person, just to name a few. The novel applications of digital technologies for personal finance management are providing a variety of new tools to support consumers and entrepreneurs in improving their financial inclusion and wellbeing. Fintech also includes the development and use of cryptocurrencies such as Bitcoin.

Technology giants are slipping on the banks' grounds and hitting this market. For all consumer's, who use digital financial technology-based services, the biggest question marks (risks) are security and privacy. It seems clear that public policies and self-regulatory measures should give consumers greater control over the initial collection and subsequent dissemination of their personal information. This is also called personal *digital footprint* management or control.

A digital footprint is a body of data that exists as a result of actions and communications online that can be traced back to an individual. Digital footprints can be used to locate which device has downloaded or used a website, for example, by phone and computer. It covers all the digital footprints on the Internet and social networks, such as blogs, photos, videos, tweets, posts, forums, comments, clicks, etc. A digital footprint can provide information about individuals or groups by computing and deducing from gathered data what they like or are interested in, what they are seeking, where they are, what is their appearance, character, gender, etc. From a financial information perspective this would mean gathering data about a person's finances, such as wealth, liabilities, sources of income, consumption patterns, and money transfers.

Digital footprints are sometimes divided into active and passive data traces. Active data traces are the ones that a user leaves trace intentionally. Facebook, Twitter and blog posts, social network connections, image and video uploads, email, phone calls and chats are some of the ways people create active digital footprints. Passive data traces are connected to an individual and are left by others or gathered through activities that the user does without purposefully leaving data. Website visits and actions, searches and online purchases are among others some of the activities that add passive data traces to a digital footprint.

Data in digital footprints can impact an individual's finances, career and personal relationships. It can also lead to security vulnerabilities, for example by providing details that enable identity theft. A digital footprint is also relatively permanent and once the data is public, or only partially public, the owner has little control over, how this data will be used by others. For this reason, a major focus of digital footprint management (DFM)^{lxx} is caution and critical attitude to online activities in order to control the primary information that is gathered in the first place.

In European Union, the GDPR^{lxxi} sets out detailed requirements for companies and organisations on collecting, storing, and managing personal data. It applies both to European organisations that process personal data of individuals in the EU^{lxxii}, and to organisations outside the EU that target people living in the EU. Personal data includes information such as a person's name, address, ID card/passport number, cultural profile, and data held by a hospital or doctor (which uniquely identifies a person for health purposes), but also one form of financial information, income, and digital source information like Internet Protocol (IP) address.

The GDPR applies strict rules for processing data based on consent.^{lxxiii} The purpose of these rules is to ensure that the individual understands what he or she is consenting to. This means that consent should be freely given, specific, informed, and unambiguous by way of a request presented in clear and plain language. Consent should be given by an affirmative act, such as checking a box online or signing a form. When someone consents to the processing of their personal data, it can be only processed the data for the purposes for which consent was given. A person has also the opportunity to withdraw their consent.

According to GDPR, individuals also have the right to access their personal data, free of charge. In addition, if an individual believes that their personal data is incorrect, incomplete, or inaccurate, they have the right to have it rectified or completed without undue delay.

In order to curb the unauthorised use of personal data and financial information, consumer's awareness must be raised. Conscious and financially literate consumers understand the ways in which businesses (and other actors) use consumers' personal information, and this should in turn lead to reluctance and caution to provide marketers and service providers with unnecessary personal information.

Digital financial literacy is a multi-dimensional concept, similar to digital literacy^{lxxiv} and financial literacy. Digital financial literacy straddles the concepts of digital literacy and financial literacy but has its unique aspects due to the nature of the products and risks involved. While some previous literature (e.g., OECD 2017) has described various aspects of digital financial literacy, there is still no standardised definition of digital financial literacy.

Morgan et.al. (2019) propose four dimensions of digital financial literacy, including knowledge of digital financial products and services, awareness of digital financial risks, knowledge of digital financial risk control, and knowledge of consumer rights and redress procedures.^{lxxv}

Incorporating financial literacy into the digital environment will tangent to the concept of digital literacy (or may be partly overlap), and vice versa. But the question is essentially a matter of perspective whether literacy is needed for financial or digital environment.

7.3 Can Open Banking help learning Financial Literacy?

Open Banking, also known as "open bank data", is a secure way to give a third-party provider (TPP) access to a person's financial banking information through the use of Application Programming Interface (API). Open banking will allow the networking of accounts and data across institutions for use by consumers, financial institutions, and TTPs.

Under open banking, customers are normally required to grant some kind of consent to let the bank allow third-party access. Third-party provider's APIs can then use the customer's shared data. Uses might include comparing the customer's accounts and transaction history to a range of financial service options, aggregating data across participating financial institutions and customers to create marketing profiles or making new transactions and account changes on the customer's behalf.

Third-party services, as defined in PSD2^{lxxvi}, can be divided into three categories:

- 1) Payment Initiation Services (PIS) i.e. payment order launch service,
- 2) Account Information Services (AIS),
- 3) Payment Instrument Issuing (PII), mainly issuance of card-based payment instruments.

Open banking provides opportunities for consumers with promising benefits but also additional risks as their information is shared more widely. These additional risks may potentially harm to financial privacy and the security of consumers' finances. Open banking APIs may face similar, or new type security risks like any other application. An extreme (and less likely) threat is a potential for a malicious third-party app to clean out a customer's account. Much broader concerns would simply be personal (and financial) data breaches^{lxxvii} due to poor security, hacking, or insider threat.^{lxxviii} These are

relatively widespread in the modern era, also in financial institutions, and will likely remain commonplace as more data becomes interconnected in more ways.

However, open banking is becoming a driving force and major source of innovation to transform the banking industry in 2020s. Open banking will force large, established banks to be more competitive with smaller and faster online banks. Ideally this should result in lower costs, better technology, and better customer service.

Open banking and third-party APIs may prove to serve as a useful accelerator in improving financial literacy. There are two ways for this:

- 1) Opportunity to make financial decisions with real-time digital data, which is available at
 - (a) bank account (such as cash, savings, existing debt, etc.),
 - (b) financial markets (such as interest rates, currency values, stock market prices, etc.),
 - and
 - (c) various portals and media (such as prices of products and services, homes, etc.)
- 2) Opportunity to learn financial literacy by playing teaching games with real time data mentioned above.

Third-party APIs are largely about who the information is disclosed to and under what conditions, but also who is able to process the information and provide value-added financial services to the end user. It is natural to assume that incorporating quick and easy-to-use, real-time information into a financial decision-making process - whether it is a purchase or savings decision, borrowing, making a short term personal financial plan or a long-term retirement financing, - improves decision-making's reliability and also chances of success.

Developing applications in open banking to improve financial decision-making and financial literacy requires, first and foremost, open innovation and a sound understanding of the opportunities and risks of opening up. This demand of open innovation applies as much to TPPs as to banks and regulators as well as start-ups, customers (business or consumers), universities, incubators etc. Today, hundreds of global companies are developing financial services, which are not closely related to their core business, including Big Tech -companies like Google and Apple. Secondly, service innovation should not be limited only to bank account or payment services, but should apply to all financial services, from asset management to financial intermediation and from borrowing to retirement planning. Thirdly, and what is really important from financial literacy perspective, innovation should also be applicable to financial education. This may not be "banking" or "financial services" but plays a growing importance in social responsibility of banking sector as well as other sectors.

By sharing financial transaction data with authorised providers, open banking could lead to the development of the following types of useful applications for consumers:

- Payment initiation services. This means transfer of money instantly between independent bank accounts, credit cards, and savings. Active payment initiation services will be going to just as important for consumers as read-only account information services.
- Aggregation of accounts. All different account balances in different banks in one dashboard. Usefulness depends on can customer's all accounts including credit cards and savings be aggregated.
- Automatic financial reports that combine all customer's bank accounts and credit cards into a unified statement. This could be a starting point for better financial literacy, manage and plan of personal finance.
- Automatically calculated spending patterns and spare money shifted into savings or investments. This could also help customer to find a new savings account that would earn a higher interest rate than the current one, or a different credit card with a lower interest rate.
- Access to banking data to prove income. This could help consumers get a more accurate picture of their own finances before applying for a loan or mortgage. For example, for

customers who want to buy a home an open banking app could automatically calculate what customers can afford based on all the information in their accounts. This could perhaps provide a more reliable picture than a bank's mortgage lending instructions currently provide (the ability to access credit on the basis of non-traditional credit risk models). Providing accurate and recent earnings and spending data should also make credit pricing and risk assessment easier and quicker.

- Access to foreign currencies on demand (instant) instead of needing to exchange in advance.
- Get reminders and suggestions about better money management from an AI personal financial assistant.
- Grant access to banking data to receive automatic suggestions about money saving on bills and insurance or to receive a more fair and accurate credit score. This is quite similar to the idea of getting better loan or credit card offers by securely sharing bank transaction data but suggests a more persistent option in terms of building or updating a score that can be used in lots of scenarios.

Open banking can also help SMEs save time through online accounting and help fraud detection companies through better monitor customer's accounts and identify possible problems sooner.

Open banking also enables greater financial inclusion and better access to financial products to certain groups of consumers. These groups could consist of, for example:

- Aged people and people with reduced mobility, blindness or visual impairment, deafness, or hearing impairment
 - The app that acts as an "personal financial trainer" or "account assistant" to help these people manage their account remotely and complete forms and applications for financial products and services, while still giving the account holder full control over final decisions.
 - The app could also help, for example, customers with visual impairments, use voice commands to better understand their finances.
- Vulnerable groups.^{lxxix} Also including newcomers, people with unfavourable credit histories and/or people with variable incomes. This group can benefit from applications that look at a consumer's spending patterns and apps that automatically inform consumers when to transfer money between accounts to avoid overdraft charges and/or interest on late payments. People in this group may benefit access to low-cost, automated financial advice, too.

7.4 Financial risk management

7.4.1 Identification of risks

Financial risk always involves a risk of a loss of financial value, whether that be current assets or the potential for future ones.

There are two big domains in which people usually has room for improvement. These are the risks of *poor financial management* and *investment risks*. Both of these risks involve the risk of misallocation. It includes allocation of income to various things, including both spending and saving, and how to allocate the assets which are saved or invested for future. Of these two, managing investment risk is often more challenging, as it requires that a person achieve an understanding of investment risk and this in turn requires both knowledge and decision-making.

Risk management is a method of mitigating the negative consequences of threats and uncertainties. As risk management is a broad topic, this book addresses only the topic of financial risk management,

which covers (1) income risks, (2) spending risks, (3) asset and investment risks, and (4) credit and debt risks.

Income risks are often related to personal or family (including close relatives or friends) living situations. It can be death, disability and disablement, job loss, underemployment, or a person may live beyond his or her financial resources.

Income risk management methods are highly personal issues such as having multiple alternative income streams (risk mitigation), life insurance coverage to ensure that family members, close relatives or friends could cope in the future, and disability insurance to ease the financial burden in case of disability and disablement. Proper career management and life-long learning can help mitigate the risk of unemployment and underemployment. Money management, budgeting, and retirement planning as well as frugal living will reduce the chance to outlive a person's financial resources.

Spending risk may occur when a person spends more money than he or she earns (including savings) or not earn enough to meet his or her needs. Some emergencies may also force a person to spend more money than usual. Because spending risks are highly dependent on the person's money use and consumption, also spending risk management methods are very personal. These include practicing frugal living to lower living expenses or learning how to earn extra income. Financial literacy domains, such as proper money and budget management, but also starting an “emergency fund” (i.e. reserve of cash to deal with emergencies) and proper insurances against major emergencies may help.

Asset and investment risks are related to financial investments and real (physical) assets (e.g., house, car, boat, art works, and other similar possessions). It is reasonable to be aware of that all these are vulnerable to various kinds of risks such as:

- Insufficient savings or wrong kind of investment/investment mix to meet attained financial goals including under-diversified or undiversified investment portfolio,
- Losing the principal of investment, especially in speculative investments,
- Insufficient amount of money to maintain real investments such as real estate, including depreciation,
- Theft or destruction of properties,
- Inflation.

Asset and investment risk management methods consist of various different issues. In addition to such obvious (self-evident) methods, like ensuring enough savings compared to financial goals, practicing of frugal living, and spending less than earn, it is useful to concentrate on the following issues:

- Learn how to invest properly and limit investment expenses. Learn about risk and return characteristics of each asset class and choose the right investment mix for each financial goal.
- Learn about the capital preservation characteristics of each investment type. Always compare risk/return -ratio of different investments. For example, investments like savings account, Certificate of Deposit (CD), certain money market investments and triple-A government bonds have a low risk— but the yield or return is lower, possibly lower than inflation. On the other hand, in the stock market or in derivatives, risk to lose a great part of (or whole) invested capital is higher — but the returns on investment are potentially higher.
- Learn how to reduce diversification risk, understand the concept of investment correlation and diversification in order to reduce the overall volatility and risk of investment portfolio. Additionally, use investment strategies that are proven to improve performance i.e., create globally diversified asset allocation, reinvest income generated from your investments and/or regularly add new money to investments, keep the investment costs as low as possible, etc.
- Buy and sell according to investment strategy, try to avoid situations when transactions seem to be inevitable or obligatory.

- Protect physical assets against theft or destruction with appropriate types of insurance and different safety precautions.
- Avoid spending money on assets than do not gain value over time.
- To reduce depreciation risk, maintain real assets regularly and in-time.
- As a protection against inflation is to choose investments that are inflation-adjusted, increase its value in tandem with inflation (e.g., valuable real estate, precious metals, commodities, etc.), or has the potential to beat inflation (e.g., stocks, mutual funds, ETFs, etc.)

Credit and debt risk. The most important thing about this is over-indebtedness, which may have many harmful consequences. Shortly over-indebtedness means accumulation of excessive debt in relation to disposable income, which causes debt and interest repayment problems and strangles financial leeway.

In addition, credit and debt risks may be associated with

- loan portfolio when it is not optimal related to person's financial situation and market conditions. This means, inter alia, higher interest rates than is necessary, high debt related charges, etc.
- payment default entry and loss of credit status, which can even cause unreasonable harm to a person's normal daily living,
- identity theft, which can lead to unauthorized use of personal information, misuse of bank or credit card in the form of bank or credit account withdrawals and / or unauthorized on-line ordering.

Credit and debt risk management methods, in addition to conventional methods like practicing frugal living, spending less than earn, and/or earn more money, may consist of the following:

- Reduce debt accumulation (which in other word means the same as increasing net asset accumulation)
- Estimate the total debt limit and debt ratio. If necessary, improve your ratios e.g. by selling some of your liquid assets.
- Moreover, if a person is already in debt, it is necessary to repay first the most expensive debt, to try to convert more expensive debt to a cheaper one and/or negotiate with the lender about realistic repayment schedule and/or refinance terms and conditions in order to avoid payment default entry and loss of credit status.
- Employ various methods and tools (digital and manual) for protection against identity theft. These include, but are not limited to, protecting all personal information, monitoring regularly bank and credit accounts, and using of strong customer authentication (SCA).

7.4.2 Digital financial risks and e-Safety

Digital financial services (DFS) carry new risks for consumers, in both developed and emerging markets. These risks may pose serious threats to the financial wellbeing of individuals, if not properly addressed. OECD has categorised these risks as follows:^{lxxx}

- *Market driven.* These risks may include misuse of unfamiliar (or new types of) products, which are often offered to uninformed consumers; new types of fraud, often taking advantage of consumers uncertainty in the digital environment; a lack of security, privacy and confidentiality of data; inappropriate or excessive use of digital profiling to identify potential customers and exclude unwanted groups; rapid access of high-cost bearing short-term credit, and other market practices that can reinforce behavioural biases.
- *Consumer driven.* The asymmetries in information when increasing digitalisation of daily life and making more complex financial decisions may not be compatible with the increasing need for level of digital and financial literacy.

- *Technology driven.* The increasing use of algorithms, which can lead to denied access to certain services or inappropriate charges based on inaccurate or wrong correlations made without human interpretation.
- *Regulation and supervision driven:* This can encompass uneven levels of protection within a country (inadequate disclosure and redress mechanisms) and across countries (variety of providers, cross-border selling, regulatory arbitrage). It can also include consideration of data protection issues, a lack of coordination among authorities with respect to new types of digital financial services.

Risk is the chance of losing something, in this context financial values. Sometimes loss is trivial, while sometimes it can cause great personal and financial difficulties. Not all risks can be eliminated, but there are ways to avoid, mitigate or protect yourself from risks. When a risk is in reasonable way to be considered low or the cost is not high, taking the risk may be one option. Risk level must also be evaluated in relation to the return, especially in investments. When a risk is high and/or managing it is expensive, other ways to manage it are needed.

Risk control and e-Safety

At its simplest, e-Safety can be defined as the safe and responsible use of technology. This includes the use of the internet, but also other means of communication by using digital media (e.g. phones, text messages, gaming devices, etc.) In this context e-Safety consist of several different precautions in order to use these means of communication, mainly internet, safely. It is the capability of maximizing the user's personal safety and minimizing security risks to private information and property associated with using the internet including the self-protection from computer crime. Simultaneously also terms such as Internet safety or online safety or cyber safety are used.

e-Safety is commonly divided into three key content areas of risk:

- **Content:** being exposed to illegal, inappropriate, or harmful material
- **Contact:** being subjected to harmful online interaction with other users
- **Conduct:** personal online behaviour that increases the likelihood of, or causes, harm.

The first content area means digital content, such as images, text or video, which directs e.g. to a bogus website (pharming). It can also be, inter alia, ransomware (malware that holds the data of a computer user for ransom) or spyware (program that surreptitiously monitor and report the actions of a computer user.)

Contact is concerned with who a person is interacting with online, and this directly leads into conduct. That is focused on how the contact is made and what is being exchanged. What is this unknown person's or organisation's behaviour? Is there a danger of things like phishing, Identity theft or social engineering, for instance?

Contact, visible or latent, attempts to influence a person's conduct. If a person is acting in accordance with the content or contact, this conduct is harmful to the individual and others close to one. In a large scale, it can be harmful to the whole society.

In the study European Parliamentary Research Service (EPRS), its Scientific Foresight Unit (STOA) identified eight significant harmful social and cultural effects associated with internet use and identified eight broad policy options for preventing and mitigating these effects.

In the study, harmful conduct was not specifically addressed from the perspective of financial literacy. However, one of the policy options (policy 4) is education about the internet and its consequences. This policy option involves strengthening education about the internet, as early as the elementary school stage, to teach pupils and students about the social, economic, technical, and cultural aspects of the internet, its potential benefits and harms for individuals and society, and critical digital skills and skills for self-aware internet use.^{lxxxii}

There are many forms of fraud and scams. Some of them are mainly related to personal finance, but some are job-related.

Digital technology can be used to prevent and identify the financial abuse of people with the help of tools, such as strong customer authentication (SCA) under PSD2^{lxxxii}, voice recognition and facial recognition. SCA's main purpose is to protect users from fraud, phishing, and unauthorized money transfers by adding an extra authorization to electronic payment procedures. And, in general, the financial aspects of e-Safety and digital awareness will become more important as online shopping and banking continue to grow.

On the other hand, traditional face-to-face banking might have security benefits which are missing from digital banking services. For example, bank tellers or banking advisers might be able to detect financial abuse during in-person visits with clients. Detection could be more difficult if, say, fraudster steal a people's personal information and use these to make transactions online or over the phone. Such problems could increase as digital banking expands.^{lxxxiii}

8 Financial behaviour

As defined by the OECD (2016), financial literacy consists of three content areas, knowledge, behaviour, and attitudes. Therefore, already by definition, it is understandable that increasing the level of financial knowledge is not enough to improve financial literacy alone. And financial knowledge is insufficient to ensure responsible financial behaviour and financial decision making.

Financial behaviour is an essential element of financial literacy and arguably important one. The positive outcomes from being financially literate are driven by behaviour such as managing a budget and planning of financial future, and conversely, certain behaviours, such as over-indebtedness, may in turn reduce financial wellbeing.

Financial behaviour, a sub-field of behavioural economics, proposes that psychological influences and biases affect the financial behaviours of investors, consumers, and financial practitioners. In addition, influences and biases can be a source for explanation of different types of market anomalies. Financial behaviour is often used to explain specifically market anomalies in the stock market, such as severe rises or falls in stock prices.

Consumer economists^{lxxxiv} have studied financial behaviour for the last three decades. Financial behaviour can be defined as any human behaviour that is related to any component of financial literacy. Defined in this way, financial behaviour includes, inter alia, cash, credit, and saving behaviour, short and long-term financial planning, and awareness of risks.

This view is the same as in the OECD / INFE questionnaire^{lxxxv}, in which section 2 examined financial behaviour as a measure of "economically savvy" behaviour. Survey questions were related to issues such as active saving, budgeting, avoiding borrowing, and reaching long-term goals.

Often financial literacy education programs focus on increasing savings and reducing debts. These are seen as outcomes of positive financial behaviours. But positive behaviour does not directly lead to positive outcomes, because behaviour only contributes partly to the outcomes. Partly because outcomes are results from both a person's own behaviour and several other factors in various situations. For example, a person wants to increase one's financial wellbeing by investing his or her savings to the stock market, but it may not be possible if the market collapses or the selected investment turns out to be loss-making. On the other hand, keeping money in a zero-interest bank account does not increase economic wellbeing either. In such a situation, positive financial behaviour may turn out to be a difficult task.

Making good financial decisions is not only depending on knowledge of financial facts. Psychology plays a significant part too. According to researchers, like Shephard et.al. (2017),^{lxxxvi} a higher level of financial behaviour is not just based on how much financial knowledge a person has acquired or the attitude towards money, but also is strongly linked to certain psychological factors, such as optimism, impulsivity and purposefulness i.e. how to approach challenges, and what is the feel of control about one's own future. On the other hand, this is not very surprising, as the same type of psychological factors affect, also many other things, such as health or success in the workplace. Much thought has been given to whether addressing certain psychological factors could be one way of improving financial behaviour.

Much of the current literature on financial behaviour focuses on basic knowledge about spending money (such as investment and borrowing). Although it is useful to identify positive financial behaviour, such as active saving, tracking spending, and using credit wisely, it is also important to identify negative (or problematic) psychology-based financial behaviour that may impair or even prevent the achievement of financial wellbeing.

Previously, much of the research related to dysfunctional financial (money) behaviour has focused almost exclusively on pathological gambling. Recently, however, money disorders, such as compulsive buying disorder and compulsive hoarding, have raised attention, as well as other money disorders frequently noticed mainly by financial professionals. These include disorders like financial enabling, financial dependence, financial denial, and financial enmeshment, which were correlated with demographic characteristics and certain financial health indicators (e.g. less net worth, less income, and/or more revolving credit). According to the study^{lxxxvii} these were found to have high reliability in measuring disordered behaviour, of which some were also associated with negative financial behaviour.

Financial enabling refers to a person, who give money in a way that keeps the receiver from having to take responsibility or become independent.

Financial dependence refers to a person who is financially non independent and relies on another person to obtain, for example, money, clothing or food.

Financial denial disorder is related to a person's neglect of one's own financial responsibilities, which in turn causes them harm because thinking about these causes too much stress. Financial worries can lead to more significant mental health problems.

Financial enmeshment is often described through family structures as an inappropriate involvement of minor children in parental financial matters. Because children learn through observing and interacting with their parents, much of what children learn about money, consumption, and debt comes from these observations and interactions. Financial enmeshment occurs when parents involve their children in adult financial matters before the children are cognitively and emotionally ready to process this information. In addition, financial enmeshment may have a negative effect on the child's development.

According to the survey "The Stress in America"^{lxxxviii} nearly every year money is a top stressor since 2007, no matter what the economy is like at the time. That stress can cause people to exhibit problematic or inappropriate behaviours.

People face countless personal finance decisions every day. They range from the seemingly trivial (e.g. dinner or movie) to the more impactful (how much should save for a new home). Yet each of these decisions impact together to over a long period to define the space of personal finances. Usually, when making financial decisions, people prioritise the present over the future, even if that means excessive spending to the detriment of longer-term savings. And when it concerns decisions of bigger picture,

longer term decisions, procrastination invariably ensues. Similarly, decision inertia, as people are inclined to stick with the “status quo” even towards sub-optimal ends.

On general level, it can be said that psychology has an impact in teaching financial literacy as well as teaching other things, but exploitation is not straightforward. While increasing systematic thinking and reducing impulse behaviour sounds a good idea in financial education, there are risks involved in when affecting people’s behaviour. And it also raises the question why certain traits are less desirable and less valuable to people than other traits. What are the "right" financial decisions? And who makes these value judgments?

In teaching financial literacy, educators should not only impart financial knowledge to students, but also encourage students to strengthen positive financial behaviour, assuming that positive financial behaviour will lead to positive outcomes, and in this way, people can improve their financial wellbeing. However, in order to develop an educational financial literacy programs focused on behavioural change, teachers (and researchers) need to better understand how behaviour is formed and why, and how to support students and/or consumers to change undesirable financial behaviour and to develop positive financial behaviour.^{lxxxix}

9 Financial attitudes

In short, financial attitude can be defined as personal inclination or individual characteristics towards financial matters. Financial attitude is a state of mind, opinion, and judgment of a person about finances and financial issues.

Attitude to financial issues and practices is an important predictor of financial behaviour. Attitudes, values, and beliefs in financial issues influence financial decision-making and are reflected in people's financial practices and habits. A person's financial attitude, value, or beliefs can influence his or her financial stability and goal setting and may be an indicator of financial decision-making related to savings, expenses, loan defaults, and credit card uses, for instance. A positive attitude to financial literacy and financial management can have a positive effect on an individual's intention to take advantage of many types of savings or investment instruments, limit the use of credit cards and manage their finances in more beneficial ways.

The literature^{xc} on personal financial literacy indicates that financial knowledge and personal financial attitude can explain different financial decisions. Financial attitude has an effect on the financial literacy. A positive financial attitude has the effect that a person also has good financial literacy. On the other hand, a person that has no financial attitude, or it may even be a negative one, has an impact on poor financial literacy. Financial attitude has also a positive and significant impact on financial management behaviour. In addition, financial attitude, financial behaviour, and financial capability have a positive relationship on financial satisfaction. And financial attitude and financial behaviour may have stronger association with financial literacy than financial knowledge alone have. Financial attitudes along with financial behaviour can also affect financial wellbeing. However, it should be noted that the relationships between knowledge, attitudes and behaviour are complex and difficult to demonstrate, also because not all external factors can be observed or measured.

The literature review supports a view that financial attitude is a necessary determinant to identify financial literacy of individuals, and it also influences the level of financial literacy and financial behaviour. Financial attitude plays a major role in converting knowledge to such a behaviour what leads to a positive financial outcome.

Financial literacy has traditionally been associated with a vision of a rational actor. At the same time consumer responsibilities for personal finance management have increased. For example, greater competition, more-flexible underwriting standards^{xcj} and easier availability of financial instruments

have increased younger populations' access to credit. Consumers' responsibilities for their own retirement investments have also grown. These trends emphasise that a consumer has a responsibility to seek, evaluate and understand financial information and must have necessary skills to do so. However, financial literacy cannot be required from individuals if society, i.e. the education system and the financial industry, do not provide adequate information and opportunities for learning. When the question concerns adults, governments should in addition support adult financial literacy education by supporting NGOs and other organisations working in the financial education and training sector.

In many real-life situations people do not act rationally. There is a disconnect between the efficient markets model and the "non-rational" behaviours. Although research shows that the acquisition of additional information can result in improved behaviour in financial issues, some studies also show that increased information does not automatically result in such improvement^{xcii}. People do not always act in their best financial interest, although the efficient markets model postulates that they should do so. People have also certain financially self-destructive aspects of behaviour, such as overconfidence or greed (investing despite the absence of complete or even sufficient information), overreaction (exaggerated reaction to new market information), fear (to start investing in stocks, for example), selflessness (giving donations despite one's own financial situation), and loss aversion (delayed entry into or exit from a financial situation inconsistent with one's financial best interest).^{xciii} On the other hand, certain individual psychological characteristics like self-discipline and thoroughness associate often with responsible financial behaviour.

People's attitudes about money and financial issues develop over time, and research has shown that most of these attitudes are originated with parents and how they felt about money (parental influence). These attitudes probably effect on saving, spending and investing in adult age. Some people use money to express their power and success even when the money they spend is not their own. On the other hand, some other people appear to have no money at all, wear second-hand clothing, and live simply life, although they have a million Euro in the bank account. And rest of people, probably a considerable majority, are somewhere between these two extremes.

Behavioural economics^{xciv} has brought a more realistic approach to understanding financial attitude and behaviour. It can also contribute to the development of policies and programs that motivate positive change.

Motivation has long been recognized as a key factor in personal behaviour. In particular, motivation is evident in long-term financial issues. For example, many people have done financially too little in preparation for retirement. In behavioural economics literature, the low saving level for pensions is explained, for example, the difference between short and long-term discounting, appearing for instance as a lack of self-control. Another explanatory factor for the low level of pension savings is information and its processing. Consumers have been found to have difficulties understanding financial concepts. Behavioural economics has also highlighted situations where consumers deviate from rational behaviour when making investment decisions.

Research has found that attitudes often have a significant impact on financial behaviour, possibly even greater than knowledge. So, it is no wonder, attitudes and preferences are also considered to be an important element in financial literacy and its measurement. The OECD/INFE definition of financial literacy recognises that even if an individual has sufficient knowledge and ability to act in a particular way, their attitude will influence their decision of whether or not to act: "A combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing".^{xcv}

The OECD/INFE financial literacy survey therefore includes three attitude statements to gauge respondents' attitudes towards money and planning for the future. The questions in the survey Section

3 ask people to use a scale to indicate whether they agree or disagree with particular statements. Financial attitudes are measured by questions like "I tend to live for today and let tomorrow take care of itself", "I find it more satisfying to spend money than to save it for the long term" and "Money is there to be spent".^{xvii}

Each question focuses on the short-term preferences, like "living today" and "spending money now". The underlying presumption behind the questions is that such preferences are likely to inhibit behaviour, which would lead to greater financial sustainability and wellbeing in the long run. In other words, the extent to which people disagree with the claims made, would indicate more financially literate attitude. However, providing a normative interpretation of financial attitudes is more difficult than when it is question about knowledge or financial behaviour, for the reason that, e.g. without knowing the background factors of the respondents and their present life situation, such an interpretation, which would be widely value-free and attitude-free, on what ground certain attitudes can be said to be indicating "right" or "wrong" kind of financial attitudes, cannot be justified reasonably.

Notwithstanding the above - or perhaps for that very reason - some practical financial literacy courses and guidance materials on personal finance provide guidance designed to help individuals identify their own financial attitudes that are said to be guided their financial decisions. Although all classifications must be treated with caution, different types of people can be found, according to numerous courses and material, based on how people approach financial issues. Usually, the following types of traits are presented: parsimonious, pleasure seeker, status seeker, indifferent, power seeker and self-worth seeker.

Parsimonious people seek financial security, and they are avoiding unnecessary expenditure of money or consumption and are also avoiding waste. Often, they are living below their means and saving money, because they believe money will offer protection from life's uncertainties; money makes them feel more secure. They rarely buy luxury items and some even may have difficulties to buy daily consumer goods.

Pleasure seekers more likely spend money than save it. This means they also often live beyond their financial capacity by spending more than they earn. Pleasure seekers may be at risk of over-indebtedness.

Status seekers people use money to raise their social status. They buy luxury items, and the best-selling and popular brand names are important to them. A status type person attracts attention by frequently demonstrating their purchases i.e. they like to "show off".

Indifferent people treat money with indifference. They place only little importance on having money. Actually, having money can make them nervous. They prefer to spend time and resources being independent, for example by making their own clothes. They are also hobby-oriented and involved with arts and crafts.

Power-seeking people use money to express their power or to get it. This profile may also use money to control other people. Money is mean to power.

Self-worth people have the sense of one's own value or worth as an individual is based on money. They believe, their own worth is based on how much money they have. They also believe that people only judge them based on the amount of money they have. They value how much they have accumulated.

It is possible that in real life anyone can meet people who fit or are near some or more of the above characteristics. However, traits or attitudes are often difficult to change and will usually only succeed with the strong immersion and motivation of the person concerned. In addition, as stated above, it is

difficult to determine the basis on which certain attitudes can be said to be "right" or "wrong" financial attitudes.

CHAPTER IV – TEACHING FINANCIAL LITERACY

10 Understanding the Audience

As stated previously, financial literacy is an important skill of life. This basic skill of people is not depending on their home country, culture, religion, education, age, gender, or socio-economic status. But in teaching these factors cannot be ignored. Teaching financial literacy to children in a classroom vs. leading a seminar or workshop with hundreds of attendees are quite different teaching and learning situations by nature.

The starting point in teaching financial literacy is to secure a deeper understanding of participants' background. It is important to have an understanding about background factors of participants. In practice this means that some answers to certain specific questions are needed that will provide a direction to create the program that meets learners' needs. And these usually are related to learner's background factors, such as home country, education, age, gender, or socio-economic status, for example. But also factors like willingness to learn and certain motivation factors are important. On the other hand, excessive data collection or profiling can also lead to simplifications and to a wrong approach in teaching. In this the teacher's pedagogical skills to also understand the limitations of background information in developing an effective curriculum or course program becomes important.

Understanding the audience is a first step in designing a program or learning process or curriculum that best fits to the participants. The goal of this phase is to get enough answers to start designing the overall financial education path. Certain tools and methods can be used to gain a better understanding of the audience.

These may consist of following actions:

- Statistical background surveys
Examining surveys that measure participant's background factors and current knowledge of financial literacy.
- Discussions and interviews
Talking with participants directly, either individually or in small groups to test the validity of background factors and to find out their areas of interests.
- Testing
Various tests may be in use to assess some courses or levels. Measure participants' current content knowledge and capabilities.

Once a better understanding about the learners is available and main learner barometers have been obtained, the choice of teaching objectives including topics and lessons will be the next step.

11 Identifying Teaching Objectives

The overall objective of teaching financial literacy is to improve learner's ability to use knowledge and skills to manage financial resources efficiently and to make sound financial decisions for the lifecycle of financial wellbeing. Learning is a life-time endeavour and Improving financial literacy is a long-term behavioural change initiative. It requires a multi-faceted approach and sustained action over time to bring about gradual improvement.

Each financial literacy's domain requires its own approach and teaching methods. In some domains, it is more appropriate to focus on practical skills, such as managing digital payment services. In some other, like investments and saving, it is more meaningful to focus on raising knowledge of product information and awareness of risks. On the other hand, in a game-based learning environment, "practical" skills related to, for instance, investments can also be practiced, but still safely.

The learning objectives for different domains of financial literacy should be defined separately, with emphasis on the issues that are important to the target audience. It follows from the foregoing that the setting of learning objectives must be based on the baseline of the learners. One of the most important variables here is the age of the learner. Learning objectives, teaching methods and the measurement or observation of learning outcomes are significantly dependent on the age of the learner. Setting of objectives and teaching of financial literacy is different for children, young people, and adults, as stated in the previous sections. Compared to children and young people, adults usually have a wider range of experiences to draw on. In educational perspective this means, inter alia, financial literacy teaching for adults is capability building on top of learners' already existing knowledge. On the other hand, it is meaningful to provide children with financial education in a playful form and avoid complex concepts and terms.

Choosing the purposeful and focused curriculum is important in teaching financial literacy. The chosen curriculum and the presentations and materials it contains, should be linked to learners' real-life situations, but they should be also interesting and fun, and meet core educational standards. In addition, the materials should encourage participants to engage in positive economic activities, but they should also be compatible with learners' cognitive abilities and confirmed learning goals.

It is appropriate that different expert organisations have been able to comment extensively on the lesson plans, their content, and objectives and, where possible, provide empirical evidence that the financial capabilities of the participants have a lasting impact. Therefore, materials that have been built with the versatility of trainers, financial professionals, and financial education experts are useful and meaningful. This ensures that a learning program, course, lesson etc. fills the gap between theoretical education and practical application.

There is no shortcut that can solve the problem of financial illiteracy. The motivation of children and high school students to become financially literate, and perhaps even graduate educated instructors who teach personal finance in an interactive environment of the 2020s, is a valuable cornerstone.

12 Identifying Teaching and Learning Methods

If we accept the premise that the world is not just mathematics, history, or biology, or even economics, we can also understand that there are phenomena around us that can be explained by different disciplines. Phenomenon-based learning can help to understand these. It is about studying large-scale themes across disciplines. Phenomenon-based learning is a learner-centred, multidisciplinary instructional approach that is based on learner's inquiries and problem solving. The starting point for learning is holistic, real clarification of the phenomenon of the world. The phenomena are considered in their entirety, in a genuinely clear context, and related knowledge and skills are learned across the boundaries of the subject. The starting point differs from the traditional subject-based teaching culture, in which often-taught subjects are broken down into relatively small and loose pieces (decontextualization).^{xcvii}

Sharing the same theoretical framework for phenomenon-based learning has much in common with problem-based learning (PBL). It is a form of teaching and learning that emphasises interaction between groups, learning needs that are jointly defined by the group, and interactive and community-based knowledge creation. PBL is a process-like activity that emphasizes natural group interaction and follows a circular pattern. Studying involves working in a group, but also in the individual's own work, for example in the form of knowledge acquisition and reflection based on the shared knowledge of the group. As part of the process, forms of "traditional" study, such as expert lectures and literature, are also utilised. The forms of obtaining information may vary widely depending on the subject being studied and the form of implementation.

Financial literacy learning contains a lot of problem-solving, analytical, and critical thinking. These are skills that cannot be thoroughly developed by sitting in a classroom listening to an instructor or by

reading and watching an e-learning videos. These skills are developed from active engagement and doing, a key requirement in phenomenon-based learning.

Phenomenon-based learning may just become more common as the 21st century continues to demand individuals who can learn on their own and solve some of life's biggest problems.^{xcviii}

However, it is worth of notice, that the main purpose of all teaching methods is to promote learners' learning. The method itself is not the goal, but how it supports learning. The choice of methods should be pedagogically sound, and the method should be suitable for learning.

There are a variety of different methods and ways for teaching and learning. The following describes some general teaching and learning options that are also applicable to teaching or learning financial literacy, albeit with varying degrees.

13 Online Learning

In short, online learning, also known as e-learning, is a way to reach large audiences through digital channels.^{xcix}

Definition: A learning system based on formalised (can be also informal) teaching but with the help of information and communication technology (ICT) resources is known as online learning. It can be roughly grouped into three different types: net-supported local teaching, combined local and distance teaching online and self-study online. Although instruction can be given inside a classroom or outside a classroom by using systems, whether free-standing or based on either local networks or the Internet in networked learning environment. ICT forms the major delivery component of online learning. Online learning can also be termed as a network enabled transfer of skills and knowledge.

Online learning is broadly inclusive of all forms of educational technology in learning and teaching but typically online learning means learning conducted on the Internet. In a broad sense, online learning includes or is widely synonymous with the following concepts: multimedia learning, technology-enhanced learning, computer-based instruction, computer-based training, computer-assisted instruction or computer-aided instruction, internet-based training, web-based training, online education, virtual education, virtual learning environments, M-learning,^c and digital educational collaboration.

These synonyms and alternative terms emphasise a particular aspect or component in online learning: delivery method. In practise, it includes several types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as film, audio, or video tape, which all are delivered through satellite/cable TV, computers/smartphones/tablets, as well as local intranet/extranet and web-based learning. Information and communication systems are used in many different types of learning processes.

Earlier, online learning was not entirely accepted as it was lacked the human element required in learning. Nowadays, with the rapid progress in technology and the advancement in learning systems, online learning is widely embraced and popular. The rapid development of computers, smartphones, tablets, and similar devices has opened an important place for them in education. Books are available also in e-books and other electronic educational materials. Knowledge can be shared and received via the Internet and other electronic networks, which is accessible 24/7, anywhere, anytime and the delivery of education can be made to a large number of recipients at the same or different times.

Strengths: The most important strengths of E-Learning for students are related to that it suits almost everyone's needs, courses and lectures can be taken a number of times, it provides access to updated content and quick receiving of lessons. Online solutions promote active and independent learning as a student have access to the material 24x7, which means training anytime and from anywhere also. It is suitable for those who e.g. are part time students or are working full time. Through discussion boards and chats, a student is able to interact with everyone online and also clear own doubts, if any. In

addition, the video instructions that are provided for audio and video learning can be rewound and seen and heard again if a student does not understand the topic first time around.

For teachers and education providers strengths comes from innovativeness and scalability of educational material and topics, and effectiveness including quick delivery of lessons. Online learning helps in creating and communicating new training, policies, concepts, and ideas. The online learning material is scalable as it can be offered to anyone, anywhere in the world and at any time. Because material provided through this delivery channel moves quickly and easily, it is easier to keep it updated, too. For this reason, online learning systems are cost effective as compared to traditional forms of learning, in which a lot of teaching or training time is reduced with respect to teachers/trainers, travel, course materials, and accommodation. Therefore, online learning also has less impact on environment.

Challenges: Despite of online learning's strengths, there are, however, some challenges as well. The main one being that a student will get knowledge only on a theoretical basis and when what has been learnt is needed to put into practice it can prove to be challenging. The face-to-face learning experience is missing, which may matter to some of students. Online learning assessments, too, generally have a tendency of being only knowledge-based and not necessarily practicality-based. In addition, most of the E-learning assessments are limited to questions that are mostly objective in nature.

The authenticity of a particular student's work is a challenge as online just about anyone can do a project rather than the actual student itself. Because E-learning works online, there may also occur security problems.

Through learning, knowledge, perceptions, skills, attitudes, or behaviours change because new knowledge meets old knowledge. Therefore, learning involves the evaluation of one's own previous perceptions. They also influence how a person understands new things, how to process and interpret information. Studying and learning requires open-mindedness, flexibility, and courage to weigh in on accustomed views.

Emotions, moods, and attitudes are also associated with studying and learning. Learning arouses enthusiasm and joy of insight, but sometimes also feelings of insecurity if, for example, new knowledge strongly contradicts previous beliefs. Attitudes towards studying and learning also affect how receptive a person is to new knowledge and how she or he actually learn.

As mentioned earlier, success in teaching financial literacy = teacher contribution + student contribution. Therefore, especially in online learning the actual challenge is, how to get students engaged and motivate them. Adult students, in particular, may have high motivation at the start of the course, but decline as the course progresses, for example due to external factors. Therefore, it would be justified to have a channel, or even an in-person meeting opportunity, between the student and the teacher or the course administrator where other issues not causally related to the course content can be discussed confidentially. Other course members can also help with this, providing answers, peer support, and other experiences in the course's discussion boards, for example. It is also important that the course is flexible and that not all parts need to be completed within a certain time in a row.

Specific and detailed financial knowledge have some effect on financial behaviours and outcomes. However, confidence and a broad understanding are important predictors of successful financial outcomes. Consumers benefit more from practical and applied learning. This could be encapsulated as follows: experience is the best teacher. A major source of learning for all consumer groups is a difficult financial experience. In this, teaching financial literacy, through E-learning, can be too abstract and ordinary. But providing consumers with easy access to valid and up-dated information on an ongoing basis may better help consumers having minor financial difficulties avoid exacerbating their situation through unwanted financial behaviours.

Online learning materials can complement textbooks, but in some cases their availability may be problematic. In addition, they often include a large number of brochures-like material which, although accessible via the Internet, lack interactive elements. Nor do the everyday practices what young people

and adults need in their daily living, such as electronic contracts, purchases and payments through mobile phones or the Internet, and access to credit from non-banks, are adequately represented in financial literacy online materials.

Online learning could take advantage of financial literacy games if they are incorporated into the course in an appropriate manner. They can serve as a test platform for understanding and applying what is learned. Particularly in digital financial literacy education, games could be of considerable benefit with a presumption that games are designed with high quality topic and pedagogical expertise.

CHAPTER V - GAME BASED LEARNING

14 Serious games and financial literacy

14.1 Defining terms and contents

When an industry is new and rapidly growing, the terms used are usually mixed and the boundaries are unclear or even confusing. Online learning, gamification and serious games are three trends, but users and professionals from different fields may have problems to distinguish and define these new terms. Some see that terms have nothing in common, others think that they are the same thing. In the following will attempt to shed light on this topic.

Online learning is defined as a learning system based on (in)formalised teaching but with the help of ICT resources. Online learning tools digitalised traditional books and added interaction. The idea is to mix in-person and distance learning. Interaction and instant feedback about work done makes learning more engaging and more interesting, and gives students feel that they are the ones controlling the process. However, in online learning the actual challenge is, how to get students engaged and motivate them during the whole course. Usually, students do become rapidly engaged when introduced to E-learning but in a few weeks, they might get bored, and teachers become frustrated. Something is missing.

Gamification offers one solution for maintaining engagement and motivation, also in education. The digital game industry has created powerful and popular technologies for visualisation, computing, networking, and social interaction. These applications were originally created for entertainment purposes, but their integration with the broader Internet experience has expanded applications to a number of industries outside the entertainment industry. This trend and the previous successes of several game-based products have given additional impetus to the use of game technologies for serious applications in science, engineering, and marketing, but also in training, education, communication, and data analysis.

Gamification has slightly different definitions depending on the disciplinary context it is used. For example, game study literature and service marketing literature are for large parts complementary, but the first adopts a systemic approach and this seems to be incompatible with the understanding of value creation in service literature which, in contrast, emphasizes the experiential nature of services.^{ci} In vernaculars the word itself refers to the incorporation of game elements, like score and reward systems, to non-game contexts, such as education, business and social impact challenges, in order to act as incentives for people to participate and success. Gamification benefits the data-driven techniques that game designers use to engage players and applies them to non-game experiences to motivate actions that add value to personal everyday life or business.

In the evolution of the gaming industry, fighting games have shown the path for the future of gaming industry. First, they are multiplayer games where up to thousands of players search and battle within the same world at the same time. Second, they have been published on several platforms. Sharing the same game across different platforms is one of the gaming industry topics. Third, in these games, the players' characters are adventurous in an imaginary world, fighting for who will survive the longest.

Other trends in the game industry include the rise of e-sports and the popularity of hyper-casual games. In e-sports, video game competitors can reach tens of million viewers. Hyper Casual games, on the other hand, are simple and addictive, and their revenue streams are based on advertising.

Competition for user's attention in the entertainment game industry is fierce. Two things make a player stay longer in the game: constantly changing content and the familiar gaming community. Free download games are no longer products but services that are constantly being developed. Therefore, they also have no price caps.

It can be estimated that in the future, gaming companies will be able to test games at least in part with psychologically modelled artificial intelligence players. However, this could lead to more and more addictive games could be designed more efficiently. Artificial intelligence would tell test results of game development in a fraction of a second.

14.2 The building blocks for serious games design

14.2.1 Gamification and serious games

Gamification in education can be an effective learning tool when properly implemented. There are elements of gamification that can encourage certain behaviours and increase motivation and commitment. Game based learning is also implemented in many educational programs and it helps teachers find a balance between achieving their goals and meeting the changing needs of students. Gamification studies provide evidence that gaming has positive effects on individuals. However, there are differences between individual and contextual ones.

What is a serious game? A serious (usually digital) game is a game designed for a primary purpose, which is other than pure entertainment. In general, the adjective "serious" in this context refers to games or designed experiences that can be used for teaching, training, activating, raising awareness, simulating, inspiring change, communicating an idea/message and storytelling. The "serious" adjective is also generally prepended to refer to video games used by industries like defence, education, scientific research, health care, emergency management, city planning, engineering, and politics. However, for serious games, this purpose of a game and its utilisation environment does not mean that playing should not be fun. Learning in a motivating and stimulating learning environment is fun and this should also apply to serious games. However, although fun is a core element of games, why some of the serious games not fun. Because creating fun is difficult.

In other words, serious games are games that are played in order to obtain certain benefit or value. Although the main goal of a serious game is to create value, the serious games are also designed to be entertaining to motivate their users to play again.

There are many different types of serious games, such as learning games, health games, advertising games and news games. More ambiguous categories are mobile casino games & online casinos, virtual reality (VR) and escape room games. The question is ultimately whether the game is meant to bring benefit or value (serious purpose) or just entertainment to the player. However, sometimes it can be difficult to draw the line between serious and entertainment, as they often overlap. In any case, even serious games are evolved multi-departures and are used by individuals as well as companies and organisations.

Nowadays, computer games (PC games, video games, mobile games and the like) are very popular among children, young people and increasingly also adults. In addition, these games are not only fun but also trigger learning processes if they are designed and marketed in sustainable way. Therefore, the idea of using motivational design for serious games to improve the educational control design of these games (digital learning games) is obvious. But how to get players interested in such serious games which also have an effective educational impact: it improves financial literacy?

14.2.2 Psychological aspects

The above-mentioned directs to ask, what kind of game makes a person become hooked (unable to resist) and is fun to play for hours at a time? What are the elements of serious games then? In order to gain some perspective on these issues, one must look at game mechanics and storytelling, in addition to external factors. These topics are strongly related to behavioural sciences such as psychology and behavioural economics. However, it is worth to emphasise, these short views, presented below, are not intended to be an in-depth study or outlines for serious game design guidelines.

Psychology divides motivations into intrinsic (internal) and extrinsic (external).^{cii} Internal motivation refers to basic psychological needs that motivate action without external rewards, which originates inside of the individual. Internal motivation factors are supported by games (such as natural curiosity). Extrinsic motivation refers to behaviour that is driven by external rewards such as money, fame, grades, and praise. This type of motivation arises from outside the individual. In games extrinsic motivation factor can be a prize for performing a task.

Games appeal to both internal and external motivations, but the types of motivation cannot be completely distinguished. The reward of winning a game challenge can strengthen sense of ability, which, on the other hand, is weakened by repeated failure. Therefore, in motivating the player, it is important to take care of continuous rewards. And feedback must come immediately to reinforce the desired behaviour. However, it has long been known that human motivation can best be increased if the prize is unpredictable. When the prize only follows the action from time to time, and not after every effort, it makes the player try harder. Similar prizes have been applied for a long time in gambling, such as slot machines located in supermarkets and service stations.

In the discourse of game design and internal motivation, there are similarities, for example, in education science and research on sports motivation. One of popular psychological theories in all these is *self-determination theory*, according to which a person has three basic psychological needs that motivate action even without external rewards: autonomy, competence and relatedness while playing. Games are primarily motivating to the extent that players are experienced by these feelings.^{ciii}

Autonomy means a sense of volition or willingness when doing a task. When game is played for interest or personal value of a player, perceived autonomy is high. Gaming is in line with the ultimate need to do something by yourself or acting of one's own free will (voluntarily). People like to focus on their own activities and try things out in these new worlds of self-adventure. Provisions for choice, use of rewards as informational feedback (rather than to control behaviour), and non-controlling instructions have all been shown to enhance autonomy and, in turn, intrinsic motivation. And vice versa, events or conditions that diminish a sense of choice, control, or freedom, interfere with perceived autonomy, and can undermine intrinsic motivation.

Competence is a need for challenge and feelings of effectance.^{civ} Feeling competence is a key part of intrinsic motivation, and many regards it as the cornerstone of good game planning. People are motivated by activities where they experience of being capable (ability), like having the fantasy of ability through the superpowers of the character, achieving their goals, and getting the feelings of success in games.

Relatedness is experienced when a person feels connected with others. This means, that games are also social. They create a sense of belonging to a group where person have a meaning. Today's gaming environments relatedness is assumed to be relevant, particularly within multiplayer games, which allow for interactions between real players, not interaction between "computer generated" personalities or artificial intelligence. Social interaction can produce feelings of relatedness, and the motivational and well-being enhancements associated with it.

14.2.3 Game mechanics

It is possible to respond these needs with game mechanics. *Game mechanics* consists of basic functions such as the processes, visual features and controls that are used to interact with the game mode. They are regular and methodical, so they form the gameplay, that is, the functionality of the game. Game mechanics are the foundation of gameplay, including rules and rewards that make a game. Success in the game can be rewarded with appropriate incentives (prizes).

The interaction of various game mechanics in a game determines the complexity and level of player interaction in the game, and in conjunction with the game's environment and resources determine

game balance. The game mechanics are different from the rules of the game in that the rules of the game are clearly visible to the player, for example in the manual, while the game mechanics are hidden features.

Success in the game can be rewarded with appropriate incentives (prizes). In digital games, the prizes are virtual: a player gets new equipment for play character, get up from one level to another and want to achieve a position for oneself in the top spot in the players scoreboard. The so-called loot boxes in digital games are also commonly used for rewards. Loot boxes usually contain collectible cards, new game characters or virtual currency. Rewards are also often used to open up new content, such as a new game world, which in turn appeals to the player's curiosity.

Optimisation of prizes and challenges represents external motivation and is only part of good game design and gameplay. The core of good game design is understanding and supporting internal motivation, which is not as straightforward as external motivation.

In designing of financial literacy learning games, designers should not only impart financial knowledge to players, but also encourage them to strengthen positive financial behaviour, assuming that positive financial behaviour will lead to positive outcomes. However, a higher level of financial behaviour is not just based on how much financial knowledge a person has acquired, but also is strongly linked to certain psychological factors. Shephard et.al.,^{cv} for instance, suggest that influencing these psychological factors, such as optimism, impulsivity, and purposefulness, would be one way of improving financial behaviour.

However, one may ask whether certain traits are, and if so, which traits are less desirable? And to what extent certain traits can truly be influenced? And finally, who defines the "right" solution in a financial decision-making situation?

Because providing the "right" answers in a certain decision-making situation (choice situation) can lead to manipulation, it has been suggested, by utilising the principles of psychological economics, that the choice situation be maintained, but how choices are presented ("choice architecture"), is changed.

This phenomenon, known as "nudging", was popularised by Thaler and Sunstein. Thaler's nudge theory considers these psychological aspects as follows: "Nudge" is any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. Instead of teaching people to make "right" financial decisions, which obviously are not free of values, people can be "nudged" to make decisions better suited for them. Rather than presenting a glut of choices, reducing choice overload may help in catalysing decision-making.^{cvi}

This "nudge theory" is defined by the belief that alterations in the "choice architecture" — how choices are presented — of a situation can "nudge" a person toward better choices. The necessity of crafting the right "choice architecture" for a given person is steeped in the psychological deficiencies of the human mind. Presenting choices in certain ways, even unintentionally, can "nudge" people to change their behaviour in predictable ways.

"Nudging", as a concept, describes how even minor changes to decision environments (e.g., setting defaults) can influence decision outcomes, typically without the decision-maker noticing this influence. Rather than presenting a glut of choices, reducing choice overload may help in catalysing decision-making. By setting optimal decisions as the default — though not the only one — choice, people's inertial tendencies can be utilised for their own benefit.

The necessity of crafting the right "choice architecture" for a given person is based on the psychological deficiencies of the human mind. It is explained with behaviour, like decision inertia, where people are

inclined to keep up in the “status quo” even towards sub-optimal ends, and when people prioritise the present over the future, even if that means oversized spending and thus impairing of longer-term savings. And generally, when “big issues” are in question, i.e. longer-term decisions, procrastination often takes place.

Nudges are small, low-cost, timely interventions that can help people think and act differently. For digital nudges to work, they should be related to the context in which people make decisions.

The more decisions people make using digital devices, the more the software engineer becomes a choice architect who knowingly or unknowingly influences people's decisions. Thus, the nudging concept will extend to the digital environment and “digital nudging” will be defined as the use of user-interface design elements to guide people's behaviour in digital choice environments, and by presenting a digital nudge design process to help online choice architects take nudging principles into consideration when designing digital choice environments like mobile apps and Web sites.^{cvi}

However, decisions are influenced by the environment in which the choices are presented. In fact, no choice is made in a vacuum, therefore there is no neutral way to present choices. Moreover, nudging, despite some opposite views, is not value neutral either. By manipulating the options, the nudger (someone who nudges or someone who gives a gentle push: app or game designer) directs the choice path in the direction of the nudger's values, though in a more subtle way than forcing. On the other hand, while nudging seeks to influence financial choices in a normative way, it is hardly possible to find any financial education that would be totally value neutral.

Stories have always been a way to communicate. Before people learned how to write, they would tell each other stories. Stories are much easier to remember than pure facts. The word storytelling quite much speaks for itself. Storytelling is about telling stories. It is about using stories to engage audience, or to make something clearer. Narratives, such as novels, comics, plays, and other stories hold the potential for making learning topic more meaningful to students. Photos, pictures, and film of course really help to tell a good story too.

The objective of any learning process is the development of knowledge and skills within given topic, such as financial literacy, for instance. Many games, including serious games, deploying an encompassing narrative offer the player a role as a character within the story. However, this character, which is an artificial projection, can undermine the validity and transferability of the experience out of the game's representational world, thereby reducing its educational value at the same time. In spite of this, the compelling nature of a good story is recognised as an efficient motivator and it can provide a useful structure for gaming activities.

According to literature, like Hirsh-Pasek et al (2015),^{cvi} four fundamental pillars of learning environments can be identified: active, engaged, meaningful, and socially interactive. In this, “meaningful” refers to learning that is purposeful and that holds personal relevance to the learner. It means embedding information within familiar contexts and narratives to achieve learning objectives.

While serious games are a fun way to learn, it is essential that they do not remove any important part of the learning and playing them is by no means “meaningless” or idle. It is obvious that with fun and creative learning good learning outcomes can be achieved, regardless of the methods or means used. Games that teach financial literacy should be as close as possible to issues that are important to the player's own financial management in order to increase meaningful of the game. Therefore, the player should be able to move freely in that part of game world (i.e., the domain of financial literacy) that he or she feels is meaningful to him/herself.

On the other hand, it should not be forgotten that also *curiosity* is essentially related to self-generated experimentation and exploration. Curiosity is a personality trait that influences a sense of interest,

which again consists of a shared experience of novelty and comprehensibility. For an app that teaches financial literacy, this could mean that an interested, but novice investor may be curious about testing one's qualifications in the financial world, even if he or she had no money to invest. Therefore, a realistic and immersive ^{ci}x gaming environment could provide an excellent learning experience without financial risk taken.

Also, the relationship between story and activities in gameplay, such as engagement and social interaction, is complex. The nature of traditional drama narrative implies passive participation of content. Instead, games require active participation when a player must complete a series of tasks in order to achieve some general or specific objective. This is also a favourable starting point for games that teach financial literacy. The player has to make a series of financial decisions that turn out to be "good" or "bad" later in the game from the point of view of the player's financial wellbeing.

14.2.4 The elements of serious games

As the summary, the position and coverage of serious games can be formulated in the following way where all previous key elements are presented.

SERIOUS GAMES = EDUCATIONAL CONTENTS + GAME MECHANICS + STORYTELLING + FUN

Basically, all these elements are a part of the same process, from E-learning through videogames further to serious games. Gamification products include stories and one sector of video games have turned to more serious content creating a new industry called serious games. Although there still are differences there are also many similarities, especially what comes to game mechanics and storytelling.

It is obvious that with fun and creative learning good learning outcomes can be achieved, regardless of the methods or means used.

15 About Money Game

15.1 The Process & The Set of Activities

Digital Game-Based Learning is the integration of gaming into learning experiences to increase engagement and motivation, and enhancing the skills of the critical-thinking, creativity, communication, and collaboration.

Money Game is a mobile game application to learn and experience financial literacy for 17-23 years old and it provides to take decisions on saving, spending, and learning the most important areas of personal financial management, to secure the financial fitness.

The Game aims to develop and increase the knowledge of financial literacy. The key objective of the Game is to increase the knowledge and the skills of the young generation, helping them to make smart decisions for brighter financial future. This game will help them to understand the real-life issues, combining with the importance of the literacy.

1. Concept Development

Concept Development

- Game Designer
- Learning Experts
- Instructional Designer
- Creative Director

The Project has been designed in line with the notion of financial literacy, and its significance on the financial inclusion of young people and improvement of entrepreneurial skills of young entrepreneurs through finance in a technological and innovative pattern.

2. Designing the Game

Design

- Game Designer
- Learning Experts
- Instructional Designer
- Creative Director
- Artists

This stage is the combining of the different parts of the conceptual design.

- learning framework,
- the languages,
- the visuals,
- the scenarios.

In this step, the project will start to cooperate with Turkish and Spanish students and platforms to start for the development of the creative design.

3. Creative Design

During this process, OKAN and UPV will support the activities by the contribution of academic staff, technicians and students. Helsinki Technical Development meeting (TPM2) will support the collaboration of the Partners.

4. Technical Implementations

Implementation

- Creative Director
- Level Designer
- Copywriter
- Artists
- Programmers

This will be the technical development process of the game.

First evaluation meeting in İstanbul (TPM-3) will help Project Partners to assess the situation of the Project life cycle.

5. Educational Test

Q&A Testing

- Q&A Testers
- Educational Testers

The application of tests is the key implementation to assess the technical and educational performance of the game, executed by the professionals, students and academic staff in Turkey, Finland, and Spain. The second evaluation meeting in Valencia (TPM-4) will show clear brief of the performance of the game.

Due to the COVID-19 this stage had to be cancelled and combined with

later stages.

6. Dissemination and Publishing the Game



After finalising the last adjustments and controls and having the Istanbul Fine Tuning meeting (TPM-5), the events with students and stakeholders started to be executed.

7. Evaluation and Assessment of the impact



The program evaluation is a systematic assessment of the implementation of a financial literacy learning by serious game with fun and compares learner achievements in financial literacy with the program goals and objectives to determine the success level of the educational program in different geographies.

8. Website Design



In addition to mobile game, the project partners agreed to launch website and online tools, to reach wider target audience to increase the awareness of financial issues and the importance of the literacy by providing information.

9. Project Framework Management



BAREM, one of the Partners will execute the monitoring, evaluating the Project' Life cycle. The team will prepare a document that helps to track and assess the results of time and cost effectiveness throughout the life of the Project.

This document will be a living document that should be referred to and updated on a regular basis. This management work will measure the performance of the project cycle. The key issue of the management of the project is to arrange the Multiplier Events in Istanbul and Valencia

on time, if possible.

15.2 The Content

Learning Objectives

Understand relevant approaches of financial literacy that help to explain to save the future and develop financial wellbeing, comprehend the best practices of the financial matters, understand the interaction between habits and financial wellbeing. Financial wellbeing is about a sense of security and feeling as though you have enough money to meet your needs.

Target group

The overall target group of the game-based learning module is young generation or students.

Learning Methodology - Approach

Throughout the game, various training models will be applied including participatory approaches, cases, best practice material and quiz.

Levels

Level 1 KNOW YOUR FINANCE

Players can identify common financial products and terms and interpret information relating to basic financial concepts. They can recognise the difference between needs and wants and can make simple decisions on everyday spending. They can recognise the purpose of everyday financial documents such as an invoice and apply single and basic numerical operations (addition, subtraction, or multiplication) in financial contexts that they are likely to have experienced personally.

Level 2 MANAGE YOUR BUDGET

Players begin to apply their knowledge of common financial products and commonly used financial terms and concepts. They can use given information to make financial decisions in contexts that are immediately relevant to them. They can recognise the value of a simple budget and can interpret prominent features of everyday financial documents. They can apply single basic numerical operations, including division, to answer financial questions. They show an understanding of the relationships between different financial elements, such as the amount of use and the costs incurred.

Level 3 SAVING IS IMPORTANT FOR YOUR FUTURE

Players can apply their understanding of commonly used financial concepts, terms and products to situations that are relevant to them. They begin to consider the consequences of financial decisions and they can make simple financial plans in familiar contexts. They can make straightforward interpretations of a range of financial documents and can apply a range of basic numerical operations, including calculating percentages. They can choose the numerical operations needed to solve routine problems in relatively common financial literacy contexts, such as budget calculations.

Level 4 UNDERSTANDING THE LOAN

At level 4 players can apply their understanding of less common financial concepts and terms to contexts that will be relevant to them as they move towards adulthood, such as bank account management and compound interest in saving products. They can interpret and evaluate a range of detailed financial documents, such as bank statements, and explain the functions of less commonly used financial products. They can make financial decisions considering longer-term consequences,

such as understanding the overall cost implication of paying back a loan over a longer period, and they can solve routine problems in less common financial contexts.

Level 5 PLAN YOUR FINANCIAL FUTURE

At level 5 students can apply their understanding of a wide range of financial terms and concepts to contexts that may only become relevant to their lives in the long term. They can analyse complex financial products and can consider features of financial documents that are significant but unstated or not immediately evident, such as transaction costs. They can work with a high level of accuracy and solve non-routine financial problems, and they can describe the potential outcomes of financial decisions, showing an understanding of the wider financial landscape, such as income tax.

Game Flow

REGISTRATION	Age / Sex / Game Group
MINI TEST	3 Questions to determine the level of knowledge to start game...
LEVEL	Game starts with level 1 or level 3.
INTRODUCTION	One pager information for the level
SCENARIO of	In each level there will be 5 questions to learn, evaluate and grade the decision the player.

Level 1 KNOW YOUR FINANCE

Determining the expense elements of the budget, understanding cash flow, prioritizing expenses, trying for saving, discussing needs and wants.

Level 2 MANAGE YOUR BUDGET

Recognizing an invoice, calculation of discount on an expense, opening a bank account, purchasing by debit card, understanding bank statement, withdraw money from ATM, making money transfer.

Level 3 SAVING IS IMPORTANT FOR YOUR FUTURE

Understanding long term financial plans, buying motorcycle or 15-day summer vacation, decision for unexpected expense, understanding the interest rate and correlation of inflation rate, solution for medical treatment, the importance of insurance, monitoring your bank account and credit card.

Level 4 UNDERSTANDING THE LOAN

Understanding the importance of access to credit, borrowing money, loan and financial wealth. Exercises on interest rate calculation, determining new rules for own budget, loan for home, application to a bank, leasing for a car, looking for alternative ways to finance.

Level 5 PLAN YOUR FINANCIAL FUTURE

Understanding the financial landscape, institutions of financial market, expectations of economic climate for next 5 years, understanding credit score, the impact of public policy changes, especially taxation.

Game Plan

During the game:

- You will be asked 50 questions to understand the financial literacy knowledge,
- You will decide for 40 different situations.
- And there will be 15 «surprise» for your budget.!
- If you see «i» you can look up terminology.

Learning outcomes will be:

- Keeping income above expenses by prioritizing different types of expenses,
- Saving funds for unexpected expenses,
- Achieving financial security by taking long term decisions,
- Learning the dynamics of the financial market and services, the importance of the insurance and the role of taxes.



Personal Budgeting

Budget is an estimation of income and expenditure for a period of time.

The key components are:

- Income which money received, especially on a regular basis,
- Saving is an amount of money that you do not need to spend,
- Expenses are the cost incurred in or required for something.

Follow the steps to put a successful budget plan into action,

- Calculate expenses. ...
- Determine your income. ...
- Set savings and debt payoff goals. ...
- Record spending and track progress. ...
- Be realistic.



Financial Services

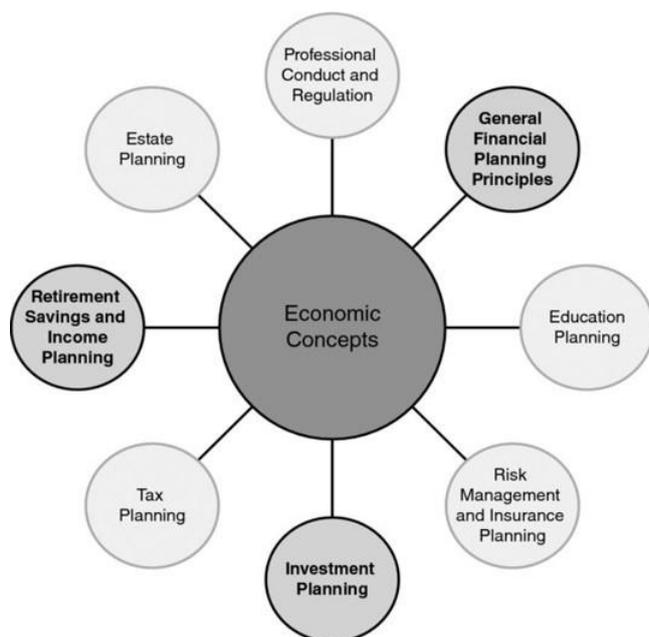
To manage your budget successfully the second step you should learn is to make banking transactions properly.

The aim of the Banks or Financial Institutions are to help managing budgets. The institutions provide services to keep your monetary wealth in safe and also provide cash when you have to pay an unexpected cost.

With this level you should learn and practice the money management through a bank.

You should understand the benefits of different ways of spending and saving.

Students begin to apply their knowledge of common financial products and commonly used financial terms and concepts. They can use given information to make financial decisions in contexts that are immediately relevant to them. They can recognise the value of a simple budget and can interpret prominent features of everyday financial documents. They can apply single basic numerical operations, including division, to answer financial questions. They show an understanding of the relationships between different financial elements, such as the amount of use and the costs incurred.



Key Financial and Economic Concepts

To make sound decisions while managing your budget the important part is to understand the key economic concepts for your future.

The players begin to consider the consequences of financial decisions in the medium and long run according to the economic expectations.

With this level you should learn and practice the value of money, the inflation rate and the correlation between interest rate.

You should understand the benefits of different ways of the value of the money.

The players begin to apply their knowledge of common financial products and commonly used financial terms and concepts. They can use given information to make financial decisions in contexts that are immediately relevant to them. They can recognise the time value of money, interest rate, inflation rate. They can apply single basic numerical operations to answer financial questions.



when and how to spend money.

The Importance of Saving

- Financial habits and norms are values, standards, routine practices, and rules to utilize the power of money. These help us navigate our day-to-day financial lives.
- Positive attitude — places value on savings, planning and self-control,
- Savings norm — considers for what, when and how to save money,
- Spending strategy — considers for what,



Spending Rule: Use the 50/20/30 rule to manage spending apply:

- 50 percent of your take-home pay to needs,
- 20 percent to savings and debt payments,
- 30 percent to your wants.

Saving money is one of the most important aspects of building wealth and having a secure financial future and wellbeing. Yet many of us have learned

the importance of saving money through trial and error, and more importantly, experience.

The players begin to make financial decisions for spending money and saving to secure their financial future. They can recognise the time value of money and interest rate. They can apply single basic numerical operations to answer financial questions.

Financial Fitness

Financial Fitness is a set of goals or programs to help you identify your financial goals and how to get in the best financial shape of your life.

Helps you to achieve financial security.

When it comes to your security, the first thing that comes to mind is money. Creating a fund for your future well in advance helps you to deal with any crisis as and when it comes.

Financial independence

Becoming financially independent takes a lot of time. Keeping a check on your cash inflows and outflows, making decisions on what you should spend and cut down on, and choosing saving and investment options are some of the factors that help you become financially independent. Doing so can help you make your money work for you. Creating financial plan, saving and investments are critical questions.

VISUALS OF TERMINOLOGY OF THE GAME



Wallet: Monthly the player will receive



Experience Success



Saving Box: For saving



Happiness



Bank Account: Monthly the player will receive the salary,
Using debit / credit cards and saving account



Game currency

CONTENT CATEGORY	TASKS OF THE PLAYERS	QUESTIONS TO PLAYERS	LEARNING OUTCOMES
<p>Planning and managing finances</p> <p>Includes planning and managing of income and wealth over both short and long term and in particular the knowledge and ability to monitor income and expenses as well as to make use of income and other available resources to enhance financial well-being</p>	<p>can draw up budget to plan regular spending and saving</p> <p>can understand cash flow</p> <p>can prioritize the expenses</p>		<p>Know how to build up a budget LO3</p>
<p>Money and transactions</p> <p>Includes the awareness of the different forms and purposes of money and handling simple monetary transactions such as everyday payments, spending, bank cards, bank accounts and currencies.</p>	<p>can understand bank statement</p> <p>can identify the difference between debit and credit card</p> <p>can identify different ways to pay for items, in person or via internet</p>		<p>Understand what is money, income payment or purchasing something LO1</p> <p>Being capable at handling and monitoring transactions LO2</p>
<p>Risk and reward</p> <p>Incorporates the ability to identify ways of managing balancing and covering risks, including insurance and saving products and understanding insurance and saving products, and</p> <p>an understanding of the potential financial gains or across a range of financial products.</p>	<p>can identify unexpected expenses various types of saving vehicles and insurance</p> <p>can understand financial well being and sustainability</p>		<p>Know benefits of saving and enhance financial well-being LO4</p> <p>Understand the purposes of accessing credit LO5</p>
<p>Financial landscape</p> <p>Relates to the character and features of the financial world. Rights and responsibilities of the financial consumers. Understanding the impacts of changes in interest rates, inflation and the consequences of economic condition or public policy changes.</p>	<p>understand the rights and responsibilities of financial consumer</p> <p>are aware of economic climate various forms of credit</p>		<p>Understand inflation rate and relation with purchasing power and interest rate LO6</p> <p>Understand time value of money LO7</p> <p>Knowledge of the influence of economic and external factors, taxation. LO12</p>

PROCESSES CATEGORY	Tasks of the students	QUESTIONS TO STUDENTS
<p>Identify financial information</p>	<p>start with mini pre-test</p> <p>if yes provide additional 100€</p>	<p>can identify the features of a purchase invoice</p> <p>can recognize financial terminology</p> <p>can understand bank statement or contract</p>
<p>Analyze information in a financial context</p> <p>covers a wide range of cognitive activities</p> <p>including comparing, interpreting, extrapolating from the information that is provided.</p>		<p>can compare the terms offered by different mobile phone, internet contracts</p> <p>can understand whether an advertisement for a loan is likely to include unstated conditions</p>
<p>Evaluate financial issues</p> <p>focuses on recognizing or constructing financial justifications and explanations, drawing on financial knowledge and understanding. Involves cognitive activities such as explaining, assessing and generalizing.</p>		<p>can identify the relative financial merits of making a purchase or deferring it, given specified financial circumstances.</p>
<p>Apply financial knowledge and understanding</p> <p>focuses on taking effective action in a financial setting by using knowledge of financial products and contexts and understanding of financial concepts.</p>		<p>can work out whether purchasing power will decline or increase over time when prices are changing at a given rate.</p>

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- ^{viii} Op cit.
- ^{ix} Lusardi, A & Mitchell, O.S. (2014). *The Economic Importance of Financial Literacy: Theory and Evidence*. *Journal of Economic Literature*, 52(1):5-44.
- ^x PISA (Program for International Student Assessment) is carried out by the Organization for Economic Co-operation and Development (OECD).
- ^{xi} For detail see OECD (2014), *Financial literacy framework in PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264190511-7-en>.
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- ^{xiii} Source (originally in Finnish): *Mitä kaikkea on osaaminen?* (Elina Arasola, SmartUp 2017).
- ^{xiv} Peura-Kapanen, L. & Lehtinen, A.-R. (2011), *Nuorten taloudellinen osaaminen: määrittelyä, toimijoita, materiaaleja*, Julkaisu 3 / 2011. Kuluttajatutkimuskeskus - Centre for Consumer Society Research publications 3 / 2011. Young people's financial capability – definitions, actors, materials.
- ^{xv} Ibid
- ^{xvi} Ibid
- ^{xvii} See e.g. Willis, L.E. (2008), *Against Financial-Literacy Education*, *Iowa Law Review* 94: 197-283, Dymski, G. (2011), *Financial Literacy Needs, strategies, and Programs in the United States*, Working Paper, University of Leeds, and Kalmi, P (2013) *Taloudellinen lukutaito ja sen kritiikki**. Kansantaloudellinen aikakauskirja – 109. vsk. – 2/2013.
- ^{xviii} OECD (2019) *PISA 2021 Financial Literacy Analytical and Assessment Framework*. OECD April 2019.
- ^{xix} Gamification is the application of game-design elements and game principles in non-game contexts. It can also be defined as a set of activities and processes to solve problems by using or applying the characteristics of game elements. Games and game-like elements have been used to educate, entertain and engage for thousands of years.
- ^{xx} See more e.g. http://edutechwiki.unige.ch/en/Serious_game
- ^{xxi} *Effective financial education for sustainable and inclusive growth*. 5th OECD-GFLEC Global Policy Research Symposium to Advance Financial Literacy. 18 May 2018 OECD Conference Centre Paris, France
- ^{xxii} Ibid
- ^{xxiii} *High-level Principles on National Strategies for Financial Education*. OECD/INFE, August 2012
- ^{xxiv} *High-level Principles on National Strategies for Financial Education*. OECD/INFE, August 2012
- ^{xxv} *National Strategies for Financial Education. Policy Handbook*. OECD/INFE 2015
- ^{xxvi} OECD (2016), *Financial Education in Europe: Trends and Recent Developments*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264254855-en..>
- ^{xxvii} The DOLCETA online education tool was available online until July 2013. It provided consumer information to adults, with one of the modules dedicated to financial services, including budgeting, consumer credit and home loans, means of payment and investments. The content is now available on the consumer education website called Consumer Classroom, which is a multilingual pan-European community website for teachers. It brings together an extensive library on consumer education from across the EU and provides interactive and collaborative tools to help prepare and share lessons with students as well as with other teachers. However,

the main target group are secondary school teachers (of students aged 12-18) in all the European Member States. https://ec.europa.eu/chafea/consumers/information-education/consumer-classroom/index_en.htm

^{xxviii} <http://europeanconsumersunion.eu/progetti/dolceta/?lang=en>

^{xxix} European Parliament, Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy. *Consumer Protection Aspects of Financial Services*. European Union, 2014.

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^{xxxi} EPRS. *Improving the financial literacy of European consumers*. European Union, 2015.

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^{xxxii} EPRS. *Protecting European consumers*. European Union, 2019.

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www.oecd.org/finance/OECD-INFE-International-Survey-of-Adult-Financial-Literacy-Competencies.pdf

^{xxxv} Batsaikhan, U and Demertzis. Financial literacy and inclusive growth in the European Union. Bruegel, Policy Contribution. Issue n°08, May 2018.

<https://bruegel.org/2018/05/financial-literacy-and-inclusive-growth-in-the-european-union/>

^{xxxvi} Institute of International Finance. *Global Debt Monitor - January 2019 & FT January 2019*

^{xxxvii} Ibid (Batsaikhan & Demertzis, 2018).

<https://bruegel.org/2018/05/financial-literacy-and-inclusive-growth-in-the-european-union/>

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<https://doi.org/10.1787/48ebd1ba-en>.

^{xxxix} OECD (2014) *PISA 2012 Results: Students and Money (Volume VI)*. OECD.

^{xl} OECD (2017) *PISA 2015 Results: Students' Financial Literacy (Volume IV)*. OECD.

^{xli} A cheque is a mean of payment, a formal document in which the issuer (drawer) of the cheque, i.e. the account holder, instructs his or her bank to pay the amount stated in the cheque from his or her bank account to the recipient (payee) of the cheque (private cheque). The issuer can also be a bank (bank cheque). The cheque can be transferred from one recipient to another. For a long time, a cheque has been considered an obsolete and unsafe means of payment and in most European countries, cheques are now rarely used, even for third party payments. In Finland, banks stopped issuing private cheques in about 1993, for instance.

^{xlii} Source: OECD, PISA 2018 Database, Tables IV.B1.2.1, IV.B1.3.10 and IV.B1.3.11

<https://doi.org/10.1787/888934123254>

^{xliii} *High-level Principles on National Strategies for Financial Education*. OECD/INFE, August 2012

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<https://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020>

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^{xlvi} <https://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020>

^{xlvi} <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

^{xlviii} Source: *Improving Financial Literacy: Analysis of Issues and Policies*, OECD. 2005.

^{xlix} Education itself can rightly be an output also. Then education inputs are the means used by the education system to achieve educational goals, such as number of teachers, teacher training and teacher experience, class size, school facilities, educational materials, and level of costs and financial resources used for education.

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^{lv} Aggressive marketing is a proactive approach to marketing whereby marketers make deliberate efforts to reach out, connect and engage customers on a frequent basis whether solicited or not.

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- ^{lvii} Susan M Sawyer, Peter S Azzopardi, Dakshitha Wickremarathne, George C Patton. *The age of adolescence* Published in January 17, 2018 DOI: [https://doi.org/10.1016/S2352-4642\(18\)30022-1](https://doi.org/10.1016/S2352-4642(18)30022-1)
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- ^{lxiv} The Standard & Poor's Ratings Services Global Financial Literacy Survey (Klapper, Lusardi & Oudheusden 2015)
- ^{lxv} The original OECD/INFE (2018) *Toolkit for measuring financial literacy and financial inclusion* was developed through an iterative process, drawing on an OECD working paper (Kempson, 2009), national surveys, international research and expert advice. It was welcomed by G20 leaders in September 2013.
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- ^{lxviii} Ibid. OECD (2018),
- ^{lxix} <https://literacy.ala.org/digital-literacy/>
- ^{lxx} Digital Footprint Management (DFM) can be defined as an approach to controlling the amount and types of existing digital and published data of a given individual because this data can be traced to the individual itself in some way.
- ^{lxxi} The General Data Protection Regulation 2016/679 (GDPR) is a regulation in EU law on data protection and privacy in the European Union and the European Economic Area. It also addresses the transfer of personal data outside the EU and EEA areas. Implementation date was 25 May 2018.
- ^{lxxii} In this case EU Member States (27) and Iceland, Liechtenstein and Norway.
- ^{lxxiii} For further information, see https://europa.eu/youreurope/business/dealing-with-customers/data-protection/data-protection-gdpr/index_en.htm
- ^{lxxiv} For a proposal to define digital literacy, see the earlier policy brief by Chetty, et al (2017). One definition of financial literacy, together with survey questions to measure it, can be found in OECD/INFE (2018)
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- ^{lxxvi} The EU Payment Service Directive 2 applies to all-digital payment methods in EU countries. Starting on September 14, 2019, all mobile and online payment will require something called "Strong Customer Authentication (SCA)". See more e.g. European Commission, fact sheet: *Payment Services Directive: frequently asked questions*. Brussels, 12 January 2018.
- ^{lxxvii} GDPR defines a "personal data breach" in Article 4(12) as: "a breach of security leading to the accidental or unlawful destruction, loss, alteration, unauthorised disclosure of, or access to, personal data transmitted, stored or otherwise processed". European Union. General Data Protection Regulation (GDPR): Art. 4 Definitions. <https://gdpr-info.eu/art-4-gdpr/>
- ^{lxxviii} An insider threat is a detrimental threat to an organization that arises from people within the organization, such as employees, former employees, contractors, or business associates, who have confidential inside information concerning the organization's security practices and data and computer systems. This threat may involve fraud, the theft of confidential or commercially valuable information, the theft of intellectual property, or the sabotage of computer systems.
- ^{lxxix} Financial vulnerability has been described as the inability to recover from sudden financial shock, such as an unexpected loss of income or uncontrollable increase in expenditure.
- ^{lxxx} Ibid (OECD 2018)
- ^{lxxxi} European Parliamentary Research Service (EPRS), Scientific Foresight Unit (STOA). *Harmful internet use. Part II: Impact on culture and society*. PE 624.269 – January 2019
- ^{lxxxii} The EU Payment Service Directive 2 applies to all-digital payment methods in EU countries. Starting on September 14, 2019, all mobile and online payment will require something called "Strong Customer Authentication (SCA)". See more e.g. European Commission, fact sheet: *Payment Services Directive: frequently asked questions*. Brussels, 12 January 2018.

^{lxxxiii} Deane, S., 2018, *Elder financial exploitation: Why it is a concern, what regulators are doing about it, and looking ahead*, U.S. Security and Exchanges Commission, Office of the Investor Advocate.

^{lxxxiv} In recent years, more studies have focused on financial behaviours in various settings (e.g. see Hilgert et al., 2003; Hogarth, Beverly, & Hilgert, 2003; Hogarth, Hilgert, & Schuchardt, 2002; Muske & Winter, 2001; O'Neill & Xiao, 2003; Xiao, 2006).

^{lxxxv} Op.cit. OECD (2016)

^{lxxxvi} Shephard, D., Contreras, J., Meuris, J., te Kaat, A., Bailey, S., Custers, A. ja Spencer, N. (2017). *Beyond Financial Literacy: The Psychological Dimensions of Financial Capability*. Think Forward Institute Technical Report.

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^{lxxxviii} <https://www.apa.org/news/press/releases/stress/index>

^{lxxxix} Xiao J.J. (2008) *Applying Behavior Theories to Financial Behavior*. In: Xiao J.J. (eds) Handbook of Consumer Finance Research. Springer, New York, NY

^{xc} See e.g. (1) Arifin, Agus Zainul. *Influence of financial attitude, financial behavior, financial capability on financial satisfaction*. Conference Paper, January 2018, 15th International Symposium on Management (INSYMA 2018). (2) Ameliawati, Meli & Setiyani, Rediana. *The Influence of Financial Attitude, Financial Socialization, and Financial Experience to Financial Management Behavior with Financial Literacy as the Mediation Variable (2018)*. (3) Rai, Kamini - Dua, Shikha – Yadav, Miklesh. *Association of Financial Attitude, Financial Behaviour and Financial Knowledge Towards Financial Literacy: A Structural Equation Modeling Approach*. First Published March 5, 2019. (4) Rothwell, David W – Khan, Mohammad N. - Cherney, Katrina (2016) *Building Financial Knowledge Is Not Enough: Financial Self-Efficacy as a Mediator in the Financial Capability of Low-Income Families*, Journal of Community Practice, 24:4, 2016. (5) Atkinson, A & Messy, F-A (2012). *Measuring Financial Literacy: Results of the OECD / International Network on Financial Education (INFE) Pilot Study*. OECD Working Papers on Finance, Insurance and Private Pensions No. 15. (6) Tang, Ning - Baker, Andrew – Peter, Paula C. *Investigating the Disconnect between Financial Knowledge and behavior: The Role of Parental Influence and Psychological Characteristics in Responsible Financial Behaviors among Young Adults*. Article in The Journal of Consumer Affairs. First published: 25 March 2015.

^{xc1} Underwriting standards are guidelines by which a loan is analysed to ensure that it meets credit standards and that the terms and conditions of a loan are appropriate to its risk and maturity.

^{xcii} See e.g. Braunstein, Sandra and Welch, Carolyn (2002). *Financial literacy: an overview of practice, research and policy*. Federal Reserve Bulletin, 88.

^{xciii} Mullainathan, Sendhil & Thaler, Richard (2000). *Behavioral Economics*. National Bureau of Economic Research (NBER), Working Papers No 7948.

^{xciv} Behavioural economics is the combination of psychology and economics that investigates what happens in markets in which some of the agents display human limitations and complications. Behavioural economics thinks that individuals' economic decision-making is influenced by social, cognitive and emotional factors, which may make decision-making seem irrational.

^{xcv} Ibid. OECD (2016)

^{xcvi} Op. cit. OECD (2016)

^{xcvii} Phenomenon based learning is not a totally new idea. Its origins are in Constructivist Learning Theory and Socio-Constructivist Learning Theory and Socio-Cultural Learning Theory. These theories suggest that learning is best achieved by actively building up the learner's own knowledge and experience rather than passive teaching. When learners work in groups, learning is also seen as socially constructed. Sharing the same theoretical framework for phenomenon-based learning has much in common with problem-based and inquiry-based learning.

^{xcviii} In Finland's educational system phenomenon-based learning has its place in the 2016 new curriculum. It introduces the concept of multidisciplinary learning, but in the context of the new curriculum talk about phenomenal learning has also begun. In substance, they are largely the same thing. The revised education system asks that students take one module each year with the phenomenon-based learning approach. The purpose is to better prepare students for real life.

^{xcix} In this context, the term "digital channels" refers to the Internet, mobile phones (both smartphones and digital feature phones), automated teller machines (ATMs), card-reading point of sale (POS) terminals, compliant devices for near-field communications (NFC), chips, electronically enabled cards, biometric devices, tablets and any other digital systems.

^c In this online learning is understood as synonym to M-learning (Mobile learning) and instruction can take place in classroom or internet labs or anywhere, anytime. Cf. e.g. Mehdipour, Yousef & Zerehkaf, Hamideh

(2013). *Mobile Learning for Education: Benefits and Challenges*. International Journal of Computational Engineering Research | Vol 03 | Issue 6.

^{ci} Deterding, S., Dixon, D., Khaled R., & Nacke L., (2011). *From Game Design Elements to Gamefulness: Defining "Gamification"*, Proceedings of MindTrek, 2011, cf. Huotari, K., & Hamari, J. (2012). "*Defining Gamification – A Service Marketing Perspective*". Proceedings of the 16th International Academic MindTrek Conference 2012, Tampere, Finland, October 3–5.

^{cii} Carlson NR, Miller HL, Heth DS, et.al. (2013) *Psychology: Pearson new international edition: the science of behavior*. Pearson Higher Ed 2013.

^{ciii} Self-determination theory addresses factors that either facilitate or undermine motivation, both intrinsic and extrinsic. Motivate actions, see e.g. Ryan RM, Rigby CS, Przybylski A (2006). *The motivational pull of video games: a self-determination theory approach*. Motiv Emot, 2006;30:344-60.

^{civ} Effectance is a state of having a causal effect on objects and events in the environment. The word is commonly used in the term effectance motivation, which refers to the desire for effective interaction with the environment, including the tendency to investigate matters of concern, to master techniques or skills, or to engage fully in the environment in general.

^{cv} Ibid. Shephard et.al. (2017),

^{cvi} Thaler, R. & Sunstein, C. (2008), *Nudge: Improving Decisions About Wealth, Health and Happiness*. Penguin.

^{cvii} Weinmann, M. & Schneider, C. & Brocke, J. (2016). *Digital Nudging. Business & Information Systems Engineering*. 58. 433 - 436. 10.1007/s12599-016-0453-1.

^{cviii} Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). *Putting education in "educational" apps: lessons from the science of learning*. Psychological Science in the Public Interest, 16(1), 3-34.

^{cix} In the context of video games, the term immersion is used to describe the users' emotional reaction to the game world in terms of feeling as if they are actually a part of the virtual world.