

5. PISA 2018 Financial Literacy Framework

PISA 2018 offers an optional assessment of financial literacy for the third time. This section presents the framework of this assessment and is based on the framework developed for the 2012 exercise, which was the first large-scale international study to assess the financial literacy of young people. It defines financial literacy as it pertains to youth, and it is organised around the content, processes and contexts that are relevant for the assessment of 15-year-old students. These content areas, processes and contexts are illustrated with several items drawn from the PISA 2018 field trial and previous assessments. In addition, the framework discusses the relationship between financial literacy and non-cognitive skills and between financial literacy and both reading and mathematics literacy.

Introduction

Policy interest in financial literacy

In recent years, developed and emerging economies have become increasingly aware of the importance of ensuring that their citizens are financially literate. This has stemmed in particular from shrinking public and private support systems, shifting demographic profiles including population aging, 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 financial resilience (OECD, 2009^[1]). As a result, financial literacy is now globally acknowledged as an essential life skill and targeted financial education policy is considered to be 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^[2]; OECD/INFE, 2012^[3]) and the OECD/INFE Policy Handbook on National Strategies for Financial Education (OECD, 2015^[4]). G20 leaders also recognise that this requires lifelong learning that starts in childhood, as indicated by their call for core competencies on financial literacy for young people and adults (OECD, 2015^[5]; OECD, 2016^[6]), and their statement supporting the widespread use of instruments to measure youth financial literacy, including the PISA financial literacy assessment (G20, 2013^[7]).

A series of tangible trends underpin the rising global interest in financial literacy as a key life skill. These are summarised below.

Demographic and cultural shifts

Longevity is increasing in most countries, 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 they were 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^[8]). Working-age adults may be expected to shoulder the tax burden to finance this expenditure whilst 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 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 many people now 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 that 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. Younger adults may also face greater financial challenges than previous generations in saving for their own retirement whilst at the same time covering the heightened long-term health care needs of elderly relatives. Traditional pay-as-you-go (PAYG) public pension schemes are supplemented by privately funded schemes in which individuals may be responsible for making their own investment decisions, including the contribution rate, the investment allocation and the type of payout 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.

A financially literate consumer will know when to seek professional help to make a sound financial plan, but professional advisors are not an alternative to financial education. Even when individuals use the services of financial intermediaries and advisors, they need to understand what is being offered or advised, and they need the skills and knowledge to manage the products they choose. They should also be aware that some advisors are not independent and may face a conflict of interest as they provide advice and at the same time sell products or receive commissions. 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 even if they are aware of them, have neither the sufficient financial knowledge nor the skills to manage such risks adequately (Barrett, Mosca and Whelan, 2013^[9]; Money and Pension Panel, 2013^[10]; OECD, 2016^[11]).

Increased supply of a wide range of financial products and services

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 remittance products to revolving credit and equity portfolios.¹ Growing numbers of consumers therefore have access to financial products and services from a variety of established and new providers delivered through traditional and digital channels. Whilst many of the products available bring advantages and help to improve financial well-being, many are also complex. Individuals are required to compare across a number of factors such as the fees charged, interest rates paid or received, length of contract and exposure to risk. They 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 be able to interact with a wide range of financial providers and 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 and remittances, and to perform online transactions. Together, these trends have 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.

New risks from financial products and services

As consumers attempt to access and use financial products, they also become vulnerable to certain associated risks. The spread of digital financial services means that consumers may face new types of risks, such as risks connected with high-cost short-term online credit. Consumers may also be exposed to new crimes, such as data and identity theft and fraud. Legitimate use of consumer data by a range of financial and non-financial companies to create consumers' digital profiles may also make it more costly or difficult to access certain types of financial products or services, as financial service providers seek to segment their consumer base and price or market their products accordingly (OECD, 2017_[12]).

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 (Amagir et al., 2018_[13]; Atkinson et al., 2015_[14]; Bruhn et al., 2016_[15]; Kaiser and Menkhoff, 2016_[16]; Miller et al., 2014_[17]). This evidence suggests a possible causal link between financial education and outcomes and indicates that improved levels of financial literacy can lead to positive changes in behaviour.

Other research indicates a number of potential benefits of being financially literate. There is 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 choices, and that they are more likely to choose mutual funds with lower fees (Clark, Lusardi and Mitchell, 2017_[18]; Gaudecker, 2015_[19]; Hastings and Tejada-Ashton, 2008_[20]; van Rooij, Lusardi and Alessie, 2011_[21]). In emerging economies, financial literacy is shown to be correlated with holding basic financial products, like bank accounts, and with insurance take-up (Grohmann, Kluhs and Menkhoff, 2017_[22]; Xu and Zia, 2012_[23]). Similarly, 15-year-old students with bank accounts have higher levels of financial literacy than those without bank accounts on average across the OECD countries participating in the 2012 and 2015 PISA exercise (OECD, 2017_[24]; OECD, 2014_[25]). Moreover, adults who have greater financial knowledge are more likely to accumulate higher amounts of wealth (Behrman et al., 2012_[26]; van Rooij, Lusardi and Alessie, 2012_[27]).

Higher levels of financial literacy have been found to be related not only to the accumulation of assets but also to debt management, with more financially literate individuals opting for less costly mortgages and avoiding high interest payments and additional fees (Disney and Gathergood, 2013_[28]; Lusardi and Tufano, 2015_[29]).

In addition to the benefits identified for individuals, widespread financial literacy can be expected to improve economic and financial stability for a number of reasons (OECD, 2006^[30]). 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 they can protect themselves to a greater extent against the negative consequences of 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 in reducing 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 coordination with other relevant bodies, including the PISA Governing Board and 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, 2005^[31]). 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 200 public institutions from more than 110 countries and economies are members of the INFE as of 2018. Members meet twice yearly to discuss the latest developments in their countries, 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, 2005^[31]). Two main reasons underpin the OECD Recommendation: the importance of focusing on youth in order to provide them with key life skills before they become

active financial consumers, and the relative efficiency of providing financial education in schools rather than attempting remedial actions in adulthood.

At the time when the OECD Recommendation was published, there was a lack of guidance on how to implement financial education initiatives for youth and in schools. The OECD/INFE therefore subsequently developed a dedicated publication, *Financial Education for Youth: The Role of Schools* (OECD, 2014^[32]). The publication includes case studies and guidelines on financial education learning frameworks and on introducing financial education in curricular teaching. It was supported by the Ministers of Finance of the Asia-Pacific Economic Cooperation (APEC) in 2012 (APEC, 2012^[33]) and welcomed by G20 leaders in 2013.

Following a call by the G20 in 2013, the OECD/INFE also developed a *Core Competencies Framework on Financial Literacy for Youth*, which describes the financial literacy outcomes that are likely to be important for 15-18 year-olds and provides a tool for policy makers to develop national learning and assessment frameworks. The lessons learned from developing the PISA 2012 assessment framework and analysing the data thereby collected contributed to the development of this core competencies framework (OECD, 2015^[5]; OECD, 2013^[34]).

The two volumes collecting the results of the PISA 2012 and 2015 financial literacy assessment provide not only international evidence on the distribution of financial literacy among 15-year-old students within and across countries, but also policy suggestions on how policy makers in finance and education can improve it (OECD, 2017^[24]; OECD, 2014^[25]).

Focus on youth

People form habits and behaviours starting at a young age, learning from their parents and others around them, which indicates the importance of early interventions to help shape beneficial behaviours and attitudes (Whitebread and Bingham, 2013^[35]). Furthermore, young people need financial knowledge and understanding from an early age in order to operate within the complex financial landscape they are likely to find themselves in, often even before reaching adulthood. Younger generations are not only likely to face more complex financial products, services and markets but as noted above, they are more likely than their parents to have to bear more financial risks in adulthood. In particular, as the previous discussion illustrates, they are likely to bear more responsibility for the planning of their own retirement savings and investments, and the coverage of their own healthcare needs.

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 recent changes in the financial marketplace and in social welfare systems mean it is unlikely that they can gain sufficient knowledge or information from their friends and family unless they work in related fields.² The majority of young people will

have to apply their skills to search for financial information and solve problems, and will need to 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. The results of the 2012 and 2015 PISA financial literacy assessments revealed that many 15-year-old students have a bank account (OECD, 2017^[24]; OECD, 2014^[25]). 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. As both young people and their families are often unfamiliar with many emerging digital financial services, financial literacy skills would clearly be of benefit to young consumers when using such products. 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, at around the ages of 15 to 18, young people (and their parents) face one of their most important financial decisions: whether or not to invest in tertiary education. The gap in wages between college and non-college educated workers has widened in many economies (OECD, 2016^[36]). At the same time, the education costs borne by students and their families have increased, often resulting in large student loans to repay, reducing students' ability to save and potentially leading to a reliance on credit (Dolphin, 2012^[37]; OECD, 2016^[36]; Ratcliffe and McKernan, 2013^[38]).

Efficiency of providing financial education in schools

Research suggests that, in developed countries, there is a link between financial literacy and family 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, Mitchell and Curto, 2010^[39]). Results of the 2012 and 2015 PISA financial literacy assessments show that a remarkable proportion of the variation in student performance in financial literacy within each country and economy is associated with their family economic, social and cultural status, and that students with at least one parent with tertiary-level education have higher scores, on average, than other students (OECD, 2017^[24]; OECD, 2014^[25]). In order to provide equality of opportunity, it is important to offer financial education to those who would not otherwise have access to it through their families. Schools are well positioned to advance financial literacy among all demographic groups, thereby reducing financial literacy gaps and inequalities.

Recognising both the importance of financial literacy for youth and the unique potential to improve the knowledge and skills of future generations, an increasing number of countries have embarked on the development of financial education programmes for children and young people. These include efforts to introduce financial literacy topics into existing curricular subjects, such as mathematics,

social sciences or citizenship, as well as extracurricular activities, such as national awareness events and educational games.

The need for data

Policy makers, educators and researchers need high-quality data on their students' 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. Indeed, the OECD has developed a questionnaire designed to capture levels of financial literacy amongst adults at an international level, which was used for several international comparative studies (OECD, 2017^[40]; OECD, 2016^[41]). However, until financial literacy was included in the PISA 2012 assessment, there were few data collection efforts on the levels of financial literacy amongst young people under the age of 18, and none that could be compared across countries.

At the national level, a robust measure of financial literacy amongst young people can help identify issues to be addressed through schools or extracurricular programmes. This measure of financial literacy can also be used as a baseline from which to gauge success and review financial education programmes in future years.

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 to possibly identify particularly effective national strategies and practices. It also makes it possible to recognise common challenges and explore the possibility of finding international solutions to the issues faced.

Against this backdrop, the collection of 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 inform the development of more targeted programmes and policies;
- An opportunity to compare financial education strategies across countries and explore good practice; and, ultimately,
- 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.

The measurement of financial literacy in PISA

PISA assesses the readiness of students for their life beyond compulsory schooling and, in particular, their capacity to use their knowledge and skills, by collecting and analysing cognitive and other information from 15-year-olds in many countries and economies.

The PISA financial literacy assessment provides a rich set of comparative data that policy makers and other stakeholders can use to make evidence-based

decisions about financial education. 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 and 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 the proficiency of 15-year-old students in demonstrating and applying knowledge and skills. And like other PISA domains, financial literacy is assessed using an instrument designed to provide data that are valid, reliable and interpretable.

The PISA financial literacy assessment framework developed in 2012 (OECD, 2013^[34]) provided a first step in constructing an assessment that satisfies these three broad criteria. It also provided national authorities with the first detailed guidance about the scope and operational definition of financial literacy, which contributed to the development of national and international frameworks, including the OECD/INFE core competencies framework on financial literacy for youth, (OECD, 2015^[5]).

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, and thereby increases 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 descriptions of students’ proficiency at different levels that can be used to interpret the results.

The development of the PISA frameworks, for financial literacy as for the other domains, can be described as a sequence of the following six steps:

- Developing a definition for the domain and a description of the assumptions that underlie that definition;
- Identifying a set of key characteristics that should be taken into account when constructing assessment tasks for international use;
- Operationalising 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;
- Evaluating how to organise the set of tasks constructed in order to report to policy makers and researchers on the achievement in each assessment domain for 15-year-old students in participating countries;
- Validating the variables and assessing the contribution each makes to understanding task difficulty across the various participating countries; and
- Preparing a described proficiency scale for the results.

The 2018 framework maintains the definition for the financial literacy domain whilst slightly updating the operationalisation of the domain to ensure 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 to lay the groundwork for designing an international financial literacy assessment, the Financial Literacy Expert Group (FEG) looked both to existing definitions of literacies in the other domains assessed by PISA, and to the nature of financial education.

PISA conceives of literacy as the capacity of students 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, 2009^[42]).

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, 2005^[31]).

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 follows:

Financial literacy is the 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 kinds of thinking and behaviour that characterise 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 on which individuals build throughout life, rather than a line to be crossed, with illiteracy on one side and literacy on the other. Literacy involves more than the reproduction of accumulated knowledge; instead, it 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 development of 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 the 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 them 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, but applied in a financial context. They include basic skills in mathematical literacy such as performing basic calculations, computing a percentage, or converting 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 to be 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 the reproduction of knowledge. In assessing financial literacy, this translates into a measure of young people's ability to transfer and apply what they have learnt 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 can refer to a range of financial contexts that relate to young people's current daily lives and experiences, 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 which mobile phone contract they will choose, but they may soon be faced with more significant 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 and is distinguished from economic literacy, which includes concepts such as the theories of supply and demand, and the structure of markets. Financial literacy is concerned with how 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 definitions of literacy in PISA, the definition of financial literacy emphasises 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

How the domain is represented and organised determines how the assessment is designed, including how items are developed, and, ultimately, what evidence about student proficiencies can be collected and reported. Many elements are part of the concept of financial literacy, not all of which can be taken into account and varied in an assessment such as PISA. It is necessary to select the elements that will best ensure the 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 what content, processes and contexts are relevant 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 areas of 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; and

- *Contexts* refers to the situations in which the knowledge, skills and understandings of the domain are applied, ranging from the personal to the global.

The development of the assessment starts by identifying and weighting the different categories within each perspective, and then ensuring that the tasks adequately reflect these categories. These steps ensure the coverage and validity of the assessment. The three perspectives are also helpful in thinking about how achievement in the area is to be reported.

The following section presents a discussion of each of the three perspectives and the categories into which they are divided. For each perspective, the framework presents lists of sub-topics and examples of what students should be able to understand and do; however, these examples should not be interpreted as a checklist of tasks to be included in any one assessment. Given that only one hour of financial literacy assessment material is administered in PISA, there is not enough space to cover every detail of each perspective.

The section includes examples of items drawn from the PISA 2018 field trial and previous assessments in order to illustrate these perspectives and categories. While they are representative of those used in the 2018 main survey, these particular items are not used in the 2018 assessment instrument; only secure, unpublished items are used for this purpose, 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 indicated that there is some consensus on the financial literacy content areas (OECD, 2014^[32]). The review showed that the content of financial education in schools around the world was – albeit with cultural differences – relatively similar, and that it was possible to identify a series of topics commonly included in these frameworks. These form the four content areas for financial literacy in PISA: *money and transactions*, *planning and managing finances*, *risk and reward*, and *financial landscape*. The work undertaken by the OECD/INFE to develop a core competencies framework on financial literacy for youth provides additional guidance on how these content areas map to desired financial literacy outcomes (OECD, 2015^[5]).

Money and transactions

This content area includes awareness of the different forms and purposes of money and managing monetary transactions, which may include being aware of national, foreign and digital currencies; making payments using a variety of available tools including mobile or online ones, taking into account value for money; and using bank cards, cheques and bank accounts. It also covers practices such as taking care of cash and other valuables, calculating value for money, and filing documents and receipts, including those received electronically.

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

- Are aware of the different forms and purposes of money:

- 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 (e.g. on line);
 - 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; and
 - Understand that money can be borrowed or lent, and the purpose of interest (in this respect, the assessment takes into account that the payment and receipt of interest is forbidden in some religions).
- Are confident and capable at handling and monitoring transactions. Students can show that they know how to:
 - Use cash, cards and other payment methods to purchase items;
 - Use cash machines to withdraw cash or obtain 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;
 - Use common tools, such as spreadsheets, online platforms or mobile applications, to monitor their transactions and perform budget calculations; and;
 - Check transactions listed on a bank statement provided on paper or digitally, and note any irregularities.

The following example from the unit BANK STATEMENT illustrates a task that requires students to understand a common financial document. In this question, and in many others, the unit of currency is the imaginary Zed. PISA questions often refer to situations that take place in the fictional country of Zedland, where the Zed is the unit of currency. This artifice (about which students are informed at the beginning of the testing session) has been introduced to enhance comparability across countries.

Figure 5.1. Illustrative PISA Financial literacy item 1 – BANK STATEMENT

Each week, Mrs Citizen transfers 130 zeds into her son’s bank account.

In Zedland, banks charge a fee for each transfer.

Mrs Citizen received this statement from her bank in November 2011.

ZEDBANK				
Statement for: Mrs Citizen		Account type Current		
Month: November 2011		Account number: Z0005689		
Date	Transaction details	Credit	Debit	Balance
1-Nov	Opening balance			1780.25
5-Nov	Wages	575.00		2355.25
5-Nov	Transfer		130.00	2225.25
5-Nov	Transfer fee		1.50	2223.75
12-Nov	Wages	575.00		2798.75
12-Nov	Transfer		130.00	2668.75
12-Nov	Transfer fee		1.50	2667.25
13-Nov	Withdrawal		165.00	2502.25
19-Nov	Wages	575.00		3077.25
19-Nov	Transfer		130.00	2947.25
19-Nov	Transfer fee		1.50	2945.75
26-Nov	Wages	575.00		3520.75
26-Nov	Transfer		130.00	3390.75
26-Nov	Transfer fee		1.50	3389.25
27-Nov	Withdrawal		180.00	3209.25
27-Nov	Withdrawal (Rent)		1200.00	2009.25
30-Nov	Interest	6.10		2015.35

QUESTION:

What were the total fees charged by the bank in November?

Total bank fees in zeds:

This question asks students to interpret a financial document, in this case, a bank statement. Students are required to identify bank fees from the statement and to perform a basic calculation (addition or multiplication). The purpose of the question is to test whether students can find the information on the statement and notice that it is not presented as a total, but as individual transactions. Such skills are fundamental to properly understanding the information received from financial service providers. The correct answer is 6.00.

Planning and managing finances

Income, expenditure and wealth need planning and managing over both the short and long term. This content area therefore 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.

This content area includes:

- The knowledge and ability to monitor and control income and expenses:
 - Identifying 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) and
 - Drawing up a budget to plan regular spending and saving and staying within it.
- The knowledge and ability to make use of income and other available resources in both the short and long term to enhance financial well-being:
 - Understanding 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;
 - Assessing the impact of different spending plans and the ability to set spending priorities in both the short and long term;
 - Planning 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;
 - Understanding the purposes of accessing credit and the ways in which expenditure can be smoothed over time through borrowing or saving;
 - Understanding the idea of building wealth, the impact of compound interest on savings, and the advantages and disadvantages of investment products;
 - Understanding the benefits of saving for long-term goals or anticipated changes in circumstances (such as living independently); and
 - Understanding how government taxes and benefits impact personal and household finances.

The examples MUSIC SYSTEM and ZCYCLE presented below illustrate items addressing *planning and managing finances* in contexts that are relevant to 15-year-olds as they think about their lives in the near future.

Figure 5.2. Illustrative PISA Financial literacy item 2 – MUSIC SYSTEM

Kelly asks her bank to lend her 2000 zeds to buy a music system.

Kelly has the choice to repay the loan over two years or over three years. The annual interest rate on the loan is the same in each case.

The table shows the repayment conditions for borrowing 2000 zeds over two years.

Repayment period	Monthly repayment (zeds)	Total repayment (zeds)	Total interest paid (zeds)
Two years	91.67	2200.08	200.08

QUESTION:

How will the repayment conditions for borrowing 2000 zeds over three years be different to the repayment conditions over two years?

Circle “True” or “False” for each statement.

Statement	Is the statement true or false?
The monthly repayments will be larger for a loan over three years.	True / False
The total interest paid will be larger for a loan over three years.	True / False

The question MUSIC SYSTEM asks students to determine the effects of extending the loan repayment period from two to three years on the monthly interest payments and on the total interest paid when the annual interest rate does not change. As credit is widely available to young people and may be offered as an option when making a purchase in some countries, it is important that they understand how loans work so that they can make an informed decision about what is the best option for them. Students may be confronted with such a decision in the near future, for example, if they look to buy equipment to start a business or durable goods to furnish a home. The question requires anticipating the future consequences of choosing loans with different durations, without having to perform any calculations. Full credit for this question is gained by replying False and True in that order.

The unit ZCYCLE provides an example of another task that falls within the *planning and managing finances* content area. ZCYCLE is also an example of an interactive item where students use a hypothetical mobile application to find relevant information and support their reasoning.

The first screenshot provides students with an introduction to a bike-sharing application that can be used to manage membership and fees.

Figure 5.3. Illustrative PISA Financial literacy item 3 – ZCYCLE

Go to item:

PISA 2018

ZCycle
Introduction

A new bike-sharing program called ZCycle was just introduced in Zedtown. Riders can pick up bikes at one bike station and then drop them off at another when they are finished riding.

In order to use ZCycle you must become a member and pay a membership fee.

Membership for ZCycle is handled through a smartphone app, as shown on the right.

To see the different prices for each plan:

- Click on "Annual" to see the annual membership fee.
- Click on "Monthly" to see the monthly membership fee.
- Select "1" ride at 61-120 minutes and "1" at 121 minutes or more to see those fees.
- Click on "Calculate Total" to see the total charge.
- Click on new selections and "Calculate Total" to see different options.

ZCycle
Bike-Sharing

Membership Fee		Zeds
<input type="radio"/>	Annual	
<input type="radio"/>	Monthly	
	<input type="text" value="Number of Months"/>	
Number of Rides	Length of Rides (minutes)	
Unlimited	Up to 60	FREE
<input type="text"/>	61 - 120	
<input type="text"/>	121 or more	
TOTAL		

The following screenshot presents the question.

Figure 5.4. Illustrative PISA Financial literacy item 3 – ZCYCLE – Question

1 Go to item:

PISA 2018

ZCycle
Question 1 / 4

▶ **How to Use the ZCycle App**

Refer to the ZCycle app on the right. Using the number keys, type your answer to the question.

Julie would like to use ZCycle to commute to and from work during the week. It will take her 45 minutes to ride to work and the same to ride home.

She would also like to use the bike twice a month on the weekends for bike rides that will be more than three hours long.

What would be Julie's total cost for a one-month membership?

 zeds

ZCycle
Bike-Sharing

Membership Fee		Zeds
<input type="radio"/>	Annual	
<input type="radio"/>	Monthly	
	<input style="width: 50px;" type="text"/> Number of Months	
Number of Rides	Length of Rides (minutes)	
Unlimited	Up to 60	FREE
<input style="width: 50px;" type="text"/>	61 - 120	
<input style="width: 50px;" type="text"/>	121 or more	
TOTAL		

In this question students are asked to use the application to figure out how much membership in the bike-sharing scheme would cost given that Julie would like to use the bike for relatively short rides during the week and two longer rides during the weekend. This question falls into the *planning and managing finances content* area because students need to demonstrate the ability to put together different pieces of information on the relevant fees to choose among different options and plans. The correct response is 32 (the monthly fee is 20 zeds and each ride of at least 121 minutes costs 6 zeds).

Risk and reward

Risk and reward is a key area of financial literacy, incorporating the ability to identify ways of balancing and covering risks and managing finances in uncertainty and an understanding of the potential for financial gains or losses across a range of financial contexts. Two types of risk are of particular importance in this domain. The first relates to the risk of financial losses that an individual cannot cover using personal resources, such as those caused by catastrophic events. The second is the risk inherent in financial products, such as the risk of facing an increase in repayments on a credit agreement with variable interest rates, or the risk of loss or insufficient returns on 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 being able to make a general assessment of the level of risk and reward related to different products, purchases, behaviours or external factors.

This content category includes:

- Recognising 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):
 - Knowing how to assess whether certain insurance policies may be of benefit, and the level of cover needed.
- Applying knowledge of the benefits of contingency planning and diversification, and of the dangers of defaulting on bill and loan payments 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; and
 - Various forms of credit, including informal and formal credit, unsecured and secured, rotating and fixed term, and those with fixed or variable interest rates.
- Knowing about and managing the 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, and deteriorating health or mobility;
 - Fluctuations in interest rates and exchange rates; and
 - Other market changes.
- Knowing about the risks and rewards associated with substitutes for financial products, in particular:
 - Saving in cash, or buying property, livestock or gold as a store of wealth; and
 - Taking credit or borrowing money from informal lenders.
- Knowing that there may be unidentified risks and rewards associated with new financial products (such as mobile payment products and online credit).

An illustration from the *risk and reward* content category is provided in the example MOTORBIKE INSURANCE.

Figure 5.5. Illustrative PISA Financial literacy item 4 – MOTORBIKE INSURANCE

Last year, Steve’s motorbike was insured with the PINSURA insurance company. The insurance policy covered damage to the motorbike from accidents and theft of the motorbike.

QUESTION:

Steve plans to renew his insurance with PINSURA this year, but a number of factors in Steve’s life have changed since last year.

How is each of the factors in the table likely to affect the cost of Steve’s motorbike insurance this year?

Circle “Increases cost”, “Reduces cost” or “Has no effect on cost” for each factor.

Factor	How is the factor likely to affect the cost of Steve’s insurance?
Steve replaced his old motorbike with a much more powerful motorbike	Increases cost / Reduces cost / Has no effect on cost
Steve has painted his motorbike a different colour	Increases cost / Reduces cost / Has no effect on cost
Steve was responsible for two road accidents last year	Increases cost / Reduces cost / Has no effect on cost

Motorbike insurance falls under the content area of *risk and reward* because insurance is a product designed specifically to protect individuals against risks and financial losses that they would not otherwise be able to bear. Whilst insurance companies can provide many different products with different pricing options, they apply basic actuarial principles when calculating risk. The question tests whether students understand that the higher their risk exposure is with regards to measurable criteria, the more it will cost them to buy the same level of insurance cover. The correct answers are “Increases cost”, “Has no effect on cost”, and “Increases cost”, in that order.

Financial landscape

This content area relates to the character and features of the financial world. It covers an awareness of the role of regulation and protection for financial consumers, knowing the rights and responsibilities of consumers in the financial marketplace and within the general financial environment, and the main implications of financial contracts that they may enter into in the near future, either with parental consent or alone. The financial landscape also takes into account the wide variety of information available on financial matters, from education to advertising. 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, sustainability and environmental targets or welfare benefits for individuals, households and society. The content in this area includes:

- Awareness of the role of regulation and consumer protection.
- Knowledge of rights and responsibilities, such as:
 - Understanding that buyers and sellers have rights, such as being able to apply for redress;
 - Understanding that buyers and sellers have responsibilities, such as:
 - For consumers and investors, giving accurate information when applying for financial products;
 - For providers, disclosing all material facts; and
 - For consumers and investors, being aware of the implications of one of the parties not doing so.
 - Recognising the importance of the legal documentation provided when purchasing financial products or services and the importance of understanding the content therein.
- Knowledge and understanding of the financial environment, including:
 - Identifying which providers are trustworthy, and which products and services are protected through regulation or consumer protection laws;
 - Identifying whom to ask for advice when choosing financial products, and where to go for help or guidance in relation to financial matters;
 - Awareness of existing financial crimes such as identity theft, data theft, online fraud and other 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; and
 - Awareness of the potential for new forms of financial crime and alertness to the risks.
- Awareness of the financial risks and implications of sharing personal data, and awareness that personal data may be used to create a person's digital profile, which can be used by companies to offer targeted products and services.
- Knowledge and understanding of the impact of their own financial decisions on themselves and others, and on the environment:
 - Understanding that individuals have choices in spending and saving, and that each action can have consequences for the individual and for society; and
 - Recognising how personal financial habits, actions and decisions have an impact at the individual, community, national and international levels.
- Knowledge of the influence of economic and external factors:

- Awareness of the economic climate and understanding of the impact of policy changes such as reforms related to the funding of post-secondary education or compulsory savings for retirement;
- Understanding how the ability to build wealth or access credit depends on economic factors such as interest rates, inflation and credit scores; and
- Understanding that a range of external factors, such as advertising and peer pressure, can affect individuals' financial choices and outcomes.

The item MOBILE PHONE CONTRACT provides an example of a question about the *financial landscape*.

Figure 5.6. Illustrative PISA Financial literacy item 5 – MOBILE PHONE CONTRACT

Alan wants a mobile phone but he is not old enough to sign the contract.
His mother buys the phone for Alan and signs a one-year contract.
Alan agrees to pay the monthly bill for the phone.
After 6 weeks, Alan's mother discovers that the bill has not been paid.

QUESTION:

Is each statement about the mobile phone bill true or false?

Circle "True" or "False" for each statement.

Statement	Is the statement about the mobile phone bill true or false?
Alan's mother is legally responsible for paying the bill.	True / False
The mobile phone shop must pay the bill if Alan and his mother do not.	True / False
The bill does not have to be paid if Alan returns the mobile phone to the shop.	True / False

To answer this question correctly, students should understand the legal implications of financial contracts and recognise the potential financial consequences on others (Alan's mother) if a contract is not honoured (if Alan does not pay the phone bill). Even if they cannot sign contracts at 15, students will soon be confronted with legal obligations and their financial consequences. In order to get full credit, students should answer True, False and False, in that order.

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. Four process categories have been defined in PISA's financial literacy domain: *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^[43]), an important distinction is that the processes in the financial literacy construct are not operationalised as a hierarchy of skills. They are, instead, parallel 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, 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 this 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 2018, the information is in the form of texts such as contracts, advertisements, charts, tables, forms and instructions displayed on 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.

Example 6, PAY SLIP, shows an item that focuses on identifying and interpreting financial information.

Figure 5.7. Illustrative PISA Financial literacy item 6 – PAY SLIP

Each month, Jane's employer pays money into Jane's bank account.

This is Jane's pay slip for July.

EMPLOYEE PAY SLIP	Jane Citizen	
<i>Position</i>	Manager	1 July to 31 July
<i>Gross salary</i>	2 800 zeds	
<i>Deductions</i>	300 zeds	
<i>Net salary</i>	2 500 zeds	
<i>Gross salary to date this year</i>	19 600 zeds	

QUESTION:

How much money did Jane's employer pay into Jane's bank account on 31 July?

- A. 300 zeds
- B. 2 500 zeds
- C. 2 800 zeds
- D. 19 600 zeds

Students are asked to identify financial information in a simple pay slip and to indicate that the correct answer is 2 500 zeds.

The question BANK STATEMENT presented previously also belongs to the category *identifying financial information* as it requires the student to identify bank fees in a commonly used financial document, in that case, a bank statement.

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 PHONE PLANS.

Figure 5.8. Illustrative PISA Financial literacy item 7 – PHONE PLANS

Ben lives in Zedland and has a mobile phone. In Zedland, there are two different kinds of phone plans available.

Plan 1

- You pay the phone bill at the end of the month.
- The bill is the cost of the calls you make **plus** a monthly fee.

Plan 2

- You buy credit for the phone in advance.
- The credit lasts for a maximum of one month or until all credit has been used.

Ben decides to use Plan 1. He must now choose which phone company to use.

The table below shows the details of the four different phone companies that offer Plan 1. All costs are shown in zeds.

	Company 1	Company 2	Company 3	Company 4
Monthly fee (zeds)	20	20	30	30
Cost of call per minute (zeds)	0.27	0.25	0.30	0.25
Number of free minutes per month	90	90	60	60
Cost of text message (zeds)	0.02	0.02	free	0.01
Number of free text messages per month	200	100	unlimited	200

QUESTION:

I speak on the phone for about an hour each day, but I very rarely send text messages.

Which company offers the best financial deal for Ben?

- Company 1
- Company 2
- Company 3
- Company 4

This question in the unit PHONE PLANS illustrates the process of *analysing information in a financial context* by looking at students' ability to select the most suitable telephone plan for a particular individual. Students are required to compare the conditions offered by different mobile phone companies by looking at multiple dimensions, such as flat fees, cost of calls and cost of messages, select the ones that are most relevant, and find the best offer for a given need. To get full credit, students should indicate that Company 2 offers the best deal for Ben's needs.

The item MUSIC SYSTEM is another example of *analysing information in a financial context* as students are asked to identify the implications of changing the duration of a loan on the total interest paid and the monthly repayments. The item MOTORBIKE INSURANCE is also an example of a question requiring students to *analyse information in a financial context*, as students have to show an understanding of the implications of different factors on the cost of insurance.

Evaluate financial issues

In this process the focus is on recognising or constructing financial justifications and explanations, by applying financial knowledge and understanding to specific 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 understandings. 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 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 deciding on the relative financial merits of making a purchase or deferring it, given specified financial circumstances.

ONLINE SHOPPING provides an example of a demanding task that falls within the *evaluate financial issues* category.

Figure 5.9. Illustrative PISA Financial literacy item 8 – ONLINE SHOPPING

QUESTION:

Kevin is using a computer at an Internet café. He visits an online shopping website that sells sports equipment. He enters his bank card details to pay for a football.

The security of financial information is important when buying goods on line.

What is one thing Kevin could have done to increase security when he paid for the football on line?

The question ONLINE SHOPPING asks students to reflect on the potential risks of conducting financial transactions on line using computers in public places and to evaluate those risks. Internet cafés are less widespread in developed countries than they were when the item was designed, but young people may still be sharing computers with friends, and may make payments on line in public places or use public Wi-Fi to access personal data. In the case of ONLINE SHOPPING, all of the necessary information is provided in the question, but to gain credit students need to identify what is relevant and reflect on the consequences of taking a particular action. Various responses are awarded full credit, such as referring to using a secure computer rather than one in a public place, using a more secure or safer method of online payment, or using a trusted website.

The item MOBILE PHONE CONTRACT is also an example of evaluating financial issues, because students should use their critical thinking to recognise the implications of a contract.

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 increase or decrease over time when prices are changing at a given rate. In this case, knowledge about inflation needs to be applied.

The following example, RINGTONES, falls into the process category *apply financial knowledge and understanding*.

Figure 5.10. Illustrative PISA Financial literacy item 9 – RINGTONES

Colin sees this advertisement in a magazine for teenagers.

Get **Cheeky Monkey™** ringtones for your phone.
Your phone will make a monkey noise when your friends call you.

Get one **NOW** for only **3 zeds***



Text the word **MONK** to **13 45 67**

* Each ring-tone costs 3 zeds. By texting MONK to 13 45 67 customer agrees to receive a different Cheeky Monkey™ ring-tone every day. Customer can cancel contract at any time by texting STOP to 13 45 67. Cancellation fee is 5 zeds.

QUESTION:

Colin has 30 zeds credit on his phone.

He texts the word MONK to 13 45 67.

Colin does **not** use his phone again to make calls or send texts. He does **not** add any more credit.

How much credit will Colin have on his phone exactly one week later?

Credit in zeds:

This question asks students to pay attention and interpret the small print to understand the terms and conditions of buying a service, and then to calculate the implications for the true cost. When developed as a test item for the 2012 assessment, this question presented a widely relevant situation; while ads for ringtones may have changed in the meantime in some countries, students continue to receive advertisements, as for purchases through digital games and apps, in a similar format. The question falls in the category *Apply financial knowledge and understanding* because it asks students to perform basic calculations (multiplication and subtraction) taking into account multiple elements that are not immediately evident (by buying one ringtone the user agrees to receiving – and pays for – a ringtone every day). This item also highlights a wider issue that young people face when starting to make financial decisions and budget their own money. An impulse decision to make a purchase of 3 zeds without first reading the small print would cost the student a minimum of 8 zeds even if they recognised their error immediately. The correct response is 9 or 6, recognising the potential ambiguity as to when the first or last download occurs.

Contexts

In building a framework, and developing and selecting assessment items based on this framework, attention is given to the breadth of contexts in which the domain literacy is exercised. 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 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 set in general, everyday situations, which may take place in but are not confined to the school. The focus may be on the individual, family or peer group, on the wider community, or even more widely on a global scale.

The contexts identified for the PISA financial literacy assessment are *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 students sitting the PISA assessment, 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. Furthermore, many will move from education into some form of employment, including self-employment, before reaching their twenties.

Typical tasks within this context 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.

Item PAY SLIP illustrates a task designed to fall into the *education and work* context category. This question asks students to address problems related to earning income and identifying information on a payslip, which is a situation that students will soon encounter as they grow up.

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 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.

Both the items MOBILE PHONE CONTRACT and BANK STATEMENT discussed previously provide an illustration of the *Home and family* context, as both look at the interaction between a parent and her child and present typical situations that may happen in a family.

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; as well as subscriptions for season tickets or 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 impact 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 associated with the operation. The *individual* context 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.

Items from the *individual* context category include MUSIC SYSTEM, ZCYCLE, MOTORBIKE INSURANCE, PHONE PLANS and RINGTONES. All of them illustrate decisions that impact the individual, like choosing a loan or a phone plan, planning monthly expenses, renewing insurance, and paying attention to hidden costs.

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 their consequences 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 matters such 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 extends also to considering financial choices such as donating to non-profit organisations and charities.

The task ONLINE SHOPPING shown earlier is categorised as falling within the *societal* context, since it relates to the protection of financial data and the risk of fraudulent behaviour targeted across society.

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 (Mandell and Klein, 2009^[44]; Arellano, Cámara and Tuesta, 2014^[45]; Palameta et al., 2016^[46]). 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 how they interact with the cognitive elements of financial literacy. Information collected about the financial attitudes and behaviour of 15-year-olds might constitute useful baseline data for any longitudinal investigation of the financial literacy of adults, including their financial behaviours.

The FEG identified four non-cognitive factors for inclusion 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 experience with all the financial contexts and decisions that their children face (Gudmunson and Danes, 2011^[47]; Otto, 2013^[48]). Copying and discussing financial behaviours with friends is another important source of socialisation, but this also may vary in terms of quality and reliability, with research from the UK indicating that money is rarely talked about honestly (Money Advice Service, 2014^[49]). Moreover, the amount and quality of formal education and training about money and personal finance received by students varies within and across countries (OECD, 2014^[32]).

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 the typical sources of information that they access 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. The 2018 student questionnaire also asks students whether they have heard of or learnt about specific financial concepts during school lessons and whether they have encountered some types of tasks about money matters at school.

In addition, 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 and 2015 PISA financial literacy exercise showed that in some countries, 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, 2017^[24]; OECD, 2014^[25]). Whilst 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. In order to further understand the potential role of learning through experience, the 2018 non-cognitive student questionnaire collects evidence on a range of practical financial experiences, such as making payments using a mobile phone or making online purchases.

Students who have had more personal experience of 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 parents who are more involved (Drever et al., 2015^[50]). The 2018 framework therefore recognises the importance

of knowing whether students have access to money, through which channels, and to what extent spending and savings decisions are discussed with parents.

Attitudes towards and confidence about financial matters

The PISA definition of financial literacy highlights the important role of attitudes. Individual preferences can be related to financial behaviour and the ways in which financial knowledge is used. PISA 2012 showed that students' perseverance and openness to problem solving were strongly associated to their financial literacy scores (OECD, 2014^[25]). PISA 2015 showed a positive association between students' financial literacy and their motivation to achieve (OECD, 2017^[24]). In addition to this, 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, Grönqvist and Lindahl, 2014^[51]; Lee and Mortimer, 2009^[52]; Meier and Sprenger, 2013^[53]). Moreover, confidence in one's own ability to make a financial decision may make it more likely that a student will work through complex financial problems or carefully make choices across several possible products. At the same time, however, confidence may turn into over-confidence, leading to mistakes and overly risky decisions. The 2018 framework therefore recognises the importance of investigating students' perception of their own financial skills and asks them about their confidence in dealing with various financial matters, from understanding a bank statement to using digital devices to make payments.

Spending and saving behaviour

While items on 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. In particular, the PISA 2018 assessment explores how students make spending decisions, such as whether they compare prices, check change or buy items that cost more than they intended to spend, and whether decisions are made alone or with the guidance or recommendation of a trusted adult.

Assessing financial literacy

The structure of the assessment

In 2012, the PISA financial literacy assessment was developed as a one-hour pen-and-paper exercise, to be completed alongside one hour of material from other cognitive domains. The financial literacy assessment was comprised of 40 items divided into two clusters, chosen from 75 tasks initially administered during the field trial. The choice of items was made based on their psychometric properties, ensuring that each item discriminated between high- and low-scoring students.

In 2015, items were transferred to a computer-based delivery platform, and additional items were developed for this form of delivery in order to replace items that had been released to the public in the report of the 2012 results and were

therefore no longer valid for testing purposes. The 2015 financial literacy assessment was developed as a one-hour exercise, comprising 43 items divided into two clusters. All students sitting the financial literacy test also sat the standard PISA test of science, reading and mathematics.

New items were developed for the 2018 assessment. These incorporate specially developed interactive elements, in order to provide additional reality and interest for students. For instance, some interactive items require the student to actively seek more information by clicking links, rather than relying solely on the information presented on the first screen. Others include graphs that can be manipulated to see a variety of potential outcomes. Such items allow the student to test different scenarios and explain why certain outcomes occur, while at the same time eliminating the need to make calculations and allowing students to focus on financial decisions.

Twenty new interactive items were designed for the 2018 field trial in order to cover all dimensions of the framework and the different levels of difficulty. Out of these, 14 items were retained for the main 2018 survey. These are used alongside non-interactive items developed for the 2012 and 2015 assessments in order to ensure that the overall set of items continues to provide the necessary links across waves of data collection, and to provide the necessary breadth of coverage across the framework. Overall, the PISA 2018 financial literacy assessment consists of 43 items for a total of a one-hour financial literacy exercise.

As with other PISA assessment domains, computer-based financial literacy items are grouped in units comprising one or more 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 comprise a broad sample of items covering a range of difficulty that allow the strengths and weaknesses of students and key subgroups to be measured and described.

Response formats and coding

Some PISA items require short descriptive responses, others require more direct responses of one or two sentences or a calculation, and 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 the complex multiple-choice item, in which students respond to a series of “Yes/No”-type questions. Selected-response items are typically regarded as most suitable for assessing whether students can identify and recognise information, but they are also a useful way of measuring students’ understanding of higher-order concepts that they may not easily be able to express.

Although particular item formats lend themselves to specific types of questions, care needs to be taken that the format of the item does not affect the interpretation of the results. Research suggests that different groups (for example, boys and girls, or students in different countries) respond differently 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 comparison of the PISA reading literacy assessment and the IEA Reading Literacy Study (IEARLS), Lafontaine and Monseur (2006^[54]) found that response format had a significant impact on the performance of the different genders. In another study, countries were found to show differential item difficulties in the PISA reading assessment on items in different formats (Grisay and Monseur, 2007^[55]). This finding may relate to the fact that students in different countries are not equally familiar with the particular formats. In summary, the PISA financial literacy option includes items in a variety of formats to minimise the possibility that the item format influences overall student performance. Such an influence would detract from the intended object of measurement, in this case, financial literacy.

The resources available to code students’ responses and the equity issues discussed in the preceding paragraphs must both be weighed when considering the distribution of item formats. Selected-response items have predefined correct answers that can be computer-coded, therefore demanding fewer resources. While some of the constructed-response items are automatically coded by computer, some elicit a wider variety of responses that cannot be categorised in advance, thus requiring human coding from expert judges. The proportions of constructed- and selected-response items are determined taking into account all of these considerations. The majority of the items selected for the PISA 2018 main survey were automatically coded. Only 13 out of 43 items were human-coded.

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 a more nuanced scoring of items, to take into account that some answers, even though incomplete, are better than others.

Distribution of score points

In this section, we outline the distribution of score points across the categories of the three main framework characteristics discussed previously. 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. The assessment contains a mix of original items, developed for the 2012 assessment, and those items developed for the 2015 and 2018 assessments. In particular, care was taken to ensure that the interactive items cover most of the framework perspectives discussed above (content areas, processes and contexts).

While each PISA financial literacy item is categorised according to a single content area, a single process and a single context category, it is often the case that 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 by financial literacy content areas is shown in Table 5.1. The distribution reflects that *money and transactions* is considered to be the most relevant content area for 15-year-olds.

Table 5.2 shows the target distribution of score points over the four processes. The weighting shows that greater importance was attributed to *evaluating financial issues* and *applying financial knowledge and understanding*.

Table 5.3 shows the target distribution of score points over the four contexts. Consistent with an assessment of the personal financial literacy of 15-year-olds, there is a clear emphasis on scenarios focussing on the *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.

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 contexts

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

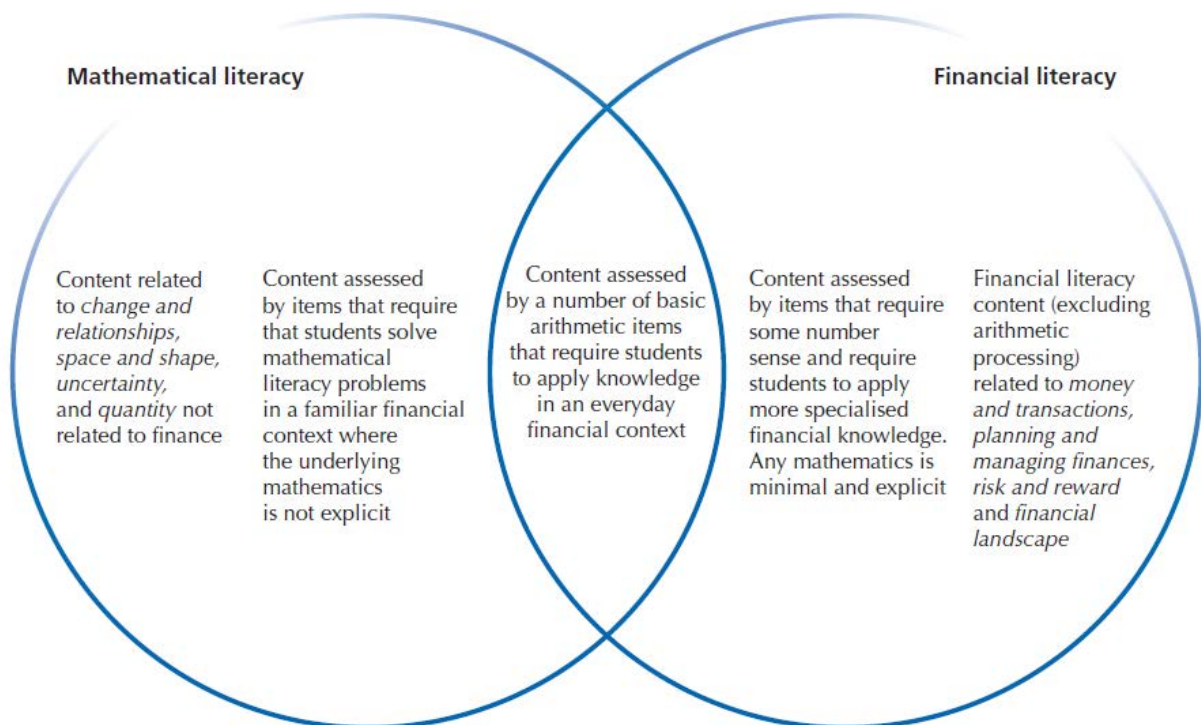
The impact of knowledge and skills in other domains on financial literacy

A certain level of numeracy (or mathematical literacy) is regarded as a necessary condition of financial literacy. Houston (2010_[56]) 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 the 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 that there will be a risk of losing money and (sometimes) a possibility of gains in a particular situation or for a particular financial product. This is a non-numerical 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, quantity-related proficiencies are applied to problems requiring more financial knowledge than can be expected in the mathematical literacy assessment. Figure 5.11 represents the relationship between the content of mathematical literacy and financial literacy in PISA.

Figure 5.11. 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. Use of financial formulae (requiring capability with algebra) is not considered appropriate for the assessment. The assessment minimises the need for substantial or repetitive calculation. The calculators used by students in their classrooms and on the PISA mathematics assessment will also be available in the financial literacy assessment, but success in the items will not depend on calculator 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 proficiency varies widely both within and across countries (OECD, 2010_[57]). 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, 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 FEG 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 and 2015 PISA financial literacy assessments gave a more precise measure of how students' performance in financial literacy was related to their mathematics and reading performance. In 2015, around 38% of the financial literacy score reflected factors that are uniquely captured by the financial literacy assessment (25% in 2012), while the remaining 62% of the financial literacy score reflected skills measured in the mathematics and/or reading assessments (75% in 2012) (OECD, 2017_[24]; OECD, 2014_[25]). The association between financial literacy and the 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 (OECD, 2017_[24]; OECD, 2014_[25]).

Reporting financial literacy

The data from the 2012 and 2015 financial literacy assessments are available at <http://www.oecd.org/pisa/data/>. The databases include financial literacy, reading and mathematics scores (as well as science scores in 2015), behavioural data from the short questionnaire on financial literacy, and data from the general student questionnaire and school questionnaire (a section on financial education was included in the school questionnaire only in 2012).

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

The financial literacy cognitive data is scaled in a similar way to data in other PISA domains. A comprehensive description of the modelling technique used for scaling can be found in the *PISA Technical Report* (OECD, 2014^[58]; OECD, 2017^[59]).

Each item is associated with a particular location on the PISA financial literacy scale of difficulty, and each student's performance is associated with a particular location 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 getting each task correct. The relative proficiency of each student is estimated by considering the proportion of test items that they answer correctly and the difficulty of those items. A single continuous scale showing the relationship between the difficulty of items and the proficiency of students is constructed. Following PISA practice, a scale is constructed with a mean of 500 and a standard deviation of 100 among participating OECD countries.

The scale was divided into levels according to a set of statistical principles, following which descriptions of each level were generated based on the tasks located within each level. These descriptions encapsulate the kinds of skills and knowledge needed to successfully complete those tasks. The scale and set of descriptions are known as a described proficiency scale. The described proficiency scale helps in interpreting what students' financial literacy scores mean in substantive terms.

Five levels of proficiency in financial literacy were described in the 2012 assessment (OECD, 2014^[25]). The same descriptions of the proficiency levels are used in the 2015 and 2018 financial literacy assessment.

Notes

¹ Financial inclusion has 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 remain unbanked (Demirguc-Kunt et al., 2015^[60]).

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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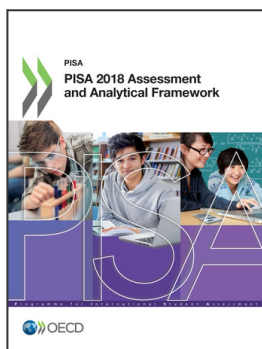
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