PISA 2022 Technical Report

5 Context Questionnaire Development

Introduction

This chapter describes the PISA 2022 context questionnaire development process, as guided by the 2022 framework, as well as its linking to questionnaires from previous PISA cycles of the PISA assessment, as set out in the PISA 2012, 2015, and 2018 questionnaire frameworks (OECD, 2013[1]; 2017[2]; 2019[3]). The constructs that need to be covered for monitoring trends in education are discussed in the context of research into the effectiveness of education systems. These measures have been used previously in PISA reports, as international indicators published in Education at a Glance, and in secondary analyses. For more information about the PISA Questionnaire Development, see OECD (2023[4]).

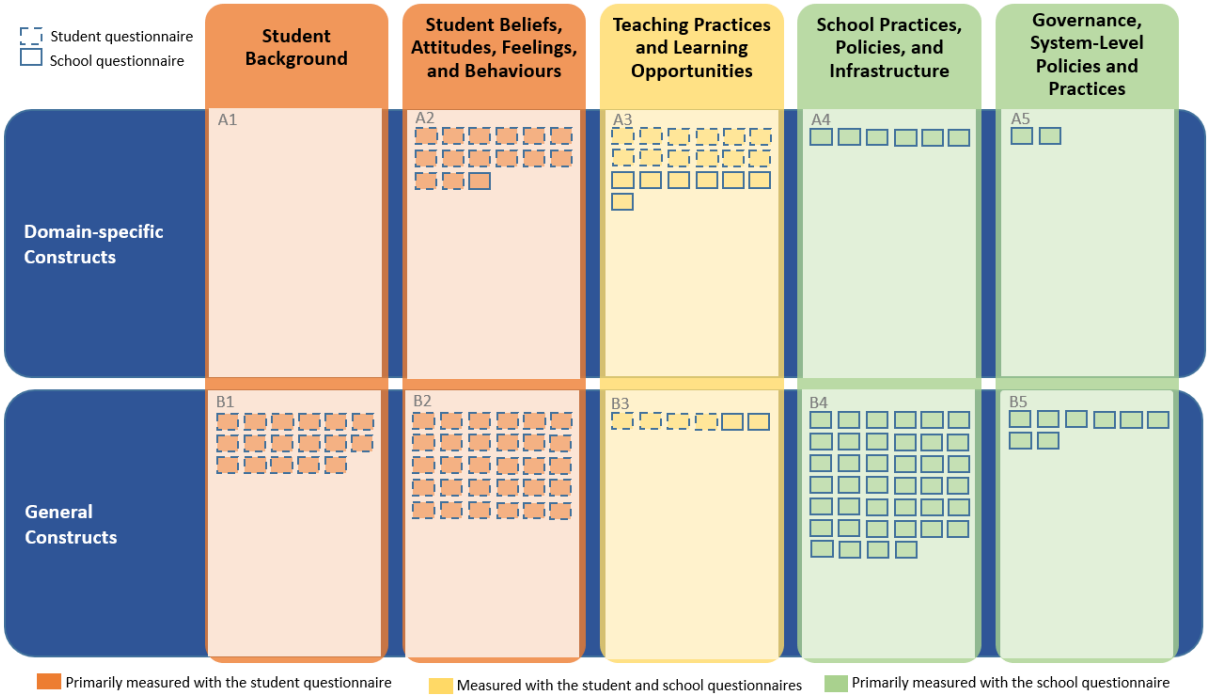
One of the major features of the implementation of PISA is the cyclical change in focus of the cognitive assessment: mathematics was the major domain of assessment in PISA 2003 and 2012 and is so again in PISA 2022, whilst reading literacy was the major domain of PISA 2000, 2009 and 2018, and science in PISA 2006 and 2015. The major domain of the cognitive assessment is also the focus of domain-specific context assessment in the associated questionnaire – in other words, various mathematics-related constructs were assessed in the PISA 2022 questionnaire since mathematics was the major domain. However, there is also a need for stability in measures administered in different cycles in order to gauge and understand trends in education. Stability has to be considered at two levels: across periods of three years (various questions in the questionnaires tend to recur in every cycle) and in subject-specific constructs across periods of nine years (mathematics-specific constructs assessed in the 2012 wave could be reused in 2022) [1].

The role of the PISA context questionnaire framework in development

The PISA 2022 two-dimensional framework taxonomy is presented in Figure 5.1. The first dimension classifies proposed constructs into the two overarching categories distinguished by the PISA Governing Board (PGB; domain-specific constructs and general constructs, with the latter including Economic, Social, and Cultural Status [ESCS]). The second dimension classifies proposed constructs into five categories based on key areas of educational policy setting at different levels of aggregation (Student Background; Student Beliefs, Attitudes, Feelings, and Behaviours; Teaching Practices and Learning Opportunities; School Practices, Policies, and Infrastructure; and Governance, System-Level Policies and Practices). The small boxes in the taxonomy below indicate the relative distribution of constructs in the PISA 2022 context questionnaires across all modules described in this framework.

Every module represents a focus around a topic, and the set of 21 content modules (see Table 5.1) covers a wide and comprehensive array of educational policy issues that are relevant across all participating countries/economies. The framework first discusses student background constructs, followed by student beliefs, attitudes, feelings, and behaviours constructs, teaching and learning constructs, and finally school policy and governance constructs. PISA treats the mandatory core questionnaires (school questionnaire and student questionnaire) separately from the optional questionnaires, which countries must opt into.

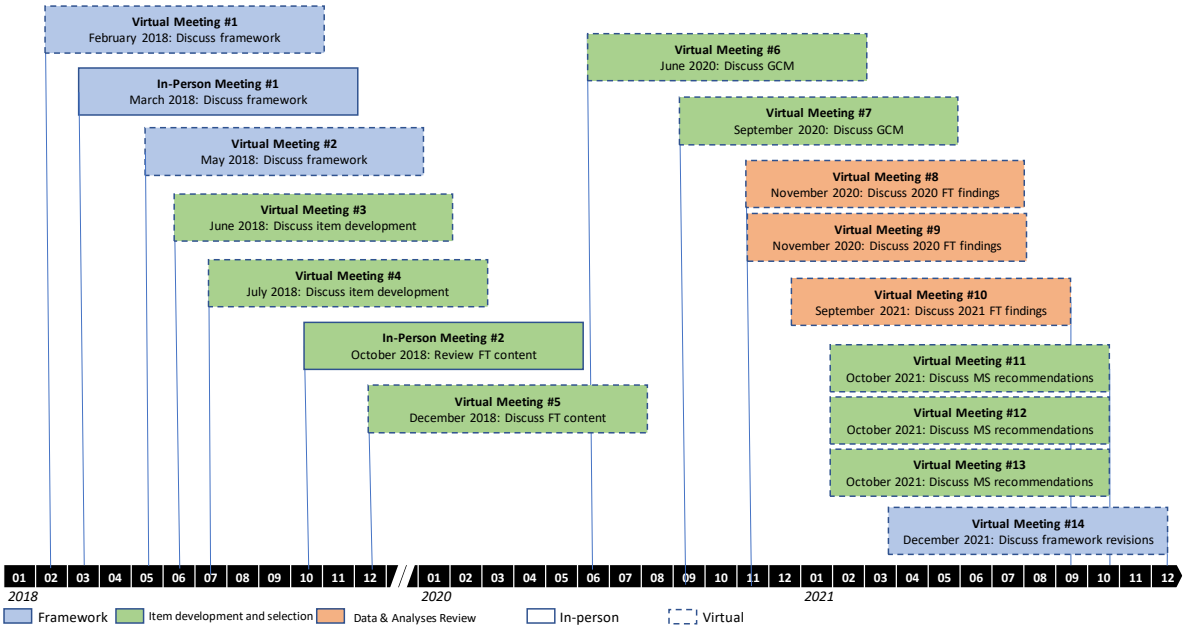
Figure 5.1. PISA 2022 Questionnaire Framework and Modules



As reflected in Figure 5.1, the PISA 2022 questionnaires have a stronger focus on general constructs (including economic, social, and cultural status) compared to domain-specific constructs. This was in response to the PGB's recommendation to re-balance questionnaire content in the direction of a larger focus on general constructs and a reduced focus on domain-specific constructs.

As in previous cycles, the Questionnaire Expert Group (QEG) guided the development of the PISA context questionnaires and framework through regular meetings. QEG members reviewed drafts of each instrument as well as feedback from countries and economies and discussed the material together with the OECD Secretariat and the international contractors to ensure the concordance between the assessment, the context questionnaires, and the corresponding frameworks. During this process, the QEG for PISA 2022 liaised with the Mathematics Expert Group (MEG) and received and reacted to presentations from the Creative Thinking contractor, guaranteeing a close link between the development of the assessment framework and tests and the questionnaire development process. Figure 5.2 provides an overview of the junctions at which the QEG was consulted via in-person or virtual meetings. Please note, meetings 11 through 13 were originally planned as a single in-person meeting but facilitated as a series of shorter virtual meetings due to COVID-19 travel restrictions.

Figure 5.2. Virtual and in-person meetings with the PISA 2022 Questionnaire Expert Group (QEG)



Questionnaires for different respondent groups

There were seven context questionnaires administered in PISA 2022. Two of them, the student and school questionnaires, were considered core questionnaires and were administered in all participating countries/economies. The other five questionnaires were optional and administered in a subset of the participating countries/economies to students, their parents or guardians, and teachers. Optional questionnaires for student respondents were administered in the order as described below, immediately after the STQ.Core Context Questionnaires

Student Questionnaire (StQ). The 35-minute PISA Student Questionnaire was administered to all students participating in the PISA assessment. A complete version was administered to those taking the assessment on computer, while countries/economies testing on paper administered a paper version containing a subset of the questions. The computer-based version of the StQ further utilized a new within-construct matrix sampling questionnaire design, where each student received a random selection of five questions about the same topics or "constructs" from a "pool" of approximately ten questions for most constructs. This design, which was developed based on a series of methodological studies (Bertling and Weeks, 2018[5]; 2020[6]) with guidance from the PISA Technical Advisory Group, maximises the number of policy-relevant questions that can be used in the student questionnaire without increasing individual student response burden. Annex 5.A of this chapter lists the questions included in the student background questionnaire, the module and construct they measure, and whether they were administered as part of the PBA assessment or using matrix-sampling.

Details regarding the creation of scaled indices based on this new design can be found in the Chapter 18 of this report.

School Questionnaire (ScQ*).* The 45-minute PISA School Questionnaire was administered to the principals of the schools with students participating in PISA. It was administered on computer in countries taking the assessment on computer, while countries/economies using paper-based testing administered a paper version of the same questionnaire.

Optional Context Questionnaires

Financial Literacy Questionnaire (FLQ). This 10-minute computer-based questionnaire was administered to all participating students in countries/economies that were taking the assessment on computer and administered the Financial Literacy assessment. It included questions about students' access to financial information and education as well as their practical financial experiences.

Information Communication Technology Questionnaire (ICQ). This 10-minute computer-based questionnaire was administered to all participating students in countries/economies that were taking the assessment on computer and chose to implement this option. It included questions about students' usage of electronic and digital devices, as well as their confidence and attitudes towards ICT.

Well-being Questionnaire (WBQ). This 10-minute computer-based questionnaire was administered to all participating students in countries/economies that were taking the assessment on computer and chose to implement this option. It included questions about students' health and well-being, as well as activities with friends and family.

Parent Questionnaire (PaQ). This 30-minute paper-based questionnaire was administered to parents or guardians of all participating students in countries/economies that chose to implement this option. It included questions about learning contexts, support, and resources at home as well as spending on education and parents' or guardians' mathematics-related interests and attitudes.

Teacher Questionnaire (TQ). This 40-minute computer-based questionnaire was administered to teachers in countries/economies that chose to implement this option. It was administered as an integrated questionnaire that utilized digital routing to direct respondents to either a mathematics teacher or a general teacher module. After completing the initial module, all respondents then received a creative thinking module and a teacher well-being module.

Table 5.2 provides an overview how each of these seven questionnaires relates to the educational policy areas outlined in the framework.

Phases of Questionnaire Development and QUALITY ASSURANCE

Questionnaire development for PISA 2022 followed a multi-step process including several defined interaction points with subject matter experts, respondent groups, and stakeholders, and defined mechanisms to ensure quality of the developed instruments and comparability of the data across countries/economies. The following sections each give a short summary of each questionnaire development phase alongside relevant quality assurance strategies associated with each phase.

Development of initial item pool

Questionnaire development started with evaluating the existing questionnaire pool for PISA and identifying areas that required new development based on the PISA 2022 context questionnaire framework. Following prioritization with the QEG and the OECD, new questions for all questionnaires except for the WBQ, which was administered without changes from the PISA 2018 version, were drafted based on principles outlined in the framework.

Small-scale pre-testing in cognitive interviews

A subset of all newly-developed questionnaire material for the StQ representing a range of cognitive and language complexity was pre-tested in small samples of students in Hong Kong, China, India, and Brazil[2] during the development stage. The small-scale pre-testing was conducted in Cantonese, Hindi, and Portuguese in an effort to widen the languages included in pre-testing beyond western languages. Pre-

testing took the form of two rounds of in-person one-on-one cognitive interviews and a third round of virtual one-on-one interviews for the Global Crises Module (see below), each with small groups of students from socioeconomically diverse backgrounds. Interviews were facilitated under general leadership of the PISA Core A contractor by teams led by members of the QEG, to collect feedback from respondents representing diverse geographic, linguistic, and cultural backgrounds. During each cognitive interview session, an interviewer provided students, in paper-based format, with a set of thematically-grouped questions. Students were asked to provide answers to all questions in the set. When the student was finished providing their answers, the interviewer asked a series of retrospective probes associated with each question in the set. These probes asked about students' interpretation of the question; their understanding of words in specific items of a matrix question; other words or parts of the question that they found confusing; and the overall level of difficulty they reported in answering the question. Once the student finished responding to the probes, the interviewer provided the student with another set of questions to answer.

In the first round of cognitive interviews, four thematically-defined sets of questions were tested among student respondents. In the second round, another five thematically-defined sets were tested. A second goal of the cognitive interviews was to collect data on students' understanding of different response options (i.e., agreement, like-me, and frequency type response options) to guide recommendations regarding which response options to use for specific questionnaire content in PISA 2022. Two additional types of activities were performed during the cognitive interviews as preliminary steps toward response option classification for PISA 2022: card-sorting exercises, and response option comparisons.

Feedback from participating countries/economies

All newly-developed material was shared with representatives of countries/economies at an early stage in the development process to obtain in-depth feedback. National Centres were asked for ratings on several important factors for each question to be implemented in PISA, including the relevance of the specific topic for their educational system. The review also aimed to establish whether the addressee that is targeted in the questionnaire (e.g., students, teachers, principals) is indeed the best respondent group to answer the question. In this context, a very important aspect of ratings touched on issues of sensitivity. Feedback was collected on whether a topic might be sensitive, complied with data privacy regulations in the country/economy, or could lead to cultural bias.

Potential translation and adaptation difficulties were also addressed in this review. Finally, countries/economies were asked to give an overall rating of each proposed question and provide any additional comments or concerns that might improve the material. A similar review was repeated after the international Field Trial (FT).

Translatability assessment

To enhance comparability, a translatability assessment of the questionnaire material was carried out before finalising instruments for the FT. Linguistic experts evaluated the material with due consideration for the Ask-the-Same-Question (ASQ) model (Harkness, 2003[7]). This approach seeks to optimize the wording in the source questionnaire so that the items can be translated into all relevant languages while maintaining the construct covered, and therefore maintaining the intended measurement properties. The newly-developed questionnaire material was translated into several languages representing the most common language groups, including an East-Asian language (Cantonese), Slavic languages (Bosnian, Croatian, Russian), an Indo-German language (German), a Romance language (French, Portuguese), Turkic (Turkish), and Finno-Ugric (Hungarian). 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.

Refinement of item pool and creation of international master version for FT

After cognitive interviews, feedback from the review by countries/economies, conclusion of the translatability assessment, and review by the PISA subject matter expert groups (i.e., QEG, MEG, Creative Thinking Expert Group - CTEG), the item pool was revised for administration in the FT. An important addition to the questionnaires at this point was the Global Crises Module (GCM) (Bertling et al., 2020[8]). The GCM was developed as an additional questionnaire module for student and school questionnaire respondents with a focus on effects of the COVID-19 pandemic on student learning and well-being and the degree of interruptions or changes to education across participating countries/economies. Please note, although the GCM was added to the development process at a later stage than other questionnaire materials, the questions went through the same quality assurance steps as all other materials.

Centralised trend material transfer from previous PISA cycles

For the computer-based questionnaires, in earlier PISA cycles the international contractors implemented a centralised transfer process for national trend material. All questionnaire material from previous cycles that was chosen to be administered again for PISA 2022 was centrally transferred within the electronic platform. Because the process for adapting and translating questionnaires this cycle required that all adaptations were documented in English in the electronic platform before being translated, when the contractors transferred trend material they also supplied the English back-translation of the trend text, which the country/economy confirmed during their review. Any changes to these trend questions needed to be requested and justified by the country/economy. This process allowed for external control to preserve national trend material from the previous cycle in PISA 2022.

For the paper-based questionnaires, the international contractors did not perform a centralised transfer of trend material. Participating countries/economies were provided with their questionnaires from the previous cycle of PISA (if they participated) and were asked to copy the trend items into the PISA 2022 questionnaires.

Adaptation negotiation and verification of all questionnaire material

In some cases, cultural traditions, local understanding of a question or features of the education system vary largely, leading to the need for adaptations to the questionnaires. As in previous PISA cycles, the National Centres in each country/economy were asked to document which adaptations they needed or wished to implement in the materials by describing them in specially designed standardized 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/economy and each questionnaire, all adaptations were checked by the international contractors and documented in the QAS. After negotiation of adaptations and translation of the customized national text into the local language, 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 National Centre, and the linguistic quality control team. The chapter on translation verification in this Technical Report has additional information about this process. All final questionnaire material was then implemented into the paper-based or computer-based versions, tested in the system, and provided to the PISA participants.

Large-scale testing in international Field Trial

All question developed for potential inclusion in the PISA 2022 MS, including the GCM, were administered to the respective respondent group in the PISA 2022 international FT. In addition to examining each question’s performance across participating countries/economies, several methodological experiments were conducted as part of the FT, in an interest of choosing the most appropriate operationalisation for each construct described in the PISA 2022 Questionnaires Framework. These experiments comprised

comparison of multiple choice (MC) and fill-in questions, comparison of agreement and frequency response options, comparison of abstract and concrete frequency response options, and comparison of mother/father-focused with parent or guardian-focused education- and occupation-related questions. Results for each experiment were discussed with relevant PISA expert groups and the OECD secretariat prior to determining the final direction with questionnaire selection for the Main Survey (MS).

Finalisation of item pool for international Main Survey

A reduction of questions was needed across all questionnaires from the FT to the MS, except for the WBQ, which was administered without changes from the PISA 2018 version. Item recommendations and subsequent decisions for the MS instruments were based on the empirical performance of the items based on data from the first batch of countries/economies with submitted FT data as well as a consideration of redundancies and framework coverage and consultation with key stakeholders, including the QEG, MEG, CTEG, as well as National Centres in each country/economy. Based on findings from the above-mentioned methodological experiments, it was determined that the PISA 2022 MS would retain the mother-father focused fill-in question format from previous cycles for occupation-related questions, that agreement-types response options would be used for General Social and Emotional Characteristics, thereby maximising consistency with the OECD's survey on social and emotional skills (SSES), and that newly-developed frequency questions would use more concrete instead of highly abstract response options in efforts to improve cross-country comparability.

Main Survey review by countries

Between the FT and MS each National Centre was asked to review its FT data for unexpected response distributions to the questions and to investigate whether the data indicated that there were any errors in the adaptations they requested or the translations of the questionnaires that needed to be corrected. This included updates due to errata. All requested changes were checked by the international contractors and documented in the QAS. Approved changes to translation were implemented by verifiers.

All final questionnaire material was then implemented into the paper-based or computer-based versions, tested, and provided to the PISA participants in advance of the MS. More details about the preparation of the questionnaires is included in Chapter 19.

Summary

Each of the steps in this development process ensured that questions included in PISA 2022 were systematically evaluated and iteratively refined based on insights from empirical data before the finalisation of the international versions of the questionnaires. See Chapter 19 for how the questionnaire design was implemented in the system and see Chapter 18 for how derived variables for reporting were created for the questionnaires.

References

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Notes

1. There is a four-year gap between the last and the current PISA cycles (i.e., 2018 and 2022) and a ten-year gap (2012 and 2022) between the last two cycles focused on mathematics due to a one-year delay as a result of the COVID-19 pandemic.

2. We thank Wilima Wadhwa, Kit-Tai Hau, and Ricardo Primi and their teams for their dedication and support in facilitating these studies.

Chapter 5 tables

Table 5.1. Content Modules defined in PISA 2022 Questionnaire Framework

No.	Module	No.	Module
1	Basic Demographics	11	School Type and Infrastructure
2	Economic, Social, and Cultural Status (ESCS)	12	Selection and Enrolment
3	Educational Pathways and Post-Secondary Aspirations	13	School Autonomy
4	Migration and Language Exposure	14	Organisation of Student Learning at School
5	PISA Preparation and Effort	15	Exposure to Mathematics Content
6	School Culture and Climate	16	Mathematics Teacher Behaviours
7	Subject-specific Beliefs, Attitudes, Feelings, and Behaviours	17	Teacher Qualification, Training, and Professional Development
8	General Social and Emotional Characteristics	18	Assessment, Evaluation and Accountability
9	Health and Well-being	19	Parental/Guardian Involvement and Support
10	Out-of-school Experiences	20	Creative Thinking
		21	Global Crises

Table 5.2. Overview of the five categories based on key areas of educational policy setting at different levels of aggregation in the PISA 2022 framework covered by the questionnaires

	Main Survey Length (minutes)	Framework Coverage				
		Student Background	Student Beliefs, Attitudes, Feelings, and Behaviours	Teaching Practices and Learning Opportunities	School Practices, Policies, and Infrastructure	Governance, System-Level Policies and Practices
Student	35	√	√	√		
School	45		√	√	√	√
Financial Literacy	10	√	√	√		
ICT	10	√	√	√	√	
Well-being	10	√	√	√		
Parent	30	√		√	√	
Teacher	40			√	√	

Annex 5.A. Details of PISA 2022 Student Questionnaire Main Survey questions

Question No.	Module	Construct	Within-construct matrix sampling (CBA only)	In PBA
ST001	Basic demographics	Grade	no	yes
ST003	Basic demographics	Date of birth	no	yes
ST004	Basic demographics	Gender	no	yes
ST002	Educational career	Current study programme	no	yes
ST250	Economic, social, and cultural status (ESCS)	Home possessions	no	yes
ST251	Economic, social, and cultural status (ESCS)	Home possessions	no	yes
ST253	Economic, social, and cultural status (ESCS)	Digital devices in the home	no	yes
ST254	Economic, social, and cultural status (ESCS)	Digital devices in the home	no	yes
ST255	Economic, social, and cultural status (ESCS)	Books in the home	no	yes
ST256	Economic, social, and cultural status (ESCS)	Books in the home	no	no
ST230	Basic demographics	Number of siblings	no	yes
ST005	Economic, social, and cultural status (ESCS)	Mother's education	no	yes
ST006	Economic, social, and cultural status (ESCS)	Mother's education	no	yes
ST007	Economic, social, and cultural status (ESCS)	Father's education	no	yes
ST008	Economic, social, and cultural status (ESCS)	Father's education	no	yes
ST014	Economic, social, and cultural status (ESCS)	Mother's occupation	no	yes
ST015	Economic, social, and cultural status (ESCS)	Father's occupation	no	yes
ST258	Economic, social, and cultural status (ESCS)	Food insecurity	no	yes
ST259	Economic, social, and cultural status (ESCS)	Subjective socioeconomic status	no	yes
ST019	Migration and language exposure	Immigration background	no	yes
ST021	Migration and language exposure	Immigration background	no	yes
ST022	Migration and language exposure	Primary home language	no	yes
ST226	Educational career	Time attended current school	no	yes
ST125	Educational career	Age started ISCED 0	no	yes
ST126	Educational career	Age started ISCED 1	no	yes
ST127	Educational career	Grade repetition	no	yes
ST260	Educational career	Truancy	no	yes
ST261	Educational career	Truancy	no	yes
ST062	Educational career	Truancy	no	yes
ST267	School culture and climate	Quality of student-teacher relationships	yes	yes
ST034	School culture and climate	Sense of belonging	yes	yes

Question No.	Module	Construct	Within-construct matrix sampling (CBA only)	In PBA
ST038	School culture and climate	Being bullied	no	yes
ST265	School culture and climate	Feeling safe	no	yes
ST266	School culture and climate	School safety risks	no	yes
ST294	Out-of-school experiences	Activities before school	no	yes
ST295	Out-of-school experiences	Activities after school	no	yes
ST326	Health and well-being	Time spent on online activities	no	yes
ST322	Health and well-being	Digital device usage behaviours	yes	no
ST307	General social and emotional characteristics	Perseverance	yes	no
ST309	General social and emotional characteristics	Self control	yes	yes
ST301	General social and emotional characteristics	Curiosity	yes	yes
ST343	General social and emotional characteristics	Cooperation	yes	no
ST311	General social and emotional characteristics	Empathy	yes	no
ST315	General social and emotional characteristics	Trust	yes	yes
ST303	General social and emotional characteristics	Perspective taking	yes	no
ST305	General social and emotional characteristics	Assertiveness	yes	yes
ST345	General social and emotional characteristics	Stress resistance	yes	no
ST313	General social and emotional characteristics	Emotional control	yes	yes
ST263	Subject-specific beliefs, attitudes, feelings, and behaviours	Growth mindset	no	no
ST016	Health and well-being	Overall life satisfaction	no	yes
ST059	Organisation of student learning at school	Class periods per week in in mathematics	no	yes
ST296	Out-of-school experiences	Time spent on mathematics homework	no	yes
ST272	Mathematics teacher behaviours	Perceived quality of mathematics instruction	no	yes
ST273	Mathematics teacher behaviours	Disciplinary climate in mathematics	yes	yes
ST270	School culture and climate	Mathematics teacher support	no	yes
ST285	Mathematics teacher behaviours	Cognitive activation in mathematics: Foster reasoning	yes	yes
ST283	Mathematics teacher behaviours	Cognitive activation in mathematics: Encourage mathematical thinking	yes	no
ST275	Exposure to mathematics content	Exposure to formal and applied mathematics tasks	yes	yes
ST276	Exposure to mathematics content	Exposure to mathematics reasoning and 21st century mathematics topics	yes	yes
ST268	Subject-specific beliefs, attitudes, feelings, and behaviours	Preference of math over other core subjects, and Perception of mathematics as easier than other subjects	no	no
ST290	Subject-specific beliefs, attitudes, feelings, and behaviours	Mathematics self-efficacy: formal and applied mathematics	yes	yes
ST291	Subject-specific beliefs, attitudes, feelings, and behaviours	Mathematics self-efficacy: reasoning and 21st century mathematics	yes	no
ST289	Subject-specific beliefs, attitudes, feelings, and behaviours	Subjective familiarity with mathematics concepts	yes	no
ST293	Subject-specific beliefs, attitudes, feelings, and behaviours	Proactive mathematics study behaviour	yes	yes

Question No.	Module	Construct	Within-construct matrix sampling (CBA only)	In PBA
ST292	Subject-specific beliefs, attitudes, feelings, and behaviours	Mathematics anxiety	yes	yes
ST297	Out-of-school experiences	Participation in additional mathematics instruction	no	yes
ST334	Creative thinking	Creative self-efficacy	yes	no
ST335	Creative thinking	Creative school and class environment	yes	no
ST336	Creative thinking	Creative peers and family environment	yes	no
ST337	Creative thinking	Creative school activities	no	no
ST338	Creative thinking	Creative outside school activities	no	no
ST339	Creative thinking	Beliefs about creativity	no	no
ST340	Creative thinking	Creativity and openness to intellect	yes	no
ST341	Creative thinking	Openness to art and reflection	no	no
ST342	Creative thinking	Imagination and adventurousness	yes	no
ST300	Parental/guardian involvement and support	Family support	yes	yes
ST327	Post-secondary preparedness and aspirations	Expected educational level	no	yes
ST329	Post-secondary preparedness and aspirations	Expected occupation	no	yes
ST330	Post-secondary preparedness and aspirations	Future study or work information	yes	no
ST324	Post-secondary preparedness and aspirations	Outlook on future educational career	yes	no
ST347	Global Crises	Type/duration of school closure	no	yes
ST348	Global Crises	School actions/activities to sustain learning	yes	yes
ST349	Global Crises	Type of digital device used for school work	no	yes
ST350	Global Crises	Subjective impression of learning during school closure	no	yes
ST351	Global Crises	Types of learning resources used while school was closed	yes	yes
ST352	Global Crises	Problems with self-directed learning	yes	yes
ST353	Global Crises	Family support for self-directed learning	yes	yes
ST354	Global Crises	Feelings about learning during school closure	yes	yes
ST355	Global Crises	Self-directed learning self-efficacy	yes	yes
ST356	Global Crises	Feeling of preparedness for future school closures	no	yes