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# PISA 2015 financial literacy framework

This chapter describes the rationale behind measuring 15-year-olds' financial literacy in the Programme for International Student Assessment (PISA) and defines the term. It explains the content, processes and contexts that are reflected in the financial literacy problems used in the assessment, and describes how student proficiency in financial literacy is measured and reported.



PISA 2012 was the first large-scale international study to assess the financial literacy of young people. The assessment found wide variations in levels of financial literacy within and across countries. The PISA 2015 assessment provides information about trends and data from countries that have not previously participated in this optional assessment.

This framework is based on that developed for the 2012 assessment. It discusses how the items and the language used to measure and describe financial literacy were designed and developed. It also contains a definition of financial literacy and organises the domain around the content, processes and contexts that are relevant to 15-year-old students. Content areas include *money and transactions*, *planning and managing finances*, *risk and reward* and *the financial landscape*. The framework covers some of the processes through which students exhibit their financial literacy, such as *identify financial information*, *analyse information in a financial context*, *evaluate financial issues*, and *apply financial knowledge and understanding*. Items are set in the *education and work*, *home and family*, *individual* and *societal* contexts. In addition, the framework discusses the relationship between financial literacy and non-cognitive skills and between both mathematics and reading literacy. It also discusses how students' financial behaviour and experience are measured.

## POLICY INTEREST IN FINANCIAL LITERACY

In recent years, developed and emerging countries and economies have become increasingly concerned about the level of financial literacy among their citizens. This has stemmed, in particular, from shrinking public and private support systems, shifting demographic profiles, including the ageing of the population, and wide-ranging developments in the financial marketplace. A lack of financial literacy contributes to ill-informed financial decisions, and these decisions could, in turn, have tremendous adverse effects on both personal and, ultimately, global finance (OECD/INFE, 2009; OECD, 2009a; see also Gerardi et al., 2010, for empirical analysis of financial literacy and mortgage delinquency). As a result, financial literacy is now acknowledged as an important element of economic and financial stability and development. This is reflected in the G20 endorsement of the OECD/INFE (International Network on Financial Education) High-level Principles on National Strategies for Financial Education (G20, 2012; OECD/INFE, 2012), the OECD/INFE policy handbook on national strategies for financial education and core competencies on financial literacy for youth, and its statement supporting the widespread use of instruments to measure financial literacy, including the PISA financial literacy assessment (G20, 2013; OECD INFE, 2015b; OECD INFE, 2015c).

### Demographic and cultural shifts

In most countries, longevity is increasing, and in many the birth rate is falling. At the same time, women's participation in the labour force and the proportion of people entering higher education are both increasing, and grown-up children are less likely to continue to live in close proximity to older family members than in previous generations. The likely outcome of these shifts will be a greater need for financial security in retirement and professional care in old age, resulting in additional government expenditure (Colombo et al., 2011). Working-age adults may be expected to shoulder the tax burden to finance this expenditure while at the same time also saving for their own retirement, potentially repaying their own student loans, and managing increasingly varied working-life trajectories, which may include periods of inactivity, self-employment and/or retraining.

### Risk shift and increased individual responsibility

There has been a widespread transfer of risk from both governments and employers to individuals, meaning that now many people face the financial risks associated with longevity, investment, credit, out-of-pocket healthcare and long-term care. The number of financial decisions that individuals have to make, and the significance of these decisions, is increasing as a consequence of changes in the market and the economy. For instance, longer life expectancy means individuals need to ensure that they accumulate savings to cover much longer periods of retirement than previous generations, despite the steadily rising age of retirement in many countries. Traditional pay-as-you-go (PAYG) public pension schemes are supplemented by privately funded schemes in which the individual may be responsible for making investment decisions, including the contribution rate, the investment allocation and the type of pay-out product. Moreover, defined-contribution pension plans are quickly replacing defined-benefit pension plans for new entrants, shifting onto workers the risks of uncertain investment performance and of longer life expectancy.

Even when individuals use the services of financial intermediaries and advisors, they need to be financially literate in order to understand what is being offered or advised, and to manage the products they choose. They should also be aware that some advisors may face a conflict of interest. Depending on the national legal framework for financial advice, individuals may be fully responsible for the financial product they decide to purchase, facing all the direct consequences of their choice.



Surveys show that a majority of workers are unaware of the risks they now have to face, and have neither sufficient financial knowledge nor the skills to manage such risks adequately, even if they are aware of them (OECD, 2008; Money and Pensions Panel, 2013; Barrett et al., 2013).

### **Greater supply of a wide range of financial products and services**

In addition, in all countries, growing numbers of consumers have access to a wide range of financial products and services from a variety of providers, delivered through various channels.<sup>1</sup> Greater financial inclusion in emerging economies, as well as worldwide developments in technology and deregulation have resulted in widening access to all kinds of financial products, from current accounts and remittances products to revolving credit and equity portfolios. The products available are also becoming more complex, and individuals are required to compare these products in a number of ways, such as the fees charged, interest rates paid or received, length of contract and exposure to risk. Individuals must also identify appropriate providers and delivery channels from the vast array of possibilities, including community groups, traditional financial institutions, online banks and mobile phone companies.

### **Increased demand for financial products and services**

Economic and technological developments have brought greater global connectedness and massive changes in both the methods and frequency of communications and financial transactions, as well as in social interactions and consumer behaviour. Such changes have made it more important that individuals are able to interact with financial providers and their intermediaries. In particular, consumers often need access to financial services (including banks and other providers, such as post offices) in order to make and receive electronic payments, like income, remittances and online transactions, and even to conduct face-to-face transactions when cash or cheques are no longer favoured. Together, these trends have transferred the responsibility of major financial decisions to individuals, enlarged the options for the majority of the population (including new financial consumers) and increased the level of complexity they face. Against this backdrop, individuals are expected to be sufficiently financially literate to take the necessary steps to protect themselves and their relatives and ensure their financial well-being.

### **Expected benefits of financial education and improved levels of financial literacy**

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 (Bernheim et al., 2001; Cole et al., 2011; Lusardi, 2009; Atkinson et al. 2015; Bruhn et al. 2013; Miller et al. 2014). 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.

Other research indicates a number of potential benefits of being financially literate. There is mounting evidence that in developed countries those with higher financial literacy are better able to manage their money, participate in the stock market and perform better on their portfolio choice, and that they are more likely to choose mutual funds with lower fees (Hastings and Tejada-Ashton, 2008; Hilgert et al., 2003; Lusardi and Mitchell, 2008, 2011; Stango and Zinman, 2009; van Rooij et al., 2011; Yoong, 2011). In emerging economies, financial literacy is shown to be correlated with holding basic financial products, like bank accounts, and buying insurance (OECD/INFE, 2013; Xu and Zia, 2012). Similarly, 15-year-old students with bank accounts have higher levels of financial literacy than those without, on average across the OECD countries participating in the 2012 PISA exercise (OECD, 2014c). Moreover, adults who have greater financial knowledge are more likely to accumulate more wealth (Lusardi and Mitchell, 2011).

Higher levels of financial literacy have been found to be related not only to asset building but also to debt and debt management, with more financially literate individuals opting for less costly mortgages and avoiding high interest payments and additional fees (Gerardi et al., 2010; Lusardi and Tufano, 2009a, 2009b; Moore et al., 2003).

In addition to the benefits identified for individuals, large-scale financial literacy can be expected to improve economic and financial stability for a number of reasons (OECD, 2005). Financially literate consumers can make more informed decisions and demand higher-quality services, which can, in turn, encourage competition and innovation in the market. As individuals can protect themselves to a greater extent against income or expenditure shocks and are less likely to default on credit commitments, macro-level shocks are likely to have a lower impact on financially literate populations. Financially literate consumers are also less likely to react to market conditions in unpredictable ways, less likely to make unfounded complaints and more likely to take appropriate steps to manage the risks transferred to them. All of these factors can lead to a more efficient financial services sector. They can also ultimately help to reduce government aid (and taxation) aimed at assisting those who have taken unwise financial decisions – or no decision at all.



### Box 5.1 OECD activities in relation to financial education

In 2002, the OECD initiated a far-reaching financial education project to address governments' emerging concerns about the potential consequences of low levels of financial literacy. This project is serviced by the OECD Committee on Financial Markets and the Insurance and Private Pensions Committee in co-ordination with other relevant bodies, including the Education Policy Committee, on issues related to schools. The project takes a holistic approach to financial-consumer issues that highlights how, alongside improved financial access, adequate consumer protection and regulatory frameworks, financial education has a complementary role to play in promoting the outcome of financial literacy.

One of the first milestones of the financial education project was the adoption of the *Recommendation on Principles and Good Practices for Financial Education and Awareness* by the OECD Council (OECD, 2005a). Alongside these recommendations, the publication, *Improving Financial Literacy: Analysis of Issues and Policies*, details the reasons for focusing on financial education, and provides a first international overview of financial education work being undertaken in various countries (OECD, 2005b). The book also includes principles and good practices for policy makers and other stakeholders seeking to improve levels of financial literacy in their country. It is complemented by a global clearinghouse on financial education, the OECD International Gateway for Financial Education ([www.financial-education.org/home.html](http://www.financial-education.org/home.html)), which gathers data, resources, research and news on financial education issues and programmes from around the world.

Recognising the increasingly global nature of financial literacy and education issues, in 2008 the OECD created the International Network on Financial Education (INFE) to benefit from and encompass the experience and expertise of developed and emerging economies. More than 240 public institutions from more than 110 countries and economies are members of the INFE (2015 figures). Members meet twice a year to discuss the latest developments in their country, share their expertise, and collect evidence, as well as to develop analytical and comparative studies, methodologies, good practice, policy instruments and practical guidance on key priority areas.

#### Financial education for youth and in schools

The 2005 OECD Recommendation advised that “financial education should start at school. People should be educated about financial matters as early as possible in their lives” (OECD, 2005a). Two main reasons underpin the OECD recommendation: the importance of focusing on youth in order to provide them with key life skills before they start to become active financial consumers; and the relative efficiency of providing financial education in schools rather than attempting remedial actions in adulthood.

At the time the OECD Recommendation was published, there was a lack of guidance on ways to implement financial education initiatives for youth and in schools. The OECD/INFE subsequently created a dedicated expert subgroup to develop policy and practical tools. The resulting publication was welcomed by G20 leaders in September 2013 (OECD, 2014b). The publication includes guidelines for financial education in schools and guidance on financial education learning frameworks, which were also supported by the Ministers of Finance of the Asia-Pacific Economic Cooperation in August 2012.

Young people are increasingly seen as an important target group for financial education. A survey of individual financial literacy schemes supported by the European Commission (Habschick et al., 2007) found that most were directed at children and young people; and stock-taking exercises launched by the OECD/INFE demonstrated that many OECD and non-OECD countries have developed or are developing programmes in schools to varying extents (OECD 2014b; Messy and Monticone, 2016a, 2016b).

**Note:** The Joint Ministerial Statement from the 2012 APEC Finance Ministerial Meeting is available at <http://mddb.apec.org>.

## Focus on youth

People form habits and behaviours from a young age, learning from their parents and others around them. This shows how important it is to intervene early to help shape beneficial behaviours and attitudes (Whitebread and Bingham, 2013). Young people need to understand basic financial principles and practices from an early age in order to operate within the complex financial landscape they are likely to find themselves, often before reaching adulthood. Younger generations are



not only likely to face ever-increasing complexity in financial products, services and markets, but, as noted above, they are more likely to have to bear more financial risks in adulthood than their parents. In particular, they are likely to bear more responsibility for planning their own retirement savings and investments, and covering their healthcare needs; and they will have to deal with more sophisticated and diverse financial products.

Young people may learn beneficial behaviours from their friends and family, such as prioritising their expenditure or putting money aside “for a rainy day”; but the recent changes in the financial marketplace and social welfare systems make it unlikely that they can gain adequate knowledge or information about these systems unless they work in related fields.<sup>2</sup> The majority of young people will have to apply their skills to search for information and solve problems, and know when to make informed use of professional financial advice. Efforts to improve financial knowledge in the workplace or in other settings can be severely limited by a lack of early exposure to financial education and by a lack of awareness of the benefits of continuing financial education. It is therefore important to provide early opportunities for establishing the foundations of financial literacy.

In addition to preparing young people for their adult life, financial education for youth and in schools can also address the immediate financial issues facing young people. Children are often consumers of financial services from a young age. The results of the PISA 2012 financial literacy assessment revealed that, on average across the 13 participating OECD countries and economies, almost 60% of 15-year-old students have a bank account (OECD, 2014c). Moreover, it is not uncommon for them to have accounts with access to online payment facilities or to use mobile phones (with various payment options) even before they become teenagers. Clearly, they would benefit from improved financial literacy skills. Before leaving school, they may also need to make decisions about issues such as scooter or car insurance, savings products and overdrafts.

In many countries, adolescents (around the age of 15 to 18) and their parents face one of their most important financial decisions: that is, whether or not to invest in tertiary education. The gap in wages between university-educated workers and those who had not attended university has widened in many economies (OECD, 2014a). At the same time, the education costs borne by students and their families have increased, often resulting in large student loans to repay, and potentially leading towards a reliance on credit (Bradley, 2012; OECD, 2014b; Ratcliffe and McKernan, 2013; Smithers, 2010).

### **Efficiency of providing financial education in schools**

Research suggests that there is a link between financial literacy and a family’s economic and educational background: those who are more financially literate disproportionately come from highly educated families that hold a wide range of financial products (Lusardi et al., 2010). Results of the 2012 PISA financial literacy assessment show that, on average across OECD countries and economies, 14% of the variation in student performance in financial literacy within each country and economy is associated with the student’s socio-economic status, and that students with at least one parent who has tertiary-level education score higher, on average, than other students (OECD, 2014c). In order to provide equal opportunities to all students, it is important to offer financial education to those who would not otherwise have access to it. Schools are well-positioned to advance financial literacy among all demographic groups and reduce gaps and inequalities in financial literacy, including across generations.

Recognising both the importance of financial literacy for youth and the unique potential to create more skilled and knowledgeable future generations, an increasing number of countries have begun to develop financial education programmes for children and young people. These are either dedicated to youth generally or to (some part of) the school population, and include programmes at the national, regional and local levels as well as pilot exercises.

### **The need for data**

Policy makers, educators and researchers need high-quality data on levels of financial literacy in order to inform financial education strategies and the implementation of financial education programmes in schools by identifying priorities and measuring change across time.

Several countries have undertaken national surveys of financial literacy across their adult population; and the OECD has developed a questionnaire designed to capture levels of financial literacy among adults at an international level, which was first piloted in 2010 and is now being used for a second international comparative study (Atkinson and Messy, 2012; OECD/INFE, 2011; OECD/INFE, 2015a). However, until financial literacy was included in the 2012 PISA assessment, there were few efforts to collect data on the levels of financial literacy among young people under the age of 18, and none that could be compared across countries.



A robust measure of financial literacy among young people provides information at the national level that can indicate whether the current approach to financial education is effective. In particular, it can help to identify issues that need addressing through schools or extracurricular activities or programmes that will enable young people to be properly and equitably equipped to make financial decisions in adulthood. Such a measure can also be used as a baseline against which the success of school and other programmes can be assessed and reviewed in the future.

An international study provides additional benefits to policy makers and other stakeholders. Comparing levels of financial literacy across countries makes it possible to see which countries have the highest levels of financial literacy and begin to identify particularly effective national strategies and good practices. It also makes it possible to recognise common challenges and explore the possibility of finding international solutions to the issues faced.

Thus, collecting robust and internationally comparable financial literacy data in the student population provides policy makers, educators, curriculum and resource developers, researchers and others with:

- international evidence on how young people are distributed across the financial literacy proficiency scale, which can be used to develop more targeted programmes and policies
- an opportunity to compare financial education strategies across countries and explore good practice
- comparable data over time to track trends in financial literacy and potentially assess the association between financial literacy and the availability of financial education in schools.

In addition, developing a financial literacy assessment framework that is applicable across countries provides national authorities with detailed guidance about the scope and operational definition of financial literacy without having to fund national studies. As noted in the article, “Financial Literacy and Education Research Priorities”, there has been a gap in the research on financial literacy related to the lack of consistency in defining and measuring programme success. There is a need for researchers to develop a clear understanding of what it means to be ‘financially educated’” (Schuchardt et al., 2009).

### **Measuring financial literacy in PISA**

PISA 2012 was the first large-scale international study to assess the financial literacy of young people. PISA assesses the readiness of students for their life beyond compulsory schooling – and, in particular, their capacity to use knowledge and skills – by collecting and analysing cognitive and other information from 15-year-olds in countries and economies.

PISA financial literacy data provides a rich set of comparative data that policy makers and other stakeholders can use to make evidence-based decisions. International comparative data on financial literacy can answer questions such as, “How well are young people prepared for the new financial systems that are becoming more global and more complex?” and “In which countries/economies do students show high levels of financial literacy?”.

As with the core PISA domains of reading, mathematics and science, the main focus of the financial literacy assessment in PISA is on measuring the proficiency of 15-year-old students in demonstrating and applying knowledge and skills. And like the other PISA domains, financial literacy is assessed using an instrument designed to provide data that are valid, reliable and comparable.

The PISA financial literacy assessment framework developed in 2012 (OECD, 2013a) provided the first step in constructing an assessment that satisfies these three broad criteria. The main benefit of constructing an assessment framework is improved measurement, as it provides an articulated plan for developing the individual items and designing the instrument that will be used to assess the domain. A further benefit is that it provides a common language for discussion of the domain, thereby improving understanding of what is being measured. It also promotes an analysis of the kinds of knowledge and skills associated with competency in the domain, thus providing the groundwork for building a described proficiency scale or scales that can be used to interpret the results.

The development of the PISA frameworks can be described as a sequence of the following six steps:

- Develop a definition for the domain and a description of the assumptions that underlie that definition.
- Identify a set of key characteristics that should be taken into account when constructing assessment tasks for international use.
- Operationalise the set of key characteristics that will be used in test construction, with definitions based on existing literature and experience in conducting other large-scale assessments.



- Evaluate how to organise the set of tasks constructed in order to report to policy makers and researchers on achievement in each assessment domain for 15-year-old students in participating countries.
- Validate the variables and assess the contribution each makes to understanding task difficulty across the various participating countries.
- Prepare a described proficiency scale for the results.

The 2015 framework maintains the definition of the domain used in 2012 while updating the operationalisation of the domain to ensure that it is in line with recent developments in financial markets and the latest research findings.

## DEFINING FINANCIAL LITERACY

In developing a working definition of financial literacy that can be used as the basis for designing an international financial literacy assessment, the Financial Literacy Expert Group (FEG) looked both to existing PISA domain definitions of literacies and to articulations of the nature of financial education.

PISA conceives of literacy as students' capacity to apply knowledge and skills in key subject areas and to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. PISA is forward-looking, focusing on young people's ability to use their knowledge and skills to meet real-life challenges, rather than merely on the extent to which they have mastered specific curricular content (OECD, 2010a).

In its *Recommendation on Principles and Good Practices for Financial Education and Awareness*, the OECD defined financial education as "the process by which financial consumers/investors 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 to take other effective actions to improve their financial well-being" (OECD, 2005a).

The FEG agreed that "understanding", "skills" and the notion of applying understanding and skills ("effective actions") were key elements of this definition. It was recognised, however, that the definition of financial education describes a process – education – rather than an outcome. What was required for the assessment framework was a definition encapsulating the outcome of that process in terms of competency or literacy.

The definition of financial literacy for PISA is as shown in Box 5.2.

### Box 5.2 The 2015 definition of financial literacy

*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 well-being of individuals and society, and to enable participation in economic life.*

This definition, like other PISA domain definitions, has two parts. The first part refers to the kind of thinking and behaviour that characterises the domain. The second part refers to the purposes for developing the particular literacy.

In the following paragraphs, each part of the definition of financial literacy is considered in turn to help clarify its meaning in relation to the assessment.

#### **Financial literacy...**

Literacy is viewed as an expanding set of knowledge, skills and strategies, which individuals build on throughout life, rather than as a fixed quantity, a line to be crossed, with illiteracy on one side and literacy on the other. Literacy involves more than the reproduction of accumulated knowledge, although measuring prior financial knowledge is an important element in the assessment. It also involves a mobilisation of cognitive and practical skills, and other resources, such as attitudes, motivation and values. The PISA assessment of financial literacy draws on a range of knowledge and skills associated with the capacity to deal with the financial demands of everyday life and uncertain futures within contemporary society.

#### **...is knowledge and understanding of financial concepts and risks...**

Financial literacy is thus contingent on some knowledge and understanding of fundamental elements of the financial world, including key financial concepts as well as the purpose and basic features of financial products. This also includes risks that may threaten financial well-being as well as insurance policies and pensions. It can be assumed that 15-year-olds



are beginning to acquire this knowledge and gain experience of the financial environment that they and their families inhabit and the main risks they face. All of them are likely to have been shopping to buy household goods or personal items; some will have taken part in family discussions about money and whether what is wanted is actually needed or affordable; and a sizeable proportion of students will have already begun to earn and save money. Some students already have experience of financial products and commitments through a bank account or a mobile phone contract. A grasp of concepts such as interest, inflation, and value for money are soon going to be, if they are not already, important for their financial well-being.

**...and the skills,...**

These skills include generic cognitive processes, such as accessing information, comparing and contrasting, extrapolating and evaluating, applied in a financial context. They include basic skills in mathematical literacy, such as the ability to calculate a percentage, undertake basic mathematical operations or convert from one currency to another, and language skills, such as the capacity to read and interpret advertising and contractual texts.

**...motivation and confidence...**

Financial literacy involves not only the knowledge, understanding and skills to deal with financial issues, but also non-cognitive attributes: the motivation to seek information and advice in order to engage in financial activities, the confidence to do so, and the ability to manage emotional and psychological factors that influence financial decision making. These attributes are considered as a goal of financial education, as well as being instrumental in building financial knowledge and skills.

**...to apply such knowledge and understanding in order to make effective decisions...**

PISA focuses on the ability to activate and apply knowledge and understanding in real-life situations rather than on the ability to reproduce knowledge. In assessing financial literacy, this translates into a measure of young people's ability to transfer and apply what they have learned about personal finance into effective decision making. The term "effective decisions" refers to informed and responsible decisions that satisfy a given need.

**...across a range of financial contexts...**

Effective financial decisions apply to a range of financial contexts that relate to young people's present daily life and experience, but also to steps they are likely to take in the near future as adults. For example, young people may currently make relatively simple decisions such as how they will use their pocket money or, at most, which mobile phone contract they will choose; but they may soon be faced with major decisions about education and work options with long-term financial consequences.

**...to improve the financial well-being of individuals and society...**

Financial literacy in PISA is primarily conceived of as literacy around personal or household finance, distinguished from economic literacy, which includes concepts such as the theories of demand and supply, market structures and so on. Financial literacy is concerned with the way individuals understand, manage and plan their own and their households' – which often means their families' – financial affairs. It is recognised, however, that good financial understanding, management and planning on the part of individuals has some collective impact on the wider society, in contributing to national and even global stability, productivity and development.

**...and to enable participation in economic life.**

Like the other PISA literacy definitions, the definition of financial literacy implies the importance of the individual's role as a thoughtful and engaged member of society. Individuals with a high level of financial literacy are better equipped to make decisions that are of benefit to themselves, and also to constructively support and critique the economic world in which they live.

## **ORGANISING THE DOMAIN OF FINANCIAL LITERACY**

How the domain is represented and organised determines the assessment design, including item development and, ultimately, the evidence about student proficiencies that can be collected and reported. Many elements are part of the concept of financial literacy, not all of which can be taken into account in an assessment like PISA. It is necessary to select the elements that will best ensure construction of an assessment comprising tasks with an appropriate range of difficulty and a broad coverage of the domain.





A review of approaches and rationales adopted in previous large-scale studies, and particularly in PISA, shows that most consider the relevant content, processes and contexts for assessment as they specify what they wish to assess. Content, processes and contexts can be thought of as three different perspectives on the area to be assessed.

- **Content** comprises the knowledge and understanding that are essential in the area of literacy in question.
- **Processes** describes the mental strategies or approaches that are called upon to negotiate the material.
- **Contexts** refers to the situations in which the domain knowledge, skills and understandings are applied, ranging from the personal to the global.

To construct the assessment, the different categories within each perspective are identified and weighted, and then a set of tasks is developed to reflect these categories. The three perspectives are also helpful in thinking about how achievement in the area is to be reported.

The following section examines each of the three perspectives and the framework categories into which they are divided. Examples of items drawn from the PISA 2012 field trial to illustrate these three different perspectives are available in the PISA 2012 Assessment and Analytical Framework (OECD, 2013b) and on the PISA website ([www.oecd.org/pisa/](http://www.oecd.org/pisa/)). While they are representative of those used in the main survey, these particular items are not used in the assessment instrument; only secure, unpublished items are used to protect the integrity of the data that is collected to measure student proficiency.

## Content

The content of financial literacy is conceived of as the areas of knowledge and understanding that must be drawn upon in order to perform a particular task. A review of the content of existing financial literacy learning frameworks from Australia, Brazil, England, Japan, Malaysia, the Netherlands, New Zealand, Northern Ireland, Scotland, South Africa and the United States indicates that there is some consensus on financial literacy content areas (OECD, 2014b). The review shows that the content of financial education in schools was similar, albeit with some cultural differences, and that it was possible to identify a series of topics commonly included in these frameworks. These topics form the four content areas of the PISA financial literacy assessment: *money and transactions*, *planning and managing finances*, *risk and reward*, and *financial landscape*. Further work undertaken by the OECD/INFE to develop a core-competencies framework on financial literacy for young people provides additional guidance on how these content areas are mapped to desired outcomes (OECD/INFE, 2015c).

### **Money and transactions**

This content area includes awareness of the different forms and purposes of money and managing monetary transactions, which may include spending or making payments, taking into account value for money, and using bank cards, cheques, bank accounts and currencies. It also covers practices such as taking care of cash and other valuables, calculating value for money, and filing documents and receipts.

Tasks in this content area can ask students to show that they are:

- Aware of the different forms and purposes of money. Students can:
  - Recognise bank notes and coins.
  - Understand that money can be exchanged for goods and services.
  - Identify different ways to pay for items purchased in person or at a distance (from a catalogue or on line, for example).
  - Recognise that there are various ways of receiving money from other people and transferring money between people or organisations, such as cash, cheques, card payments in person or on line, or electronic transfers on line or via SMS.
  - Understand that money can be borrowed or lent, and the purpose of interest (taking into account that the payment and receipt of interest is forbidden in some religions).
- Confident and capable of handling and monitoring transactions. Students can:
  - Use cash, cards and other payment methods to purchase items.
  - Use cash machines to withdraw cash or to get an account balance.
  - Calculate the correct change.
  - Work out which of two consumer items of different sizes would give better value for money, taking into account the individual's specific needs and circumstances.
  - Check transactions listed on a bank statement and note any irregularities.



## Planning and managing finances

Income, expenditure and wealth need planning and managing over both the short term and long term. This content area reflects the process of managing, planning and monitoring income and expenses and understanding ways of enhancing wealth and financial well-being. It includes content related to credit use as well as savings and wealth creation.

Tasks in this content area can ask students to show that they know about and can:

- Monitor and control income and expenses. Students can:
  - Identify various types of income (e.g. allowances, salary, commission, benefits,) and ways of discussing income (such as hourly wage and gross or net annual income).
  - Draw up a budget to plan regular spending and saving and live within it.
- Use income and other available resources in the short and long term to enhance financial well-being. Students can:
  - Understand how to manipulate various elements of a budget, such as identifying priorities if income does not meet planned expenses, or finding ways to increase savings, such as reducing expenses or increasing income.
  - Assess the impact of different spending plans and be able to set spending priorities in the short and long term.
  - Plan ahead to pay future expenses: for example, working out how much money needs to be saved each month to make a particular purchase or pay a bill.
  - Understand the purposes of accessing credit and the ways in which expenditure can be smoothed over time through borrowing or saving.
  - Understand the idea of building wealth, the impact of compound interest on savings, and the pros and cons of investment products.
  - Understand the benefits of saving for long-term goals or anticipated changes in circumstance, such as living independently.
  - Understand how government taxes and benefits affect personal and household finances.

## Risk and reward

*Risk and reward* is a key area of financial literacy. It incorporates the ability to identify ways of balancing and covering risks and managing finances in uncertainty with an understanding of the potential for financial gains or losses across a range of financial contexts. There are two types of risk of particular importance in this domain. The first relates to financial losses that an individual cannot bear, such as those caused by catastrophic or repeated costs. The second is the risk inherent in financial products, such as credit agreements with variable interest rates, or investment products. This content area therefore includes knowledge of the types of products that may help people to protect themselves from the consequences of negative outcomes, such as insurance and savings, as well as the ability to assess the level of risk and reward related to different products, purchases, behaviours or external factors.

Tasks in this content area can ask students to show that they:

- Recognise that certain financial products, including insurance, and processes, such as saving, can be used to manage and offset various risks, depending on different needs and circumstances. Students know how to assess whether certain insurance policies may be of benefit.
- Understand the benefits of contingency planning, diversification and the dangers of default on payment of bills and credit agreements. Students can apply this knowledge to decisions about:
  - limiting the risk to personal capital
  - various types of investment and savings vehicles, including formal financial products and insurance products, where relevant
  - various forms of credit, including informal and formal credit, unsecured and secured, rotating and fixed term, and those with fixed or variable interest rates.
- Know about and can manage risks and rewards associated with life events, the economy and other external factors, such as the potential impact of:
  - theft or loss of personal items, job loss, birth or adoption of a child, deteriorating health or mobility
  - fluctuations in interest rates and exchange rates
  - other market changes.



- Know about the risks and rewards associated with substitutes for financial products, particularly:
  - saving in cash, or buying property, livestock or gold as a store of wealth
  - taking credit or borrowing money from informal lenders.
- Know that there may be unidentified risks and rewards associated with new financial products (examples may include innovative digital finance or “crowd funding”, but, by definition, such a list will change over time).

### **Financial landscape**

This content area relates to the character and features of the financial world. It covers awareness of the role of regulation and consumer protection, knowing the rights and responsibilities of consumers in the financial marketplace and within the general financial environment, and the main implications of financial contracts. Information resources are also topics relevant to this content area. In its broadest sense, *financial landscape* also incorporates an understanding of the consequences of changes in economic conditions and public policies, such as changes in interest rates, inflation, taxation or welfare benefits for individuals, households and society.

Tasks in this content area can ask students to show that they:

- Are aware of the role of regulation and consumer protection.
- Know about rights and responsibilities. Students can:
  - understand that buyers and sellers have rights, such as being able to apply for redress
  - understand that buyers and sellers have responsibilities, such as giving accurate information when applying for financial products (consumers and investors), disclosing all material facts (providers); and being aware of the implications of one of the parties not doing so (consumers and investors)
  - recognise the importance of the legal documentation provided when purchasing financial products or services and the importance of understanding the content.
- Know and understand the financial environment. Students:
  - can identify which providers are trustworthy, and which products and services are protected through regulation or consumer-protection laws
  - can identify whom to ask for advice when choosing financial products, and where to go for help or guidance in relation to financial matters
  - are aware of existing financial crimes, such as identity theft and scams, knowledge of how to take appropriate precautions to protect personal data and avoid other scams, and knowledge of their rights and responsibilities in the event that they are a victim
  - are aware of the potential for new forms of financial crime and awareness of the risks.
- Know and understand the impact of their own financial decisions on themselves and others. Students:
  - understand that individuals have choices in spending and saving, and each action can have consequences for the individual and for society
  - recognise how personal financial habits, actions and decisions have an impact at an individual, community, national and international level.
- Understand the influence of economic and external factors. Students:
  - are aware of the economic climate and understand the impact of policy changes, such as reforms related to the funding of post-school training or compulsory savings for retirement
  - understand how the ability to build wealth or access credit depends on economic factors, such as interest rates, inflation and credit scores
  - understand that a range of external factors, such as advertising and peer pressure, can affect individuals’ financial choices and outcomes.

### **Processes**

The process categories relate to cognitive processes. They are used to describe students’ ability to recognise and apply concepts relevant to the domain, and to understand, analyse, reason about, evaluate and suggest solutions. PISA defines four process categories for financial literacy: *identify financial information*, *analyse information in a financial context*,



*evaluate financial issues and apply financial knowledge and understanding.* While the verbs used here bear some resemblance to those in Bloom's taxonomy of educational objectives (Bloom, 1956), an important distinction is that the processes in the financial literacy construct are not operationalised as a hierarchy of skills. They are, instead, parallel essential cognitive approaches, all of which are part of the financially literate individual's repertoire. The order in which the processes are presented here relates to a typical sequence of thought processes and actions, rather than to an order of difficulty or challenge. At the same time, it is recognised that financial thinking, decisions and actions are most often dependent on a recursive and interactive blend of the processes described in this section. For the purposes of the assessment, each task is identified with the process that is judged most central to its completion.

### **Identify financial information**

This process is engaged when the individual searches and accesses sources of financial information, and identifies or recognises its relevance. In PISA 2015 the information is in the form of texts, such as contracts, advertisements, charts, tables, forms and instructions displayed on a screen. A typical task might ask students to identify the features of a purchase invoice, or recognise the balance on a bank statement. A more difficult task might involve searching through a contract that uses complex legal language to locate information that explains the consequences of defaulting on loan repayments. This process category is also reflected in tasks that involve recognising financial terminology, such as identifying "inflation" as the term used to describe increasing prices over time.

### **Analyse information in a financial context**

This process covers a wide range of cognitive activities undertaken in financial contexts, including interpreting, comparing and contrasting, synthesising, and extrapolating from information that is provided. Essentially, it involves recognising something that is not explicit: identifying the underlying assumptions or implications of an issue in a financial context. For example, a task may involve comparing the terms offered by different mobile phone contracts, or working out whether an advertisement for a loan is likely to include unstated conditions. An example in this process category is provided below, in the unit *SHARES*.

### **Evaluate financial issues**

In this process, the focus is on recognising or constructing financial justifications and explanations, drawing on financial knowledge and understanding applied in specified contexts. It involves such cognitive activities as explaining, assessing and generalising. Critical thinking is brought into play in this process, when students must draw on knowledge, logic and plausible reasoning to make sense of and form a view about a finance-related problem. The information that is required to deal with such a problem may be partly provided in the stimulus of the task, but students will need to connect such information with their own prior financial knowledge and understanding.

In the PISA context, any information that is required to understand the problem is intended to be within the expected range of experiences of a 15-year-old – either direct experiences or those that can be readily imagined and understood. For example, it is assumed that 15-year-olds are likely to be able to identify with the experience of wanting something that is not essential, such as a music player or games console. A task based on this scenario could ask about the factors that might be considered in determining the relative financial merits of making a purchase or deferring it, given specified financial circumstances.

### **Apply financial knowledge and understanding**

The fourth process picks up a term from the definition of financial literacy: "to apply such [financial] knowledge and understanding". It focuses on taking effective action in a financial setting by using knowledge of financial products and contexts, and understanding of financial concepts. This process is reflected in tasks that involve performing calculations and solving problems, often taking into account multiple conditions. An example of this kind of task is calculating the interest on a loan over two years. This process is also reflected in tasks that require recognition of the relevance of prior knowledge in a specific context. For example, a task might require the student to work out whether purchasing power will decline or increase over time when prices are changing at a given rate. In this case, knowledge about inflation needs to be applied.

## **Contexts**

Decisions about financial issues are often dependent on the contexts or situations in which they are presented. By situating tasks in a variety of contexts, the assessment offers the possibility of connecting with the broadest possible range of individual interests across a variety of situations in which individuals need to function in the 21st century.



Certain situations will be more familiar to 15-year-olds than others. In PISA, assessment tasks are framed in situations of general life, which may include but are not confined to school contexts. The focus may be on the individual, family or peer group, on the wider community, or even on a global scale.

As a starting point, the Financial Literacy Expert Group (FEG) looked at the contexts used in the Programme for the International Assessment of Adult Competencies (PIAAC) literacy framework: *education and work*, *home and family*, *leisure and recreation*, and *community and citizenship* (PIAAC Literacy Expert Group, 2009). For the purposes of the financial literacy domain, the heading *leisure and recreation* was replaced by *individual* to reflect the fact that many of the financial interactions that young people have are related to themselves as individual consumers. Such interactions may include leisure and recreation, but are not limited to these. It was further decided to replace *community and citizenship* with *societal*. While *community and citizenship* captures the idea of a perspective wider than the personal, it was felt that the term *community* was not wide enough.

*Societal*, by contrast, implicitly encompasses national and global situations as well as the more local, thus better fitting the potential reach of financial literacy. The contexts identified for the PISA financial literacy assessment are, then, *education and work*, *home and family*, *individual* and *societal*.

### **Education and work**

The context of *education and work* is of great importance to young people. Virtually all 15-year-olds will be starting to think about financial matters related to both education and work, whether they are spending existing earnings, considering future education options or planning their working life.

The educational context is obviously relevant to PISA students, since they are, by definition, a sample of the school-based population; indeed, many of them will continue in education or training for some time. However, many 15-year-old students are also already engaged in some form of paid work outside school hours making the work context equally valid. In addition, many will move from education into some form of employment, including self-employment, before reaching their 20s.

Typical tasks within this context could include understanding payslips, planning to save for tertiary education, investigating the benefits and risks of taking out a student loan, and participating in workplace savings schemes.

### **Home and family**

*Home and family* includes financial issues relating to the costs involved in running a household. Family is the most likely household circumstance for 15-year-olds; however, this category also encompasses households that are not based on family relationships, such as the kind of shared accommodation that young people often use shortly after leaving the family home. Tasks within this context may include buying household items or family groceries, keeping records of family spending, and making plans for family events. Decisions about budgeting and prioritising spending may also be framed within this context.

### **Individual**

The context of the *individual* is important within personal finance since there are many decisions that a person takes entirely for personal benefit or gratification, and many risks and responsibilities that must be borne by individuals. These decisions span essential personal needs as well as leisure and recreation. They include choosing personal products and services, such as clothing, toiletries or haircuts, buying consumer goods, such as electronic or sports equipment, and more long-term commitments, such as season tickets or a gym membership. They also cover the process of making personal decisions and the importance of ensuring individual financial security, such as keeping personal information safe and being cautious about unfamiliar products.

Although the decisions made by an individual may be influenced by the family and society (and may ultimately affect society), when it comes to opening a bank account, buying shares or getting a loan, it is typically the individual who has the legal responsibility and ownership. The context *individual* therefore includes contractual issues around events such as opening a bank account, purchasing consumer goods, paying for recreational activities, and dealing with relevant financial services that are often associated with larger consumption items, such as credit and insurance.

### **Societal**

The environment young people are living in is characterised by change, complexity and interdependence. Globalisation 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. While the core of the financial literacy domain is focused on personal finances, the *societal* context recognises that individual financial well-being cannot be entirely separated from the rest of society. Personal financial well-being affects and is affected by the local community, the nation and even global activities. Financial literacy within this context includes such matters as being informed about consumer rights and responsibilities, understanding the purpose of taxes and local government charges, being aware of business interests, and taking into account the role of consumer purchasing power. It also extends to considering financial choices, such as donating to non-profit organisations and charities.

### **Non-cognitive factors**

The PISA working definition of financial literacy includes the non-cognitive terms *motivation* and *confidence*, attitudes which, according to some, have an influence on money-management behaviour (Johnson and Staten, 2010). PISA conceives of both financial attitudes and behaviour as aspects of financial literacy in their own right. Attitudes and behaviour are also of interest in terms of their interactions with the cognitive elements of financial literacy. Information collected about the financial attitudes and behaviour of 15-year-olds could also constitute useful baseline data for any longitudinal study of the financial literacy of adults, including their financial behaviours.

The Financial Literacy Expert Group identified four non-cognitive factors to include in the framework: *access to information and education, access to money and financial products, attitudes towards and confidence about financial matters, and spending and saving behaviour.*

#### **Access to information and education**

There are various sources of financial information and education that may be available to students, including informal discussion with friends, parents or other family members, information from the financial sector, as well as formal school education. The literature in this area often refers to the process of “financial socialisation”, which can be seen as the process of acquiring financial literacy. Parents have a major role in the financial socialisation of children but, as discussed above, they may not have been exposed to all the financial contexts and decisions that their children face (Gudmondson and Danes, 2011; Otto, 2013). Copying and discussing financial behaviours with friends can be another important source of socialisation, but this also may vary in terms of quality and reliability, with recent research from the UK indicating that money is rarely talked about honestly (Money Advice Service, 2014). In addition, the amount and quality of formal education and training about money and personal finance received by students varies within and across countries (OECD, 2014b, 2014c).

Data about students’ access to financial information and education can be collected through both the student questionnaire and the questionnaire for school principals. In the student questionnaire, students can be asked about their typical sources of information in order to analyse the extent to which each source is correlated with financial literacy. This is intended to provide a description of students’ main sources of financial socialisation, rather than assessing whether they understand the importance of using appropriate sources of information or advice, which is covered in the cognitive assessment. Students can also be asked about the types of tasks that they face and the financial concepts they are exposed to during curricular classes. The school questionnaire can ask principals about the availability and quality of financial education in their schools. Evidence about the extent to which there is a link between levels of financial literacy and financial education inside and outside schools is likely to be particularly useful in shaping education programmes for improving financial literacy.

#### **Access to money and financial products**

The results of the 2012 PISA financial literacy exercise showed that, in the Flemish Community of Belgium, Estonia, New Zealand and Slovenia, students with a bank account scored higher in financial literacy than students with similar socio-economic status who did not hold a bank account (OECD, 2014c). While this does not indicate a causal relationship, it is plausible to assume that real-life experiences of financial products may influence young people’s financial literacy and vice versa. Personal experience may come, for example, from using financial products, such as payment cards, from dealing with the banking system, or from occasional working activities outside of school hours.

Students who have had more personal experience in dealing with financial matters from earning money or receiving an allowance might also be expected to perform better on the cognitive assessment than those without such experience. However, a recent review suggests that the key factor may not be experience, but the extent to which parents are involved in the spending decisions made by young people, with higher financial literacy associated with more involved parents (Drever et al., 2015). The 2015 framework recognises the importance of knowing whether students have access to money and financial products.



### **Attitudes towards and confidence about financial matters**

The PISA definition of financial literacy highlights the important role of attitudes. Individual preferences can determine financial behaviour and affect the ways in which financial knowledge is used. PISA 2012 showed that students' perseverance and openness to problem solving were strongly associated with their financial literacy scores (OECD, 2014c). In addition, the extent to which students believe that they are in control of their future, and their preference for current consumption may influence their financial decisions, their independence, and their propensity to learn how to make plans for their own financial security (Golsteyn et al., 2013; Lee and Mortimer, 2009; Meier and Sprenger, 2013).

Confidence in one's own ability to make a financial decision may also be a key driver in explaining who will work through complex financial problems or make choices across several possible products. At the same time, however, confidence may turn into overconfidence, leading to a tendency to mistakes and overly risky decisions. The 2015 framework recognises the importance of a student's perception of his or her own financial knowledge and skills.

### **Spending and saving behaviour**

While items in the cognitive assessment test students' ability to make particular spending and savings decisions, it is also useful to have some measure of what their actual (reported) behaviour is: that is, how students save and spend in practice. The PISA financial literacy assessment provides the opportunity to look at the potential relationship between 15-year-olds' spending and saving behaviour and their results on the cognitive financial literacy assessment.

## **ASSESSING FINANCIAL LITERACY**

### **The structure of the assessment**

In 2012, the PISA financial literacy assessment was developed as a one-hour, paper-based exercise to be completed in addition to one hour of material from other cognitive domains. The financial literacy assessment was composed of 40 items divided into two clusters, chosen from 75 tasks that were used in the field trial. The selection of items was made based on their psychometric properties, such as ensuring that each item distinguished between high- and low-scoring students.

In 2015, items are transferred to a computer-based platform. Additional items were developed for this form of delivery in order to replace items that had been released in the report of the 2012 results. The 2015 financial literacy assessment was developed as a one-hour exercise, comprising 43 items divided into two clusters.

As with other PISA assessment domains, computer-based financial literacy items are grouped in units composed of one or two items based around a common stimulus. The selection includes financially-focused stimulus material in diverse formats, including prose, diagrams, tables, charts and illustrations. All financial literacy assessments include a broad sample of items covering a range of difficulty that allows for measuring and describing the strengths and weaknesses of students and key subgroups of students.

### **Response formats and coding**

Some PISA items require short descriptive responses; others require more direct responses of one or two sentences or a calculation, while some can be answered by checking a box. Decisions about the form in which the data are collected – the response formats of the items – are based on what is considered appropriate given the kind of evidence that is being collected, and also on technical and pragmatic considerations. In the financial literacy assessment as in other PISA assessments, two broad types of items are used: constructed-response items and selected-response items.

Constructed-response items require students to generate their own answers. The format of the answer may be a single word or figure, or may be longer – a few sentences or a worked calculation. Constructed-response items that require a more extended answer are ideal for collecting information about students' capacity to explain decisions or demonstrate a process of analysis.

The second broad type of item in terms of format and coding is selected response. This kind of item requires students to choose one or more alternatives from a given set of options. The most common type in this category is the simple multiple-choice item, which requires the selection of one from a set of (usually) four options.

A second type of selected-response item is complex multiple choice, in which students respond to a series of "Yes/No"-type questions. Selected-response items are typically regarded as most suitable for assessing items associated with identifying and recognising information, but they are also a useful way of measuring students' understanding of higher-order concepts that they themselves may not easily be able to express.



Although particular item formats lend themselves to specific types of questions, the format of the item should not affect the interpretation of the results. Research suggests that different groups (for example, boys and girls, and students in different countries) respond differentially to the various item formats. Several research studies on response-format effects based on PISA data suggest that there are strong arguments for retaining a mixture of multiple-choice and constructed-response items. In their study of PISA reading literacy compared with the IEA Reading Literacy Study (IEARLS), Lafontaine and Monseur (2006) found that response format had a significant impact on gender performance. In another study, countries were found to show differential equivalence of item difficulties in PISA reading on items in different formats (Grisay and Monseur, 2007). This finding may relate to the fact that students in different countries are more or less familiar with the particular formats. The PISA financial literacy option includes items in a variety of formats to minimise the possibility that item format affects student performance. Such an influence would be extrinsic to the intended object of measurement – in this case, financial literacy.

When considering the distribution of item formats, the question of resources must be weighed as well as the equity issues discussed in the preceding paragraphs. All except the most simple of constructed-response items are coded by expert judges who must be trained and monitored. Selected-response and short “closed” constructed-response items do not require expert coding and therefore demand fewer resources.

The proportions of constructed- and selected-response items are determined taking of all these considerations into account. Most of the items selected for the PISA 2015 main survey do not require expert judgement.

Most items are coded dichotomously (full credit or no credit), but where appropriate an item’s coding scheme allows for partial credit. Partial credit makes possible more nuanced scoring of items. Some answers, even though incomplete, are better than others. If incomplete answers for a particular question indicate a higher level of financial literacy than inaccurate or incorrect answers, a scoring scheme has been devised that allows partial credit for that question. Such “partial credit” items yield more than one score point.

### Distribution of score points

While each PISA financial literacy item is categorised according to a single content, a single process and a single context category, it is recognised that, since PISA aims to reflect real-life situations and problems, often elements of more than one category are present in a task. In such cases, the item is identified with the category judged most integral to responding successfully to the task.

The target distribution of score points according to financial literacy content areas is shown in Table 5.1. The term “score points” is used in preference to “items”, as some partial credit items are included. The distributions are expressed in terms of ranges, indicating the approximate weighting of the various categories. They contain a mix of original items, developed for the 2012 and 2015 assessments.

The distribution reflects that *money and transactions* is considered to be to the most immediately relevant content area for 15-year-olds.

Table 5.2 shows the target distribution of score points among the four processes.

The weighting shows that greater importance is attributed to evaluating financial issues and applying financial knowledge and understanding.

Table 5.3 shows the target distribution of score points among the four contexts.

**Table 5.1 Approximate distribution of score points in financial literacy, by content**

Money and transactions	Planning and managing finances	Risk and reward	Financial landscape	Total
30% – 40%	25% – 35%	15% – 25%	10% – 20%	100%

**Table 5.2 Approximate distribution of score points in financial literacy, by process**

Identify financial information	Analyse information in a financial context	Evaluate financial issues	Apply financial knowledge and understanding	Total
15% – 25%	15% – 25%	25% – 35%	25% – 35%	100%

**Table 5.3 Approximate distribution of score points in financial literacy, by context**

Education and work	Home and family	Individual	Societal	Total
10% – 20%	30% – 40%	35% – 45%	5% – 15%	100%





Consistent with an assessment of personal financial literacy of 15-year-olds, there is a clear emphasis on *individual*, but also a weighting towards the financial interests of the household or family unit. *Education and work* and *societal* contexts are given less emphasis, but included in the scheme as they are important elements of financial experience.

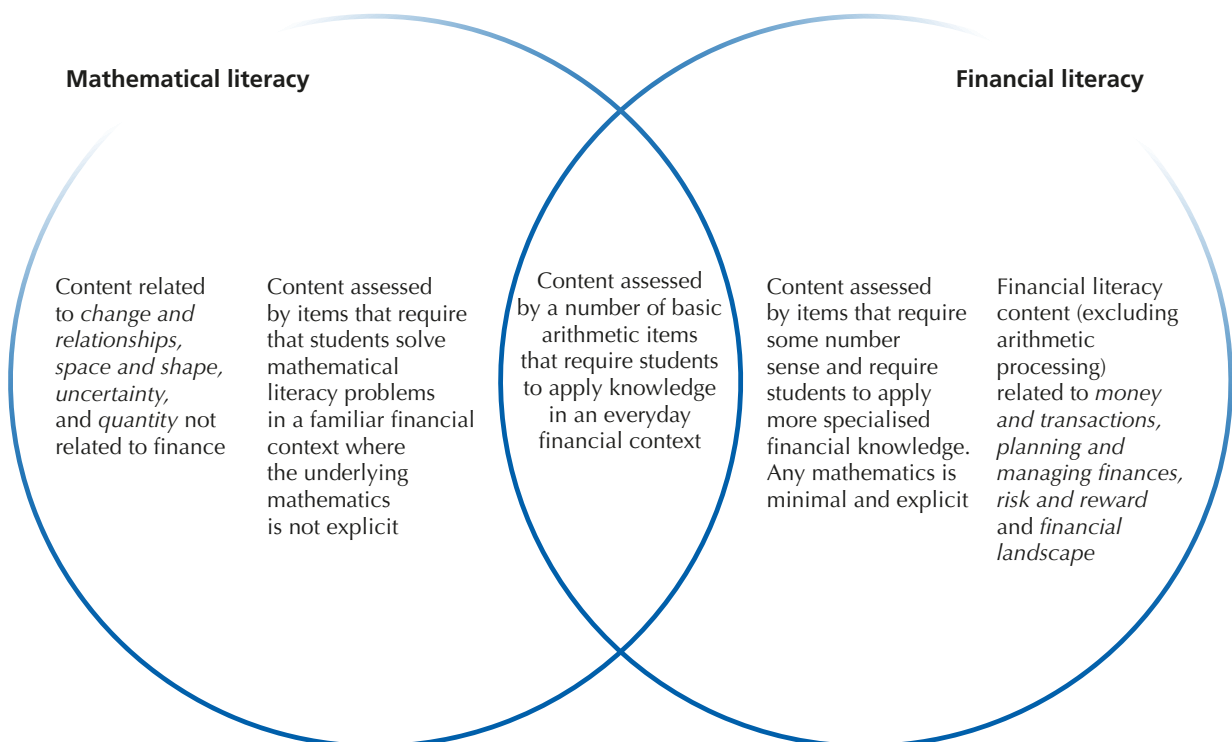
### THE IMPACT OF OTHER DOMAIN KNOWLEDGE AND SKILLS ON FINANCIAL LITERACY

A certain level of numeracy (or mathematical literacy) is regarded as a prerequisite for financial literacy. Huston (2010) argues that “if an individual struggles with arithmetic skills, this will certainly impact his/her financial literacy. However, available tools (e.g. calculators) can compensate for these deficiencies; thus, information directly related to successfully navigating personal finances is a more appropriate focus than numeracy skills for a financial literacy measure”. Mathematically-related proficiencies, such as number sense, familiarity with multiple representations of numbers, and skills in mental calculation, estimation and the assessment of reasonableness of results, are intrinsic to some aspects of financial literacy.

On the other hand, there are large areas where the content of mathematical literacy and financial literacy do not intersect. As defined in the PISA 2012 mathematics literacy framework, mathematical literacy incorporates four content areas: *change and relationships*, *space and shape*, *quantity* and *uncertainty*. Of these, only *quantity* directly intersects with the content of the PISA financial literacy assessment. Unlike the mathematical literacy content area *uncertainty*, which requires students to apply probability measures and statistics, the financial literacy content area *risk and reward* requires an understanding of the features of a particular situation or product that indicate a that there will be a risk of losing money and (sometimes) a possibility of gains. This is a non-numeric appreciation of the way financial well-being can be affected by chance and an awareness of the related products and actions to protect against loss.

In the financial literacy assessment, the quantity-related proficiencies described above are applied to problems requiring more financial knowledge than can be expected in the mathematical literacy assessment. Similarly, knowledge about financial matters and the ability to apply such knowledge and reasoning in financial contexts (in the absence of any specifically mathematical content) characterise much of all four content areas of financial literacy: *money and transactions*, *planning and managing finances*, *risk and reward* and *financial landscape*. Figure 5.1 represents the relationship between the content of mathematical literacy and financial literacy in PISA.

Figure 5.1 ■ Relationship between the content of financial literacy and mathematical literacy in PISA





Operationally, there are few items populating the portion of the diagram where the two circles intersect. In the financial literacy assessment, the nature of the mathematical literacy expected is basic arithmetic: the four operations (addition, subtraction, multiplication and division) with whole numbers, decimals and common percentages. Such arithmetic occurs as an intrinsic part of the financial literacy context and enables financial literacy knowledge to be applied and demonstrated.

Items that require such arithmetic skills involve basic mathematics of a level within the reach of most 15-year-olds. Use of financial formulae (requiring knowledge of algebra) is not considered appropriate. Dependence on calculation is minimised in the assessment; tasks are framed in such a way as to avoid the need for substantial or repetitive calculation. The calculators used by students in their classrooms and on the PISA mathematics assessment are also available in the financial literacy assessment, but success in the items will not depend on their use.

A similar reasoning holds for reading skills. It is assumed that all students taking part in the financial literacy assessment will have some basic reading proficiency, even while it is known from previous PISA surveys that reading skill varies widely both within and across countries (OECD, 2010b). To minimise the level of reading literacy required, stimulus material and task statements are generally designed to be as clear, simple and brief as possible. In some cases, however, the stimulus may deliberately present complex or somewhat technical language. The capacity to read and interpret the language of financial documents or pseudo financial documents is regarded as part of financial literacy.

Highly technical terminology relating to financial matters is avoided. The Financial Literacy Expert Group has advised on terms that it judges reasonable to expect 15-year-olds to understand. Some of these terms may be the focus of assessment tasks.

In practice, the results of the 2012 PISA financial literacy assessment gave a more precise measure of students' performance in financial literacy in comparison with reading and mathematics performance. The results indicated that around 25% of the financial literacy score reflected factors that are uniquely captured by the financial literacy assessment, while the remaining 75% of the financial literacy score reflected skills measured in the mathematics and/or reading assessments.

The association between financial literacy and other domains indicates that, in general, students who perform at higher levels in mathematics and/or reading also perform well in financial literacy. There were, however, wide variations in financial literacy performance for any given level of performance in mathematics and reading, meaning that the skills measured by the financial literacy assessment went beyond or fell short of the ability to use the knowledge that students acquired from subjects taught in compulsory education. For instance, in Australia, the Flemish Community of Belgium, the Czech Republic, Estonia, New Zealand and the Russian Federation, students performed better in financial literacy than students in other countries with similar performance in mathematics and reading, while, by contrast, in France, Italy and Slovenia, students' performance in financial literacy was lower, on average, when compared to that of students in the other participating countries and economies who displayed the same level of proficiency in reading and mathematics (OECD, 2014c).

## REPORTING FINANCIAL LITERACY

The data from the 2012 financial literacy assessment is held in a database separate from the main PISA database. In 2015, the data from all domains is presented together. The databases include, for the sampled students, their financial literacy, mathematics and reading cognitive results, the behaviour data from the short questionnaire on financial literacy, and data from the general student questionnaire and school questionnaire.

In each PISA cycle, financial literacy is reported as an independent result, and in relation to performance in other domains, financial behaviour, and to some background variables, such as socio-economic status and immigrant background. The data also allow for the development of further work under the aegis of the OECD Project on Financial Education.

The financial literacy cognitive data is scaled similarly to the other PISA data. A comprehensive description of the modelling technique used for scaling can be found in the *PISA 2012 Technical Report* (OECD, 2014d).

Each item is associated with a particular point on the PISA financial literacy scale that indicates its difficulty, and each student's performance is associated with a particular point on the same scale that indicates the student's estimated proficiency.

As with the other PISA domains, the relative difficulty of tasks in a test is estimated by considering the proportion of test takers answering each question correctly. The relative proficiency of students taking a particular test is estimated by considering the proportion of test items that they answer correctly. A single continuous scale showing the relationship between the difficulty of items and the proficiency of students is constructed.



Starting from the 2012 assessment, the scale was divided into levels, according to a set of statistical principles, and then descriptions were generated based on the tasks located within each level, to encapsulate the kinds of skills and knowledge needed to complete those tasks successfully. The scale and set of descriptions are known as a described proficiency scale.

By calibrating the difficulty of each item, it is possible to locate the degree of financial literacy that the item represents. By showing the proficiency of each student on the same scale, it is possible to describe the degree of financial literacy that the student possesses. The described proficiency scale helps to interpret what students' financial literacy scores mean in substantive terms.

Following PISA practice, a scale is constructed (based on participating OECD countries) having a mean of 500 and a standard deviation of 100. Five levels of proficiency in financial literacy are described in the assessment, as a first step in reporting how financial literacy develops, and to compare student performance between and within participating countries and economies (see OECD, 2014c, Chapter 2).



## Notes

1. Financial inclusion increased from 51% of the adult population with an account at a financial institution or mobile money service in 2011, to 62% in 2014. However, two billion adults have no bank account at all (Demirguc-Kunt et al., 2015).
2. PISA 2012 indicates that students with a parent working in the financial services sector have higher levels of financial literacy, on average, although data are only available for a limited number of countries.

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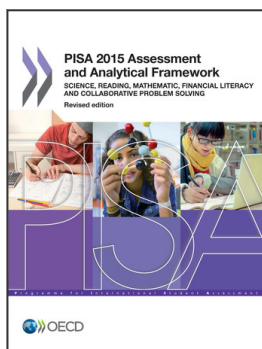
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**From:**  
**PISA 2015 Assessment and Analytical Framework**  
Science, Reading, Mathematic, Financial Literacy and  
Collaborative Problem Solving

**Access the complete publication at:**  
<https://doi.org/10.1787/9789264281820-en>

**Please cite this chapter as:**

OECD (2017), "PISA 2015 Financial Literacy Framework", in *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematic, Financial Literacy and Collaborative Problem Solving*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264281820-6-en>

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