# Chapter 3: CONTEXT QUESTIONNAIRE DEVELOPMENT

## INTRODUCTION

The context questionnaires in PISA-D provide information on the learning context at the individual level for students and teachers, at the school level for school administrators, and the national level. A review of the experience of low- and middle-income countries participating in cycles from PISA 2000 to 2015 found that the PISA questionnaires did not capture some of the most relevant contextual factors for these countries (Lockheed, Bruer and Shadrova, 2015). Therefore, efforts were made to improve them. PISA-D enhanced the contextual questionnaires by measuring students' educational attainment, engagement, and health and wellbeing as key outcomes that sit alongside the measures of reading, mathematics, and science achievement. The questionnaires also measured in detail a small set of classroom and school processes that earlier literature has found to be related to these outcomes. For each of these processes, the questionnaires included items on one or more constructs, as well as supplementary questions that captured supporting content that provide a broader context for these processes. In addition, the measure of economic, social, and cultural status (ESCS) used by PISA was extended to better capture lower levels of home possessions in the context of the PISA-D countries, which is used as a proxy for family income. This enabled the development of a four-category measure of poverty as it pertains to educational development.

This chapter presents the framework for the PISA-D contextual questionnaires. The first four sections define the contextual assessment, explaining (1) the Education Prosperity framework that shaped the enhancements made to the contextual questionnaires for PISA-D, (2) the model for assessing equality and equity, (3) the selection and organisation of the content of the PISA-D instruments, and (4) the potential of PISA-D to inform education policy. The final section describes the steps taken for quality assurance in the development of the questionnaires. Technical details regarding the scaling and psychometric properties of these measures are described in Chapter 16.
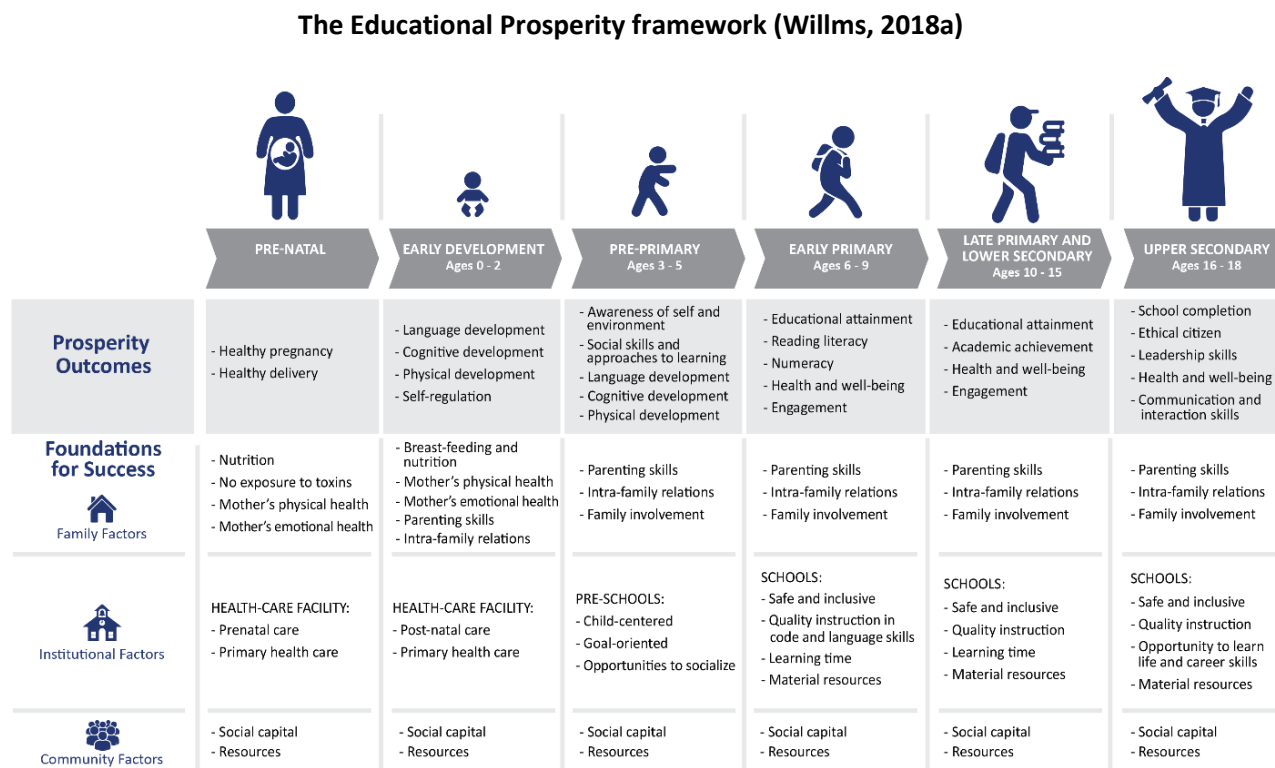
## EDUCATIONAL PROSPERITY

The capacity of a society to develop young people's literacy skills and well-being depends on its ability to provide the right kinds of human and material resources to support healthy development from conception to adolescence and beyond. The PISA-D questionnaire framework draws on the Educational Prosperity framework (Willms, 2018a; 2018b), which follows a life-course approach to assessing children's outcomes and the salient factors that shape these outcomes over a student's or youth's lifetime. Educational Prosperity refers to the success of the education system in developing children's cognitive skills and their social, emotional, physical, and spiritual well-being. The term "prosperity" simply refers to the condition of experiencing

success or thriving (Willms, 2018a).

The Educational Prosperity framework (Willms, 2018a) is shown in Figure 3.1. The framework includes six stages of development, covering the period from conception to upper secondary. Each stage includes a small set of outcomes, called "Prosperity Outcomes", and a number of family, institutional, and community factors that drive these outcomes called "Foundations for Success".

■ Figure 3.1 ■

**The Educational Prosperity framework (Willms, 2018a)**



The in- and out-of-school components of PISA-D focus on the Prosperity Outcomes and the Foundations for Success for the fifth stage of the Educational Prosperity framework, while the out-of-school component also collects some data on earlier stages.

### Prosperity outcomes

The framework for PISA-D conceptualises success as cumulative, emphasising that development at age 15 is a product of children's environments and experiences since birth. The prosperity outcomes include measures of academic performance, educational attainment, engagement at school, and health and well-being. The Educational Prosperity framework was adapted to fit with the needs of the PISA-D participating countries, taking account of analysis of the results of low- and middle-income countries in PISA studies, reviews of relevant international and regional studies, and consultation with representatives of the participating countries.

**Foundations for success**

The Foundations for Success are factors that affect children's outcomes at each stage of development. For example, from ages 3 to 5, children's development is affected by parents' engagement with the child and intra-family relations as well as by the quality of care at home and in early childhood centres. The foundations are considered to be universal in that they are necessary conditions for success at each stage of development. The selection of the foundation factors was based on theories of child development and a large body of research that provides evidence of the effects of each factor on student outcomes.

Three criteria were considered in determining which factors to include as Foundations for Success: the factors must be potent, proximal, and pervasive (Willms, 2018a, 2018b). A "potent" factor is one that has a strong correlation with an outcome or set of outcomes. For example, the quality of classroom instruction is arguably the most important driver of student outcomes during the schooling period (Anderson, 2004; Rosenshine, 2010; Kyriakides, Christoforou and Charalambous, 2013; Creemers and Kyriakides, 2006).

A "proximal" factor is close to the outcome in the sense that its relationship with the outcome is not mediated through some other factor. For example, the quality of classroom instruction has a direct, positive relationship on student outcomes, without any intervening factors. "Principal leadership" is also an important factor and several studies have shown that it is correlated with student outcomes. However, it is not proximal because the "effects" of principal leadership are mediated through the school-related foundations factors, namely inclusive context, quality instruction, learning time, and material resources. Thus, a jurisdiction may allocate resources to improving principal leadership, but this would only result in improved outcomes if it led to improvements in quality instruction, increased learning time, and so on.

A "pervasive" factor is positively correlated with a wide range of outcomes, although the strength of the correlation may vary with each outcome. For example, the effects associated with an "inclusive school context" not only affect student's academic performance, but also their educational attainment, their health and well-being, and their social, institutional and intellectual engagement.

## EQUALITY, EQUITY, AND ACCESS

The terms "equality" and "equity" have been used by researchers and policy makers to denote several different concepts. These include, for example, the achievement gap between low- and high-status groups, differences in access to schooling, and the segregation of students into different types of schools and school programmes. Willms (2011) argued in the OECD's 2011 *Education at a Glance* (OECD, 2011) that equality and equity should be defined as separate concepts and measured with a consistent approach, with equality referring to differences among sub-populations in the distribution of their educational outcomes and equity referring to differences among sub-populations in their access to the resources and schooling processes that affect schooling outcomes.

Based on this approach, PISA-D defines equality as the differences among groups in the

distribution of prosperity outcomes, which are performance, attainment, student engagement, and health and well-being. Equity, on the other hand, has to do with ensuring that all children benefit in the same way from school. It can be measured by examining whether children from different groups have equal access to the five foundations of success, which for PISA-D are inclusive environments, quality instruction, learning time, material resources, and family and community support. Lower equity in the foundation factors increases inequalities in outcomes. For example, when disadvantaged children are taught in schools with lower levels of instructional resources and school infrastructure, it inevitably results in socioeconomic inequalities in attainment, academic performance, engagement, and health and well-being.

If we consider equality and equity in reading performance for students from differing socioeconomic backgrounds, for example, equality is assessed by examining the relationship between reading performance and socioeconomic status, while equity is assessed by examining the relationship between socioeconomic status and the foundation factors that are considered core to learning how to read.

The PISA-D questionnaires collect information on several demographic factors that impact equality and equity and are relevant to both the in-school and out-of-school population. The framework focuses in particular on gender, disability, language, immigrant background, socioeconomic status, and poverty. This model is characterised in Figure 3.2 (Willms, 2018a; modified from Willms, Tramonte, Duarte and Bos, 2012).

■ Figure 3.2 ■

**Equality and equity in PISA-D (Willms, 2018a)**
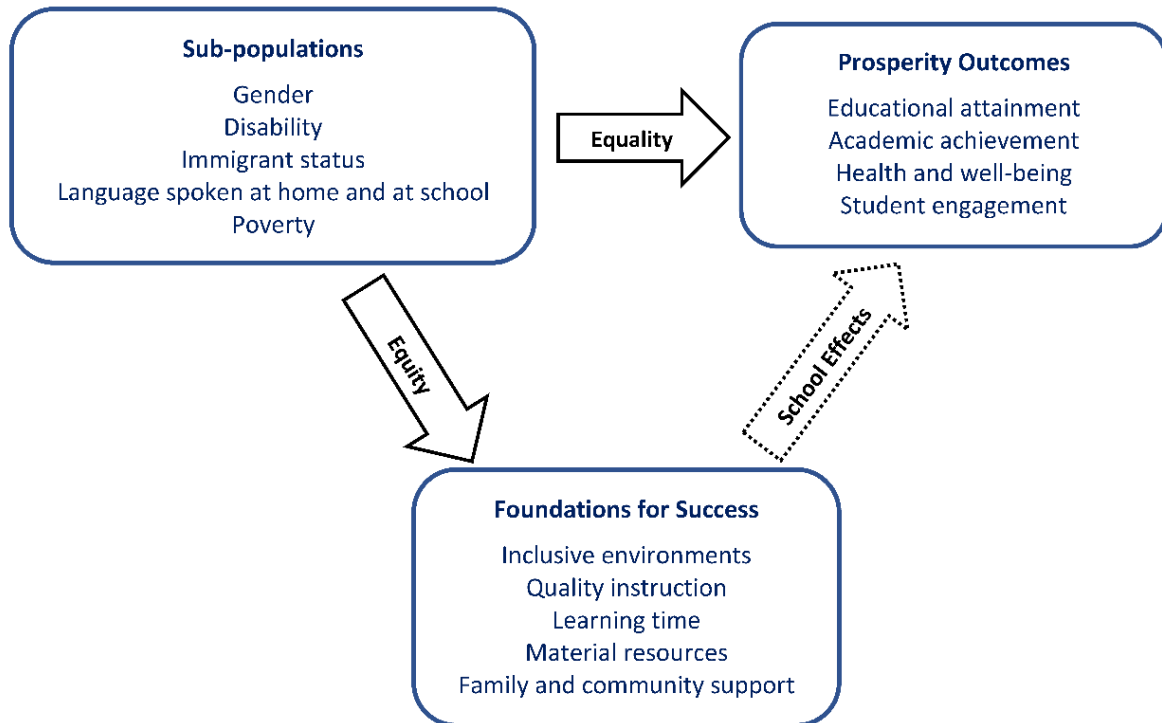
The term "access" in education generally refers to whether schooling is freely available to children in a jurisdiction. The emphasis is on the *provision* of schooling, and it is incumbent upon governments and educational institutions to ensure that schools are available locally and that educational policies do not create barriers for attending school. In practical terms, however, "access" is gauged simply by measures of school attendance (e.g., UNESCO Institute for Statistics, 2006). In striving to improve school attendance, several governments have turned to demand-side initiatives, such as the provision of free meals, cash transfers to families that are conditional upon their child's attendance, and vouchers designed to increase school choice (Patrinos, 2007).

Some definitions of "access" also incorporate the *quality* of school provision and in some cases are attached to a desired outcome. For example, the UN Sustainable Development Goal 4.1 states: "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes" (United Nations, 2016). The statement calls not only for equal opportunities to attend school, but also equality of outcomes (relevant and effective learning outcomes) and equity of school provision (quality primary and secondary education).

The Educational Prosperity model and the approach taken in PISA-D identify two types of access: access as an outcome, which depends on both demand and supply and considered an aspect of school attainment, and access as a condition for success, which depends on supply and measured by the foundations for success, including, for example, the provision of a safe and inclusive environment, quality instruction, and material resources.

## SELECTION AND ORGANISATION OF CONTEXT QUESTIONNAIRES

### The instruments

There were two sets of instruments developed: one for in-school students, and one for out-of-school youth.

The questionnaires for the in-school students include: a) a student questionnaire with 49 questions comprising 191 items, b) a teacher questionnaire with 33 questions comprising 189 items, and c) a school questionnaire with 28 questions comprising 147 items.

The instruments for the out-of-school youth include: a) an in-person interview for the youth with 102 questions comprising 216 items, b) a questionnaire for the person most knowledgeable about the child with 22 questions comprising 102 items, and c) a household observation schedule completed by the interviewer with 17 questions comprising 17 items.

The questions for the PISA-D instruments were drawn from PISA and other international and regional studies, or were developed in consultation with the PISA-D participating countries. The criteria for selecting and developing items included the fit with the Educational Prosperity model, relevance as confirmed through analysis of the results of low- and middle-income countries in PISA questionnaires, and reviews of relevant international and regional studies and consultation with representatives of the participating countries.

The questionnaires for students attending school included several constructs assessing the core elements of the Educational Prosperity model. These are shown in Figure 3.3, with the green ovals representing the Prosperity Outcomes and the orange ovals indicating the Foundations for Success. The green and orange dots indicate the number of constructs. The purple rectangles indicate the sub-populations used for assessing equality and equity. The outer blue border represents several questions that are supporting content relevant to the core elements of Educational Prosperity. Table 3.1 lists the relevant question number for the various constructs.

As in PISA, the contextual information collected through the PISA-D questionnaires is complemented by system-level data on contextual variables in educational systems. The system-level questionnaire used in PISA was adapted for use by PISA-D countries, and both versions capture data on the structure of national programmes, national assessments and examinations, instructional time, teacher training and salaries, educational finance (including enrolment), national accounts, and population data (UNESCO Institute of Statistics, 2016).

■ Figure 3.3 ■

**Constructs assessing Educational Prosperity (in-school students)**
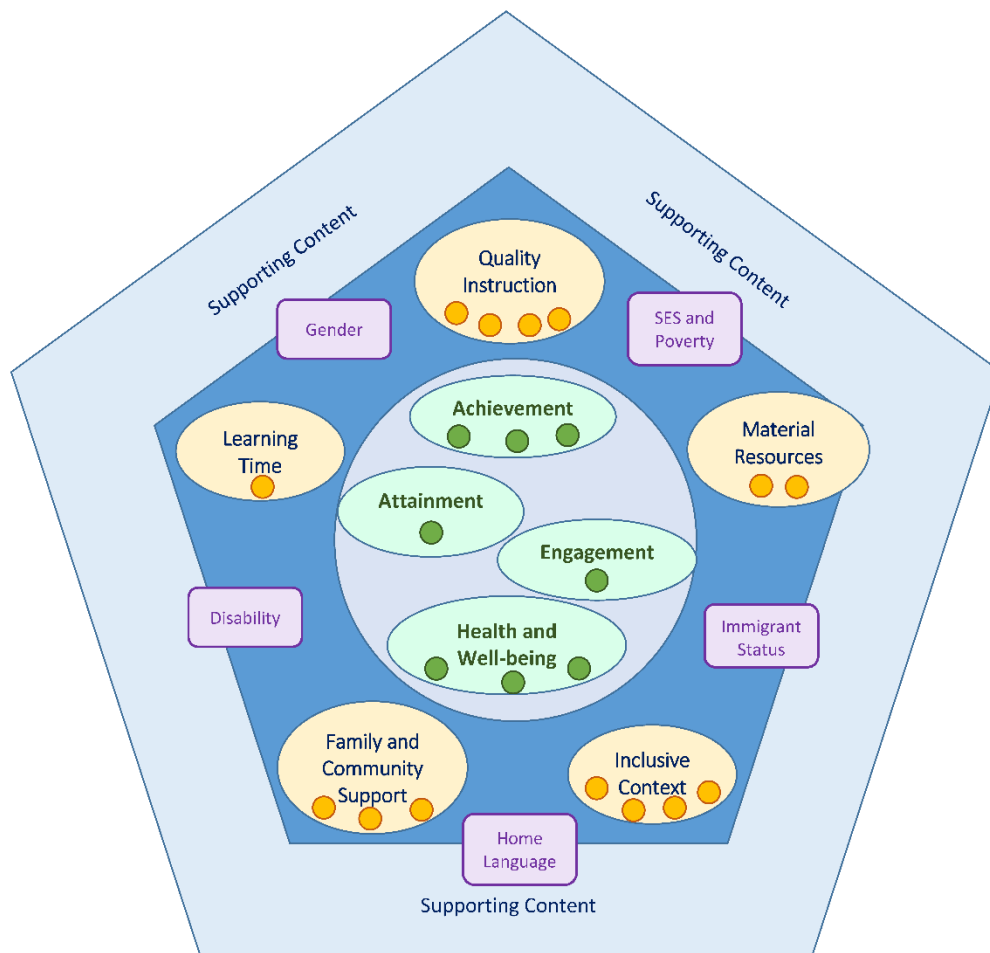
**Questionnaire content for assessing Educational Prosperity**

The conceptual framework for the PISA-D questionnaires includes the four Prosperity Outcomes, five Foundations for Success, and five student demographic background factors relevant to assessing equality and equity (see Figure 3.3). It also includes a set of questions grouped under the category, supporting content, which complement the variables included in the educational prosperity framework. The content of the measures is discussed below.

**Prosperity outcomes**

*Academic performance*

The measures of academic performance in PISA-D are based on the assessments of performance in reading, mathematics and science. The frameworks for these assessments are described in Chapter 2.

*Educational attainment*

Educational attainment—how far students go in school—is a key outcome for low- and middle-income countries that sits alongside measures of academic performance. Many of the key policy questions of low- and middle-income countries pertain to students' and families' demand for education, which depends on students' early learning experiences and their perceptions of its relevance, quality, and long-term benefits. In many low- and middle-income countries, students do not attend school beyond the primary level.

A salient feature of low- and middle-income countries is that the distribution of 15-year-old students stretches well below the 9th or 10th grade. Another salient feature is that even though formal education might be compulsory, a large proportion of 15-year-old youth have dropped out of school. The primary aim in measuring attainment is to gain a better understanding of students' pathways to their current level of attainment and understand the reasons for staying in school or dropping out.

Information about attainment is collected through all PISA-D questionnaires except for the teacher questionnaire and the household observations questionnaire, which is answered by the out-of-school youth interviewer. The PISA-D student questionnaire and the out-of-school youth interview include questions about grade, early childhood education attendance, and grade repetition; the school questionnaire asks about grade retention policies and academic support services. PISA-D explores educational attainment in greater depth than PISA by asking students and out-of-school youth about long-term absenteeism and reasons for missing school for long periods. PISA-D further investigates the experience of out-of-school youth with questions about whether they work, their profession, hours worked per week, and wage or salary. Also unique to PISA-D, the parent questionnaire asks parents about their educational expectations for the out-of-school youth and factors that could hinder the youth's completion of compulsory education.

The approach used by PISA-D to assess educational attainment is inspired by the framework set out by the UNESCO Institute for Statistics (UIS) and UNICEF (2005), which has been used to

characterise the entire school-age population. In PISA-D, data will be used to describe the levels of attainment of 15-year-olds who are in school, and 14- to 16-year-olds who are out of school.

Data from students' current grade level, or in the case of out-of-school students the last grade completed, data on students' birth date, and information on the date of entry into lower primary were used to construct an ordinal variable describing five levels of attainment:

1. **On track.** Students are in their expected grade, given their birth date, that is, they started school on schedule and have not repeated a grade. In most cases, this would be grade 9 or 10.

2. **One year below expected grade.** These students have usually repeated a grade or were out of school for a prolonged period. They would typically be in grades 8 or 9.

3. **Two or three years below expected grade.** In most cases, these students have repeated two or three grades, but some may have started late or simply faded in and out of school for a year. They would typically be in grades 7 or 8.

4. **Enrolled in school but are four or five grades below the expected grade.** In most cases, these students will have repeated more than three times, but some may have started late or simply faded in and out of school for one year or more. They would typically be in grades 5 or 6.

5. **Not attending school, and their highest grade attained was five or more years below expected grade.** These students are not attending school, and their highest grade attained was below grade 5.

For those with attainment levels 2 through 5, the analyses will be extended to discern the stage of schooling when they fell off track by one or more grades.

*Health and Well-Being*

The concept of well-being is very broad, and typically refers to the quality of people's life. Diener (2006) defines subjective well-being as "an umbrella term for the different valuations people make regarding their lives, the events happening to them, their bodies and minds, and the circumstances in which they live" (p. 400). PISA 2015 uses the following definition of well-being, which extends beyond students' subjective appraisal of their life quality: "Students' well-being refers to the psychological, cognitive, social and physical functioning and capabilities that students need to live a happy and fulfilling life" (OECD, 2017).

The health and well-being measures in PISA-D are relevant to students' physical and emotional well-being.

Children's physical health is particularly important in low- and middle-income countries as it is often compromised in ways that affect their educational outcomes due to hunger; physical and

emotional abuse; chronic illnesses such as asthma, bronchitis, diabetes, or epilepsy; and acute illnesses that cause children to miss school and fall behind. PISA-D asks respondents to rate their overall health on a scale from 0 to 10 and to report whether they had any particular health issues during the previous year.

Emotional well-being is the affective component of well-being—people's reactions to their experiences. It can be positive, such as people's overall rating of their happiness as used in the World Happiness Report (Helliwell, Layard and Sachs, 2012), or negative, such as people's feelings of anxiety, depression, or fear. PISA-D includes measures of anxiety and depression, and as in PISA, a measure of general life satisfaction.

*Student engagement*

The PISA studies have examined students' interest and motivation in reading, mathematics, and science, and their participation in activities related to the subject. For example, the OECD report, *Reading for Change: Performance and Engagement across Countries,* examined students' motivation and interest in reading, and the time students spend reading for pleasure and reading diverse materials (OECD, 2002). PISA has also considered engagement more broadly to refer to students' attitudes towards schooling and their participation in school activities (Willms, 2003).

Several studies have considered engagement to be a predictor of educational performance and attainment, and there is strong evidence that engagement is correlated with both performance and attainment (Willms, 2003). However, in PISA-D it is considered an important outcome in its own right, situated as a prosperity outcome alongside performance and attainment. A strong case can be made that the direction of causation is reversed, from performance to engagement, at certain stages of the life course. For example, children who do not make a successful transition from learning-to-read to reading-to-learn are more likely to become disaffected from school during the late primary and lower secondary years. Moreover, engagement is seen "as a *disposition* towards learning, working with others and functioning in a social institution" (Willms, 2003, p. 8), and as such is a key prosperity outcome that leads to lifelong learning and the likelihood of becoming a productive member of society.

The PISA-D student questionnaire and the out-of-school youth interview include a measure of institutional engagement, providing information on general attitudes towards school and learning outcomes as well as attitudes towards learning activities. Out-of-school youth are asked about student engagement based on their experience when attending school, while their parents are asked about their attitudes towards education. The out-of-school youth interview also gathers information about youth's engagement in reading and writing literacy activities, such as how often they read a newspaper, magazine or book, write a text or email, and so on.

## Assessing the foundation of success

As noted earlier in this chapter, the Foundations for Success are factors that affect children's outcomes at each stage of development. They are considered to be universal in that they are necessary conditions for success at each stage of development. The selection of the foundation factors for PISA-D was based on theory and a large body of research that provides evidence of

the effects of each factor on student outcomes. The factors selected for PISA-D are: inclusive environments; quality instruction; learning time; material resources; and family and community support. These factors are described briefly below. Some of the elements included in each factor are core to the factor, while other elements are considered supporting content.

*Inclusive environments*

Inclusive environments are classrooms, schools, and broader communities that value and support inclusion. "Inclusion is a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion within and from education. It involves changes and modifications in content, approaches, structures and strategies, with a common vision which covers all children of the appropriate age range and a conviction that it is the responsibility of the regular system to educate all children" (UNESCO, 2005, p. 13). UNESCO's (2009) policy guidelines provide a schema for measuring aspects of inclusion relevant to teachers' and principals' attitudes and values.

Inclusive environments are places in which all students can succeed. *All* means learners across the categorical boundaries of disability, social class, gender, ethnicity, national origin, sexual orientation and religion. *Succeed* means succeeding in terms of learning, as well as in terms of physical, social, emotional and spiritual outcomes (Willms, 2009). The provision of inclusive environments is a foundation for Educational Prosperity in low- and middle-income countries as it concerns the opportunities for children with disabilities; children from ethnic, linguistic, and religious minorities; and girls to have equal access to schooling and a complete school experience, including opportunities to learn, engage in the social life of the school, and feel accepted by their peers and teachers.

Inclusive classroom and school practices affect students' sense of belonging at school, their participation in the social life of the school, and their opportunities to learn. The metrics also capture the attitudes and practices of teachers and principals. Inclusion requires teachers to be ambassadors for inclusion in their community by embracing and celebrating diversity, becoming skilled at meeting the needs of students with special needs, and using new approaches to assessing learning (Riehl, 2000). At the system level, inclusion is concerned with the extent to which students from different sub-populations or ability are segregated into different schools or school programmes.

For the school-based component, PISA-D collects information on inclusion from students, teachers, and school principals. For the out-of-school component, it collects this information from the youth interview, asking youth to describe their experience when they attended school.

PISA-D asks students to report on their sense of belonging at school, whether they feel safe at school, and whether they have been sexually harassed at school. Out-of-school youth are asked these same questions based on their experiences when they attended school.

PISA-D asks teachers a set of questions about their attitudes and practices towards teaching students with low literacy levels. Both PISA and PISA-D ask school principals about school policies

concerning how students are admitted to the school and grouped for instruction as well as about the diversity of the school. PISA-D also asks teachers about their attitude towards grade retention.

### Quality instruction

Quality of instruction is the most important driver of student performance, but arguably the most difficult to define and measure. Anderson (2004) defined effective teachers as "those who achieve the goals they set for themselves or which they have set for them by others (e.g., ministries of education, legislators and other government officials, school principals)." (p. 22). His model assumes that teachers are aware of, understand, and actively pursue goals; that they teach with a purpose—to facilitate learning—material which they consider worthwhile; and that their goals are concerned directly or indirectly with student learning. This perspective, that effective teachers are goal-oriented, is evident in virtually all of the contemporary models of effective instruction.

The "delivery of the lesson" and "interacting with students" are at the centre of Anderson's (2004) conceptual framework of teacher effectiveness. Four other elements of his framework—standards, learning units, classroom climate and culture, and classroom organisation and management—have effects that are mediated through lesson delivery and teacher-student interactions. All six elements have direct effects on student learning and engagement. Teachers' characteristics, including their professional knowledge, expectations, and leadership, and students' characteristics, including their aptitudes, prior knowledge, and attitudes and values, are positioned behind the six core elements of the framework. In the language of Educational Prosperity presented above, they are distal factors that have their effects through the proximal core elements and thus are included as supporting content and not as a Foundation for Success. Quality instruction is assessed with questions to students, teachers, and school principals and is not assessed for the out-of-school component. Similar to PISA, the PISA-D student questionnaire includes measures on student-teacher interactions and assesses the classroom learning climate. PISA-D adds new questions on lesson delivery to gather information on the structure of lessons and teaching practices in mathematics lessons. PISA-D also includes questions of teachers about their practices for teaching less able students and questions of school principals about teachers' behaviours that could have a negative impact on classroom climate.

### Learning time

Learning time in low- and middle-income countries differs from that of high-income countries in several ways. In many cases, children of low- and middle-income families start school at a later age, they miss many days of school during the primary school period, and they are more likely to repeat grades. Many children work in part-time jobs outside the home from an early age. Moreover, there appears to be considerable variation in class time devoted to the three core PISA subjects, and curriculum coverage is not as deep. How learning time is measured in main PISA has changed through the cycles.

The school-based component of PISA-D captures learning time in and out of school. Similar to PISA, the PISA-D student questionnaire asks about reasons for loss in learning time due to student

truancy, though it extends this measure to collect information about other reasons for missing school, such as being sick or having to look after others. PISA-D also collects information on reasons for reduced teaching time and the time students take to travel from their home to school. PISA-D asks teachers about the reasons they are absent and school principals about their policies regarding teacher absenteeism. PISA-D also asks school principals about the reasons for and amount of instructional time lost during the previous year. Learning time is not assessed for the out-of-school component.

### *Material resources*

Studies based on the *Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación* (Latin American Laboratory for the Evaluation of the Quality of Education; LLECE) data by Murillo and Román (2011) and Willms and Somers (2001) suggest that in low- and middle-income countries, school resources have substantial effects, even after taking into account the socioeconomic characteristics of students.

PISA-D's school-based component used a schema set out by Murillo and Román (2011), which distinguishes between basic services, didactic facilities, and didactic resources:

- Basic services at the school include factors such as potable water, sewage services, bathrooms, electricity, and telephones.
- Didactic facilities refer to places other than the classroom, for teaching and learning. These include, for example, school libraries, gymnasiums, art and music rooms, science laboratories, computer rooms, and sports fields.
- Didactic resources can include very basic materials, such as textbooks and blackboards, through to computers in the school, laptop computers for students and teachers, and quality books in the library.

PISA-D's questions to school principals focus on the availability and condition of school infrastructure and facilities as well as the availability of instructional resources. The questions also distinguish between the availability of school resources and teachers' use of school resources.

### *Family and community support*

The nature and extent of family and community support differs among countries, not only because of cultural differences, but also due to the large number of children living in poverty in many of the partner countries.

In consultations with countries participating in PISA-D there was a demand for questions about community support. Small and Newman (2001) describe two over-arching connections between community and families that are relevant for developing measures of community support. One considers the socialisation of children, with neighbourhoods moulding children into certain behavioural patterns. The other pertains to the access of resources that support parents in raising their children. This could include, for example, literacy programmes, recreation facilities and programmes, or interventions to combat drug use and violence.

PISA-D asks both students and out-of-school youth about the types of communication they have with their parents or someone in their family.

PISA-D asks teachers about families' involvement at school and asks school principals about how parent and community members or organisations contribute to the school. PISA-D also asks parents of out-of-school youth about the type of support they provided to the youth in their early years.

**Student-level demographic factors for assessing equality and equity**

PISA-D focuses on the following measures pertaining to students' and families' backgrounds that are particularly relevant for low- and middle-income countries: gender, disability, immigrant status, socioeconomic status, and poverty, and the language spoken at home and the language of instruction of school. Though ethnicity is a variable related with being out of school, it was not included as one of the five demographic factors because it is embedded within poverty, immigrant status, language spoken at home, and language of instruction.

Similarly, living in a rural area is not included as a core demographic factor for assessing equality and equity, as living in a rural area versus a larger community is confounded with student-level demographic factors. The school-level questionnaire includes a variable pertaining to the size of the community, which can be used to determine rural status of the school. This question is also part of the questionnaire for the person most knowledgeable in the out-of-school component and can be used to determine rural status at the youth level. Therefore, one can discern whether levels of performance associated with rural status and other community types are attributable to student-level demographic factors and various foundation factors, such as material resources or quality instruction.

For each category, a single dichotomous variable was constructed which can be used to provide summary indices of equality and equity. However, broader measures were also developed to assess equality and equity in more detail, such as an extension to the PISA measure of socioeconomic status. The measures are described below.

*Gender*

Like PISA, the PISA-D question on gender simply asks students and youth whether they are male or female. PISA-D does not capture data about gender identity or sexual orientation.

*Disability*

PISA-D is the first PISA study to include self-reported measures pertaining to disability. The questions follow contemporary approaches to disability, which emphasise the extent to which a disability limits a person in doing certain activities in a particular environment. For example, students are asked about whether a disability limited their participation in school activities, while out-of-school youth are asked about whether they have a disability or medical condition that limits their daily activities. Out-of-school youth who report having a disability are also asked about the nature of the disability.

*Immigrant status*

The measure of immigrant status is based on a long-standing approach used in PISA which is based on questions of students and youth about where they and their parents were born.

*Socioeconomic status and poverty*

Socioeconomic status (SES) refers to the position of a person or family in a hierarchical social structure, based on their access to, or control over, wealth, prestige, and power (Mueller and Parcel, 1981; Willms and Tramonte, in press) Numerous studies have shown that a person's position on an SES hierarchy is related to a wide range of outcomes pertaining to their physical, economic, and social well-being. SES affects people's educational opportunities, their access to certain labour markets, their exposure to health and crime risks, and their lifetime earnings.

The literature on child development in low- and middle-income countries focuses mainly on the risk factors associated with poverty, especially during the prenatal period and the early years. These include, for example, poor nutrition during pregnancy, a lack of stimulation during the early years, and stressful living conditions.

The measure of SES in PISA, which is called Economic, Social and Cultural Status (ESCS), does not adequately capture lower levels of education and lower levels of income and wealth for the majority of students in low- and middle-income countries. PISA-D extends this measure to lower levels of SES, keeping the link with the PISA measure. PISA-D also gathers specific information on poverty.

Poverty is expected to be a fundamental characteristic of the out-of-school population. Unique to PISA-D, for the out-of-school component, parents provide information about the out-of-school youth's prenatal and early childhood living conditions; and the household observation questionnaire includes questions about the youth's housing and neighbourhood, including questions that discern whether the housing is in a rural or urban setting.

*Language spoken at home and language of instruction*

In several low- and middle-income countries, the students' first language differs from the language of instruction. Also, in some countries, the language of instruction during the primary grades, when children are learning to read, differs from the official language of instruction after the third or fourth grade. A further issue, which is more difficult to capture with a survey, is that in some schools, the teachers use the students' native language, or some combination of the native language and the official language of instruction.

PISA asks students, "What language do you speak at home most of the time?" This construct is extended for PISA-D in both the school-based and out-of-school components to include questions about the language of instruction at school and the language they first learnt to read. In addition, teachers are asked about which language they use during their lessons, as well as which language they use when talking with students.

*Supporting content*

PISA-D also includes some teacher, school, and system-level background variables that help explain the Prosperity Outcomes and the Foundations for Success. Some of the questions used to assess these variables come from PISA 2015 and others were created to fit the needs of low- and middle-income countries.

Like PISA, PISA-D asks teachers about their age and sex, qualification, employment status, educational background, years of experience, and professional development activities. PISA-D gathers new information about whether the teacher teaches multi-grade classrooms, holds multiple teaching jobs or works other jobs in addition to teaching. PISA-D also asks teachers a number of questions relevant to their pre-service training, socioeconomic status, and health and well-being.

The PISA-D teacher questionnaire asks questions about school leadership at the school where they work and job satisfaction. PISA-D also includes a question about their satisfaction with specific aspects of their job, such as benefits and pay. Also unique to PISA-D, the teacher questionnaire asks about the proportion of students in their class that lack the literacy and numeracy skills to learn the curriculum.

School principals in both PISA and PISA-D are asked numerous questions on resources and management, including type of school, number of students, average class size, school management and funding, as well as how many full- and part-time teachers work at their school. PISA-D adds questions on school location and nearby hazards.

## THE POTENTIAL FOR PISA-D TO INFORM EDUCATION POLICY

The key levers of educational policy are related to the allocation of resources and the structure of education systems. PISA-D is designed to generate high quality data to inform policy in both of these areas. With good evidence about the most pressing needs and the effectiveness and efficiency of different policies, governments can make informed decisions about the allocation of funds. PISA-D data can help identify binding constraints that hinder access to school and learning, as well as priorities related to three over-arching aims: improving overall outcomes, reducing inequalities and the prevalence of vulnerability, and reducing inequities.

Changing the structural features of schooling that determine the ways in which schools are managed and instruction is delivered can be particularly challenging for education policy makers because of the multiple levels of governance involved in school education. For example, in many low- and middle-income countries, the national or local policy regarding grade repetition is of paramount concern. Another key policy question for many countries concerns the language of instruction during the primary grades. Developing a new policy for either of these two structural features of the system entails a major shift in school management and the delivery of instruction. PISA-D and PISA data provide comparative data to identify the structural features of countries that are most successful on a global and regional scale. PISA-D data also provide a tool for monitoring the levels of Prosperity Outcomes and for assessing the extent to which current and future reforms and policy interventions are modifying structural features of schooling and

affecting outcomes.

## QUALITY ASSURANCE IN THE DEVELOPMENT OF QUESTIONNAIRES

Specific standards underlie the PISA-D questionnaire development process as well as the implementation of the material into the final instruments. These standards aim at quality assurance as well as comparability of the data across countries and economies. Mechanisms for PISA-D included the field testing of all instruments in all participating countries, translatability assessment, detailed psychometric analyses of the Field Trial data, adaptation negotiation with the participating countries, and reviews by the Questionnaire Expert Group and the Technical Advisory Group at each stage of the instrument development.

### Field Trial

All the items in the questionnaires were tested in a Field Trial. Questions were not retained for the Main Survey if their psychometric properties (e.g., reliability, unidimensionality, completion of items, consistency across cultures) were inadequate. When there were two versions of a particular question, only one question was retained. To be retained for the Main Survey, questions also had to meet at least one of the following conditions:

1. relevant to the measurement of ESCS common to PISA 2015 or new measures required to extend the scale to lower values of ESCS;

2. required for the measurement of poverty;

3. required for a measure of material resources;

4. required for coverage of all domains of the Educational Prosperity framework; or

5. relevant to the classification of students into the five key sub-populations.

### Translatability assessment

To enhance comparability, a translatability assessment of the questionnaire material was carried out. Translators highlighted any linguistic issues related to the translation of the questionnaire content that could lead to non-translatability or possible bias in later meaning of a question. Questionnaire developers then revised the material based on this feedback. The translatability assessment is described in detail in Chapter 5 of this report.

### Adaptation negotiation and verification

In some cases, cultural traditions, national understanding of a question or features of the education system vary largely, leading to the need for adaptations in questionnaires. As in previous cycles, the National Centres in each country and economy were asked to document which national adaptations they needed or wished to implement in the materials by describing them in specially designed standardised forms. For the questionnaires, a Questionnaire Adaptation Spreadsheet (QAS) was provided describing all adaptations that a country or economy wished to implement. For each country and each questionnaire, all adaptations were

checked by the international contractors and documented in the QAS. After translation and negotiation of adaptations, all national material was verified by the international contractors. Linguistic checks were performed, and any unclear translation was discussed with the international questionnaire developers, the country, and the linguistic quality control team. More information is given in Chapter 5.

All final questionnaire and interview material were then implemented into the paper-based versions of the questionnaires or the interviewers' tablets, tested, and provided to the PISA participants.

## *References*

**Anderson, L. W.** (2004), *Increasing Teacher Effectiveness (2nd ed.)*, UNESCO International Institute for Educational Planning, Paris.

**Creemers, B. P. M. and L. Kyriakides** (2006), "Critical analysis of the current approaches to modelling educational effectiveness: The importance of establishing a dynamic model", *School Effectiveness and School Improvement*, Vol. 17, pp. 347–366.

**Diener, E.** (2006), *Guidelines for National Indicators of Subjective Wellbeing and Ill-Being. Applied Research in Quality of Life,* Vol. 1, pp. 151-157.

**Helliwell, J. F., R. Layard and J. Sachs (eds.)** (2012), *World Happiness Report*, Earth Institute, Columbia University, New York, NY.

**Kyriakides, L., C. Christoforou and C. Y. Charalambous,** (2013), "What matters for student learning outcomes: A meta-analysis of studies exploring factors of effective teaching", *Teaching and Teacher Education,* Vol. 36, pp. 143–152.

**Lockheed, M., T. Prokic-Bruer and A. Shadrova** (2015), *The Experience of Middle-Income Countries Participating in PISA 2000-2015*, World Bank, Washington, D.C./OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264246195-en.*

**Mueller, C. W. and T. L. Parcel** (1981), "Measures of socioeconomic status: Alternatives and recommendations." *Child Development*, Vol. 52, pp. 13-30.

**Murillo, F. J., and M. Román** (2011), "School infrastructure and resources do matter: Analysis of the incidence of school resources on the performance of Latin American students", *School Effectiveness and School Improvement*, Vol. 22*,* pp. 29-50.

**OECD** (2002), *Reading for Change: Performance and Engagement across Countries: Results from PISA 2000,* OECD Publishing, Paris.

**OECD (2011),** *Education at a Glance 2011: Highlights*, OECD Publishing, Paris, *https://doi.org/10.1787/eag_highlights-2011-en*.

**OECD** (2017), *PISA 2015 Results (Volume III): Students' Wellbeing*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264273856-en.*

**Patrinos, P. A.** (2007), *Demand-side Financing in Education,* UNESCO International Institute for Educational Planning, Paris.

**Riehl, C. J.** (2000), "The principal's role in creating inclusive schools for diverse students: A review of normative, empirical, and critical literature on the practices of educational administration", *Review of Educational Research,* Vol. 70/1, pp. 55-81.

**Rosenshine, B.** (2010), *Principles of Instruction,* International Academy of Education, UNESCO International Bureau of Education, Geneva, Switzerland.

**Small, M. L. and K. Newman** (2001), "Urban poverty after the truly disadvantaged: The rediscovery of the family, the neighbourhood, and culture", *Annual Review of Sociology,* Vol. 27/1, pp. 23-45.

**UNESCO** (2005), *Guidelines for Inclusion: Ensuring Access to Education for All,* UNESCO, Paris.

**UNESCO** (2009), *Policy Guidelines on Inclusion in Education*, UNESCO, Paris.

**UNESCO Institute for Statistics and UNICEF** (2005). *Children Out of School: Measuring Exclusion from Primary Education,* UIS, Montreal, Canada.

**UNESCO Institute for Statistics** (2006), *Global Education Digest: Comparing Education Statistics across the World,* UIS, Montreal, Canada.

**UNESCO Institute of Statistics** (2016), *Making Education Count for Development: Data Collection and Availability in Six PISA for Development Countries,* PISA, OECD Publishing, Paris. *http://dx.doi.org/10.1787/9789264255449-en.*

**United Nations** (2016), *Sustainable Development Knowledge Platform*.

**Willms, J. D.** (2003), *Student Engagement at School: A Sense of Belonging and Participation*. OECD Publishing, Paris.

**Willms, J. D.** (2009), *Classroom Diversity and Inclusion: The Educational Advantage.* Plenary presentation at the Return to Salamanca – Global Conference on Inclusive Education, Salamanca, Spain.

**Willms, J. D.** (2011), *An Analysis Plan on Educational Equality and Equity: Recommendations for the OECD Education at a Glance.* Paper prepared for the OECD NESLI INES Network for the collection and adjudication of system-level descriptive information on educational structures, policies and practices (NESLI), UNB-CRISP, Fredericton, New Brunswick.

**Willms, J. D.** (2018a), *Learning Divides: Using Monitoring Data to Inform Educational Policy,* UNESCO Institute for Statistics, Montreal, Canada.

**Willms, J. D.** (2018b), *Educational Prosperity*, The Learning Bar Inc., Fredericton, New Brunswick, Canada.

**Willms, J. D. and M.-A. Somers** (2001), "Family, classroom and school effects on children's educational outcomes in Latin America", *International Journal of School Effectiveness and Improvement*, Vol. 12/4, pp. 409-445.

**Willms, J. D., and L. Tramonte** (in press),"The measurement and use of socioeconomic status in educational research", in L. E. Suter, B. Denman, and E. Smith (eds.), *The Sage Handbook of Comparative Studies in Education,* Sage, London.

**Willms, J. D., L. Tramonte, J. Duarte, and S. Bos** (2012), *Assessing Educational Equality and Equity with Large-Scale Assessment Data: Brazil as a Case Study*, Inter-American Development Bank, Washington.

**Table 3.1 Educational prosperity measures in questionnaires for students attending school**

| | Construct | Context Questionnaire Number | | |
| | | Student | Teacher | School |
|---|---|---|---|---|
| **Prosperity Outcomes** | | | | |
| Achievement | Reading, Mathematics and Science Performance | | | |
| Attainment | Attainment | 1, 2 | | |
| Health and well-being | Happiness | 6 | | |
| | General health | 9 | | |
| | Depression | 8 | | |
| Engagement | Attitudes towards school | 18 | | |
| **Foundations for Success** | | | | |
| Inclusion | Sense of belonging | 19 | | |
| | Feel safe at school | 20 | | |
| | Sexual harassment | 23 | | |
| | Attitudes towards working with less able students | | 28 | |
| Quality instruction | Structured lessons in math | 25 | | |
| | Teacher-student relations | 22 | | |
| | Expectations for success | | | |
| | Classroom disciplinary climate | 24 | | |
| Learning time | Truancy | 26 | | |
| Family and community support | Family and community support | 29 | | |
| | Family involvement | | 12 | 19 |
| | Community involvement | | | 18 |
| Material resources | Instructional resources | | 6, 8–10 | |
| | School infrastructure | | | 11–12 |
| **Sub-populations** | | | | |
| Gender | | 3 | | |
| Disability | | 7 | | |
| Home language | | 4 | | |
| Immigrant status | | 5 | | |
| SES and poverty | | 32–40, 42, 44, 45, 47 & 49 | | |