SCHOOL-TO-SCHOOL INTERNATIONAL

GLOBAL MINDEDNESS IN INTERNATIONAL BACCALAUREATE® SCHOOLS

A BENCHMARK STUDY WITH YOUNG ADULTS' WORLD VALUES SURVEY DATA

Fernanda Gándara, Aimee Reeves, and Drew Schmenner

School-to-School International

February 2021

ACKNOWLEDGEMENTS

School-to-School International would like to thank the International Baccalaureate for its support and partnership throughout this research study. We would also like to recognize the International Baccalaureate schools, teachers, and students who collaborated on and participated in the study. We thank them for their time, patience, and enthusiasm. Without them, this study would not have been possible.

The following persons were instrumental to this study:

Laura Zasoski	(School-to-School International)
Hetal Thukral	(School-to-School International)
Miloš Kankaraš	(Independent Consultant)
Michael Thier	(International Baccalaureate)
Phuong (Holly) Tran	(International Baccalaureate)
Mia Jankosky	(International Baccalaureate)
Zach Fernebok	(International Baccalaureate)
Jerica Kelley-Stegall	(International Baccalaureate)

CONTENTS

ACRONYMS

CFA	Confirmatory Factor Analysis
COVID-19	2019 Novel Coronavirus
CP	Career-Related Programme
DP	Diploma Programme
HL	Higher Level
HLM	Hierarchical Linear Model
IB	International Baccalaureate®
IRB	Institutional Review Board
MLCA	Multi-group Latent Class Analysis
MYP	IB Middle Years Programme
PYP	IB Primary Years Programme
SD	Standard Deviation
SE	Standard Error
SES	Socioeconomic Status
SL	Standard Level
STS	School-to-School International
URL	Uniform Resource Locator
US	United States of America
TIF	Test Information Function
WVS	World Values Survey
WVSA	World Values Survey Association

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

CONTEXT

Established in 1968, the International Baccalaureate® (IB) is a nonprofit educational foundation that offers four programmes to more than one million students aged 3 to 19. It currently works in nearly 5,300 schools in 158 countries. The concept of global mindedness is integral to IB. In its mission statement, IB states it "aims to develop inquiring, knowledgeable, and caring young people who help create a better and more peaceful world through intercultural understanding and respect."[1] Its learner profile enumerates 10 attributes, including being "open-minded" and "principled," that IB values in developing "internationally minded people."[2]

Measuring global mindedness—generally and within IB programmes—however, has proved challenging. Nevertheless, tools that can be used to measure global mindedness and related constructs do exist. Prominent among these is the World Values Survey (WVS), an international research programme that studies people's social, political, economic, religious, and cultural values worldwide. WVS is one of the most widely used cross-national surveys in the social sciences.[3] IB identified the potential to leverage WVS's cross-national survey data to understand IB students' global-mindedness levels compared to country-level benchmarks of peers in the same countries and of a similar age range.

RESEARCH OBJECTIVES AND SCOPE

In 2019, IB commissioned School-to-School International (STS) to conduct a research study to better understand its Diploma Programme (DP) and Career-Related Programme (CP) students' global-mindedness levels. Due to the impossibility of using an experimental design to measure its programmes' impact, IB proposed drawing on the WVS Wave 6 to set country-level benchmarks for IB students' global mindedness in multiple nations.[4]

This research study

- Measures global-mindedness levels of students, aged 16–19, in publicly funded or private national schools that offer IB's DP and/or CP using selected items from the WVS Wave 6;

[1] See IB's Mission (https://www.ibo.org/about-the-ib/mission) for additional information.
[2] See IB's learner profile (https://www.ibo.org/contentassets/fd82f70643ef4086b7d3f292cc214962/learner-profile-en.pdf) for additional information.
[3] See http://www.worldvaluessurvey.org/wvs.jsp for additional information.
[4] WVS Wave 6 contains data from more than 85,000 respondents in 60 countries from 2010 to 2014. See http://www.worldvaluessurvey.org/wvs.jsp for additional information.

- Analyzes students' global-mindedness levels disaggregated by characteristics such as IB programme type (DP and CP), number of IB courses taken, year in IB programme (first year and second year), and demographics; and
- Benchmarks IB students' global-mindedness levels against previously collected data from nationally matched young adult (ages 18–29) WVS Wave 6 respondents.

In addition to using WVS Wave 6 items to construct a country-level benchmark, STS also developed a global-mindedness measure that includes a broader set of items to compare students within the IB programmes of interest for this study.

The global-mindedness study includes seven research questions, the first three of which STS addressed in an interim report submitted previously to IB.[5, 6] In the current report, STS has addressed research questions 4 to 7:

4. Based on a measure composed of items tested during Phase I, how do the following characteristics associate with global-mindedness levels:
    a. IB programme type (DP or CP)?
    b. Year in IB programme (first year or second year)?
    c. Candidacy (diploma or course)?[7]
    d. Number of standard level (SL) and higher level (HL) courses?
5. Based on a measure composed of items tested during Phase I, how do global-mindedness levels of young adults (ages 18–29) compare to corresponding levels among nationally relevant subgroups?
6. Which factors, if any, explain or moderate comparisons articulated in research questions 4 and 5?[8]
7. Has the COVID-19 health crisis influenced the levels of global-mindedness of IB DP and CP students?[9]

METHOD

STS conducted the global-mindedness study in two phases. In the pilot phase, STS focused on confirming the properties of global mindedness as a construct, assessing the adequacy of WVS Wave 6 items to measure the construct, and creating a robust tool to measure it. In the

[5] Research questions from pilot phase include: 1. In each nation of interest, to what extent do young adults' (ages 18–29) responses to selected global-mindedness items from the WVS Wave 6 demonstrate adequate psychometric properties to support the intended cross-cultural comparisons?; 2. To what extent do data collected using those global-mindedness items confirm the psychometric properties with data from DP and CP students within IB schools sampled from the same nations?; and 3. Are the global-mindedness items psychometrically adequate for within-nation comparisons of previously collected data from young adults and data collected from DP and CP students in IB schools?

[6] See Appendix II for additional details on the pilot phase.

[7] STS defined diploma candidates as students enrolled in the Diploma Programme who had a total course load of (a) three SL courses and three HL courses, or (b) two SL courses and four HL courses. Course candidates included DP students with less than six courses in total and all CP students. STS applied this definition to both first- and second-year students.

[8] STS modified the factors under research question 6 to align with operational findings.

[9] STS added research question 7 in the summer of 2020 to address the COVID-19 pandemic.

operational phase, STS measured IB students' global mindedness and compared IB students' responses against the WVS country-level benchmark.

The pilot phase began in December 2019 and ended in May 2020, and the operational phase began in June 2020 and ended in October 2020. In the pilot phase, STS selected Australia, Germany, Japan, Mexico, Spain, and the United States (US) for inclusion in the study.[10] STS also produced a final global-mindedness tool.[11, 12] To reflect the primary languages of the selected countries, STS made the survey available in English, German, Japanese, and Spanish, regardless of where students attended school among this study's six nations of interest.[13]

The operational phase resulted in 3,414 submissions from students in 79 schools across Australia, Germany, Japan, Mexico, Spain, and the United States. Despite the large sample sizes across most countries, readers should not assume that the results of this study are representative of all IB schools in the participating countries.

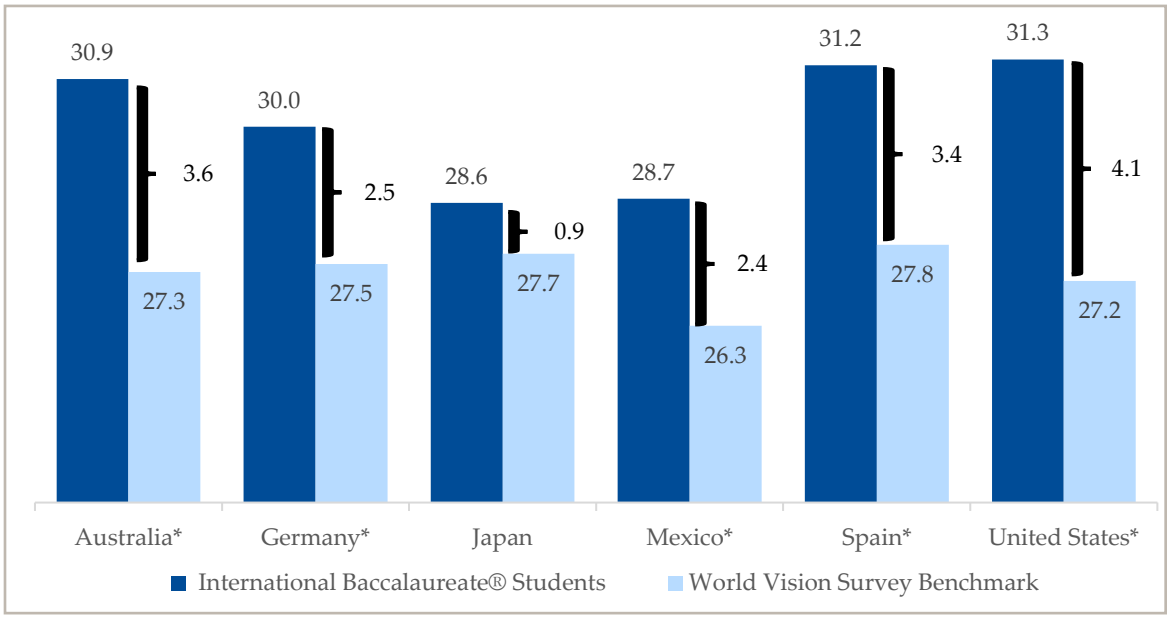
KEY FINDINGS AND RECOMMENDATIONS

Through this study, **STS found that IB DP and CP students in all six countries included in the study showed higher global-mindedness levels than young adults in the WVS Wave 6 benchmark group** (see Figure 1). Across countries, IB students' global-mindedness levels were between 3% and 15% higher than the country-level benchmark sample. STS also found evidence that exposure to IB programmes is associated with higher levels of global mindedness.

Given the promising results presented in this report and the results' connection to IB's mission statement, STS recommends that IB disseminates key report findings to IB schools, teachers, students, parents, and other relevant stakeholders. The findings may help IB internally and externally promote its successes in cultivating globally minded student communities. IB schools may also use the results to engage current and potential stakeholders in discussions about the benefits of IB's DP and CP. As outlined in the recommendations below, IB may also use the report findings to encourage IB schools to explicitly reflect on how they can cultivate global mindedness in their student populations.

[10] See Appendix II for details on the country selection process.
[11] STS selected four dimensions of global mindedness for the final tool: social responsibility and interconnectedness; humanistic and pluralist order; openness and perspective taking; and global citizenship. Order of the dimensions does not indicate statistical nor theoretical relevance.
[12] Characteristics of the IB's mission statement and learner profile echo the multidimensional construct of global mindedness formulated for this study. See IB's learner profile (https://www.ibo.org/contentassets/fd82f70643ef4086b7d3f292cc214962/learner-profile-en.pdf) for additional information.
[13] Students could select from Castilian Spanish or Latin American Spanish.

Figure 1 (points): Across all six countries, International Baccalaureate® students averaged higher levels of global mindedness than the World Values Survey country-level benchmarks, although the difference in means was not statistically significant in Japan.



Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level

STS proposes several programmatic and research recommendations for IB's consideration. STS has provided recommendations that may be enacted by IB schools, with facilitation by IB. STS also provides recommendations for future research to build upon the findings of this study (see Table 1). Specifically, IB may utilize the findings in this report to draft a theory of change for its DP and CP that articulates how the different elements of the IB experience—e.g., course content, training, methodologies—contribute to the development of students' global mindedness and any other relevant outcomes. A theory of change may help IB prioritize a research agenda and focus on uncovering the different relations between its DP- and CP-related activities and IB's desired outcomes. IB and IB schools may also leverage learnings to strengthen the global-mindedness levels of their DP and CP students.

Table 1: School-to-School International provides key findings and recommendations based on global-mindedness findings.

Key Finding	Recommendations
Research question 4: Based on a measure composed of items tested during Phase I, how do the following characteristics associate with global-mindedness levels: IB programme type (DP or CP); year in IB programme (first year or second year); candidacy (diploma or course); and the number of standard level (SL) and higher level (HL) courses?	
On average, Mexican Diploma Programme (DP) students had significantly higher levels of global mindedness than their Career-Related Programme (CP) counterparts.[14]	• International Baccalaureate® (IB) may replicate this study with a greater emphasis on exploring the differences in global mindedness of DP and CP students. With a more intentional sampling strategy, a replication study may offer a large enough CP student sample across multiple countries to understand potential differences between DP and CP students in more than one country.
Global mindedness tended to be higher for second-year students, with the difference being statistically significant among students in Australia.	• IB may consider studying DP and CP students as they transition from their first to second years, with the goal of understanding how global-mindedness levels change the longer they are in those IB programmes. For example, IB may consider systematically interviewing DP and CP students at the end of the first year to learn about their self-reported changes in worldviews. In this example, IB may pay particular attention to other factors relevant to global mindedness, such as gender.
Global mindedness did not vary based on the number of standard level (SL) or higher level (HL) courses.	• IB may study the impact that DP and CP have on global mindedness by examining a course's nature and content as opposed to the number of courses taken or programme type. This alternative method could mitigate challenges that STS faced in attributing impact when relying on the number of courses. Further, IB's research may identify how course content and pedagogy might relate to global mindedness—and explore those variations—to understand IB programmes' potential impact on students.
Research question 5: Based on a measure composed of items tested during Phase I, how do global-mindedness levels of young adults (ages 18–29) compare to corresponding levels among nationally relevant subgroups?	
DP and CP students averaged higher global-mindedness levels than their respective World Values Survey (WVS) country-level benchmark	• IB may identify IB schools where students are less globally minded and qualitatively contrast them to IB schools where students are more

[14] Due to the removal of responses from students with missing data, Mexico was the only country where enough student data existed for this comparison.

Key Finding	Recommendations
groups. These differences were statistically significant in all countries except Japan.	globally minded. To minimize selection bias, IB could prioritize pairs of IB schools that are relatively similar in terms of student composition, years since authorization, location, and other relevant characteristics. By comparing schools in these ways, IB could identify school factors that can boost or deter the development of global mindedness. • Given the constraints of this study due to the Japan sample sizes in the WVS country-level benchmark, IB may consider replicating this study with Japanese students using a different design or method. For example, IB may use comparison schools in Japan or select a different benchmark. Additional research is needed to confirm the findings of this study in the Japanese context.
Research question 6: Which factors, if any, explain or moderate comparisons articulated in research questions 4 and 5?	
Across countries, DP and CP students' gender correlated significantly with global mindedness across all countries; female, non-binary, and gender non-conforming respondents averaged higher global-mindedness levels than male respondents.	• IB may conduct follow-up studies utilizing interviews or focus groups to understand the drivers of global mindedness by gender and to determine whether they differ by gender identity. Further, IB may conduct similar research and intentionally sample more balanced proportions of students by gender to better understand if the results from this study may have been underestimated given the higher proportion of male respondents. • IB may create opportunities for IB school heads to connect with one another and discuss strategies that have seemed to boost students' global mindedness, especially among male students. If IB could identify schools where male students have higher levels of global mindedness, IB could facilitate sharing schools' promising practices in that area.
Across countries, DP and CP students' future aspirations about life and education correlated highly with global mindedness. It is unclear whether these aspirations increase students' global mindedness or the other way around.	• IB may create spaces for IB school heads to share their experiences on how to expose DP and CP students to the ideas of foreign travel, living abroad, and pursuing graduate degrees. For example, IB schools could share strategies that they enact to provide traveling opportunities to students. • IB schools may establish alliances with each other and develop new strategies for increasing

Key Finding	Recommendations
	global mindedness. For example, IB schools from different countries can find ways for their students to connect. Through that type of exchange, IB schools might increase their students' exposure to foreign cultures and develop an interest in traveling abroad.
The results of this study suggest that Primary Years Programme (PYP) and Middle Years Programme (MYP) participation is not an essential driver of global mindedness among the DP and CP students that previously participated in those IB programmes. However, students were not selected based on their PYP or MYP participation, and students who attend PYP and/or MYP programs could be fundamentally different than those who begin IB programmes in high school.	• IB may commission a mixed methods study to follow students along their paths and understand when and how global mindedness appears. IB may focus on identifying the trajectories of students across different IB programmes to evaluate how global mindedness evolves over time. • IB may study the age or grade at which global mindedness emerges as a stable trait to better target research and IB programmatic activities meant to develop global mindedness in students.
The relevance of gender and aspirations to global mindedness suggests that students of different gender, aspirations, and/or world exposure influence each other.[15]	• IB may encourage IB school heads to examine and share the ways that different DP and CP students positively or negatively influence each other. For example, IB schools with gender diversity could share their experiences with other schools and discuss strategies to purposefully increase the levels of global mindedness of students, recognizing how students influence each other.
Research question 7: Has the COVID-19 health crisis influenced the levels of global-mindedness of IB DP and CP students?	
For Mexican students, global-mindedness levels were not resilient to COVID-19.[16]	• IB and IB schools, including heads, coordinators, and teachers, may explore how to make students' global-mindedness levels more resilient—specifically during and after COVID-19. For example, IB may include creating spaces for IB schools to reflect or share lessons on how to cultivate global mindedness during disruptive global events. • IB may consider commissioning a similar study not during a pandemic. Given that global mindedness may not be resilient to shocks and that IB students' perceptions of their country and the world varied after the COVID-19 pandemic began, students' global-mindedness

[15] This concept is known as peer effects.

[16] Due to the sample sizes obtained in March 2020, STS used data solely from Mexico for this analysis.

Key Finding	Recommendations
	levels during the pandemic may not be the same as during a more emblematic time.
Across countries, DP and CP students' perceptions revealed that COVID-19 influenced their worldviews.	• IB may facilitate an increase in schools' awareness of students' sensitivity to pandemics and other large-scale disruptive events, and how students' reactions are context specific. IB may prompt schools to develop spaces to reflect on national and international events in ways that are constructive and that mitigate the loss of global mindedness.

IB may utilize these findings, as well as several other key learnings from the study, to further IB's and the greater academic community's body of research on global mindedness and how it develops and differs across individuals and contexts. IB and IB schools may also leverage learnings to strengthen the global-mindedness levels of their DP and CP students.

INTRODUCTION

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) outlines the research objectives and research questions. Key highlights include:

- International Baccalaureate® (IB) is a nonprofit educational foundation that offers four programmes to more than one million students aged 3 to 19. As of the writing of this report, IB works in nearly 5,300 schools in 158 countries.
- The World Values Survey (WVS), an international research programme that studies people's social, political, economic, religious, and cultural values worldwide, can be used to study global mindedness or constructs alike.
- This research study measures global-mindedness levels of IB Diploma Programme (DP) and Career-Related Programme (CP) students, aged 16 to 19; analyzes DP and CP students' global-mindedness levels; and benchmarks DP and CP students' global-mindedness levels against previously collected data from nationally matched young adult WVS Wave 6 respondents.
- STS answered seven research questions throughout this study. STS presented responses to research questions 1 to 3 in an interim report submitted and to research questions 4 to 7 in this report.

CONTEXT

Established in 1968, the International Baccalaureate® (IB) is a nonprofit educational foundation that offers four programmes to more than one million students aged 3 to 19. As of the writing of this report, IB works in nearly 5,300 schools in 158 countries.

The concept of global mindedness is integral to IB. In its mission statement, IB states it "aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect."[17] IB's learner profile enumerates 10 attributes, including being "open-minded" and "principled," that the organization values in developing "internationally minded people."[18] Characteristics of the IB's mission statement and learner profile echo the multidimensional construct of global mindedness that exists in current literature and was formulated for this study, including *social responsibility and interconnectedness* and *openness and perspective taking*.

Measuring global mindedness—generally and within IB programmes—however, has proved challenging. Because of the multidimensional nature of global mindedness, researchers have not

[17] See IB's Mission (https://www.ibo.org/about-the-ib/mission) for additional information.
[18] See IB's learner profile (https://www.ibo.org/contentassets/fd82f70643ef4086b7d3f292cc214962/learner-profile-en.pdf) for additional information.

proposed a uniform method for assessing global mindedness in IB schools with their multiple cultural contexts. Instead, researchers recognize the need to choose global-mindedness assessments based on context (Sriprakash, Singh, & Qi, 2014). In a case study of international mindedness at nine IB schools, researchers found few structured mechanisms at the schools for formal assessment of the concept (Hacking, Blackmore, Bunnell, Donnelly, & Martin, 2018). Researchers relate international mindedness to global mindedness based on their common dimensions of global engagement, intercultural understanding, and multilingualism (Singh & Qi, 2013). Common definitions of global mindedness also include intercultural understanding and global engagement.

Despite the challenges, tools that measure global mindedness or related constructs do exist. Prominent among these is the World Values Survey (WVS), an international research programme that studies people's social, political, economic, religious, and cultural values worldwide. The World Values Survey Association (WVSA) publicly provides WVS item-level data for adults aged 18 to 65 in 60 nations and many linguistic contexts. Many of its items align with academically recognized dimensions of global mindedness. For that reason, researchers have made use of WVS data to study global mindedness or constructs alike. Presently, WVSA is one of the most widely used cross-national surveys in the social sciences.[19]

RESEARCH OBJECTIVES

In 2019, IB commissioned School-to-School International (STS) to conduct a research study to better understand its Diploma Programme (DP) and Career-Related Programme (CP) students' global-mindedness levels. Due to the impossibility of using an experimental design to measure its programmes' impact, IB proposed drawing on the WVS Wave 6 to set country-level benchmarks for IB students' global mindedness in multiple nations.[20] Based on the WVS country-level benchmark, IB DP and CP students could be compared to peers of a similar age range in the same country. This study is believed to be the first use of WVS items to collect data from secondary school students—specifically, secondary school students enrolled in IB programmes.

Specifically, this research study

- Measures global-mindedness levels of students, aged 16 to 19, in publicly funded or private national schools that offer the DP and/or the CP using selected items from the WVS Wave 6;

[19] See http://www.worldvaluessurvey.org/wvs.jsp for additional information.
[20] WVS Wave 6 contains data from more than 85,000 respondents in 60 countries from 2010 to 2014. See http://www.worldvaluessurvey.org/wvs.jsp for additional information.

- Analyzes students' global-mindedness levels disaggregated by characteristics such as IB programme type (DP and CP), number of IB courses taken, year in IB programme (first year and second year), and demographics; and
- Benchmarks IB DP and CP students' global-mindedness levels against previously collected data from nationally matched young adult (ages 18–29) WVS Wave 6 respondents.

In addition to using WVS Wave 6 items to construct a country-level benchmark, STS also developed a global-minded measure that includes a broader set of items to compare students within the IB programmes of interest for this study.

RESEARCH SCOPE

STS and IB determined that six countries would be included in the research study. Further, of the six, two would come from each of IB's three regions—IB Africa, Europe, and the Middle East; IB Americas; and IB Asia-Pacific.[21] Based on research criteria, STS selected Australia, Germany, Japan, Mexico, Spain, and the United States (US) for inclusion in the study.[22] To reflect the primary languages of the selected countries, STS made the survey available in English, German, Japanese, and Spanish, regardless of where students attended school among this study's six nations of interest.[23]

RESEARCH QUESTIONS

IB presented six research questions in the proposal stage—three corresponding to the pilot phase and three to the operational phases of the study. STS added a seventh question in the summer of 2020 to address the COVID-19 pandemic's potential influence on global mindedness.

Research questions for the pilot phase relate to the confirmation of the properties of global mindedness as a construct, the assessment of the adequacy of WVS Wave 6 items to measure the global-mindedness construct, and the creation of a robust tool to measure it. Research questions for the operational phase pertain to the analysis of IB students' global mindedness as well as the benchmarking of IB students' responses against WVS Wave 6 respondents. After the study's pilot phase, STS refined the operational research questions.[24]

[21] STS established six criteria for the selection of countries: 1) Countries must have at least 30 schools with IB DPs or CPs; 2) Countries should offer at least three of the four possible IB programmes throughout the country; 3) Countries should have at least four cities with a high density of IB schools; 4) Countries should have schools of different sex composition—single-sex and co-ed; 5) Countries should have schools that offer both DP and CP; and 6) Countries should offer IB programmes in private and state-funded schools.

[22] See Appendix II for details on the country selection process.

[23] Students could select from Castilian Spanish or Latin American Spanish.

[24] STS slightly altered IB's proposed wording of research questions to eliminate the suggested subgroups and factors. STS ultimately selected subgroups and factors for analysis based on findings.

The final seven research questions are

Pilot Phase (I): Testing the adequacy of WVS Wave 6 items

1. In each nation of interest, to what extent do young adults' (ages 18–29) responses to selected global-mindedness items from the WVS Wave 6 demonstrate adequate psychometric properties to support the intended cross-cultural comparisons?[25]
2. To what extent do data collected using those global-mindedness items confirm the psychometric properties with data from DP and CP students within IB schools sampled from the same nations?
3. Are the global-mindedness items psychometrically adequate for within-nation comparisons of previously collected data from young adults and data collected from DP and CP students in IB schools?

Operational Phase (II): Comparing levels of global mindedness

4. Based on a measure composed of items tested during Phase I, how do the following characteristics associate with global-mindedness levels:
    a. IB programme type (DP or CP)?
    b. Year in IB programme (first year or second year)?
    c. Candidacy (diploma or course)?[26]
    d. Number of standard level (SL) and higher level (HL) courses?
5. Based on a measure composed of items tested during Phase I, how do global-mindedness levels of young adults (ages 18–29) compare to corresponding levels among nationally relevant subgroups?
6. Which factors, if any, explain or moderate comparisons articulated in research questions 4 and 5?[27]
7. Has the COVID-19 health crisis influenced the levels of global mindedness of IB DP and CP students?

STS presented responses to research questions 1 to 3 in an interim report (see Appendix II) and to research questions 4 to 7 in this report.

[25] Psychometric properties may include model convergence, expected a posteriori reliability, appropriate parameterization, distinct dimensionality, or lack of differential item functioning, among others.

[26] STS defined diploma candidates as students enrolled in the Diploma Programme who had a total course load of (a) three SL courses and three HL courses, or (b) two SL courses and four HL courses. Course candidates included DP students with less than six courses in total and all CP students. STS applied this definition to both first- and second-year students.

[27] STS modified the factors under question 6 to align with findings.

LITERATURE REVIEW[28]

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) provides a review of previous studies related to the topic. Key highlights include:

- Global-mindedness literature does not provide a clear definition of the concept, and global mindedness is sometimes used interchangeably with other elusive concepts, such as global citizenship.
- Although researchers' definitions and usages of global mindedness vary, studies on global mindedness share two consistent characteristics: global mindedness is multidimensional, and the "worldview" aspect of the definition is prominent.
- Global mindedness is typically measured with self-reported assessments, which have many positive aspects, as well as drawbacks.
- Scholars, journalists, and organizations generally use the World Values Survey's (WVS) nationally representative data for cross-cultural research. Researchers have also used WVS data for studies investigating global mindedness.

DEFINITION OF GLOBAL MINDEDNESS

Literature on global mindedness indicates that the concept itself is contested. To some researchers, global mindedness may refer to an attitude (Hett, 1993; Singh and Qi, 2013), an experience (Beek, 2017), or a values orientation (Béneker, van Dis, & van Middelkoop, 2014). Further, global mindedness is sometimes used interchangeably with other elusive concepts, such as global citizenship (Singh & Qi, 2013). Broader perspectives on the concept define it as multidimensional, composed of several sub-traits. Some researchers state that it is impossible to formulate a uniform definition for global mindedness, as the concept should be reinterpreted at the local level (Castro, Lundgren, & Woodin, 2015). Although researchers' definitions and usages of global mindedness vary, studies share two consistent characteristics.

First, most influential definitions of global mindedness are multidimensional. This complexity is seen in how it manifests itself both in form—individuals' attitudes, feelings, and behaviors—and contexts—such as its relation to social responsibility or individuals' readiness to act in global problems. The multidimensional expression of global mindedness is reflected in Hett's (1993, p. 142) influential definition of the concept as a commitment to global issues that is "reflected in attitudes, beliefs, and behaviors." Notably, its multidimensionality is also evident

[28] STS began the literature review by reviewing the articles used by IB in its request for proposals. STS then expanded the review to cover foundational definitions of global mindedness, issues around measuring constructs like global mindedness and the empirical relations between global mindedness and other variables. STS selected additional articles by using keywords (e.g., "assessment" + "global-mindedness") and by using recommendations from the cross-cultural psychologist that supported the work.

from empirical evidence. Multiple research studies using various surveys conceptualize global mindedness using four or five dimensions (Béneker, van Dis, and van Middelkoop, 2014; Hett, 1993; Lawthong, 2003; Meyer et al., 2011). Global mindedness's dimensions may include attitudes and preferences regarding cultural pluralism; a tendency towards interconnectedness; and personal concern and awareness about the world's problems, globalism, or global citizenship. Like other psychological constructs, global mindedness can be expressed differently across cultures, social contexts, and historical eras. Although global mindedness's manifestation is context-specific, it is still possible to outline a general definition of the concept that transcends local specificities and builds on the often-identified similarities (see Table 2). A necessary condition to conduct cross-cultural comparisons is transcending the local contexts. Researchers need to create a definition of global mindedness applicable across multiple contexts and empirically validate their definition.

Table 2: Researchers' definitions of global mindedness reveal overlapping and diverging dimensions.

	Hett (1993)	Lawthong (2003)	Meyer et al. (2011)
#	Dimension	Dimension	Dimension
1	Responsibility	Care in the world's problems	Social responsibility
2	Cultural pluralism	Acceptance of different cultures	Skilled dispositions and open-mindedness
3	Global centrism	World citizenship	Ethnocentrism and nationalism
4	Interconnectedness	Interconnectedness and peace	Global kinship
5	Global efficacy	N/A	Personal efficacy

Second, the "worldview" aspect of the definition is prominent in several conceptualizations. The relevance of this worldview component is consistent with Hett's (1993, p. 142) definition of global mindedness, which refers to "a worldview in which one sees oneself as connected to the world community and feels a sense of responsibility for its members." The Organisation for Economic Co-operation and Development (OECD, 2018) has adopted this definition, which frames global mindedness as an essential component for the development of global competency. Many researchers view global mindedness as a worldview encompassing several related attitudinal dispositions toward other cultures. This framing is consistent with more recent definitions of the term, such as Lawthong's (2003, p. 60) from the Thai context, which states that global mindedness is:

> An extensive view of the world that considers cultural pluralism and cares of global issues, especially the use of resources and the preservation of the environment. All countries are interconnected and live peacefully together. Every human being is a citizen of the world who bears equal rights and freedom.

ASSESSMENT OF GLOBAL MINDEDNESS

Global mindedness is typically measured with self-reported assessments, which have many positive aspects (Kankaraš, 2017). Self-reports can generally capture reliable and valid

information on a wide range of individuals' psychological characteristics, especially those that are more subjective in nature. In addition, self-reports have shown excellent measurement properties for constructs that are less socially sensitive (Vazire & Carlson, 2010). Moreover, self-reports are efficient to administer, and respondents can typically express their attitudes in ways that are consistent with researchers' intentions. In practice, self-reported assessments are considered the "only feasible measurement form for use in large-scale international surveys" (Kankaraš and Suarez-Alvarez, 2018, p. 65).

Still, self-reported assessments do have drawbacks (Kankaraš and Suarez-Alvarez, 2018). Researchers may confuse respondents if items are too vague or contain imprecise or complex language. In addition, respondents may not describe their feelings accurately or recall an event accurately. Social desirability is another constraint of self-reports. Respondents may overemphasize socially appropriate traits and underreport disagreeable traits. Another drawback is reference bias, which refers to how respondents from different countries may interpret a concept based on different standards (Kankaraš and Suarez-Alvarez, 2018). These limitations do not discard self-reported instruments, as alternative methods for assessing global mindedness have their own important limitations. For example, the concept's subjective nature would make it difficult for independent observers to estimate a person's level of global mindedness reliably. Also, reports from other informed observers—such as parents or teachers—are skewed by similar methodological biases, such as social desirability or response styles (Kankaraš, Feron, and Renbarger, 2019). Overall, self-reported assessments continue to be predominant.

PREDICTORS OF GLOBAL MINDEDNESS

Global mindedness, like other psychological constructs, can be associated with contextual factors related to a person's upbringing. From early studies on global mindedness, researchers have suggested that characteristics such as identifying as female, exposure to international cultures, access to international travel, and time spent studying or living abroad are relevant predictors of global mindedness (Hett, 1993). More recently, researchers have identified other factors that correlate positively with global mindedness, such as pluralism, openness to diversity, the interconnectedness between different people and cultures (Shadowen, Chieffo, & Guerra, 2015), speaking two or more languages (Cui, 2016; Kirkwood-Tucker et al., 2017), more liberal political leanings, being born outside of the country of residence, and a grade-point average (Kirkwood-Tucker et al., 2017). Researchers have found identifying as female to associate consistently with higher levels of global mindedness (Cui, 2016; Hett, 1993; Kirkwood-Tucker et al., 2017; Lawthong, 2003), yet not always with global citizenship (Anthony, Bederman Miller, & Yarrish, 2014). Hett (1993) found that exposure to international cultures by having international friends or taking college-level courses with an international focus are both associated with higher levels of global mindedness, a finding that more recent studies have corroborated (Cui, 2016). Researchers have found that both having lived or studied abroad

associated with higher levels of observed global mindedness and global citizenship (Hett, 1993; Tarrant and Lyons, 2012). There is also evidence that the choice of college major may associate with differential levels of global citizenship (Anthony, Bederman Miller, and Yarrish, 2014).

In addition, relevant factors can interact in significant ways. For example, women may benefit more, in terms of global citizenship, from traveling abroad than do their male counterparts (Tarrant and Lyons, 2012). This finding on gender may also be true at the school level. For instance, a school's sex composition is relevant to global citizenship, with all-girls schools showing the highest levels (Tormey and Gleeson, 2012). However, readers could interpret these results with caution as they may also be confounded with other school-level characteristics, such as the ideologies that schools might espouse. Last, in the context of this study, access to materials and media platforms focused on global issues and phenomena is relevant. Issues related to access are especially pertinent during the COVID-19 pandemic when people rely more heavily on virtual and remote technologies to stay connected to their school communities and the larger world.

In contrast, research has found that some seemingly relevant factors are not always related to global mindedness, including age (Lawthong, 2003), foreign language skills (Hett, 1993; Lawthong, 2003), religion (Lawthong, 2003), or intention to travel abroad in the future (Lawthong, 2003). These factors could be further explored and not just discarded. The results of these findings may be context-specific or reflect methodological shortcomings, such as omitted variable bias or poorly measured variables. In addition, given that many of these aforementioned factors are related to socioeconomic status (SES), it is essential to evaluate global mindedness in relation to proxies of SES—such as the number of books at home and parental education—and to reevaluate some relations after controlling for SES.

THE WORLD VALUES SURVEY

To respond to the research questions in this study, School-to-School International (STS) used data from the World Values Survey (WVS). Overseen by a vast network of social scientists, the WVS is a research program of global values conducted across 60 nations and many linguistic contexts. The international network develops the WVS, and each country has a principal investigator to manage its fieldwork and contributions to datasets. WVS researchers adapt the English master questionnaire to different languages and cultures using forward and back translations. Scholars, journalists, and organizations generally use the WVS's nationally representative data for cross-cultural research.

Fieldwork for each iteration of the survey occurs over the course of several years. The first iteration of the survey, referred to as Wave 1, took place from 1981 to 1984. STS used data from WVS Wave 6, representing data collected from more than 85,000 respondents in 60 countries from 2010 to 2014 (Inglehart et al., 2014). The WVS Wave 6 questionnaire totaled 250 items and

measured concepts such as cultural values; attitudes and beliefs towards gender, democracy, social tolerance, and trust; and ethical values and norms.

Other researchers have also used WVS data for studies investigating global mindedness. For instance, using WVS data, researchers concluded that globalized and integrated economies had not brought about a higher convergence in values across the world (World Values Survey, 2020). Indeed, this study concluded that the gap in values has increased between low-income and high-income countries; high-income countries have changed rapidly in terms of attitudes towards family, marriage, gender, and sexual orientation, moving towards more secular and self-expression values. Researchers did not find that low-income countries had experienced similar changes. In other studies that examine WVS data, "self-categorization as a world citizen is associated with desire to help others, environmental sustainability, and endorsement of supranational organizations" (Reysen and Katzarska-Miller, 2018). Overall, the WVS questionnaire enabled multiple cross-cultural studies examining culture, and many of its items are relevant to the construct of global mindedness.

METHOD[29]

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) provides a brief overview of the pilot phase and detailed information on the operational phase, including sample selection and recruitment, data collection, and analysis. Key highlights include:

- STS's final global-mindedness tool contained 40 items that measured the four identified dimensions of global mindedness, four items to measure perceptions of the COVID-19 pandemic, and 20 demographic and background items.
- In total, STS invited 469 schools to participate in the study. Of those, 79 schools (16.8%) completed the required steps and participated.
- STS collected operational phase data from 3,414 Diploma Programme (DP) and Career-Related Programme (CP) students, across Australia, Germany, Japan, Mexico, Spain, and the United States (US).
- Of the students who participated in the study, roughly two in three were DP students, 40.9% were from Mexico, and 57.2% were male.

PILOT PHASE[30]

From December 2019 to May 2020, School-to-School International (STS) conducted pilot phase activities to answer research questions 1 to 3. STS proposed to conceptualize global mindedness as a five-dimension construct for the pilot phase: 1) social responsibility, 2) openness and perspective taking, 3) global citizenship, 4) efficacy, and 5) interconnectedness. To develop the student survey for the pilot phase, STS consulted various sources (see Appendix Table 4). The World Values Survey (WVS) Wave 6 questionnaire served as the primary source, contributing 25 items that fit the study's initial dimensions of global mindedness. In addition, STS selected items from six other sources and created two original items to reach the pilot's desired quota of items for each dimension.[31] In total, STS piloted 66 items.

Four of the six countries included in the study—Germany, Mexico, Spain, and the United States (US)—participated in the pilot phase (see Appendix Table 1). No schools in Australia or Japan

[29] STS received Institutional Review Board (IRB) approval for the multi-country study from Solutions IRB on February 12, 2020. Solutions IRB approved a study amendment on September 10, 2020. The approval of the study is valid through February 11, 2021.
[30] See Appendix II for a summary of pilot phase findings.
[31] STS aimed to include a minimum of four items per dimension. In total, STS piloted 11 items for social responsibility, 28 for openness and perspective taking, 14 for global citizenship, four for efficacy, and nine for interconnectedness. See Appendix II for additional details on the pilot phase.

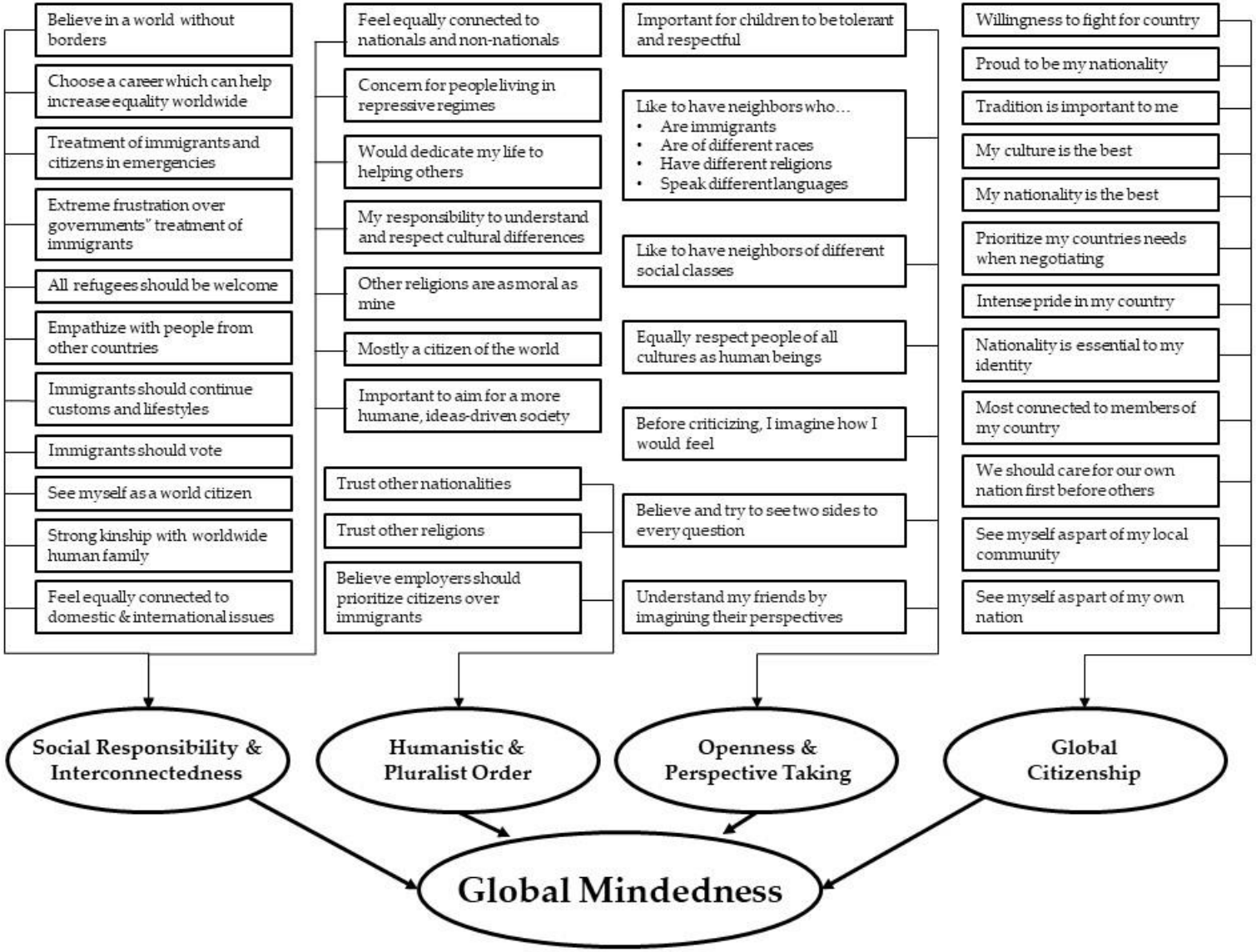
opted to participate due to the emergence of the COVID-19 pandemic at the beginning of pilot data collection in March 2020.[32]

After analysis of pilot results, STS finalized the study's four dimensions of global mindedness and the set of items for the operational phase (see Figure 2). At that stage, STS retained 34 items from the original 66, including 12 from WVS Wave 6. Before finalizing items for the operational tool, STS modified 14 non-WVS items to improve the scale's properties at the higher end of the scale.[33] In addition, STS added six global-mindedness items and four items about the COVID-19 pandemic.[34]

The final tool contained 40 items that measured the four identified dimensions of global mindedness, four items to measure perceptions of the COVID-19 pandemic, and 20 demographic and background items (see Appendix I).

[32] In consultation with IB, STS determined that Australia and Japan would only be included in the inferential data analysis if the properties of the tool behaved similarly to the other countries where piloting was possible.
[33] There was little variation at the higher end of the scale—in other words, for students with high levels of global mindedness. Therefore, STS added items to increase variability among students with high or very high levels of global mindedness.
[34] STS added eight global-mindedness items, retained six of the eight in the final tool, and used all six in the final analyses.

Figure 2: School-to-School International's final global-mindedness tool contains four dimensions derived from 40 items.



OPERATIONAL SAMPLE SELECTION AND RECRUITMENT

STS used lessons learned from the pilot phase and school data from the International Baccalaureate® (IB) to construct an appropriate operational school sample (see Table 3).[35] Specifically, STS utilized pilot school response rates to calculate the number of schools to target for the operational phase, with the ultimate goal of reaching a sufficient number of participating schools.[36] This process ensured a group of students large enough to conduct mean comparisons between different subgroups and between the entire sample within a country and the corresponding WVS country-level benchmark.

Table 3: School-to-School International invited 469 schools to participate in the operational phase of the study, and 79 schools opted in.[37]

Country	Total International Baccalaureate® Schools		Recruitment Operational School Sample		Final Operational School Sample	
	Diploma Programme	Career-Related Programme	Diploma Programme	Career-Related Programme	Diploma Programme	Career-Related Programme
Australia	77	3	77	3	14	1
Germany	80	7	79	7	5	2
Japan	51	0	51	0	6	0
Mexico	81	17	45	13	8	9
Spain	142	1	60	1	15	0
United States	965	133	149	6	19	0
Total	**1,396**	**161**	**461**	**30**	**67**	**12**

The school recruitment process for the operational phase varied by country. In the US, STS sampled public and private schools separately. Due to the specificities of receiving external research approval from US public school districts, STS identified 18 school districts within 18 states—a total of 74 schools—that met a set of predetermined criteria (see Appendix Table 11). Of these 18 school districts, STS submitted applications to 15 seeking participation from a total of 50 schools. Four school districts ultimately approved the research, with a total of seven schools participating. For private schools, STS selected all schools with active Career-Related Programmes (CP) and then randomly selected schools with Diploma Programmes (DP) to reach the remaining operational school sample.

[35] The target number of students was 300 per country. STS assumed that each school had 20 eligible DP or CP students.
[36] Response rates for the pilot phase were 50% for Australia, Germany, and Japan; 60% for Mexico; 80% for Spain; and 40% for the US STS determined that the operational sample of students—and accordingly, of schools—should be sufficiently large to conduct mean comparisons between different subgroups and between the entire sample and a benchmark.
[37] 23 schools had both DP and CP and are double counted in the table.

The low response rates in Australia, Germany, and Japan during the pilot phase prompted STS to invite all IB schools to participate. To reach the desired student sample size of 300, more IB schools in these three countries than currently exist would need to participate.[38] In Mexico and Spain, STS followed the same sampling protocol as with US private schools and included all active CP schools and a random selection of DP schools to round out the sample.

STS conducted school outreach in two groups. Group 1 included all sampled schools except US public schools, and Group 2 included all US public schools. For Group 1, STS and IB developed an outreach strategy to engage with school heads and coordinators of the relevant IB programmes. First, each Group 1 school received one email from IB and another from STS.[39] In its email, IB informed heads and coordinators that they had been selected to participate. STS emailed Group 1 schools, asking them to opt in or out of the study via an online survey.[40] To comply with IRB requirements, schools first had to elect to participate and then submit a site-approval letter to receive access to the survey. STS provided passive or active parental consent forms in all four study languages to schools based on their specific requirements.[41]

In total, STS invited 469 schools to participate in the study. Of those, 79 schools (16.8%) completed the required steps and participated (see Figure 3).[42]

[38] Using standard parameters—an alpha of 0.05, power of 0.8, effect size of 0.2 on standard deviations and a one-tailed test—the number of students needed in the operational sample is 156 students per subgroup. However, these numbers assume no intra-cluster correlation, which may be unrealistic. Depending on the intra-cluster correlation coefficient and the number of students selected by school, numbers may increase. For example, a design effect could be 2.0, which would mean that each sample size would be increased by a factor of two and that the final sample requirements would be 312 students per subgroup. Per subgroup of interest, STS would ideally require a minimum of 15 schools—and 300 students—per country to confront potentially high levels of intra-cluster correlation. Therefore, STS assumed 20 students per IB school.

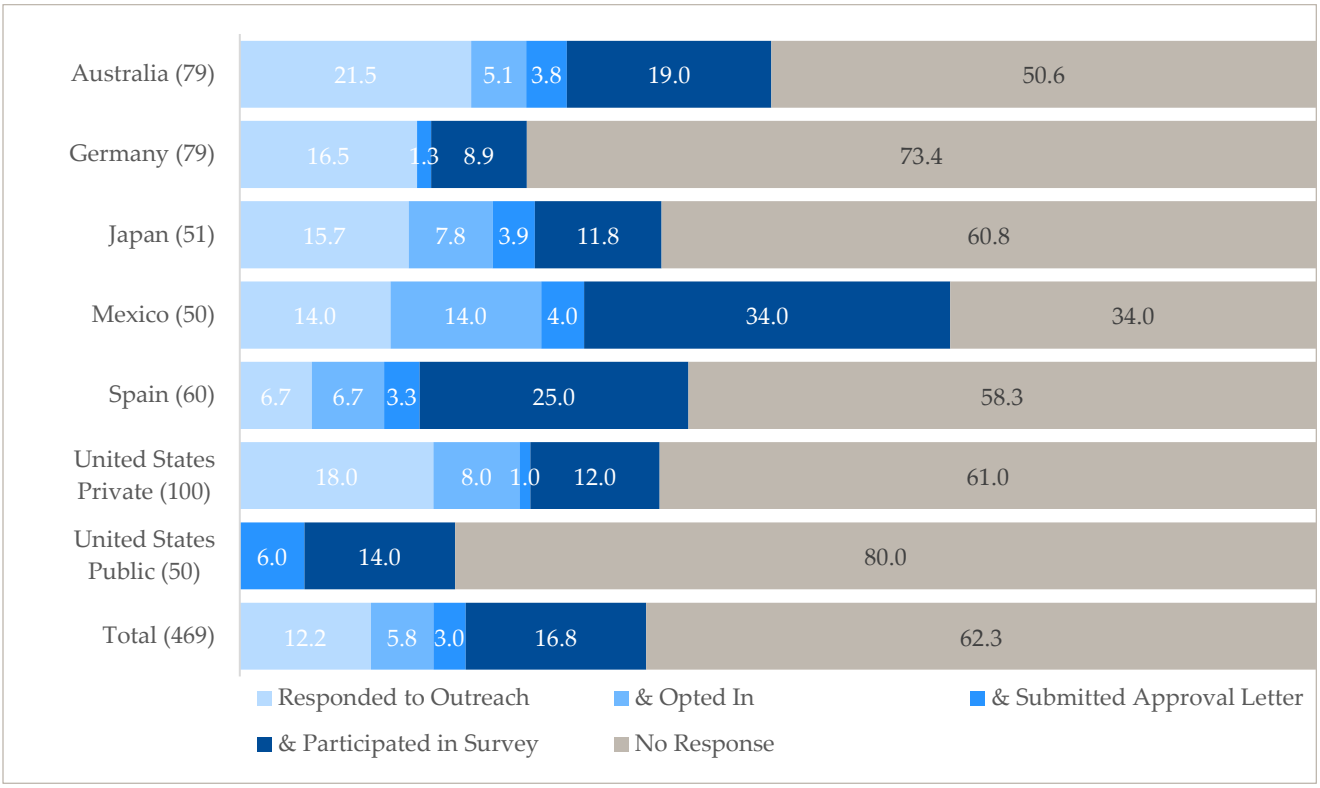
[39] STS randomly assigned Group 1 schools into two subgroups—Group 1A and Group 1B. STS sent an email to all Group 1 schools approximately one month prior to the start of operational data collection. IB sent an email to Group 1A one week before STS's email and to Group 1B one week afterward. The recruitment strategy was devised to test which methods of engagement resulted in better response rates.

[40] A forthcoming study using data from this project's A/B testing approach of head's up versus follow-up recruitment emails is quantifying each approach's influence on school response rates and eventual participation.

[41] By default, STS provided schools with passive parental consent forms in the primary language of the country. STS instructed schools to request passive consent forms in any other of the survey languages. STS also instructed schools to request active parental consent forms. Of all the schools that opted in, eight schools—two in Spain, two in Germany, and four in the US—requested active parental consent forms.

[42] Of the invited 469 schools, 23 schools had both DP and CP but are only counted as one school.

Figure 3 (%): Differing proportions of operational schools participated in the study, with an overall participation rate of 16.8%.[43]



OPERATIONAL DATA COLLECTION

Operational data collection started on September 28, 2020 and closed on October 27, 2020. IB sent each participating school's point of contact a unique uniform resource locator (URL) to the survey hosted on Qualtrics, its data-collection platform. STS invited all first- and second-year students enrolled in DP or CP at participating schools, except those under 18 years of age whose parents did not provide consent, to participate in the study. Before accessing the survey, each student had to read an assent statement and agree to participate. Students could choose to skip any survey item and terminate survey participation at any time.

In total, 3,414 students participated and completed the survey (see Table 4).[44, 45] Of the respondents, 40.9% were from Mexico. Across all six countries in this study, a larger proportion of male students (57.2%) than non-male students—which included female, non-binary, and gender non-conforming students—responded. The average age of respondents was 16.6 years.

[43] STS employed a different selection process for US public schools. As a result, these schools are not included in **Error! Reference source not found.**.

[44] In total, 81.6% of these students provided complete responses. STS used those students' responses in all the analyses. STS retained 83.2% of students who provided complete responses for the analysis involving WVS benchmarks.

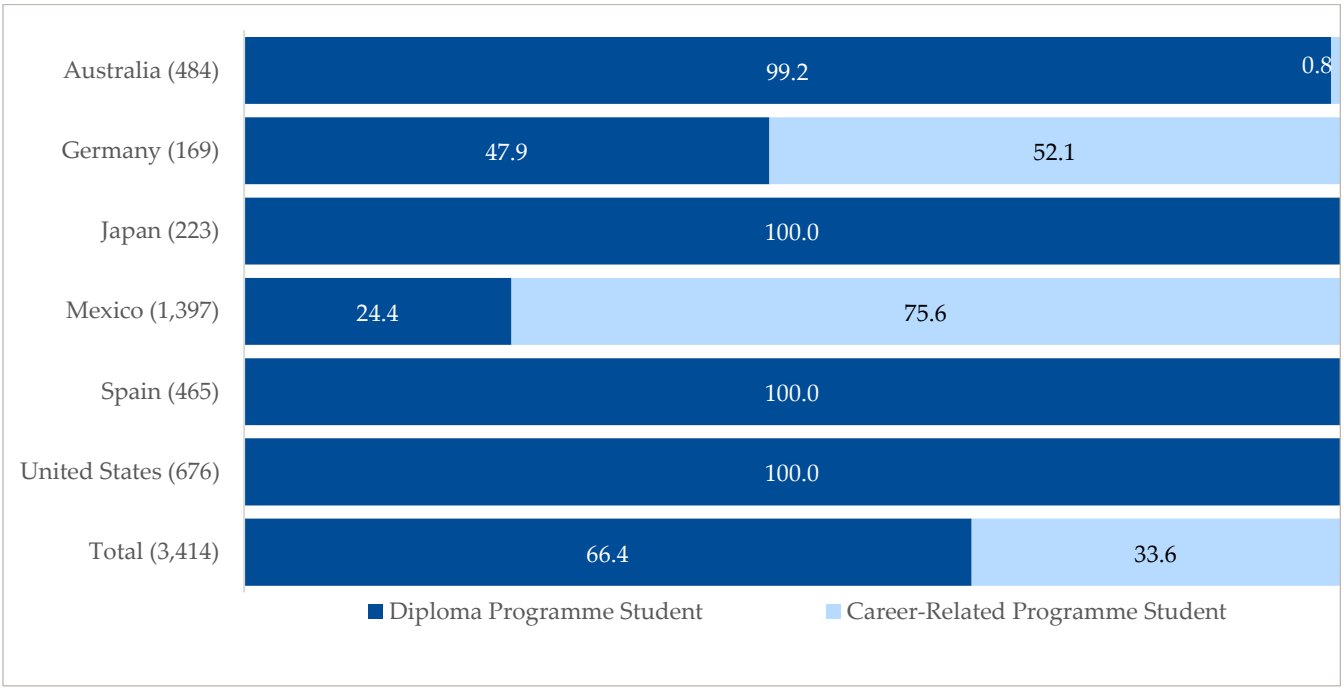
[45] The total number of student respondents per school varied considerably from one student per school to 371 students per school.

Table 4: A larger proportion of male students than female, non-binary, and gender non-conforming students participated in the operational phase.

Country	Total Students	Total Schools	Gender				Age	
			% Female	% Male	% Non-Binary	% Other	Mean	Standard Deviation
Australia	484	15	38.7	59.2	0.8	1.2	16.7	0.8
Germany	169	7	38.8	58.2	1.2	1.8	16.7	0.8
Japan	223	6	36.2	62.5	0.9	0.4	16.7	0.9
Mexico	1,397	17	45.8	53.5	0.7	0.0	16.6	0.8
Spain	465	15	41.3	57.0	0.9	0.9	16.4	0.9
United States	676	19	36.4	61.4	1.5	0.7	16.5	0.7
Total	**3,414**	**79**	**41.3**	**57.2**	**0.9**	**0.6**	**16.6**	**0.8**

Of the students who participated in the study, roughly two in three were DP students (see Figure 4). In Mexico, about three in four students were CP students. In Japan, Spain, and the US, all students were DP students.

Figure 4 (%): Of the students who participated in the operational phase, roughly two in three were Diploma Programme students.



Students responded to items about their previous and current experience with IB programmes (see Table 5). Overall, about one in 10 students had participated in an IB Primary Years Programme (PYP), and about one in three students had participated in an IB Middle Years

Programme (MYP).[46] On average, students were enrolled in 2.8 standard level (SL) courses and 3.0 higher level (HL) courses.[47] Students averaged 1.5 years' experience in any of IB's programmes, including MYP and PYP.

Table 5: Most operational phase students had 1.5 years' experience in any International Baccalaureate's® programmes, and less than half were Primary Years Programme or Middle Years Programme alumni/ae.

Country	Total Students	Previous International Baccalaureate® Experience		Standard Level Courses		Higher Level Courses		Years in International Baccalaureate®	
		% Primary Years Programme Alumni/ae	% Middle Years Programme Alumni/ae	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Australia	484	12.8	29.5	2.9	0.3	3.0	0.3	1.5	2.2
Germany	169	18.8	40.6	2.9	0.2	3.1	0.3	1.4	3.2
Japan	223	13.4	31.7	3.0	0.3	3.0	0.2	1.6	2.7
Mexico	1,397	14.6	43.1	2.7	0.6	2.9	0.8	1.4	2.7
Spain	465	6.0	22.5	2.9	0.3	3.0	0.3	1.4	1.8
United States	676	9.6	35.1	2.6	0.6	3.1	0.7	1.6	2.3
Total	**3,414**	**12.3**	**35.9**	**2.8**	**0.5**	**3.0**	**0.6**	**1.5**	**2.5**

STS has included additional descriptive statistics in Appendix IV.

[46] PYP and MYP are IB programmes that serve 3- to 12-year-olds and 11- to 16-year-olds, respectively.
[47] SL and HL course load was relevant to analysis of diploma versus course candidates. STS defined diploma candidates as students enrolled in the Diploma Programme who had a total course load of (a) three SL courses and three HL courses, or (b) two SL courses and four HL courses. Course candidates included DP students with less than six courses in total and all CP students. STS applied this definition to both first- and second-year students.

OPERATIONAL DATA ANALYSIS

The purpose of the operational data analysis was to respond to research questions 4 through 7. To do so, STS conducted multiple analyses using Stata and Excel.[48] STS used factor analysis to corroborate the appropriateness of its conceptualization of global mindedness and the appropriateness of the selected items to measure global mindedness as intended. STS also used factor analysis to evaluate the level of measurement equivalence—or invariance—of the construct across countries.[49] After evaluating these foundational aspects of the construct and removing select non-conforming items, STS proceeded to

- Use the full tool to compute means of global mindedness across relevant subgroups (research question 4);
- Use the WVS selected items to compute means across relevant subgroups and to compute WVS country-level benchmarks (research question 5);
- Conduct correlation and multilevel regression analyses to understand the factors related to global mindedness among IB students (research question 6); and
- Conduct propensity score matching to evaluate if there was a significant difference in global-mindedness levels among Mexican students pre- and during COVID-19 (research question 7).[50]

Box 1
Operational Data Analysis

Evaluation of
- the operational items (exploratory factor analysis)
- the appropriateness of the intended construct (confirmatory factor analysis)
- invariance of the tool across countries (multi-group latent class analysis)

Computation of
- means for different subgroups using the full tool for global mindedness
- means for different subgroups using the WVS selected items
- country-level benchmarks using the WVS selected items
- correlations between global mindedness and other factors
- multilevel models to predict global mindedness in each country

STS determined that the global-mindedness tool's level of invariance was "metric invariance," which implies that the same construct is being measured, but that means are not directly comparable.[51] To compare means across metric invariant scales, values need to be shifted upwards or downwards by a certain amount. Thus, in this study, global-mindedness means cannot be compared across countries. However, because measurement units are the same across countries, readers may compare *differences in means* for given subgroups—for example, DP versus CP students—across

[48] See Appendix V for a detailed explanation of analysis steps.
[49] See Appendix V for more details about the assessment of invariance.
[50] The analysis only included Mexican students due to their higher level of participation during the pilot phase. Although STS collected data from four countries, only the Mexican student sample provided enough students for this analysis.
[51] An example of scales that are metric invariant are the Kelvin and Celsius temperature scales, which have identical measurement units but different origins.

countries. Additionally, despite the large sample sizes across most countries, readers should not assume that the results of this study are representative of all IB schools in the participating countries.

FINDINGS

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) provides findings for research questions four through seven. Key highlights include:

- The Diploma Programme (DP) and Career-Related Programme (CP) students that STS sampled—irrespective of their programme, candidate status, and number of years in their current IB programme—possessed levels of global mindedness higher than the World Values Survey (WVS) country-level benchmark in all countries, with the difference being statistically significant in all countries except Japan. Across countries, IB students' global-mindedness levels were between 3% and 15% higher than the country-level benchmark sample.
- Across most countries, International Baccalaureate® (IB) second-year students averaged higher levels of global mindedness than did IB first-year students, with second-year students having between 1% lower to 5% higher global-mindedness levels than first-year students.
- IB students' gender was significantly correlated with global mindedness across all countries, with female, non-binary, and gender non-conforming respondents averaging higher levels of global mindedness.
- A comparison of Mexican IB students' global-mindedness levels from pilot (before COVID-19) and operational (during COVID-19) phases provides preliminary evidence that the construct of global mindedness might be sensitive to an external shock such as COVID-19.

Box 2
Statistical and Practical Significance

INFERENTIAL STATISTICs entails testing hypotheses and detecting relations between, and effects of variables. ***Statistical significance*** refers to determining whether a relation or effect exists. However, there are many situations in which statistically significant results are too small to be relevant for practice. To that end, researchers also report measures of ***practical significance***, or the magnitude of an existing effect. Practical significance is a context-specific definition. However, a standard way of evaluating practical significance is through ***effect sizes***, or measures intended to describe how large a detected effect is. The results presented below allow the reader to understand both the statistical and practical significance of the findings.

RESEARCH QUESTION 4

Based on a measure composed of items tested during Phase I, how do the following characteristics associate with global-mindedness levels:

a. *International Baccalaureate® (IB) programme type (Diploma Programme (DP) or Career-Related Programme (CP))?*

b. *Year in IB programme (first year or second year)?*

c. *Candidacy (diploma or course candidacy)?*

d. *Number of standard level (SL) and higher level (HL) courses?*

STS used the total scores on the full operational tool to measure global mindedness for students across the six countries.[52] Using these scores, School-to-School International (STS) compared global-mindedness levels for students who

- Were enrolled in different IB programmes (Diploma Programme (DP) versus Career-Related Programme (CP));
- Were enrolled in different grade levels (first year versus second year);
- Held different levels of candidacy (diploma versus course candidate) based on the students' number of standard level (SL) and higher level (HL) courses;[53] and
- Had different numerical combinations of SL and HL courses.

Although STS made these comparisons within each country, readers may compare differences between subgroups across countries.

STS first compared global-mindedness levels between students enrolled in DP and CP. Due to the removal of students with missing data, Mexico was the only country where enough student data existed for this comparison.[54, 55, 56] On average, Mexican DP students had significantly higher levels of global mindedness than their CP counterparts. DP students' global-mindedness levels

Box 3
Effect Size

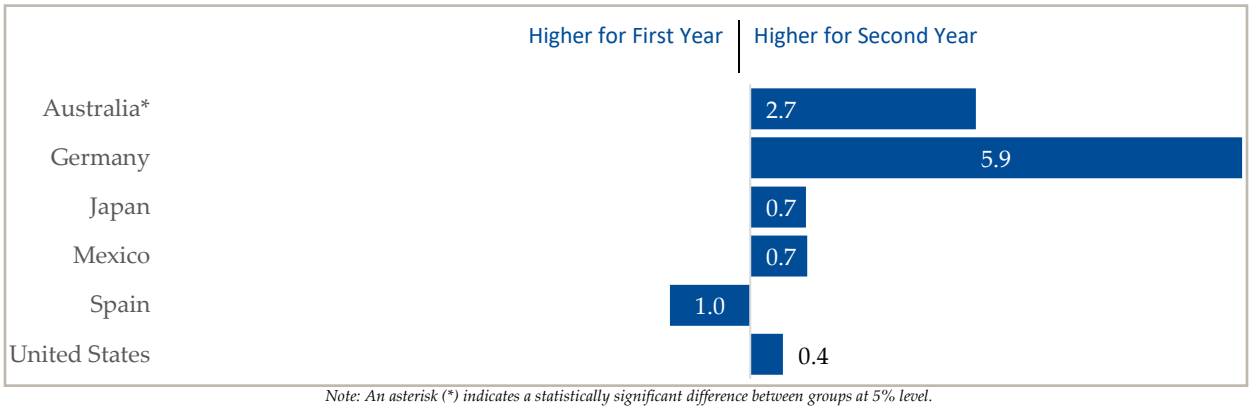
The most common effect size to evaluate differences in means is Cohen's *d*. Cohen (1988) states that effect sizes can be categorized according to their absolute value as small [0.2 to 0.5], medium [0.5 to 0.8], and large [0.8 or larger]. For the purposes of this report, STS only reported effects sizes where the differences were statistically

[52] For further details on the final tool, see Appendix I and Appendix V.
[53] STS defined diploma candidates as students enrolled in the Diploma Programme who had a total course load of (a) three SL courses and three HL courses, or (b) two SL courses and four HL courses. Course candidates included DP students with less than six courses in total and all CP students.
[54] This idea is technically known as listwise deletion.
[55] See Appendix IV for additional information regarding country-level data and analysis.
[56] For example, fewer than 10 German CP students completed the survey.

averaged 3.7 points higher than those of CP students, with the effect size of the difference in means being of small magnitude (Cohen's d = 0.4).[57]

STS then compared global-mindedness levels between students enrolled in the first year of their programme and those enrolled in the second year (see Figure 5). This comparison found that, **across most countries, second-year students averaged higher levels of global mindedness than did first-year students.** Second-year students had between 1% lower to 5% higher global-mindedness levels than first-year students. However, the difference was only statistically significant in Australia, where second-year students averaged 2.7 points higher than did first-year students.[58] The magnitude of the difference in the mean's effect size was small (Cohen's d = 0.2). In Spain, STS observed the inverse trend, where first-year students' global mindedness levels were higher than second year students, although the difference was not statistically significant.

Figure 5 (points): Across most countries, second-year students averaged higher levels of global mindedness than did first-year students.



Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

Third, STS compared global-mindedness levels between diploma candidates and course candidates as defined for this study.[59] For the purposes of this analysis, STS defined diploma candidates as DP students enrolled who had a total course load of (a) three SL courses and three HL courses, or (b) two SL courses and four HL courses. Course candidates included DP students with fewer than six courses in total and all CP students. STS applied this definition to both first- and second-year students.

[57] STS calculated Cohen's d as follows: $\frac{Difference}{\sqrt{\frac{(n1-1)*sd_1^2+(n2-1)*sd_2^2}{(n1+n2-2)}}}$, where $n1$ is total for group 1, sd_1 is the standard deviation for group 1, where $n2$ is total for group 2, sd_2 is the standard deviation for group 2.

[58] Although the difference between first- and second-year students was large in Germany, the standard error of the difference was large. Therefore, the difference was not statistically significant.

[59] STS's definition differs from the traditional IB definition of diploma candidates based on data collection limitations and IB's guidance. IB traditionally refers to a diploma candidate as a student who registers to complete a full suite of DP courses and core requirements. See https://nhs.svvsd.org/files/The%20Diploma%20Programme%20From%20principles%20into%20practice.pdf for additional information on candidacy definitions.

STS first examined mean global-mindedness levels by a student's number of SL and HL courses taken (see Table 6 and Table 7). STS found no clear relation between the number of SL or HL courses and global mindedness.

Table 6 (mean): Global-mindedness levels by a student's number of standard level courses showed little variation.[60]

Country	One Course		Two Courses		Three Courses	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Australia	-	-	124.6	3.1	122.8	0.6
Germany	-	-	127.3	13.0	119.6	1.9
Japan	119.5	11.5	121.3	8.7	116.4	0.9
Mexico	117.6	1.6	118.8	1.2	120.6	0.5
Spain	123.0	-	124.3	2.1	122.1	0.8
United States	122.3	2.3	126.4	1.0	124.5	0.8

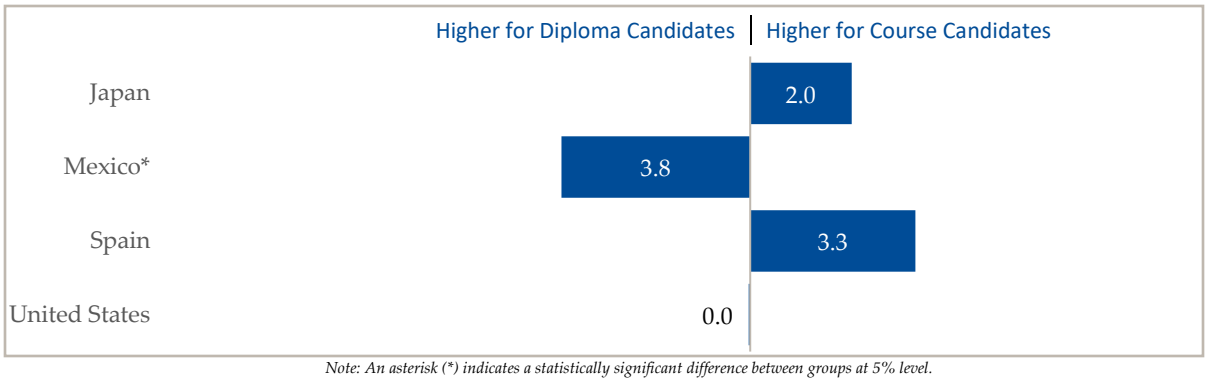
Table 7 (mean): Global-mindedness levels by a student's number of higher level courses showed little variation.[61]

Country	One Course		Two Courses		Three Courses	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Australia	-	-	-	-	122.9	0.6
Germany	-	-	-	-	119.5	1.9
Japan	108.0	-	96.0	-	116.8	0.9
Mexico	117.8	1.4	119.6	1.8	120.0	0.6
Spain	128.0	-	118.1	3.5	122.4	0.8
United States	126.3	2.5	123.6	3.2	124.7	0.7

Then, STS examined the difference in global mindedness between diploma and course candidates (see Figure 6). **STS found that global mindedness between diploma and course candidates varied by country.**[62] In Japan and Spain, course candidates averaged higher global-mindedness levels; however, in Mexico, diploma candidates averaged higher global-mindedness levels. There were almost no differences in global mindedness between diploma and course candidates in the US (0.03 points). The difference in global-mindedness levels between course and diploma candidates was statistically significant only in Mexico's case, with the effect size of the difference in means being of small size (Cohen's $d = 0.4$).

[60] Mean global-mindedness levels should not be compared across countries due to the global-mindedness tool's metric invariance.
[61] Mean global-mindedness levels should not be compared across countries due to the global-mindedness tool's metric invariance.
[62] STS did not present results for Australia and Germany in the figure due to inadequate sample sizes for this analysis.

Figure 6 (points): Global mindedness differences between diploma and course candidates varied by country



Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

Last, STS evaluated whether there was a linear trend between the number of courses taken by students and their levels of global mindedness. A significant linear trend would indicate a linear relation between the number of courses taken and global mindedness. However, **STS found no statistically significant linear trends for either SL or HL courses** (see Appendix Table 20).[63]

RESEARCH QUESTION 5

Based on a measure composed of items tested during Phase I, how do global-mindedness levels of young adults (ages 18–29) compare to corresponding levels among nationally relevant subgroups?

STS used items from the World Values Survey (WVS) Wave 6 retained from the pilot phase to compare IB students' global mindedness against WVS Wave 6 data collected from individuals in their corresponding countries. Acknowledging that global mindedness may be sensitive to age, STS compared IB students to individuals in the same countries who were 18-29 years old, as 18 was the youngest in the WVS Wave 6 dataset. Using these data, STS created country-level, global-mindedness benchmarks. STS then compared the aggregated responses of IB students on the same items against these benchmarks.[64]

Across all six countries, IB students averaged higher levels of global mindedness than the WVS country-level benchmarks (see Figure 7). Across countries, IB students' global-mindedness levels were between 3% and 15% higher than the country-level benchmark sample. The difference in means was statistically significant in all countries except for Japan, which is largely explainable by the extremely small sample of respondents used in the WVS benchmark.[65, 66]

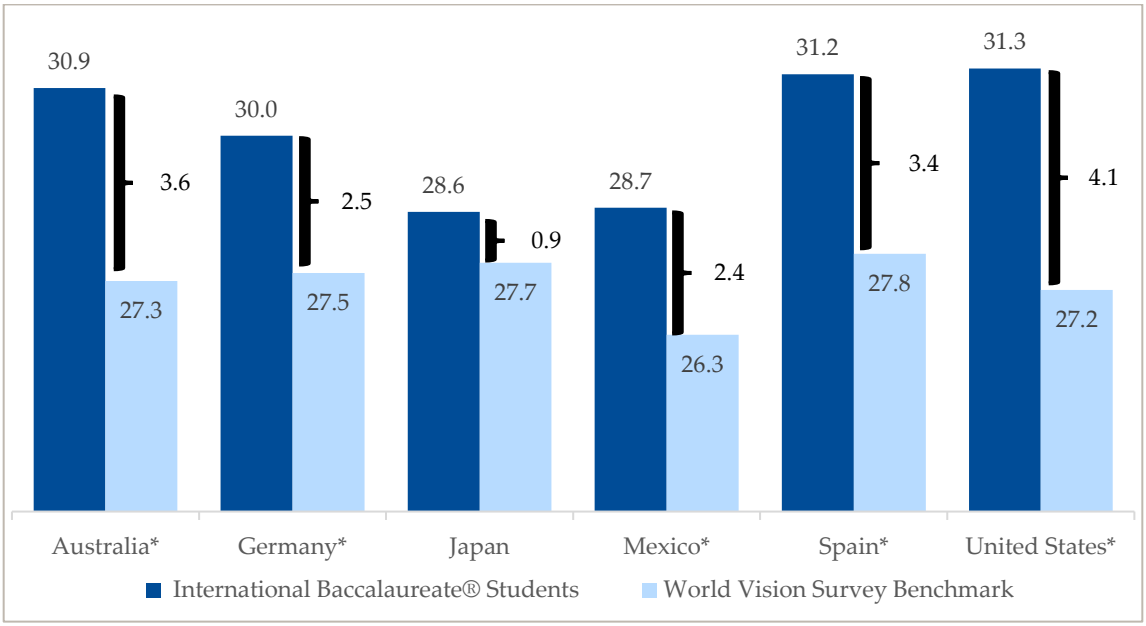
[63] $\alpha = .05$

[64] The benchmark comparison between IB students and the country-level benchmark contained 12 WVS items.

[65] To compare the IB and WVS samples, STS examined the overlap of 95% confidence intervals, estimated by Mean +/- 1.965* Standard Error. When the IB and WVS intervals overlapped, STS determined that the difference was not statistically significant.

[66] Using listwise deletion, STS only retained the records of students who provided valid answers to each of the items used in the comparison; this number was extremely low in the case of the WVS Japanese sample. See Appendix IV.

Figure 7 (points): Across all six countries, International Baccalaureate® students averaged higher levels of global mindedness than the World Values Survey country-level benchmarks, although the difference in means was not statistically significant in Japan.

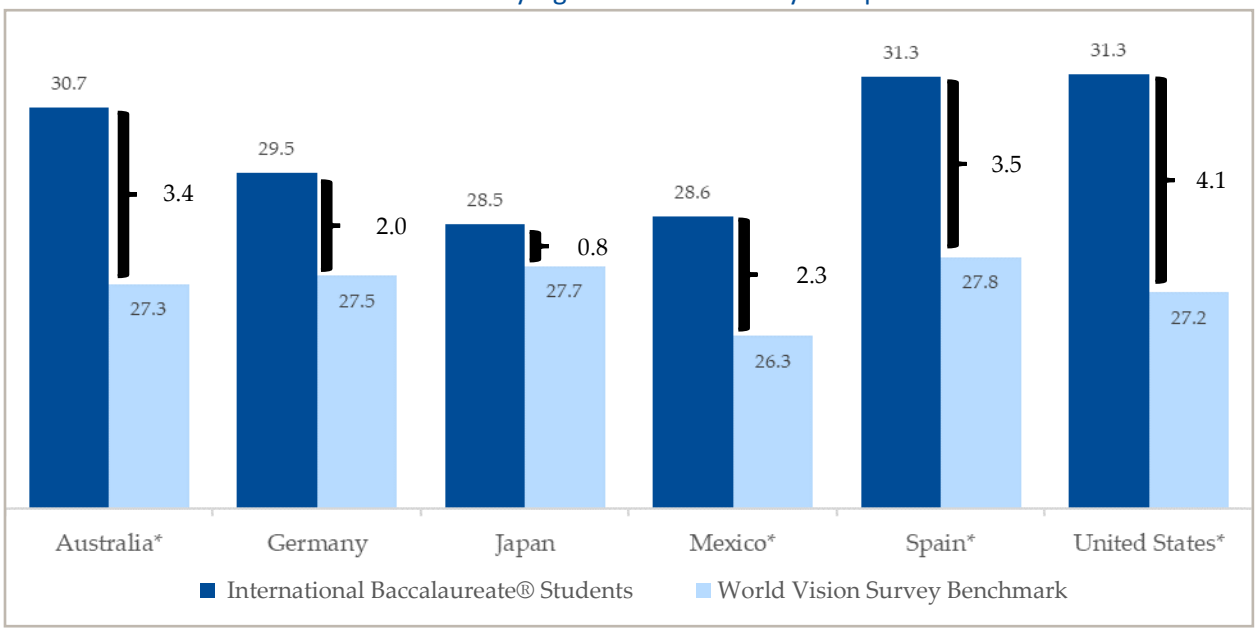


Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

The difference in global-mindedness levels between IB students and WVS country-level benchmarks ranged from 0.9 points in Japan to 4.1 points in the United States. The effect sizes of the differences in means were mostly large; Cohen's *d* was 1.2 in Australia, 0.7 in Germany, 0.3 in Japan, 0.8 in Mexico, 0.9 in Spain, and 1.2 in the US. The effect sizes for Australia and the US can be considered very large. Taken together, these differences showed a very consistent picture: **IB students possessed higher levels of global mindedness than did respondents in the WVS country-level benchmark sample.**

STS also compared subgroups of IB students and country-level benchmarks. When examining the levels of global mindedness of different subgroups of IB students against the WVS country-level benchmark, the conclusion was largely the same. **The DP and CP students that STS sampled—irrespective of their programme, candidate status, and number of years in their current IB programme—demonstrated higher global-mindedness levels than the benchmark sample in all countries**. Across subgroups, the differences between IB students' and the benchmark sample's global mindedness levels were statistically significant in all countries except Japan. Additionally, in one subgroup comparison for Germany, the difference between global-mindedness levels of first-year IB students and the country-level benchmark was positive, yet not statistically significant (see Figure 8).

Figure 8 (points): Across all six countries, first-year International Baccalaureate® students averaged higher levels of global mindedness than the World Values Survey country-level benchmarks, although the difference in means was not statistically significant in Germany or Japan.



Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

RESEARCH QUESTION 6

Which factors, if any, explain or moderate comparisons articulated in research questions 4 and 5?

STS estimated correlations between a series of factors and students' scores on the full global-mindedness scale, by country. STS selected these factors based on their observed predictive power in the pilot analysis. The factors included DP and CP students' (a) background characteristics, such as age or having a working mother; (b) future aspirations, such as intending to spend an extended period of time abroad; (c) IB enrollment characteristics, such as the number of IB courses they took during the year; and (d) self-reported influence of the COVID-19 pandemic on their views of government and the world.

Specifically, STS looked at the coefficients for those variables that had a statistically significant correlation with the global-mindedness score—known as moderators (see Table 8). **STS found limited stability of correlations across countries, with most relations being context specific**. For example, the number of languages spoken at home correlated significantly to global mindedness in Japan and Spain, but not elsewhere. Correspondingly, being an MYP alumnus/a correlated significantly to global mindedness in Australia, Mexico, and Spain. Still, the relation had different magnitudes and directions among these three countries.

Box 4
Correlation Coefficients

CORRELATION COEFFICIENTS CAN BE TAKEN AS one type of effect size. Correlation coefficients take values between -1 and 1, with absolute values closer to 1 representing stronger relations and with absolute values closer to 0 representing weaker relations. Positive coefficients indicate that variables vary in the same direction; negative coefficients indicate that variables vary in opposite directions. According to Cohen (1988), a correlation coefficient can be categorized according to its absolute value as small [0.1 to 0.3], medium [0.3 to 0.5], and large [0.5 or larger].

STS found three sets of consistent correlations across countries: gender, future aspirations, and concerns related to the COVID-19 pandemic. First, students' gender correlated significantly with global mindedness across all countries, with female, non-binary, and gender non-conforming respondents averaging higher levels of global mindedness.

Table 8 (correlation coefficients): There were three sets of consistent correlations across countries: gender, future aspirations, and concerns related to the COVID-19 pandemic.[67, 68]

Variable	Australia	Germany	Japan	Mexico	Spain	United States
	Medium effect size			Small effect size		
Gender (1 = female, non-binary, and gender non-conforming)	0.30*	0.36*	0.30*	0.26**	0.27*	0.36*
Age				0.07*		
Country of birth (1 = same as residence)						
Languages spoken at home			0.25*	0.06*	0.14*	
Mother employed (1 = yes)					0.16*	
Father employed (1 = yes)				0.06*		
Books at home[69]	0.19*			0.14**	0.16*	
Foreign travel in past five years (1 = yes)				0.06*		0.10*
Intention to study abroad for limited period (1 = yes)	0.23*	0.31*		0.14**	0.11*	0.31*
Intention to move abroad for extended period (1 = yes)	0.25*	0.32*	0.27*	0.24**	0.23*	0.30*
Intention to pursue a graduate degree (1 = yes)		0.27*	0.16*	0.19**	0.22*	0.13*
Intention to find a career with travel (1 = yes)	0.12*		0.20*	0.13**	0.24*	0.19*
Years of International Baccalaureate® education	0.14*			-0.06*	-0.15*	
Total courses (standard level and higher level)				0.12*		
Primary Years Programme alumni/ae (1 = yes)						
Middle Years Programme alumni/ae (1 = yes)	0.12*			-0.07**	-0.22*	
Pandemic influence on perceptions around country (1 = not at all, 2 = a lot)			-0.20*			0.40*
Pandemic influence on perceptions around world (1 = not at all, 2 = a lot)				0.08**		0.19*
Judgment of government's response (0 = more negative…2 = more positive)				0.10**		0.20*
Concern about impact of pandemic on creating disunity (0 = not at all…2 = very)	0.38*	0.46*	0.25*	0.28**	0.32*	0.44*

[67] Empty cells indicate that STS found no significant correlation between that factor and global mindedness.

[68] An asterisk (*) indicates statistical significance at 5% level. Two asterisks (**) indicates statistical significance at 1% level.

[69] Categories were: 0 "None or very few (0–10 books)"; 1 "Enough to fill one shelf (11–25 books)"; 2 "Enough to fill one bookcase (26–100 books)"; 3 "Enough to fill two bookcases (101–200 books)"; and 4 "Enough to fill three or more bookcases (more than 200 books)."

Second, future aspirations about life and education correlated highly with global mindedness. Global mindedness tended to correlate positively and significantly with students' intentions to (a) study abroad for a limited period of time, (b) move abroad for an extended period of time, (c) find a career that involves travel, and (d) pursue a graduate degree. The relations between these intentions and global mindedness, whenever statistically significant, ranged from small to moderate depending on the country. STS found most consistent and predictive of these relations between "moving abroad for an extended period of time" and global mindedness. The other relations were relatively consistent across countries, but some variations included:

- Intending to study abroad for a limited period was not significantly correlated with global-mindedness among IB students in Japan;
- Intending to pursue a graduate degree was not significantly correlated with global-mindedness among IB students in Australia; and
- Intending to find a career that involves international travel was not significantly correlated with global-mindedness among IB students in Germany.

Third, the more concern students reported regarding the potential impact that the COVID-19 pandemic has had on creating disunity among people from different countries and origins, the higher their levels of global mindedness. According to standards from Cohen (1988), the relation was moderate for all countries. Across most countries, this relation was stronger than the relation between gender and global mindedness. Yet, the two variables interact: while 51.4% of female, non-binary, and gender non-conforming students reported feeling very concerned about the impact of the pandemic on disunity, only 34.0% of males reported similar feelings (see Table 9). These results suggest that the relation may be moderated or confounded by other factors.

Table 9 (%): A larger proportion of female, non-binary, and gender non-conforming students reported feeling very concerned about the impact of the pandemic on disunity than their male peers.

Country	Female, Non-Binary, and Gender Non-Conforming (% Very Concerned)	Male (% Very Concerned)
Australia	54.4	30.1
Germany	36.3	25.8
Japan	39.0	32.5
Mexico	53.9	36.3
Spain	50.9	31.4
United States	54.4	36.1
Total	**51.4**	**34.0**

STS also evaluated the correlations between the aforementioned factors and the total scores on the selected WVS items (see Appendix Table 24).[70, 71] The smaller number of items used in the analysis left less power to detect meaningful correlations. Indeed, many correlations—12 out of 57—became non-significant, and those that were consistent reduced in magnitude. The exception was Germany, where STS observed the same pattern and magnitude of correlations as with the full global-mindedness tool. STS found a notable variation in the correlation between global mindedness and the judgment of government response among students in the US. When examining the correlation with WVS items, the coefficients were stronger and changed direction. With that in mind, none of the major conclusions changed when comparing correlations with the full operational measure or with the WVS items only.

RESEARCH QUESTION 7

Has the COVID-19 health crisis influenced the levels of global mindedness of IB DP and CP students?

First, STS matched students who took the pilot survey in March 2020—at the beginning of the pandemic—to students who took the operational survey in October 2020—several months into the pandemic. This process allowed a comparison of students' global mindedness before and during the pandemic within the same nation to assess their resiliency levels. Due to the sample sizes obtained in March 2020, STS used data solely from Mexico for this analysis.[72]

Second, STS developed four items that dealt with how the COVID-19 pandemic influenced students' views. Through these responses, STS could determine the extent to which students believed that the pandemic had affected their views. This second analysis included operational phase students from all six countries.

To compare Mexican students' levels of global mindedness before and during the COVID-19 pandemic, STS reserved pilot data from 70 students to be matched and compared with 70 operational students; STS excluded the reserved pilot data from the pilot analysis.[73] STS matched students using propensity scores based on the three most predictive background characteristics, in terms of global mindedness, for IB students in Mexico: gender, books at home, and intention to move abroad for an extended period of time (see Appendix Figure 10).[74] This analysis assumed that any significant differences in global-mindedness levels between the pilot

[70] There were 12 selected items.

[71] In addition to the correlational analysis, STS conducted a series of multilevel analyses within each country to test the predictability of the factors on global mindedness (see Appendix V). However, some variables in these models can be confounded and the risk of endogeneity is high. Although there are some technical methods to deal with endogeneity and correlated variables in multilevel models, STS believes that the correlational analysis is more appropriate for this circumstance and dataset.

[72] Mexico had 301 pilot respondents, although all other countries in the sample had fewer than 80 pilot respondents.

[73] STS's rationale behind excluding the 70 students from the pilot analysis was to protect the integrity of the comparisons: if data from these 70 students had been used to determine the operational tool, the final tool could have "over fitted" the students' responses and distorted the comparison with other samples. See Appendix II for a full explanation on the rationale behind reserving sampled students for this analysis.

[74] STS avoided increasing the number of background variables to match students, as doing so meant reducing the sample even further. STS then compared matched students' global-mindedness levels.

and operational phases had resulted from the COVID-19 pandemic.[75] STS recognizes that there may be other factors influencing the results, such as natural changes in global mindedness that occur during the summer break or unobserved variables. The reader should interpret these matching results with this limitation in mind.

To compare differences in students' global mindedness before and during the pandemic, STS used all the items that were the same on the pilot and final operational global-mindedness tools.[76] After removing incomplete cases, there were very few students remaining to match (n = 18).[77] For robustness, STS replicated the analysis on the entire set of students in the Mexican pilot sample (n = 90). The first sample is referred to as the reduced sample (n = 18) and the second one as the extended sample (n = 90).

STS examined the average differences—or Average Treatment Effect—in global-mindedness for both samples from before and during the pandemic (see Table 10). Negative differences for both samples indicated that **students' global mindedness decreased after the COVID-19 pandemic surged in Mexico**. Differences were statistically significant for both samples; the effect size was of high magnitude in the reduced sample (Cohen's d = -0.8) and very high magnitude in the extended sample (Cohen's d = -1.2). These results provide preliminary evidence that the construct of global mindedness might be sensitive to an external shock such as COVID-19.

Table 10 (Average Treatment Effect): In Mexico, sampled students' global-mindedness levels during the COVID-19 pandemic were lower than those of students before the pandemic.[78]

Sample	Difference	Standard Error	z	$P > \|z\|$	Cohen's d
Reduced sample (n = 18)	-4.94	2.06	-2.40	0.02	-0.8
Extended sample (n = 90)	-5.33	0.65	-8.13	0.00	-1.2

STS also analyzed all students' responses to items about the influence of the COVID-19 pandemic on their views on their governments and the world. Students responded to these items only in the operational phase. Across countries, STS found that the majority of students

- believed that their perceptions about their own countries and the rest of the world had changed a lot—59.5% and 63.2%, respectively (see Figure 9 and Figure 10);
- held a more negative view of their own government—56.1% (see Figure 11); and

[75] Pilot data collection took place from March 5–April 5, 2020. On March 5, 2020, Mexico reported three daily cases of COVID-19; on April 5, 2020, Mexico reported 242 daily cases of COVID-19. In contrast, by the end of operational data collection on October 27, 2020, Mexico reported 7,729 daily cases and a cumulative total of 943,087 cases of COVID-19. See https://datos.covid-19.conacyt.mx/#DOView for additional information.

[76] See Appendix IV for additional information.

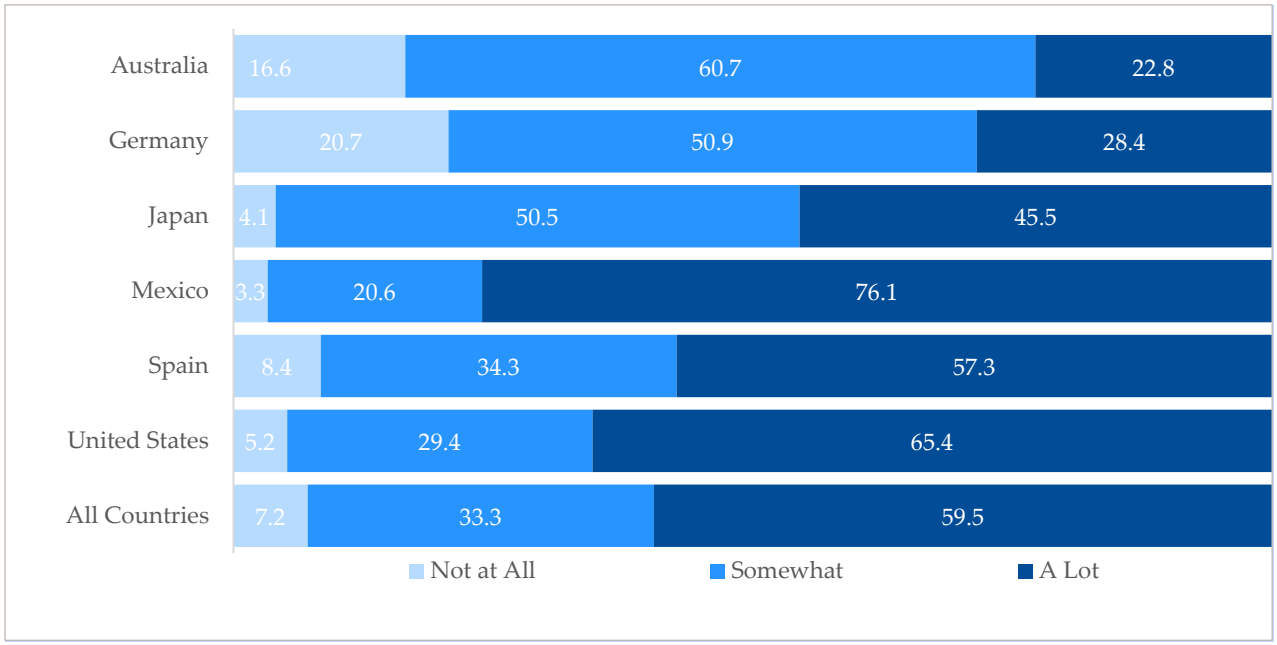
[77] Listwise deletion means the removal of all cases with incomplete data. See Appendix IV for more details.

[78] Difference – mean difference in global-mindedness between pre- and post-samples; SE – standard error; z – critical value; $P > |z|$ - p-value; Cohen's d – effect size

- were somewhat concerned about the impact that the COVID-19 pandemic may have on disunity between countries and people of different origins—45.8% (see Figure 12).

Overall, these responses suggest that **the COVID-19 pandemic had a meaningful influence on the worldviews of DP and CP students.**[79] However, student responses also varied by country. For example, 22.8% of IB students sampled in Australia and 28.4% of students sampled in Germany reported that their perceptions about their own countries changed "a lot" due to the pandemic (see Figure 9). This finding contrasts with students sampled in Mexico and the US, where larger proportions reported that their perceptions changed "a lot"—76.1% and 65.4%, respectively. The majority (73.7%) of students sampled in Mexico changed their perceptions about the rest of the world "a lot"—much higher than the 45.7% of students in the US. Only 21.0% of the students sampled in Australia had a worse opinion of their government—considerably lower than the 76.2% of students sampled in the US who report the same (see Figure 11). Finally, STS found that, although most DP and CP students were somewhat concerned about the pandemic's impact on disunity, 20.8% of students sampled in Germany reported not being concerned at all (see Figure 12).

Figure 9 (%): The majority of Diploma Programme and Career-Related Programme students reported that the COVID-19 pandemic affected perceptions about their own countries "a lot."[80]



[79] No CP students in Japan, Spain, or the US participated in the study.

[80] STS asked students: "How much has the COVID-19 pandemic affected your perceptions about your country?"

Figure 10 (%): The majority of Diploma Programme and Career-Related Programme students reported that the COVID-19 pandemic affected their perceptions about the rest of the world "a lot."[81]

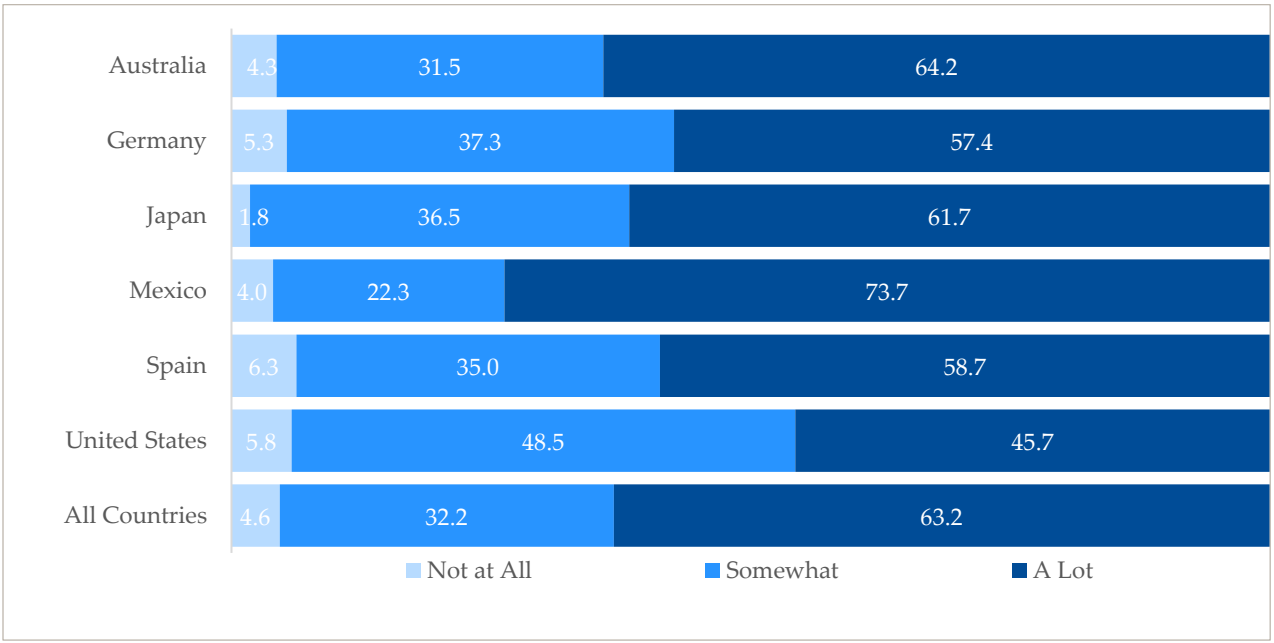
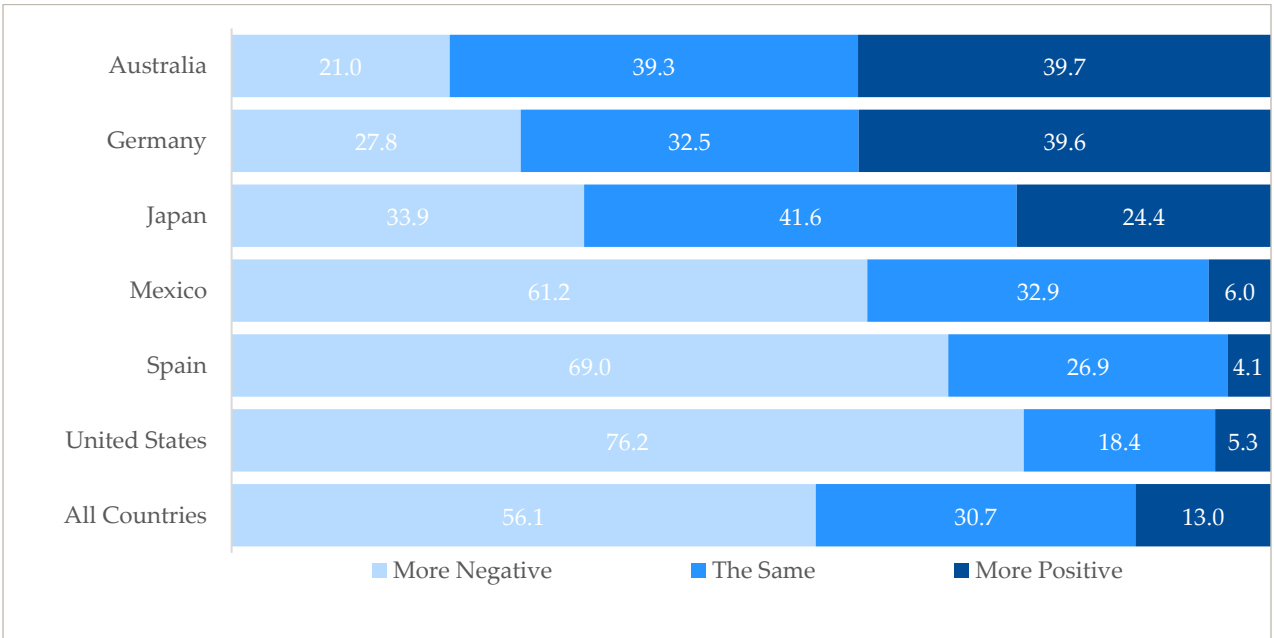
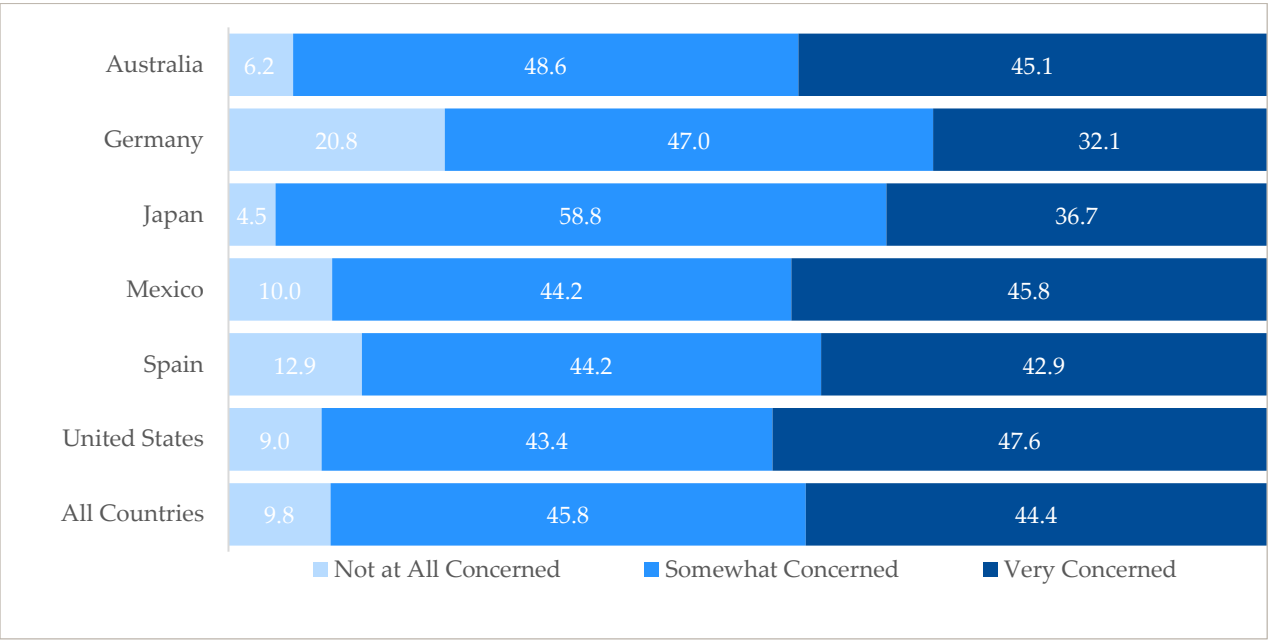


Figure 11 (%): The majority of Diploma Programme and Career-Related Programme students reported that their opinions about their governments were more negative, based on their government's COVID-19 response.[82]



[81] STS asked students: "How much has the COVID-19 pandemic affected your perceptions about the rest of the world?"
[82] STS asked students: "Based on your national government's response to the COVID-19 pandemic, is your opinion of your government now more positive, more negative, or the same?"

Figure 12 (%): The majority of Diploma Programme and Career-Related Programme students reported being somewhat concerned about the impact that the COVID-19 pandemic may have on disunity between countries and people of different origins.[83]



[83] STS asked students: "How concerned are you that the current COVID-19 pandemic is creating disunity between countries and people of different origin?"

DISCUSSION

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) describes the main findings of research questions four to seven and provides contextual interpretations. Key highlights include:

- All Diploma Programme (DP) and Career-Related Programme (CP) students averaged higher global-mindedness scores than those of young adults in the benchmark sample, and students sampled in their second year in all countries except Spain averaged higher global-mindedness levels than their peers sampled in their first years. These findings suggest that exposure to DP and CP may increase levels of global mindedness.
- The results show that, even at the early stages of DP or CP, International Baccalaureate® (IB) students averaged higher levels of global mindedness than the benchmark sample. However, the current study cannot provide definitive proof of whether the DP and CP tend to attract globally minded students or that participation in the IB programmes tends to increase students' global-mindedness levels.

Several salient learnings emerge from this study's findings. Most notably**, Diploma Programme (DP) and Career-Related Programme (CP) students in all six countries included in the study showed higher global-mindedness levels than young adults in the World Values Survey (WVS) Wave 6 benchmark group.** Across countries, IB students' global-mindedness levels were between 3% and 15% higher than the country-level benchmark sample. The differences were statistically significant for all countries except Japan. Furthermore, the DP and CP students that STS sampled—irrespective of their programme, candidate status, and number of years in their current International Baccalaureate® (IB) programme—demonstrated higher global-mindedness levels than the benchmark sample. These results are also, in many cases, practically significant. Although DP and CP students averaged higher global-mindedness scores than those of young adults in the benchmark sample, students sampled in their second year in all countries except Spain averaged higher global-mindedness levels than their peers sampled in their first year. **This finding suggests that exposure to IB programmes may increase levels of global mindedness.**

The results show that, even at the early stages of DP or CP, participation in the IB programmes was associated with higher levels of global-mindedness. Perhaps this finding suggests inherent characteristics in DP and CP students that make them more globally minded, even prior to programme participation. In other words, the current study cannot provide definitive proof of whether the DP and CP tend to attract globally minded students or that participation in the IB

programmes tends to increase students' global-mindedness levels. This problem—commonly known as selection bias—prevents STS from fully attributing observed differences in global-mindedness levels to IB programmes in a causal way. Notwithstanding, **the higher levels of global mindedness when comparing sampled second-year students to their sampled first-year peers suggest an essential effect of these two IB programmes over time.**

In addition to the first- versus second-year effects, STS also looked at IB programmatic differences—DP versus CP; course versus diploma candidacy; and numerical combinations of standard level (SL) and higher level (HL) courses. The DP versus CP comparison was only possible for students in Mexico, where DP students averaged statistically significantly higher global-mindedness scores than their peers in CP (Cohen's $d = 0.38$, a moderate effect). The candidacy comparisons yielded mixed results. These mixed results could be due to STS's definition of candidacy in this study and the difficulty in students self-reporting their candidacy status because of DP configuration of course requirements. Course candidates averaged higher global-mindedness scores in Japan and Spain; diploma candidates averaged higher scores in Mexico and the United States (US). STS could not complete this comparison in Australia or Germany due to an insufficient number of students in each candidacy group. Finally, STS found no linear trends between the number of SL and HL courses taken and global-mindedness levels. These results indicate that the type and number of courses that a DP or CP student takes are not consistently related to global-mindedness levels. However, there was not enough variation in course loads among sample students to allow STS to reach a stronger conclusion in this regard.

STS found that global mindedness correlated positively and statistically significantly to students' intentions to (a) study abroad for a limited period of time, (b) move abroad for an extended period of time, (c) find a career that involves travel, and (d) pursue a graduate degree. On the one hand, the relation of global mindedness to other factors reiterates the trends in previous studies conducted in other countries or with different populations—including Deng and Boatler (1993), Hazeltine and Rezvanian (1993), Kirkwood-Tucker et al. (2017), Lawthong (2003)—confirming the robustness of the relation between being female and global mindedness. The results of this study also show that being non-binary or gender non-conforming may also associate with higher levels of global mindedness, and that the relation between gender identity and global mindedness could be explored in more depth. Importantly, the relation between gender and global mindedness suggests that part of the difference between IB students' and WVS country-level benchmarks may be explained by the higher proportion of male students (57.2%) in the IB sample.

On the other hand, the relation of global mindedness to other factors departed from studies such as Lawthong (1993) regarding intentions to move or study abroad or pursue a graduate degree. For example, Deng and Boatler (1993) found that business students in a Canadian university who intended to work in international business were significantly more "world minded" than their peers. The results from this study are also connected to the findings in Sriprakash et al. (2014), which show that IB DP students and stakeholders believe that

international mindedness is highly relevant to students' future aspirations. Sriprakash et al. (2014) also showed that future aspirations depend on students' social capital suggesting future directions for research.

Furthermore, **this study showed a relation between global-mindedness levels and concerns due to the COVID-19 pandemic on creating disunity among people from different backgrounds.** Students who expressed being more concerned about COVID-19 averaged the highest levels of global mindedness. The relation was strong, yet the interpretation is not straightforward.[84] However, as a standalone indicator, concern about the impact that the pandemic has had on disunity was the single most correlated variable to global mindedness of the entire study.

Finally, STS tested the resiliency of global mindedness to one type of external shock: the emergence of COVID-19 that occurred between this study's pilot and operational phases. Based on the results from IB students in Mexico and the assumption that no other factors would have influenced global-mindedness levels during the same time period, it appears **that global-mindedness levels might be sensitive to a shock such as COVID-19**. Although, these results should be considered preliminary. Seemingly, findings in this study also could have been different had the operational data collection taken place at another point in time—not during a pandemic. DP and CP students' responses to their perceptions about their countries, governments, and world illuminate that, overall, the COVID-19 pandemic influenced DP and CP students' worldviews. However, the COVID-19 findings in this study also varied by country. Such variation emphasizes the nuanced reactions that individuals might have to COVID-19 and how a multitude of factors likely affect the perceptions of people across the six countries under study.

LIMITATIONS

STS acknowledges this study's primary limitations:

- The study took place during the early days of the COVID-19 pandemic. Current events likely influenced student responses and school involvement, meaning that this study's results are very specific to a moment in time.
- Researchers did not explicitly design WVS items to measure global mindedness. The comparisons between IB students and country-level benchmark samples, based on the selected WVS items, do not encompass all the dimensions of global mindedness as STS has defined it for this study.

[84] In addition to the correlational analysis, STS conducted a series of multilevel analyses within each country to test the predictability of the factors on global mindedness (see Appendix V). However, some variables in these models can be confounded and the risk of endogeneity is high. Although there are some technical methods to deal with endogeneity and correlated variables in multilevel models, STS believes that the correlational analysis is more appropriate for this circumstance and dataset.

- STS established the country-level benchmarks using WVS Wave 6 data from adults aged 18 to 29. Although age was not statistically significantly related to global mindedness in this study, there could be fundamental differences between 18- to 29-year-old adults and the ages of DP and CP students (typically 16-19 years) that affect this study's results.
- IB programmes might receive more globally minded students to begin with—noted above as selection bias—thereby preventing STS from entirely attributing any outcome to the programme in a causal way.
- A higher proportion of the operational sample for the study was male (57.2%), who tend to have lower levels of global mindedness. The gender imbalance may have influenced global-mindedness results.
- STS did not collect behavioral data on students. STS derived data solely from students' self-reports, so certain biases may have influenced the results. Behavioral data on students could have been one method used to validate self-reports of global-mindedness levels that would have strengthened the findings of this study.
- The matched designed assumed that no other variable but the COVID-19 pandemic influenced Mexican students' levels of global mindedness between March and October 2020. There may be other plausible explanations for the changes observed.
- Due to schools' voluntary decision to participate in the study, and their relatively low levels of participation, the final sample of schools may not be representative at the country level.[85] STS did not follow up with schools that declined participation to understand their motives. Therefore, STS cannot assume that their decision to participate or not was random and exempt from bias. As such, and despite the large sample sizes across most countries, readers should not assume that the results of this study are representative of and should not generalize findings to all IB schools in the participating countries.

[85] Across countries, 16.8% of schools opted into the study and participated.

RECOMMENDATIONS

SECTION SUMMARY

IN THIS SECTION, SCHOOL-TO-SCHOOL INTERNATIONAL (STS) explores the ramifications of key findings for the International Baccalaureate® (IB) and its stakeholders. Given the promising results presented in this report and the results' connection to IB's mission statement, STS recommends that IB disseminates key report findings to IB schools, teachers, students, parents, and other relevant stakeholders. The findings may help IB internally and externally promote its successes in cultivating globally minded student communities. Key highlights include:

- IB may utilize the findings in this report to draft a theory of change for its Diploma Programme (DP) and Career-Related Programme (CP) that articulates how the different elements of the IB experience–e.g., course content, training, methodologies–contribute to the development of students' global mindedness and to any other relevant outcomes. A theory of change may help IB to prioritize a research agenda and focus on uncovering the different relations between its DP- and CP-related activities and IB's desired outcomes.
- IB may further study the impact that DP and CP have on global mindedness, and on how global-mindedness levels change from a students' first year to their second year in IB programmes.
- IB may identify with IB schools where students are less globally minded and qualitatively contrast them to IB schools where students are more globally minded. By comparing these schools, IB could identify school factors that can boost or deter the development of global mindedness.
- IB may conduct follow-up studies utilizing interviews or focus groups to understand the drivers of global mindedness by gender and to determine whether they differ by gender classification. IB might also create opportunities for IB school heads to connect and discuss strategies that have boosted male students' global mindedness.
- IB may consider commissioning a similar study not during a pandemic.

Based on the findings and discussion presented above, School-to-School International (STS) proposes several programmatic and research recommendations for the International Baccalaureate's (IB) consideration. STS has provided recommendations that may be enacted by IB schools, with facilitation by IB. STS also provides recommendations for future research to build upon the findings of this study (see Table 11).

Through this study, STS found that IB Diploma Programme (DP) and Career-Related Programme (CP) students in all six countries included in the study showed higher global-mindedness levels than young adults in the World Values Survey (WVS) Wave 6 benchmark group. STS also found evidence that participation in the IB programmes was associated with higher levels of global mindedness.

Given the promising results presented in this report and the results' connection to IB's mission statement, STS recommends that IB disseminates key report findings to IB schools, teachers, students, parents, and other relevant stakeholders. The findings may help IB internally and externally promote its successes in cultivating globally minded student communities. IB schools may also use the results to engage current and potential stakeholders in discussions about the benefits of IB's DP and CP. As outlined in the recommendations below, IB may also use the report findings to encourage IB schools to explicitly reflect on how they can cultivate global mindedness in their student populations.

IB may utilize these findings, as well as several other key learnings from the study, to further IB's and the greater academic community's body of research on global mindedness and how it develops and differs across individuals and contexts. Specifically, IB may utilize the findings in this report to draft a theory of change for its DP and CP that articulates how the different elements of the IB experience—e.g., course content, training, methodologies—contribute to the development of students' global mindedness and any other relevant outcomes. A theory of change may help IB prioritize a research agenda and focus on uncovering the different relations between its DP- and CP-related activities and IB's desired outcomes. IB and IB schools may also leverage learnings to strengthen the global-mindedness levels of their DP and CP students.

Table 11: School-to-School International proposes several programmatic and research recommendations based on the findings of this study.

Research Question	Key Finding	Recommendations
4: Based on a measure composed of items tested during Phase I, how do the following characteristics associate with global-mindedness levels: IB programme type (DP or CP); year in IB programme (first year or second year); candidacy (diploma or course); and the number of standard level (SL) and higher level (HL) courses?	On average, Mexican Diploma Programme (DP) students had significantly higher levels of global mindedness than their Career-Related Programme (CP) counterparts.[86]	• International Baccalaureate® (IB) may replicate this study with a greater emphasis on exploring the differences in global mindedness of DP and CP students. With a more intentional sampling strategy, a replication study may offer a large enough CP student sample across multiple countries to understand potential differences between DP and CP students in more than one country.
	Global mindedness tended to be higher for second-year students, with the difference being statistically significant among students in Australia.	• IB may consider studying DP and CP students as they transition from their first to second years, with the goal of understanding how global-mindedness levels change the longer they are in those IB programmes. For example, IB may consider systematically interviewing DP and CP students at the end of the first year to learn about their self-reported changes in worldviews. In this example, IB may pay particular attention to other factors relevant to global mindedness, such as gender.
	Global mindedness did not vary based on the number of standard level (SL) or higher level (HL) courses.	• IB may study the impact that DP and CP have on global mindedness by examining a course's nature and content as opposed to the number of courses taken or programme type. This alternative method could mitigate challenges that STS faced in attributing impact when relying on the number of courses. Further, IB's research may identify how course content and pedagogy might relate to global mindedness—and explore those variations—to understand IB programmes' potential impact on students.
5: Based on a measure composed of items tested during Phase I, how do global-mindedness levels of young adults (ages 18–29) compare to corresponding levels	DP and CP students averaged higher global-mindedness levels than their respective World Values Survey (WVS) country-level benchmark groups. These differences were statistically significant in all countries except Japan.	• IB may identify IB schools where students are less globally minded and qualitatively contrast them to IB schools where students are more globally minded. To minimize selection bias, IB could prioritize pairs of IB schools that are relatively similar in terms of student composition, years since authorization, location, and other relevant characteristics. By comparing schools in these ways, IB could identify school factors that can boost or deter the development of global mindedness. • Given the constraints of this study due to the Japan sample sizes in the WVS country-level benchmark, IB may consider replicating this study

[86] Due to the removal of students with missing data, Mexico was the only country where enough student data existed for this comparison.

Research Question	Key Finding	Recommendations
among nationally relevant subgroups?		with Japanese students using a different design or method. For example, IB may use comparison schools in Japan or select a different benchmark. Additional research is needed to confirm the findings of this study in the Japanese context.
6: Which factors, if any, explain or moderate comparisons articulated in research questions 4 and 5?	Across countries, DP and CP students' gender correlated significantly with global mindedness across all countries; female, non-binary, and gender non-conforming respondents averaged higher global-mindedness levels than male respondents.	• IB may conduct follow-up studies utilizing interviews or focus groups to understand the drivers of global mindedness by gender and to determine whether they differ by gender identity. Further, IB may conduct similar research and intentionally sample more balanced proportions of students by gender to better understand if the results from this study may have been underestimated given the higher proportion of male respondents. • IB may create opportunities for IB school heads to connect with one another and discuss strategies that have seemed to boost students' global mindedness, especially among male students. If IB could identify schools where male students have higher levels of global mindedness, IB could facilitate sharing schools' promising practices in that area.
	Across countries, DP and CP students' future aspirations about life and education correlated highly with global mindedness. It is unclear whether these aspirations increase students' global mindedness or the other way around.	• IB may create spaces for IB school heads to share their experiences on how to expose DP and CP students to the ideas of foreign travel, living abroad, and pursuing graduate degrees. For example, IB schools could share strategies that they enact to provide traveling opportunities to students. • IB schools may establish alliances with each other and develop new strategies for increasing global mindedness. For example, IB schools from different countries can find ways for their students to connect. Through that type of exchange, IB schools might increase their students' exposure to foreign cultures and develop an interest in traveling abroad.
	The results of this study suggest that Primary Years Programme (PYP) and Middle Years Programme (MYP) participation is not an essential driver of global mindedness among the DP and CP students that previously participated in those IB	• IB may commission a mixed methods study to follow students along their paths and understand when and how global mindedness appears. IB may focus on identifying the trajectories of students across different IB programmes to evaluate how global mindedness evolves over time. • IB may study the age or grade at which global mindedness emerges as a stable trait to better target research and IB programmatic activities meant to develop global mindedness in students.

Research Question	Key Finding	Recommendations
	programmes. However, students were not selected based on their PYP or MYP participation, and students who attend PYP and/or MYP programs could be fundamentally different than those who begin IB programmes in high school.	
	The relevance of gender and aspirations to global mindedness suggests that students of different gender, aspirations, and/or world exposure influence each other.[87]	• IB may encourage IB school heads to examine and share the ways that different DP and CP students positively or negatively influence each other. For example, IB schools with gender diversity could share their experiences with other schools and discuss strategies to purposefully increase the levels of global mindedness of students, recognizing how students influence each other.
7: Has the COVID-19 health crisis influenced the levels of global-mindedness of IB DP and CP students?	For Mexican students, global-mindedness levels were not resilient to COVID-19.[88]	• IB and IB schools, including heads, coordinators, and teachers, may explore how to make students' global-mindedness levels more resilient—specifically during and after COVID-19. For example, IB may include creating spaces for IB schools to reflect or share lessons on how to cultivate global mindedness during disruptive global events. • IB may consider commissioning a similar study not during a pandemic. Given that global mindedness may not be resilient to shocks and that IB students' perceptions of their country and the world varied after the COVID-19 pandemic began, students' global-mindedness levels during the pandemic may not be the same as during a more emblematic time.
	Across countries, DP and CP students' perceptions revealed that COVID-19 influenced their worldviews.	• IB may facilitate an increase in schools' awareness of students' sensitivity to pandemics and other large-scale disruptive events, and how students' reactions are context specific. IB may prompt schools to develop spaces to reflect on national and international events in ways that are constructive and that mitigate the loss of global mindedness.

[87] This concept is known as peer effects.

[88] Due to the sample sizes obtained in March 2020, STS used data solely from Mexico for this analysis.

REFERENCES

Anthony, D., P. Bederman Miller, and K.K. Yarrish. 2014. "An analysis of initial global citizenship in a liberal arts college in Northeastern Pennsylvania." Journal of International Education Research, 10(1) 23-28.

Beek, A.E. 2017. Contextual interpretations of international-mindedness in International Baccalaureate Diploma Programme students. Bethesda, MD, USA: IBO.

Béneker, T., H. van Dis, and D. van Middelkoop. 2014. "World-mindedness of students and their geography education at international (IB-DP) and regular schools in the Netherlands." International Journal of Development Education and Global Learning, 6 (3) 5-30.

Castro, P., U Lundgren, and J. Woodin. 2015. "International-mindedness through the looking glass: Reflections on a concept." Journal of Research in International Education, 14(3) 187-197.

Cohen, J. 1988. Statistical Power Analysis for the Behavioral Sciences. New York, NY: Routledge Academic.

Cui, Q. (2016). Assessment of pre-service teachers' global-mindedness. SAGE Open, 6(3), 2158244016663284.

Deng, S., and R.W. Boatler. 1993. "Worldmindedness among Canadian business students: Implications for curricula." Journal of Education for Business, 69(2) 94-98.

Hacking, E.B., C. Bullock, K. Blackmore, T Bunnell, M Donnelly, and S. Martin. 2018. "International mindedness in practice: The evidence from International Baccalaureate schools." Journal of Research in International Education, 17(1) 3-16.

Hazeltine, J.E., and R. Rezvanian. 1998. "World-mindedness among American and Russian business students: A comparison." The Journal of Education for Business, 73 344-346.

Hett, J. 1993. "The development of an instrument to measure global-mindedness." San Diego, CA: University of San Diego.

Inglehart, R.C., Haerpfer, A., Moreno C., Welzel K., J. Kizilova, M. Diez-Medrano, et al. 2014. World Values Survey: Round Six - Country-Pooled Datafile Version.

International Association for the Evaluation of Educational Achievement. 2016. International Civic and Citizenship Education Study. https://doi.org/10.3886/ICPSR37147.v1

Kankaraš, M. 2017. "Personality matters: Relevance and assessment of personality characteristics." .http://dx.doi.org/10.1787/8a294376-en.

Kankaras, M., and G. Moors. 2010. "Researching measurement equivalence in cross-cultural studies." PSIHOLOGIJA, 43(2) 121-136.

Kankaras, M., and J. Suárez-Álvarez. 2019. Assessment framework of the OECD Study on Social and Emotional Skills. Paris: OECD Education Working Papers, No. 207, OECD Publishing.

Kankaraš, M., E. Feron, and R. Renbarger. 2019. Assessing students' social and emotional skills through triangulation of assessment methods. Paris: OECD.

Kirkwood-Tucker, T.F., S. Leierer, J. E. Turner, E. S. Rawls, D. Lyewa, and K. Bauer. 2017. "The globalmindedness of graduating seniors by gender and ethnicity in six North Florida public high schools." The Journal of Social Studies Research. doi: https://doi.org/10.1016/j.jssr.2017.04.002.

Lawthong, N. 2003. "A development of the global-mindedness scale in Thai socio-cultural context." Journal of Institutional Research South East Asia 57-70.

Meyer, L.H., C.E. Sleeter, K. Zeichner, H. Park, G. Hoban, and P. Sorensen. 2011. "An international survey of higher education students' perceptions of world-mindedness and global citizenship." In Universities and global diversities: preparing educators for tomorrow, by B. Lindsay and W. J. Blanchett, 179-191. New York, USA: Routledge.

Morais, D.B., and A.C. Ogden. 2010. "Initial development and validation of the global citizenship scale." Journal of Studies in International Education 1-22.

OECD. 2018. Preparing our youth for an inclusive and sustainable world: The OECD Pisa Global Competence Framework. OECD.

Reysen, S., and I. Katzarska-Miller. 2013. "A model of global citizenship: antecedents and outcomes." International Journal of Psychology 48(5).

Schulz, W., J. Ainley, J. Fraillon, B. Losito, and G. Agrusti. 2016. IEA International Civic and Citizenship Education Study 2016 Assessment Framework. IEA.

Shadowen, N. L., L. P. Chieffo, and N. G. Guerra. 2015. "The Global Engagement Measurement Scale (GEMS): A new scale for assessing the impact of education abroad and campus internationalization." Frontiers: The Interdisciplinary Journal of Study Abroad, 26(1) 231-247.

Singh, M., and J. Qi. 2013. 21st century international-mindedness: An exploratory study of its conceptualization and assessment. Parramatta: NSW, Australia: Centre for Educational Research.

Sriprakash, A., M. Singh, and J. Qi. 2014. "A comparative study of international mindedness in the IB Diploma Programme in Australia, China and India."

Tarrant, M, and K. Lyons. 2012. "The effect of short-term educational travel programs on environmental citizenship." Environmental Education Research, 18(3) 403-416.

Torney, R., and J. Gleeson. 2012. "The gendering of global citizenship: Findings from a large-scale quantitative study on global citizenship education experiences." Gender and Education, 24(6) 627-645.

Türken, S., and F. W. Rudmin. 2013. "On psychological effects of globalization: Development of a scale of global identity." Psychology & Society, 5(2) 63-89.

Vazire, S., and E. Carlson. 2010. "Self-knowledge of personality: Do people know themselves?" Social and Personality Psychology Compass, 4(8) 605-620.

World Values Survey. 2020. Findings and Insights. http://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=Findings.

APPENDICES

APPENDIX I: FINAL GLOBAL-MINDEDNESS TOOL[89]

Item	Response Options
In what language would you like to take this survey?	German
	English
	Japanese
	Spanish (Mexican)
	Spanish (Spain)

STUDENT ASSENT FORM

WHAT AM I BEING ASKED TO DO?

The International Baccalaureate (IB) is asking you to participate in a research study. It is called "Global mindedness in IB schools: A benchmark study with young adults' World Values Survey data." To conduct the study, IB is working with School-to-School International (STS), a US-based non-profit that specializes in education research and evaluation in countries around the world. The purpose of the study is to understand IB secondary students' global-mindedness levels across six countries—Australia, Germany, Japan, Mexico, Spain, and the United States. Then, we will compare IB students' global-mindedness levels to other young adults in the same country who may not be in IB programmes.

WHO IS THE STUDY TARGETING, AND WHAT WILL I BE DOING?

We are asking secondary school students in IB Diploma and Career-Related Programmes in six countries to fill out a confidential survey once. You will fill out the survey through a secure online platform during a time period selected by your school. The survey should take no more than 30 minutes for you to complete. The survey will include questions about your cultural values, attitudes, and beliefs. It will also include questions about your background. We do not think you will experience any risks, stress, or discomfort during the survey or because of the research.

WILL ANYONE SEE MY ANSWERS?

NO. The survey is entirely confidential. Confidential means that your parents and your school cannot see your answers. You will submit your responses through secured online survey software. Data will be encrypted while in transit, and data will be stored in password-protected servers accessible only to the study's researchers. No information from the survey or about your participation in this study will be in your school records. We will not ask for your name, and the only way we will be able to identify your survey is through a unique ID number.

The results of this project will only be reported in ways that do not identify individual participants. The data from this research study may be made available to researchers at IB or at other organizations under IB's authorization. No information that could be used to identify you will be released to these researchers. There would be no way for anyone else to know who was in the study or to know any information that might identify who is in the study.

DO I HAVE TO PARTICIPATE?

NO. You can say that you don't want to do the survey, and that is OK. You won't get in trouble, and it won't affect your grades. You can also choose not to answer certain questions even if you do the survey.

OTHER INFORMATION

[89] a = Item taken or adapted from International Civic and Citizenship Education Study 2016 (ICCS) at https://www.iea.nl/publications/technical-reports/iccs-2016-technical-report; b = Item taken or adapted from WVS Wave 6; c = Item taken or adapted from OECD (2018); d = Item developed by School-to-School International; e = Item taken or adapted from Türken and Rudmin. (2013); f = Item taken or adapted from Reysen and Katzarska-Miller (2013); g = Item taken or adapted from Hett (1993).

Item	Response Options
If you have any questions about this study, you may contact Aimee Reeves, STS Research Manager, at +1 (650) 355-6248, or by e-mail at areeves@sts-international.org. If you have any questions regarding your rights as a participant in the study, you may contact SolutionsIRB, the institution that oversees our protection of study participants, at +1 (855) 226-4472 or participants@solutionsirb.com. *Even though you don't have to participate, we really hope you will. Your responses will help IB understand how its programmes are impacting students' global-mindedness levels. This research will help other IB students in the future. Your support in this study will help us better understand a core component of IB's programmes. IB and STS thank you in advance for your help.*	
	I agree to participate in the study. If I change my mind, I can opt out at any time.
	I do not agree to participate in the study.
International Baccalaureate is conducting a global study of students' global mindedness. First, you will answer background questions about yourself, your family, and your previous experiences with IB programmes. Then, you will be asked about your opinions with respect to different statements regarding global mindedness. *Remember, you do not have to answer a question if you don't want to. If you don't want to answer a question, just skip to the next one. When you select 'next' to move on to the next set of questions, confirm you want to skip the question(s) by selecting 'continue without answering.'* *For your responses to be recorded, please press the "submit" button when you reach the end of the survey.*	
In which IB programme are you currently enrolled?	Diploma Programme
	Career-Related Programme
	None
Only students enrolled in an IB programme are eligible to take the survey. Please confirm your IB programme enrollment status.	I am enrolled in an IB programme
	I am not enrolled in an IB programme (NOTE: The survey will now end)
What is your gender?	Male
	Female
	Non-binary
	Other
How old are you?	13
	14
	15
	16
	17
	18
	19
	20
	21
Were you born in the country you currently live in?	Yes

Item	Response Options
	No
How many languages do you speak at home?	1
	2
	3
	4
Is your mother or primary caregiver currently employed?	Yes
	No
Is your father or other caregiver currently employed?	Yes
	No
How many books do you have at home?[a]	None or very few (0 - 10 books)
	Enough to fill one shelf (11–25 books)
	Enough to fill one bookcase (26–100 books)
	Enough to fill two bookcases (101–200 books)
	Enough to fill three or more bookcases (more than 200 books)
In the past five years, how many times have you travelled to one or more foreign countries?	Never
	Once
	Twice
	Three times
	Four times
	Five times or more
For each of the following statements, indicate whether, after graduating from high school, you would find the activity not at all appealing, somewhat appealing, appealing, or very appealing.	
Studying abroad for a limited period of time.	Very appealing
	Appealing
	Somewhat appealing
	Not at all appealing
Moving abroad for an extended period of time.	Very appealing
	Appealing
	Somewhat appealing
	Not at all appealing
Pursuing a graduate degree.	Very appealing
	Appealing
	Somewhat appealing
	Not at all appealing
Finding a career that involves travel.	Very appealing
	Appealing
	Somewhat appealing
	Not at all appealing

Item	Response Options
For how many school years have you been an IB student?	1
	2
	3
	4
	5
	6
	7
	8
	9
	10
	11
	12
Are you a first-year or a second-year student of the Diploma Programme?	First year
	Second year
	Other / N.A.
Are you a first-year or a second-year student of the Career-related Programme?	First year
	Second year
	Other / N.A.
How many standard level (SL) DP classes are you taking?	1
	2
	3
How many higher level (HL) DP classes are you taking?	1
	2
	3
	4
Were you previously a student in an IB Primary Years Programme (usually for students ages 3-12 in Kindergarten through Grade/Year 5)?	Yes
	No
Were you previously a student in an IB Middle Years Programme (typically for students ages 11-16 in Grade/Year 6-10)?	Yes
	No
Now, you will be asked about your opinions on different statements related to global mindedness.	
How important is it for children to be tolerant and respectful of other people?[b]	Very important
	Rather important
	Not very important
	Not at all important
For the following groups of people, please indicate if you would or would not like them as neighbors. [b]	
Immigrants / foreign workers	Yes, I would like them as neighbors
	No, I would not like them as neighbors
People of a different race	Yes, I would like them as neighbors
	No, I would not like them as neighbors

Item	Response Options
People of a different religion	Yes, I would like them as neighbors
	No, I would not like them as neighbors
People who speak a different language	Yes, I would like them as neighbors
	No, I would not like them as neighbors
People of a different social class	Yes, I would like them as neighbors
	No, I would not like them as neighbors
Of course, we all hope that there will not be another war, but if it were to come to that, would you be willing to fight for your country? [b]	Yes
	No
How proud are you to be [American]?[90] [b]	Very proud
	Quite proud
	Not very proud
	Not at all proud
	I am not [American]
How well does each of the following statements below describe you?	
I respect people from other cultures as equal human beings.[c]	Always like me
	Very much like me
	Like me
	Somewhat like me
	A little like me
	Not like me
	Not at all like me
Before criticizing somebody, I try to imagine how I would feel if I were in their place. [c]	Always like me
	Very much like me
	Like me
	Somewhat like me
	A little like me
	Not like me
	Not at all like me
I believe that there are two sides to every question and try to look at them both. [c]	Always like me
	Very much like me
	Like me
	Somewhat like me
	A little like me
	Not like me
	Not at all like me
	Always like me

[90] STS and IB programmed the language in brackets to change based on the country in which the student was located. For example, for students in schools located in Mexico, the item read, "How proud are you to be Mexican?"

Item	Response Options
I sometimes try to understand my friends better by imagining how things look from their perspective. [c]	Very much like me
	Like me
	Somewhat like me
	A little like me
	Not like me
	Not at all like me
Tradition is important to me – to follow the customs handed down by one's religion or family.[b]	Very much like me
	Like me
	Somewhat like me
	A little like me
	Not like me
	Not at all like me
How much do you trust people of another nationality? [b]	Trust completely
	Trust somewhat
	Do not trust very much
	Do not trust at all
How much do you trust people of another religion? [b]	Trust completely
	Trust somewhat
	Do not trust very much
	Do not trust at all
Please indicate if you strongly agree, agree, disagree, or strongly disagree with each of the following statements:	
I believe in a world without national borders.[d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I will definitely choose a career through which I can help increase equality worldwide.[d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel very comfortable having discussions with people who do not share my values. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I am fascinated by learning how differently people can experience the same event. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
In emergency situations, immigrants and citizens should be treated equally. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
My nationality is an essential component of my identity. [d]	Strongly agree
	Agree

Item	Response Options
	Disagree
	Strongly disagree
I get extremely frustrated when my government doesn't respect the rights of immigrants. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
All refugees should be welcome in my country. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
My own culture is much better than other cultures.[e]	Strongly agree
	Agree
	Disagree
	Strongly disagree
In most circumstances, I am able to empathize with people from other countries. [f]	Strongly agree
	Agree
	Disagree
	Strongly disagree
Immigrants should be able to continue practicing their own customs and lifestyle, even if those customs and lifestyle aren't common in my country. [c]	Strongly agree
	Agree
	Disagree
	Strongly disagree
Immigrants who live in a country for any period of time should have the opportunity to vote in elections. [c]	Strongly agree
	Agree
	Disagree
	Strongly disagree
[American] people are among the best people in the world.[91][g]	Strongly agree
	Agree
	Disagree
	Strongly disagree
The needs of [the United States] must continue to be our highest priority in negotiating with other countries.[92] [g]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel intense pride when I think about my country.[e]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel most connected to members of my own country. [e]	Strongly agree

[91] STS and IB programmed the language in brackets to change based on the country in which the student was located. For example, for students in schools located in Mexico, the item read, "Mexican people are among the best people in the world."
[92] STS and IB programmed the language in brackets to change based on the country in which the student was located. For example, for students in schools located in Mexico, the item read, "The needs of Mexico must continue to be our highest priority in negotiating with other countries."

Item	Response Options
	Agree
	Disagree
	Strongly disagree
One should first care for his or her nation, then others. [e]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel a strong kinship with the worldwide human family.[g]	Strongly agree
	Agree
	Disagree
	Strongly disagree
In the long run, [Americans] will probably benefit from the fact that the world is becoming more interconnected.[93] [g]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel equally connected to issues that arise in other parts of the world as issues that arise in my own country.[d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I feel equally connected to people from other parts of the world as my fellow nationals. [d]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I am always concerned about the difficult lives of people who live in politically repressive regimes. [g]	Strongly agree
	Agree
	Disagree
	Strongly disagree
If I could, I would dedicate my life to helping others no matter what country they are from.[f]	Strongly agree
	Agree
	Disagree
	Strongly disagree
It is my responsibility to understand and respect cultural differences across the globe to the best of my abilities. [f]	Strongly agree
	Agree
	Disagree
	Strongly disagree
People who belong to different religions are probably just as moral as those who belong to mine. [b]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I see myself as a world citizen. [b]	Strongly agree
	Agree

[93] STS and IB programmed the language in brackets to change based on the country in which the student was located. For example, for students in schools located in Mexico, the item read, "In the long run, Mexicans will probably benefit from the fact that the world is becoming more interconnected."

Item	Response Options
	Disagree
	Strongly disagree
I see myself as part of my local community. [b]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I see myself as part of [the United States].[94] [b]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I see myself as part of [North America].[95] [b]	Strongly agree
	Agree
	Disagree
	Strongly disagree
I consider myself more as a citizen of the world than a citizen of some nation. [b]	Strongly agree
	Agree
	Disagree
	Strongly disagree
Please indicate if you agree, disagree, or neither agree nor disagree with the following statement.	
When jobs are scarce, employers should give priority to people of this country over immigrants. [b]	Agree
	Neither
	Disagree
People sometimes talk about what the aims of this country should be for the next ten years. Below are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important? [b]	A stable economy
	Progress toward a less impersonal and more humane society
	Progress toward a society in which ideas count more than money
	The fight against crime
Now, you will be asked about some questions about the COVID-19 pandemic.	
How much has the COVID-19 pandemic affected your perceptions about your country? [d]	A lot
	Somewhat
	Not at all
How much has the COVID-19 pandemic affected your perceptions about the rest of the world? [d]	A lot
	Somewhat
	Not at all
	More positive

[94] STS and IB programmed the language in brackets to change based on the country in which the student was located. For example, for students in schools located in Mexico, the item read, "I see myself as part of Mexico."

[95] STS and IB programmed the language in brackets to change based on the country in which the student was located. In some countries, STS added an additional item to capture additional geopolitical categories. For Mexico, STS included two items: "I see myself as part of North America" and "I see myself as part of Latin America." For Germany and Spain, STS included one item: "I see myself as part of the European Union." For Australia, STS included one item: "I see myself as part of the Asian Pacific region." For Japan, STS included one item: "I see myself as part of APEC."

Item	Response Options
Based on your national government's response to the COVID-19 pandemic, is your opinion of your government now more positive, more negative or the same? [d]	More negative
	The same
How concerned are you that the current COVID-19 pandemic is creating disunity between countries and people of different origin? [d]	Very concerned
	Somewhat concerned
	Not at all concerned
You've reached the end of the survey. Please click the "submit" button to submit your responses.	

APPENDIX II: PILOT PHASE SUMMARY

Pilot Research Questions

The specific research questions that School-to-School International (STS) expected to answer through the research study were based on the International Baccalaureate's (IB) originally proposed research questions from the proposal. IB grouped questions into two phases. The first phase—also referred to as the pilot phase—corresponded to the confirmation of the properties of "global mindedness" as a construct, the assessment of the adequacy of WVS Wave 6 items to measure the global-mindedness construct, and the creation of a robust tool that used a subset of items from a variety of sources.

Pilot Phase (I): Testing the adequacy of WVS Wave 6 items

1. In each nation of interest, to what extent do young adults' (ages 18–29) responses to selected global-mindedness items from the WVS Wave 6 demonstrate adequate psychometric properties to support the intended cross-cultural comparisons?[96]
2. To what extent do data collected using those global-mindedness items confirm the psychometric properties with data from Diploma Programme (DP) and Career-Related Programme (CP) students within IB schools sampled from the same nations?
3. Are the global-mindedness items psychometrically adequate for within-nation comparisons of previously collected data from young adults and data collected from DP and CP students in IB schools?

Construct Definition

Based on the works of Hett (1993), Lawthong (2003), and Meyer et al. (2011), STS proposed to conceptualize global mindedness as a five-dimension construct for the pilot phase:

1. Social responsibility
2. Openness and perspective taking
3. Global citizenship
4. Efficacy
5. Interconnectedness

STS used students' responses to multiple items or prompts to support each dimension. STS intended that each dimension should have at least five contributing items once it finalized the tool for the study's operational phase.

[96] Psychometric properties may include model convergence, expected a posteriori reliability, appropriate parameterization, distinct dimensionality, or lack of differentia item functioning, among others.

Country and Pilot Sample Selection

STS proposed including a total of six countries—two from each of IB's three regions—in the research study. STS based its country selection on a set of criteria determined in collaboration with IB:

1. Countries must have at least 30 schools with IB programmes;
2. Countries should offer at least three of IB's four programmes throughout the country;
3. Countries should have at least four cities with a high density of IB schools;
4. Countries should have schools of different sex composition—single-sex and co-ed;
5. Countries should have schools that offer both DP and CP; and
6. Countries should offer IB programmes in private and state-funded schools.

Based on the criteria, STS selected Australia, Germany, Japan, Mexico, Spain, and the United States (US) for the study.

Within the selected countries, STS identified a sample of schools for piloting. STS calculated the number of respondents in the pilot sample based on the multiple analyses to be conducted, including factor analysis, item response theory (IRT) analysis, multivariate methods, and differential item functioning (DIF) methods.[97] STS assumed that there would be 20 eligible IB students per school and proposed a pilot sample of a minimum of six schools—or 120 students—per country.[98]

Due to low response rates in Australia, Germany, Japan, and Spain, STS randomly selected a sample of alternate pilot schools to participate in the study.[99] STS also directly reached out to one IB school coordinator in the US—a personal contact of an STS staff member—to participate in the study.

Pilot Tool

STS utilized a variety of source documents to develop the pilot tool for the study. The WVS Wave 6 served as the primary source, and STS selected 25 items from the survey that fit within this study's definition and dimensions of global mindedness. Then, STS selected items from six additional sources and wrote two original items to reach the desired quota of items within each

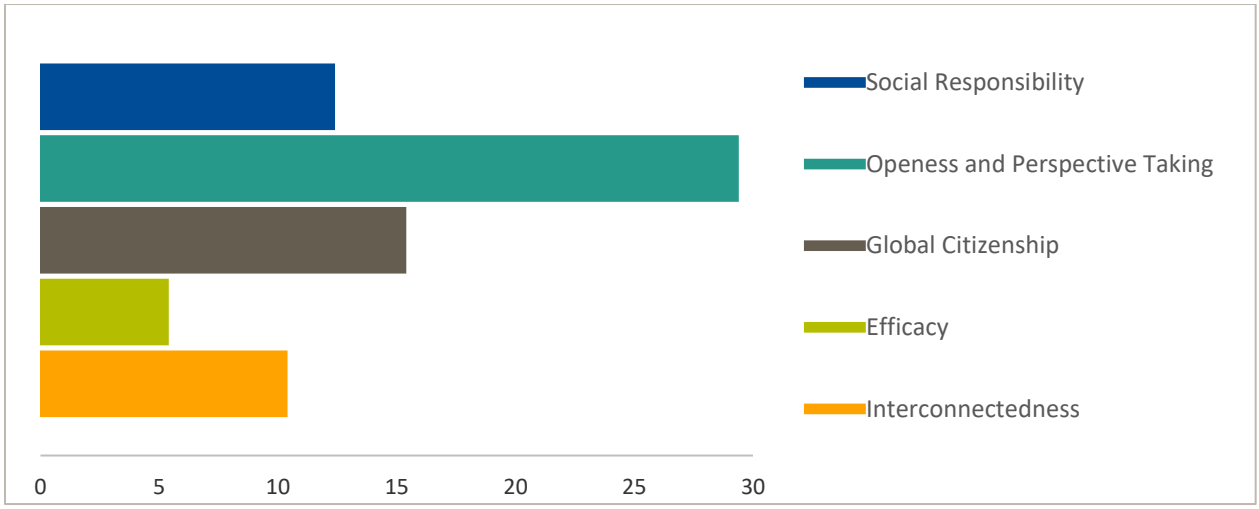
[97] Because best practices for Exploratory Factor Analysis (EFA) recommend a minimum of 10 observations per item, STS did not know the estimated pilot sample size without having the final number of items. For IRT considerations, item calibrations within 0.5 to 1.0 logit are stable; therefore, STS needed a minimum sample of 50 to 100 students per country . For multivariate methods, the sample size depends on the number of dependent and independent variables and the R2 tested; both were unclear at the time of the pilot. Finally, for DIF, STS would determine the number of students the effect size; for instance, 100 students in each subgroup would detect a DIF of 0.4 logits or more.

[98] Assuming that some schools would likely opt out of participation in the research study, STS sampled at least eight schools per country for the pilot.

[99] Ultimately, STS and IB did not reach out to alternate pilot schools in Japan due to the country's COVID-19-related closure of all schools on February 27, 2020.

dimension for piloting. In total, STS piloted 66 items. Items were unevenly distributed across the five dimensions (see Appendix Figure 1).

Appendix Figure 1: School-to-School International included five domains and 66 items in the pilot global-mindedness tool.



.

Pilot Data Collection

IB sent out an email with instructions and survey links through Qualtrics on March 5, 2020, to all schools that had opted-in to participate in the survey and had submitted approval letters. Because no schools in Japan submitted approval letters, and because of the country's closure of schools on February 27, 2020, due to COVID-19, STS and IB decided to remove the country from the pilot data collection.

Pilot Sample Description

The pilot student sample was comprised of respondents from four countries—Germany, Mexico, Spain, and the US (see Appendix Table 1).[100] Overall, 446 students consented to the pilot survey, nearly 70% of whom were from Mexico. STS reduced the pilot sample to 378 respondents, with just over 60% from Mexico.[101] STS saved data from 70 respondents from Mexico so that their responses could be used to evaluate the potential influence that the COVID-19 pandemic had on students' levels of global mindedness. STS's rationale behind excluding the 70 students from the pilot analysis was to protect the integrity of the comparisons. If data from these 70 students had been used to determine the operational tool, the final tool could have "over fitted" the students' responses and distorted the comparison with other

[100] STS did not include any Japanese schools in the pilot sample due to school closures, and no Australian students responded to the pilot survey.
[101] STS removed a portion of Mexican students were removed from the pilot sample. STS analyzed their responses to measure the potential impact that the COVID-19 global pandemic has had on students' levels of global mindedness.

samples. An overfitted tool means less error, potentially through bias; in turn, this creates opportunities for inflated power and for bias in the comparisons with other samples.

Appendix Table 1: School-to-School International analyzed a pilot sample of 378 respondents, with just over 60% from Mexico.

Country	Sample with consent		Sample with consent and reduced	
	Frequency	% of total	Frequency	% of total
Germany	53	11.9	53	14.0
Mexico	301	67.5	233	61.6
Spain	78	17.5	78	20.6
United States	14	3.1	14	3.7
Total	**446**	**100.0**	**378**	**100.0**

The majority of respondents across all countries were female, although non-binary and gender non-conforming students comprised just over 1% of the total sample. Male students comprised approximately one-third of the sample (see Appendix Table 2).

Appendix Table 2 (%): The majority of pilot respondents across all countries were female.

Gender	Germany	Mexico	Spain	United States	Total
Male	29.4	37.6	39.0	14.3	35.9
Female	70.6	62.0	58.4	78.6	63.0
Non-binary	0.0	0.4	1.3	7.1	0.8
Other	0.0	0.0	1.3	0.0	0.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Due to the small sample size, STS retained respondents who were 15 years old in the pilot sample (see Appendix Table 3). In Mexico and the US, more than half of the respondents were 17 years old, although 57.5% of the respondents in Spain were 16. Overall, 49.2% and 35.1% of respondents were 17 and 16 years old, respectively.

Appendix Table 3 (%): Overall, 49.2% and 35.1% of pilot respondents were 17 and 16 years old, respectively.

Age in years	Germany	Mexico	Spain	United States	Total
15	0.0	0.0	1.3	0.0	0.3
16	29.4	29.2	57.7	28.6	35.1
17	47.1	54.9	32.1	57.1	49.2
18	19.6	15.5	9.0	7.1	14.4
19	**3.9**	**0.4**	**0.0**	**7.1**	**1.1**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Findings

The purpose of the research study's pilot phase was to evaluate a number of issues: if notions about global mindedness were appropriate for the population of IB students, if the pre-selected items performed appropriately on the sample of respondents, and if the subsample of WVS Wave 6 items were appropriate to create a benchmark to evaluate the levels of global mindedness of IB students. The results supported a four-dimension survey that included the dimensions of social responsibility and interconnectedness, openness and perspective taking, global citizenship, and a broader dimension related to rights and social justice. Only the fourth dimension could not be traced back to the construct map developed for this pilot study. However, STS retained the fourth dimension because of the exploratory factor analysis (EFA) results; to align with reviewed studies, none of which had fewer than four dimensions; and because the overall issue of human rights, social justice, and pluralist democracy has been found in similar studies and in other conceptualizations of global mindedness.

Research question 1: In each nation of interest, to what extent do young adults' (ages 18–29) responses to selected global-mindedness items from the WVS Wave 6 demonstrate adequate psychometric properties to support the intended cross-cultural comparisons?

The selected WVS Wave 6 items demonstrated partial appropriateness to support the intended cross-cultural comparisons. The final set of 34 items did not show high levels of reliability; however, this is partly due to the fact that STS's team only found 12 WVS Wave 6 items that could properly fit the data. The main limitation to producing a more reliable benchmark had to do with the fact that the WVS was not designed to measure global mindedness exclusively. Therefore, the number of items that could be used for this purpose was limited. In addition, not all the selected items showed adequate fit when evaluated using an item response model framework.

Research question 2: To what extent do data collected using those global-mindedness items confirm the psychometric properties with data from DP and CP students within IB schools sampled from the same nations?

The set of WVS Wave 6 items behaved differently on the sample of IB students—both in terms of information provided or of best-fitting items. One of the largest differences between both samples is that the IB sample had higher levels of missing data than did WVS Wave 6. STS suspected that this was due to an unexpectedly large number of students responding, "I don't know" or "I don't want to respond" to eligible items. This difference was clear when examining the two test information functions, as it showed that the main loss of information from IB students occurred near the center of the scale.[102] If STS had required respondents to provide a valid answer, likely, the observed test information function (TIF) curves for WVS Wave 6 and IB students would have been more similar.

[102] This represents more neutral students who may have chosen "I do not know."

Research question 3: Are the global-mindedness items psychometrically adequate for within-nation comparisons of previously collected data from young adults and data collected from DP and CP students in IB schools?

When considering the operational tool, STS found that the global-mindedness items were psychometrically adequate for comparisons—certainly, the full tool was more adequate than the 12 WVS items. The operational global-mindedness tool comprised 34 items, out of which most had decent levels of fit and performed well across countries. The level of information provided by this tool was relatively good except for the higher end of the scale. In addition, the correlation between the scores on the tool and answers to demographic items conform to results from previous research, providing further evidence that the global mindedness tool was properly measuring such a construct.

STS explored ways through which to improve the reliability of the operational tool. Specifically, STS addressed two issues—the high levels of missing data and the negatively skewed distribution of the responses. One option to deal with these issues was to slightly modify the wording of the items and/or add response options. Doing so would provide more opportunities for differentiation between those respondents with very high and extremely high levels of global mindedness. Another option was to create new items per dimension; in the pilot tool, the two items created by STS were retained in the final solution as good performing items. STS, in consultation with IB, decided to explore both options in the operational version of the study.

Importantly, STS reevaluated newly created items, items flagged for potential bias, and items marked as poorly fitting on the operational sample, and included these items in the operational phase analysis based on their performance.

Finally, STS proposed the addition of a seventh research question to explore the influence of COVID-19 on global mindedness:

6. Has the COVID-19 health crisis influenced the levels of global mindedness of IB students?

Limitations and Lessons Learned

The biggest limitations of this pilot study related to the reduced sample size, a large number of missing responses, and a small number of properly fitting WVS Wave 6 items. The combination of these factors made it impossible to run certain analyses, thus preventing STS from fully corroborating certain properties of the survey. These limitations are detailed in this section, as are potential responses for the operational phase.

1. **An unexpectedly high level of missing data limited the ability to measure invariance by running a multigroup confirmatory factor analysis (CFA) as planned.**

In order to mitigate the issue of missing data, STS anticipated making two modifications. First, STS worked to substantially increase the number of students who take the survey so that missing data does not prevent properly running all of the analyses that should be run. Second,

STS explored adding language to the survey that asks respondents to choose a response other than “I don’t know” or “I don’t want to respond” to the extent possible.

Recognizing that a larger overall sample size of schools would make the issue of missing data less acute, STS and IB explored outreach methods that may better engage schools in the operational data collection. STS utilized pilot phase school opt-in rates by country to inform the total outreach sample sizes needed for the operational phase.

2. **The number of properly fitting WVS Wave 6 items is less than desired.**

The small number of WVS Wave 6 items that properly fit this study's construct of "global mindedness" limited STS's ability to produce a more reliable benchmark to gauge the relative levels of global mindedness among IB students. The unreliability of such a benchmark was further exacerbated by the fact that WVS Wave 6's sample of young adults is mostly comprised of individuals closer to their 30s than students aged 16–19. Young adults are a very different group of people than high schoolers who have not yet gained autonomy in many aspects of their lives.

In the absence of other research design alternatives and in order to increase the performance of the 12 retained WVS Wave 6 items, STS and IB improved outreach efforts and ensured that the operational sample is as large as possible.

3. **The administration of the pilot survey corresponded with the beginning of the COVID-19 pandemic and the subsequent closing of schools.**

The inopportune overlap of the pilot survey's deployment and the COVID-19 pandemic resulted in a reduction in the number of students who participated in the pilot survey. Moreover, it meant that global mindedness was a less reliable construct currently as students shifted their views in response to what their country's officials and peers say and do in relation to the health crisis.

APPENDIX III: ADDITIONAL PILOT PHASE TABLES

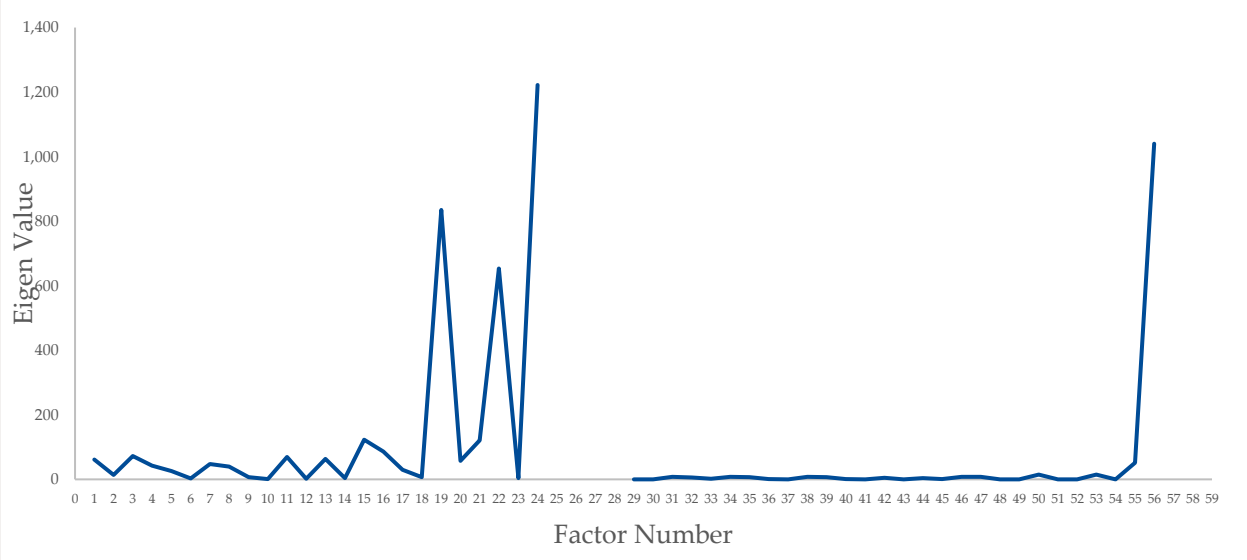
Appendix Table 4: Pilot Tool Item Sources

Item Source	Number of Items in Pilot Tool
Hett (1993)	16
International Association for the Evaluation of Educational Achievement (2016)	1
Morais and Ogden (2010)	4
Organisation for Economic Co-operation and Development (2018)	9
Reysen and Katzarska-Miller (2013)	4
Türken and Rudmin (2013)	5
School-to-School International	2
World Values Survey Wave 6	25

Appendix Table 5: Exploratory Factor Analysis Fit Indexes

Analysis	Exploratory Factor Analysis Yielded Solutions			
	3-factor	4-factor	5-factor	Hu & Bentler (1998, 1999)
Root Mean Square Residual	0.031	0.028	0.025	0.060
Comparative Fit Index	0.888	0.912	0.930	0.950
Tucker-Lewis Index	0.876	0.899	0.917	0.950
Standardized Root Mean Residual	0.090	0.083	0.076	0.080

Appendix Figure 2: Exploratory Factor Analysis Scree Plot



Appendix Table 6: Final Four-Factor Solution and Factor Loadings

Item	Dimension			
	1	2	3	4
Would like/not like have as neighbors: People who speak a different language	0.251*	**0.357***	0.032	-1.007*
How much do you trust people of another nationality?	0.366*	0.191	0.117	**0.733***
How much do you trust people of another religion?	0.252*	0.252*	0.222*	**0.709***
How important is it for children to be tolerant and respectful of other people?	0.176*	0.288*	-0.149*	**0.268***
One should first care for his or her nation, then others.	-0.014	0.244*	**0.427***	**0.228***
People sometimes talk about what the aims of this country should be for the next ten years. Below are listed some of the goals which different people would give top priority. Would you please say which one of these you, yourself, consider the most important?	0.154*	0.139	0.184*	**-0.219***
Immigrants should have the opportunity to continue their own customs and lifestyle.	**0.494***	0.207*	-0.076	**0.210***
In the long run, the [NATIONALITY] will probably benefit from the fact that the world is becoming more interconnected.	0.405*	-0.172*	-0.013	**0.201***
I know several ways in which I can make a difference on some of this world's most worrisome problems.	**0.612***	-0.197*	0.086	-0.199*
I can easily adapt to a new culture.	0.166*	**0.593***	-0.226*	0.190*
I listen carefully to what they say.	**0.576***	-0.017	-0.038	0.189*
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.	**0.557***	-0.311*	0.085	-0.181*
When jobs are scarce, employers should give priority to people of this country over immigrants.	0.041	0.147*	**0.397***	0.181*
I am able to empathize with people from other countries.	**0.466***	0.248*	-0.284*	0.180*
I believe that there are two sides to every question and try to look at them both.	0.107	**0.663***	-0.186*	0.174*
I see myself as part of the [NATIONALITY] nation.	-0.188*	-0.049	**0.798***	0.168*
I feel most connected to members of my own country.	-0.028	0.179*	**0.583***	0.161*
I see myself as part of my local community.	-0.416*	-0.072	**0.605***	0.154*
[NATIONALITY] people are probably the best in the world.	0.174*	0.09	**0.809***	-0.152*
I frequently check that we are understanding each other correctly.	**0.536***	-0.072	0.046	0.141*

Item	Dimension			
	1	2	3	4
Tradition is important to me – to follow the customs handed down by one's religion or family.	0.059	-0.261*	**0.561***	0.139*
I feel a strong kinship with the worldwide human family.	**0.464***	0.097	-0.123*	0.120*
I sometimes try to understand my friends better by imagining how things look from their perspective.	0.131	**0.583***	-0.238*	0.149
Immigrants who live in a country for several years should have the opportunity to vote in elections.	**0.439***	0.013	0.096	0.13
People who belong to different religions are probably just as moral as those who belong to mine.	**0.525***	0.035	0.209*	0.093
Before criticizing somebody, I try to imagine how I would feel if I were in their place	0.160*	**0.486***	-0.167*	0.083
If I could, I would dedicate my life to helping others no matter what country they are from.	**0.503***	0.164*	-0.118	0.05
I consider myself more as a citizen of the world than a citizen of some nation.	**0.475***	0.072	0.247*	0.031
I feel intense pride when I think about my country.	-0.091	0.146*	**0.726***	0.02
I feel an obligation to speak out when I see our government doing something I consider wrong.	**0.507***	-0.144	-0.053	0.012
I feel very concerned about the difficult lives of people who live in politically repressive regimes.	**0.703***	0.06	0.005	-0.005
I can feel a connection to people from other parts of the world.	**0.815***	-0.02	0.013	-0.015
It is my responsibility to understand and respect cultural differences across the globe to the best of my abilities.	**0.705***	0.054	0.008	-0.022
I see myself as a world citizen.	**0.630***	0.047	-0.114	-0.025
How proud are you to be [NATIONALITY]?	0.018	-0.087	**0.777***	-0.028
My own culture is the best in the world.	0.168*	0.135*	**0.699***	-0.056
The needs of [COUNTRY] must continue to be our highest priority in negotiating with other countries.	-0.129	0.181*	**0.476***	-0.069
Would like/not like have as neighbors: People of a different religion	0.051	**0.884***	0.203	-0.083
Those countries that are well off should help people in countries who are less fortunate.	**0.564***	-0.017	0.095	-0.088
Would like/not like have as neighbors: People of a different social class	-0.177*	**0.810***	-0.12	-0.089
I am able to get other people to care about global problems that concern me.	**0.619***	-0.02	-0.150*	-0.098
I can feel a connection to issues that arise in other parts of the world.	**0.828***	-0.019	-0.08	-0.106
Would like/not like have as neighbors: People of a different race	-0.008	**0.883***	0.217*	-0.124

Item	Dimension			
	1	2	3	4
Would like/not like have as neighbors: Immigrants / foreign workers	-0.06	**0.834***	0.099	-0.204

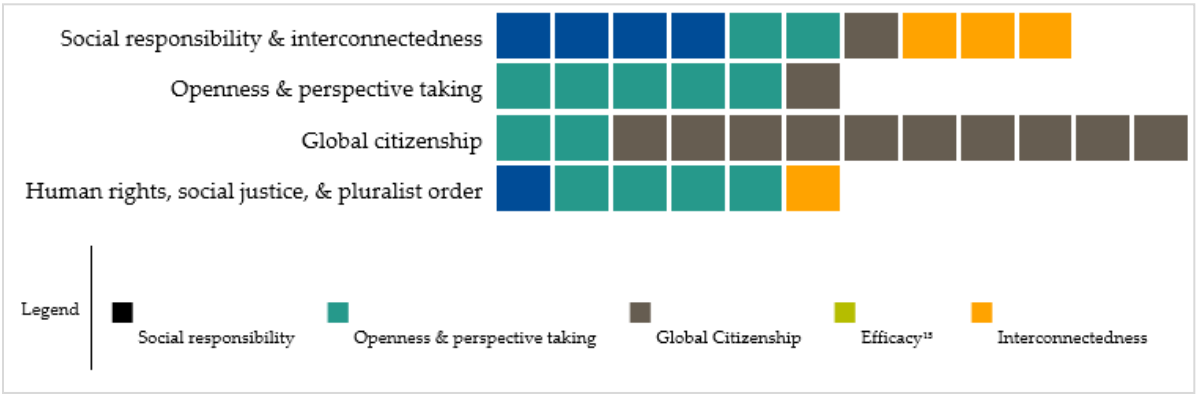
Notes: An asterisk (*) indicates significant loading (0.05 level); bolded text and shaded cells indicate retained items.

Appendix Table 7: Inter-dimension Correlations for Exploratory Factor Analysis Final Solution

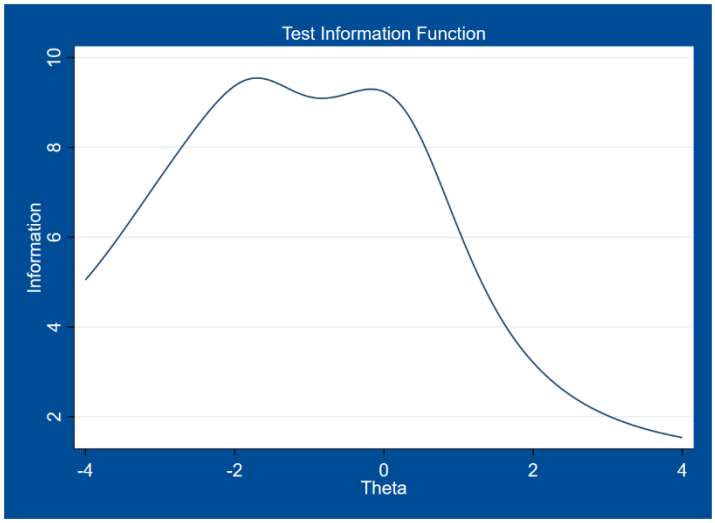
	1	2	3	4
1	1			
2	0.336*	1		
3	-0.085	0.179*	1	
4	-0.020	-0.167*	0.055	1

Note: An asterisk (*) indicates statistical significance at the $p < 0.05$.

Appendix Figure 3: Operational Items by Pilot Dimension (Color) and Operational Dimension (Row)



Appendix Figure 4: Test Information Function for the Selected 34 Items

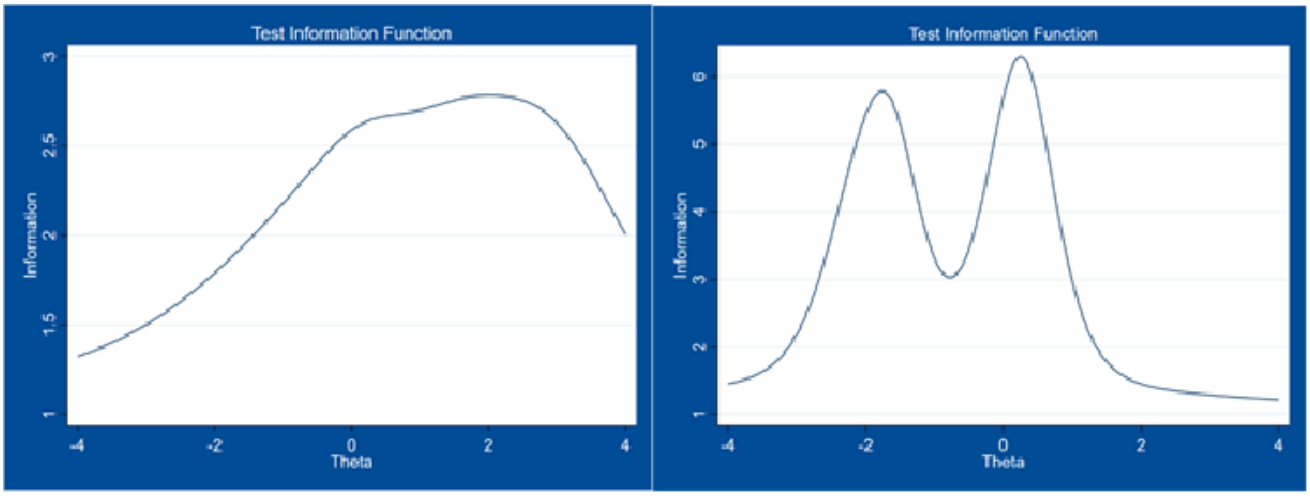


Appendix Table 8: Demographic Characteristics Relevant to Global Mindedness

Item	Effect
Gender	+ 5*
How many languages do you speak at home	+ 2*
Is your father or other caregivers currently employed	+ 3*
How many books do you have at home	+ 2
Appealing: Studying abroad for a limited period of time	- 1
Appealing: Moving abroad for an extended period of time	+ 3*
Appealing: Pursuing a graduate degree	+ 1
Appealing: Finding a career that involves travel	+ 3*
Are you currently enrolled in the IB Diploma Programme	+ 7*
Were you a student in the IB Primary Years Programme	- 6*
Were you a student in an IB Middle Years Programme	- 3

Note: An asterisk (*) indicates statistical significance at $p < 0.05$.

Appendix Figure 5: Test Information Function on World Value Survey Wave 6 (Left) and International Baccalaureate® Sample (Right)



Appendix Table 9: Item Fit for World Value Survey Wave 6 Items

Item	Items Showing Strong Fit	
	World Values Survey Sample	International Baccalaureate® Sample
Neighbors (immigrants, race, religion, language)		
How proud are you to be [NATIONALITY]?	✓	
Tradition is important to me—to follow the customs handed down by one's religion or family.	✓	✓
I see myself as part of my local community.	✓	
When jobs are scarce, employers should give priority to people of this country over immigrants.	✓	✓
People sometimes talk about what the aims of this country should be for the next ten years...Would you please say which one of these you, yourself, consider the most important?		✓
How important is it for children to be tolerant and respectful of other people?		✓
How much do you trust people of another nationality?		✓
How much do you trust people of another religion?		✓
People who belong to different religions are probably just as moral as those who belong to mine.		✓
I see myself as a world citizen.	✓	✓
Of course, we all hope that there will not be another war, but if it were to come to that, would you be willing to fight for your country?	✓	

APPENDIX IV: OPERATIONAL PHASE TABLES AND FIGURES

Appendix Table 10: Background Statistics for Study Countries[103]

Country	Location	GDP Per Capita 2018 (USD)	Population 2020 (K)	Immigration 2017 (K)	Asylum Seekers 2017 (K)	Adjusted Net Enrollment Primary Education 2017	Adjusted Net Enrollment Lower Secondary Education 2017	% GDP Government Expenditure in Education
Australia	Oceania	57,305	25,500	448	68	96.5	91.0	5.3
Germany	Europe	48,196	83,784	2,745	387	90.4	87.7	4.8
Japan	Asia	39,287	126,476	949	38	98.8	99.3	3.2
Mexico	Americas	9,698	128,933	66	29	99.2	89.5	4.9
Spain	Europe	30,524	46,755	908	61	97.3	94.3	4.2
US	Americas	62,641	331,003	2,253	588	95.6	88.2	4.9

[103] Source: World Bank (https://data.worldbank.org/) ; UNESCO (http://data.uis.unesco.org/)

Appendix Table 11: Operational School Recruitment

Country	Schools Contacted	Schools Responding to Outreach		Schools Opting In		Schools Submitting Approval Letter		Schools Participating in Survey	
		n	% of Schools Contacted	*n*	% of Schools Responding	*n*	% of Schools Opting in	*n*	% of Schools with Approval Letter
Australia	79	39	49.4	22	27.8	18	22.8	15	19.0
Germany	79	21	26.6	8	10.1	8	10.1	7	8.9
Japan	51	20	39.2	12	23.5	8	15.7	6	11.8
Mexico	50	33	66.0	26	52.0	19	38.0	17	34.0
Spain	60	25	41.7	21	35.0	17	28.3	15	25.0
United States (private)	100	39	39.0	21	21.0	13	13.0	12	12.0
United States (public)[104]	50	46	92.0	10	20.0	10	20.0	7	14.0
Total	**469**	**223**	**47.5**	**120**	**25.6**	**93**	**19.8**	**79**	**16.8**

Appendix Table 12: Operational Student Sample, School Descriptive

Country	Total Students	International Baccalaureate® Programme		School Type		
		% Diploma Programme	% Career-Related Programme	% Private	% Public	% State Subsidized
Australia	484	99.2	0.8	66.9	33.1	0.0
Germany	169	47.9	52.1	95.9	4.1	0.0
Japan	223	100.0	0.0	87.9	12.1	0.0
Mexico	1397	24.4	75.6	100.0	0.0	0.0
Spain	465	100.0	0.0	55.7	37.4	6.9
United States	676	100.0	0.0	67.6	32.4	0.0
Total	**3414**	**66.4**	**33.6**	**81.9**	**17.2**	**0.9**

[104] To arrive at the US public-school sample, STS first selected states based on the number of public and private schools in the state and their geographic region. STS grouped states into three categories by number of IB schools: 0–9 schools; 10–19; and more than 19 schools. STS also grouped states into six geographic regions. STS selected one state in each size category per region, resulting in 18 states. From those 18 states, STS purposively selected 18 school districts and ultimately submitted research requests to 15.

Appendix Table 13: Operational Student Sample, Number of Languages Spoken at Home

Country	Total Students	1 (%)	2 (%)	3 (%)	4 or more (%)
Australia	484	56.0	37.2	5.8	1.0
Germany	169	38.2	40.6	20.0	1.2
Japan	223	54.5	31.3	13.0	1.3
Mexico	1,397	57.4	36.2	5.8	0.6
Spain	465	55.9	32.7	9.9	1.5
United States	676	56.7	37.7	5.0	0.6

Appendix Table 14: Operational Student Sample, Number of Books at Home

Country	Total Students	None or very few (0 - 10 books) (%)	Enough to fill one shelf (11–25 books) (%)	Enough to fill one bookcase (26–100 books) (%)	Enough to fill two bookcases (101–200 books) (%)	Enough to fill three or more bookcases (more than 200 books) (%)
Australia	484	2.9	9.9	26.0	24.0	37.2
Germany	169	5.9	7.1	21.2	19.4	46.5
Japan	223	4.5	17.4	34.4	22.8	21.0
Mexico	1,397	5.6	21.8	36.8	20.9	14.8
Spain	465	1.7	8.8	23.7	22.2	43.5
United States	676	7.6	11.9	27.3	22.7	30.7

Appendix Table 15: Operational Student Sample, Appeal of Future Activities

Item	Response Option	Australia (%) (n = 484)	Germany (%) (n = 169)	Japan (%) (n = 223)	Mexico (%) (n = 1,397)	Spain (%) (n = 465)	United States (%) (n = 676)
Studying abroad for a limited period of time	Not at all appealing	2.7	8.2	5.4	1.7	1.5	5.8
	Somewhat appealing	15.9	13.5	18.3	13.8	12.9	22.8
	Appealing	31.6	40.6	38.8	31.5	29.7	27.4
	Very appealing	49.8	37.7	37.5	53.0	55.8	44.1
Moving abroad for an extended period of time	Not at all appealing	5.6	3.5	8.0	2.1	4.3	13.6
	Somewhat appealing	21.1	19.4	17.9	11.8	18.8	29.9

Item	Response Option	Australia (%) (*n* = 484)	Germany (%) (*n* = 169)	Japan (%) (*n* = 223)	Mexico (%) (*n* = 1,397)	Spain (%) (*n* = 465)	United States (%) (*n* = 676)
	Appealing	34.5	37.1	32.6	26.2	28.0	25.3
	Very appealing	38.8	40.0	41.5	59.8	48.9	31.2
Pursuing a graduate degree	Not at all appealing	0.8	3.0	9.8	1.5	3.0	2.8
	Somewhat appealing	5.6	10.1	24.1	13.2	12.5	9.9
	Appealing	25.4	27.8	29.9	32.5	36.3	24.9
	Very appealing	68.2	59.2	36.2	52.8	48.2	62.4
Finding a career that involves travel	Not at all appealing	10.5	9.4	22.8	4.4	6.3	10.7
	Somewhat appealing	32.0	29.4	34.4	18.9	23.5	32.8
	Appealing	29.3	29.4	23.7	29.1	30.2	29.3
	Very appealing	28.1	31.8	19.2	47.6	40.1	27.2

Appendix Table 16: Global-Mindedness Levels (Full Tool)

Country	*n*	Mean	Standard Deviation	Min.	Max.
Australia	392	122.8	11.7	76.0	152.0
Germany	67	119.9	15.0	81.0	150.0
Japan	166	116.8	11.1	83.0	141.0
Mexico	1,283	117.8	10.0	77.0	150.0
Spain	345	122.2	14.3	71.0	152.0
United States	533	124.9	13.5	46.0	151.0

Appendix Table 17: Global-Mindedness Levels by Year and Programme (Full Tool)

Country	Diploma Programme Student				Career-Related Programme Student				ANOVA (Prob > F)		
	First Year		Second Year		First Year		Second Year		Main Effect		Interaction
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Year	Programme	Year Programme
Australia	121.85	0.72	124.75	0.98			97.00		0.02	0.02	
Germany	117.29	2.52	123.63	2.76	125.00		116.00		0.90	1.00	0.48
Japan	116.45	1.26	117.11	1.19			117.00		0.70	0.99	
Mexico	119.61	0.74	120.42	0.60	115.48	0.57	116.79	0.41	0.07	0.00	0.67
Spain	122.70	1.14	121.74	1.03					0.53		
United States	124.68	0.80	125.21	0.87	127.25	4.27	122.13	6.64	0.58	0.95	0.50

Appendix Table 18: Global-Mindedness Levels by Year (Full Tool)

Country	First Year		Second Year		Difference (Second - First)	
	Mean	Standard Error	Mean	Standard Error	Value	*P*-Value
Australia	121.85	0.72	124.54	1.00	2.69	0.03
Germany	117.49	2.46	123.36	2.67	5.87	0.12
Japan	116.45	1.26	117.11	1.18	0.66	0.70
Mexico	117.36	0.47	118.04	0.35	0.68	0.24
Spain	122.70	1.14	121.74	1.03	-0.96	0.53
United States	124.72	0.79	125.10	0.87	0.39	0.74

Appendix Table 19: Global-Mindedness Levels by Number of Standard Level Courses (Full Tool)

Country	One Course		Two Courses		Three Courses		Linear Trend	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Coefficient	*p*-Value
Australia			124.63	3.10	122.75	0.60	-2.61	0.38
Germany			127.33	12.99	119.56	1.90	-7.63	0.39
Japan	119.50	11.50	121.25	8.67	116.43	0.90	-2.65	0.42
Mexico	117.60	1.65	118.77	1.18	120.56	0.55	1.38	0.10
Spain	123.00		124.27	2.09	122.06	0.82	-1.83	0.51
United States	122.30	2.25	126.41	1.01	124.49	0.76	-0.12	0.90

Appendix Table 20: Linear Trends for Standard and Higher Level Courses

Country	Standard Level Courses		Higher Level Courses	
	Coefficient	*p*-Value	Coefficient	*p*-Value
Australia	-2.61	0.38	4.94	0.09
Germany	-7.63	0.39	-0.13	0.99
Japan	-2.65	0.42	6.16	0.14
Mexico	1.38	0.10	0.23	0.74
Spain	-1.83	0.51	0.65	0.82
United States	-0.12	0.90	0.36	0.65

Appendix Table 21: Global-Mindedness Levels by Number of Higher Level Courses (Full Tool)

Country	One Course		Two Courses		Three Courses		Four Courses		Linear Trend	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error	Coefficient	*p*-Value
Australia					122.89	0.59	123.50	3.61	4.94	0.09
Germany					119.46	1.93	119.33	7.17	-0.13	0.99
Japan	108.00		96.00		116.77	0.90	117.50	13.50	6.16	0.14
Mexico	117.76	1.37	119.63	1.76	120.03	0.59	121.77	1.19	0.23	0.74
Spain	128.00		118.13	3.47	122.37	0.80	120.50	3.56	0.65	0.82
United States	126.26	2.54	123.58	3.21	124.69	0.74	125.86	1.00	0.36	0.65

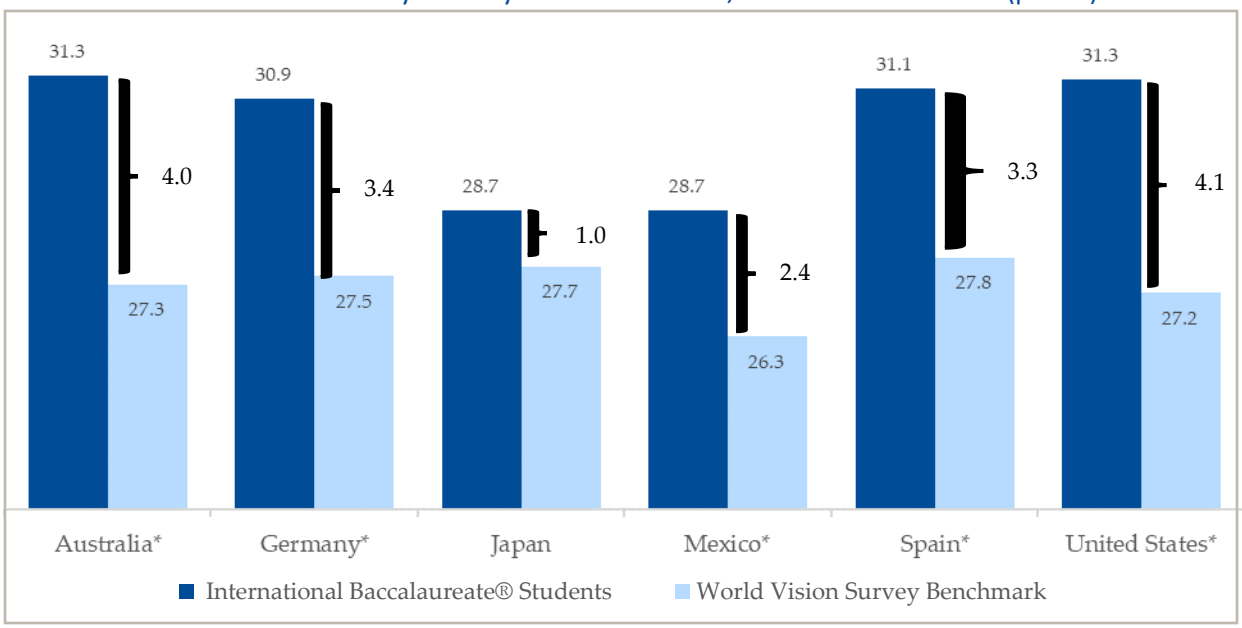
Appendix Table 22: Global-Mindedness Levels by Candidate Status (Including Career-Related Programme Students in Course Candidates)

Country	Diploma Candidate		Course Candidate		Difference (Diploma Candidate – Course Candidate)	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Australia	122.85	0.59	117.00	8.14	5.85	0.22
Germany	119.35	1.89	129.25	7.27	-9.90	0.20
Japan	116.61	0.90	118.63	2.82	-2.02	0.49
Mexico	120.58	0.58	116.82	0.31	3.76	0.00
Spain	121.98	0.81	125.27	2.25	-3.29	0.26
United States	124.90	0.69	124.86	1.05	0.03	0.98

Appendix Table 23: Global-Mindedness Levels by Candidate Status (Excluding Career-Related Programme Students from Course Candidates)

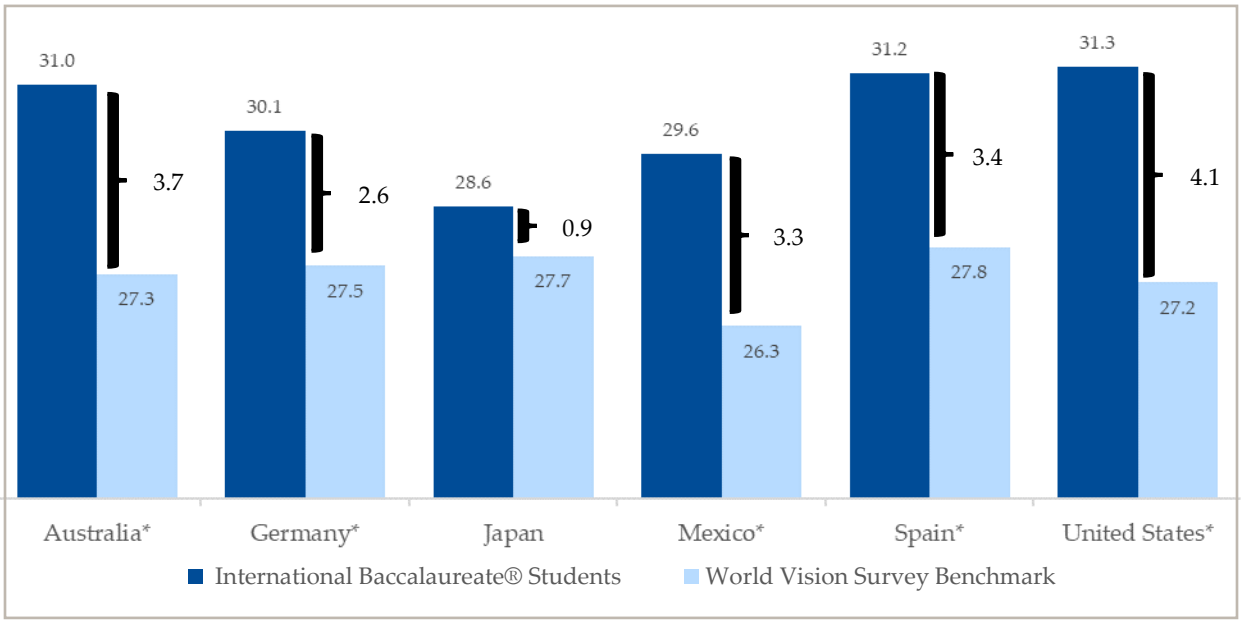
Country	Diploma Candidate		Course Candidate		Difference (Diploma Candidate – Course Candidate)	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Australia	122.85	0.59	121.00	8.69	1.85	0.72
Germany	119.35	1.89	138.00	12.00	-18.65	0.09
Japan	116.61	0.90	118.73	3.01	-2.13	0.48
Mexico	120.58	0.58	119.04	0.79	1.54	0.12
Spain	121.98	0.81	125.27	2.25	-3.29	0.26
United States	124.90	0.69	124.93	1.09	-0.04	0.98

Appendix Figure 6: Differences in Global-Mindedness Levels between International Baccalaureate® Students and World Values Survey Country-Level Benchmark, Second Year Students (points)



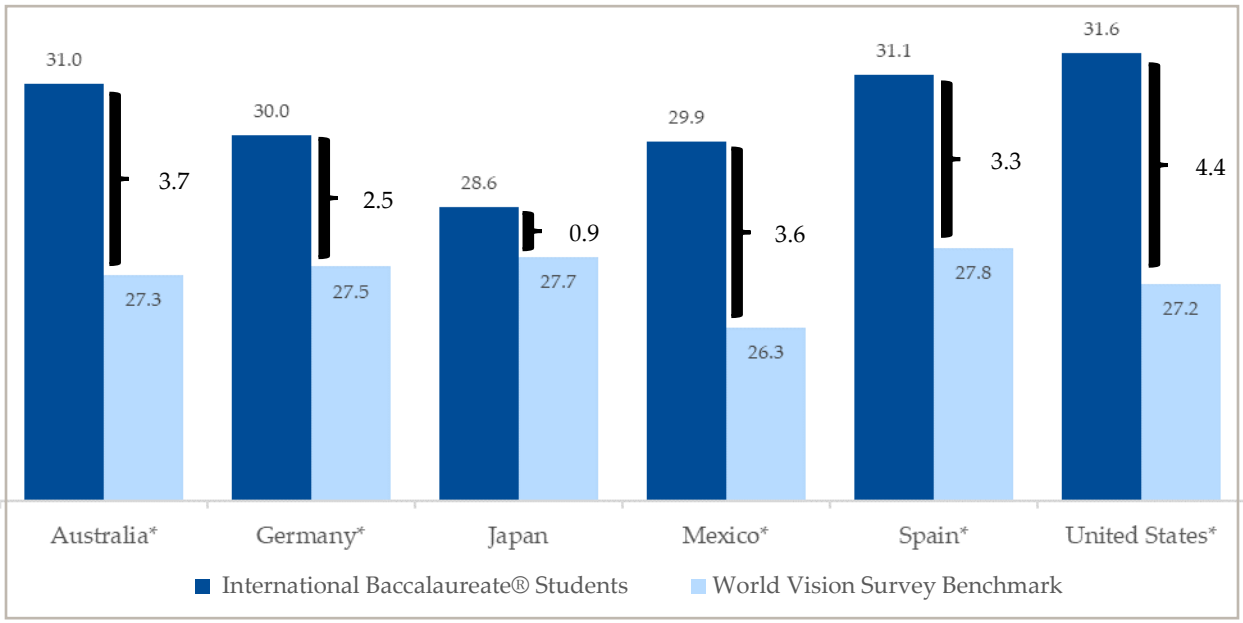
Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

Appendix Figure 7: Differences in Global-Mindedness Levels between International Baccalaureate® Students and World Values Survey Country-Level Benchmark, Diploma Programme Students (points)



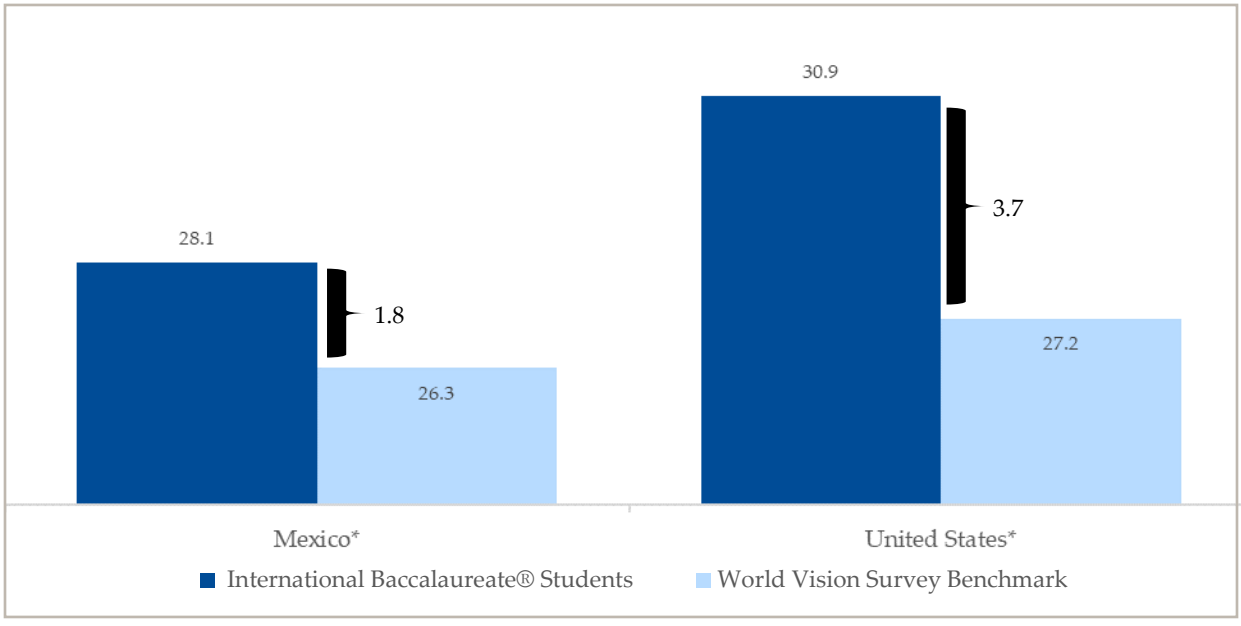
Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

Appendix Figure 8: Differences in Global-Mindedness Levels between International Baccalaureate® Students and World Values Survey Country-Level Benchmark, Diploma Candidates (points)



Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

Appendix Figure 9: Differences in Global-Mindedness Levels between International Baccalaureate® Students and World Values Survey Country-Level Benchmark, Course Candidate (points)[105]



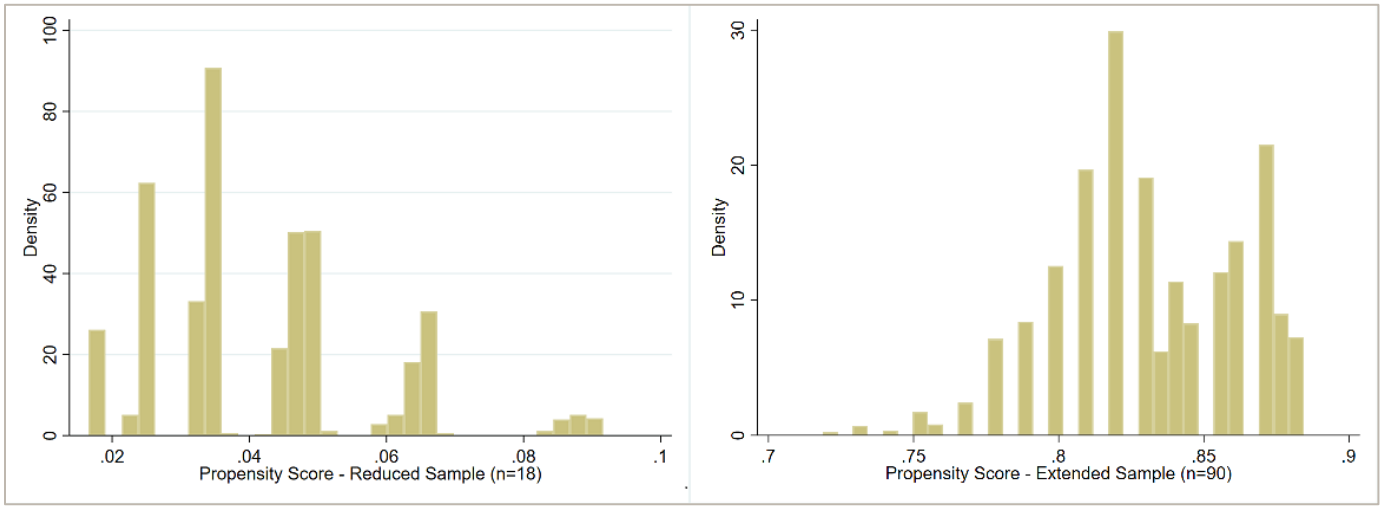
Note: An asterisk (*) indicates a statistically significant difference between groups at 5% level.

[105] Only Mexico and United States had enough sampled students in each category to produce this comparison.

Appendix Table 24: Correlations between Factors and Aggregated World Values Survey Items (significance at 5% level)

Country	Australia	Germany	Japan	Mexico	Spain	United States
Gender	0.12	0.36	0.27	0.11	0.12	0.22
Age				0.08		
Country of birth	0.11					
Languages at home	-0.18		0.16			
Mother employed					0.16	
Father employed						
Books at home	0.18			0.17	0.13	0.12
Foreign travel				0.12		0.15
Intention to study abroad for limited period		0.40		0.14		0.22
Intention to move abroad for extended period	0.14	0.37	0.16	0.20	0.19	0.21
Intention to pursue a graduate degree		0.24		0.15	0.10	
Intention to find a career with travel				0.08	0.18	
Years of International Baccalaureate® education					-0.11	
Total courses (standard level and higher level)				0.16		
Primary Years Programme alumni/ae (1 = yes)			0.15			
Middle Years Programme alumni/ae (1 = yes)				-0.06	-0.22	
Pandemic influence on perceptions around country			-0.27	-0.13	-0.17	0.32
Pandemic influence on perceptions around world			-0.16			0.10
Judgment of governments response			-0.20	-0.13	0.18	-0.39
Concern about influence of pandemic on global links	0.26	0.45		0.13	0.21	0.32

Appendix Figure 10: Propensity Score Distributions



APPENDIX V: DETAILED EXPLANATION OF OPERATIONAL ANALYSIS

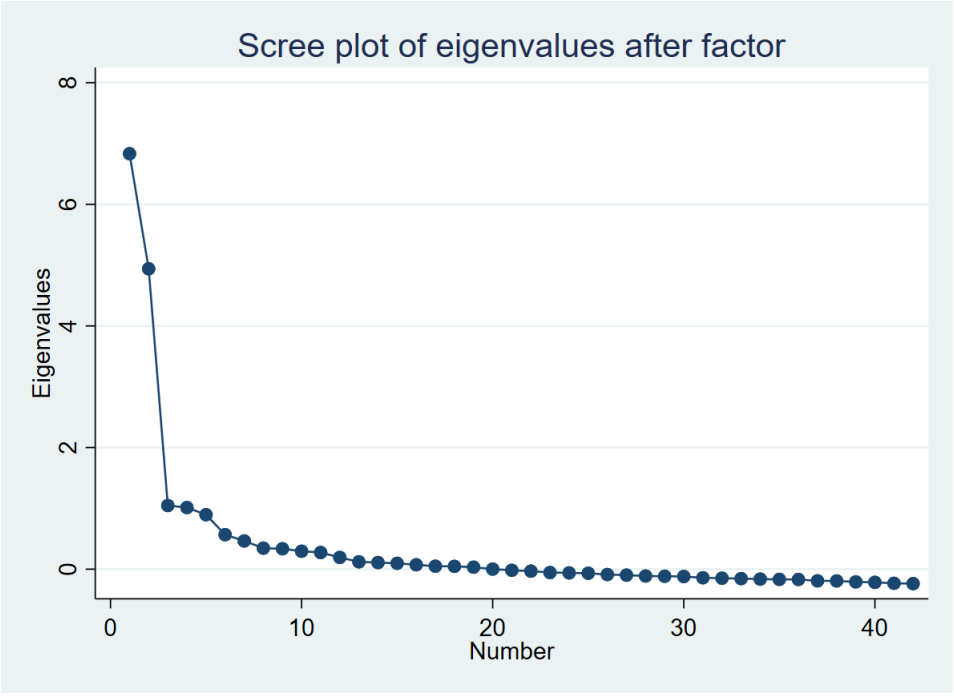
1. Data cleaning

In addition to labeling variables and responses, as routinely, School-to-School International (STS) had to remove some records from the dataset it received from the International Baccalaureate® (IB). In particular, some cases did not come with school-level information attached. Every student from a common school received the same uniform resource locator (URL). Using the URL info, STS recovered school information in most of the problematic cases. However, two cases presented unrecognized URLs–one in Spain and one in Japan. Consequently, STS dropped both cases.

2. Final tool

To determine the final structure of the instrument, STS conducted an exploratory factor analysis (EFA). The EFA yielded a 4-factor solution: the corresponding eigenvalues were 6.83, 4.94, 1.05, and 1.01, respectively. The eigenvalues quickly descended below 1 for the fifth factor (see Appendix Figure 11). Importantly, the four-factor solution conformed to STS's expectations.

Appendix Figure 11: Scree Plot for Exploratory Factor Analysis



Correlations among the four factors were small to moderate, yet substantially higher than those observed during the pilot stage (see Appendix Table 25).

Appendix Table 25: Interfactor Correlation

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	-0.058*	1.000		
Factor 3	0.507*	0.061*	1.000	
Factor 4	0.244*	0.227*	0.415*	1.000

* p-value < 0.05

STS examined items, their original loadings (from the pilot, when applicable), whether their original load conformed to the one observed in the operational dataset, and the corresponding factor loadings (see Appendix Table 26). STS defined an item as "loading onto a factor" when the loading was 0.3 or higher. A total of 87% of the items conformed to the expectations, supporting STS's original conceptualization of the construct. STS removed items that did not have any meaningful loading from the survey, except for those from the World Values Survey (WVS) Wave 6.

Appendix Table 26: Exploratory Factor Analysis - Factor Loadings for Operational Items[106, 107, 108]

Item	Original Load	Conforms	Factor 1 (Former 2)	Factor 2 (Former 3)	Factor 3 (Former 1)	Factor 4
I respect people from other cultures as equal human beings.	2	Y	0.718*	-0.015	-0.005	-0.035*
[NATIONALITY] people are probably the best in the world.	3	Y	0.070*	0.658*	-0.037*	-0.002
All refugees should be welcome in my country	N/A	Y	-0.076*	0.203*	0.602*	0.059*
Before criticizing somebody, I try to imagine how I would feel if I were in their place.	2	Y	0.716*	0.032*	0.017	-0.009
How important is it for children to be tolerant and respectful of other people?	4	N	0.238*	-0.052*	0.097*	0.045*
How much do you trust people of another nationality?	4	Y	0.015	0.056*	0.033*	0.784*
How much do you trust people of another religion?	4	Y	-0.013	-0.030*	-0.022*	0.909*
How proud are you to be [NATIONALITY]?	3	Y	-0.018	0.783*	0.084*	-0.052*
I am able to empathize with people from other countries.	1	Y	0.226*	-0.051*	0.337*	0.081*

[106] Relevant loadings highlighted. Removed items are in grey.
[107] An asterisk (*) indicates a p-value < 0.05.
[108] N/A refers to items that were not applicable to the pilot.

Item	Original Load	Conforms	Factor 1 (Former 2)	Factor 2 (Former 3)	Factor 3 (Former 1)	Factor 4
I am fascinated by learning how differently people can experience the same event.	N/A		0.267*	-0.048*	0.282*	0.078*
I believe in a world without borders.	N/A	Y	-0.023	-0.031	0.556*	-0.101*
I believe that there are two sides to every question and try to look at them both.	2	Y	0.624*	0.042*	-0.033	0.016
I can easily adapt to a new culture.	2	Y	0.430*	0.033*	0.164*	0.114*
I can feel a connection to issues that arise in other parts of the world.	1	Y	0.028	-0.081*	0.570*	-0.033
I can feel a connection to people from other parts of the world.	1	Y	0.015	0.01	0.553*	0.068*
I consider myself more as a citizen of the world than a citizen of some nation.	3	N	0.018	0.095*	0.484*	-0.026
I feel a strong kinship with the worldwide human family.	1	Y	0.068*	-0.154*	0.480*	0.102*
I feel intense pride when I think about my country.	3	Y	0.004	0.815*	0.017	-0.006
I feel most connected to members of my own country.	3	Y	0.022	0.577*	-0.019	0.078*
I feel very comfortable having discussions with people who do not share my values.	N/A		0.198*	0.059*	0.087*	0.120*
I feel very concerned about the difficult lives of people who live in politically repressive regimes.	1	Y	0.101*	-0.029	0.521*	0.043*
I get extremely frustrated when my government doesn't respect the rights of immigrants.	N/A	Y	-0.013	0.116*	0.651*	0.02
I see myself as a world citizen.	3	Y	0.074*	-0.141*	0.482*	-0.008
I see myself as part of my local community.	3	Y	-0.043	0.399*	-0.276*	-0.024
I see myself as part of the [NATIONALITY] nation.	3	Y	0.009	0.607*	-0.157*	-0.032
I will definitely choose a career through which I can help increase equality worldwide.	N/A	Y	0.107*	-0.055*	0.528*	-0.076*

Item	Original Load	Conforms	Factor 1 (Former 2)	Factor 2 (Former 3)	Factor 3 (Former 1)	Factor 4
If I could, I would dedicate my life to helping others no matter what country they are from.	1	Y	0.026	-0.099*	0.623*	-0.02
Immigrants should have the opportunity to continue their own customs and lifestyle.	4	N	0.013	0.021	0.430*	0.122*
Immigrants who live in a country for several years should have the opportunity to vote in elections.	1	Y	-0.057*	0.121*	0.466*	-0.007
In emergency situations, immigrants and citizens should be treated equally	N/A	Y	0.051*	0.073*	0.492*	0.041*
In the long run, the [NATIONALITY] will probably benefit from the fact that the world is becoming more interconnected.	4		0.022	-0.134*	0.287*	0.079*
It is my responsibility to understand and respect cultural differences across the globe to the best of my abilities.	1	Y	0.108*	-0.046*	0.499*	0.038*
My nationality is an essential component of my identity.	N/A	Y	0.032	0.646*	-0.068*	0.040*
My own culture is the best in the world.	3	Y	0.089*	0.461*	0.058*	0.107*
Of course, we all hope that there will not be another war, but if there were one, would you be willing to fight for your [COUNTRY]?	N/A	Y	-0.028	0.434*	0.054*	-0.002
One should first care for his or her nation, then others.	3	Y	-0.02	0.553*	0.120*	0.031
People who belong to different religions are probably just as moral as those who belong to mine.	1	Y	0.032	-0.034*	0.434*	0.165*
Progress toward a less impersonal and more humane society - most important aim for next 10 years.	4	N	-0.02	0.237*	0.345*	0.012
The needs of [COUNTRY] must continue to be our highest priority in	3	Y	0.003	0.556*	-0.004	0.073*

Item	Original Load	Conforms	Factor 1 (Former 2)	Factor 2 (Former 3)	Factor 3 (Former 1)	Factor 4
negotiating with other countries.						
Tradition is important to me – to follow the customs handed down by one's religion or family.	3	Y	-0.132*	0.484*	-0.003	0.017
When jobs are scarce, employers should give priority to people of this country over immigrants.	3	Y	-0.005	0.332*	0.177*	**0.082***
Would like/not like have as neighbors: Immigrants / foreign workers, people of different race, people of different religions, people who speak a different language, people of different social class	2	N	0.066*	0.018	0.284*	0.213*

The final solution put forth by STS departed slightly from this configuration. STS decided to keep at least three items per factor and to have items load onto one factor only. To finalize the assignation of items, STS used confirmatory factor analysis (CFA) and based final decisions on the CFA results yielded. As a result, STS switched an item from the second to the fourth factor (When jobs are scarce, employers should give priority to people of this country over immigrants). In addition, STS assigned items 24 (How important is it for children to be tolerant and respectful of other people?) and 25 (Would you like to have as neighbors: ...?), which did not load onto any factor in the original solution, to the first factor. With this final solution and in consideration of the final items retained, STS decided to relabel the factors as follows:

- Openness and perspective-taking
- Global citizenship
- Social responsibility and interconnectedness
- Human rights, social justice, and pluralist order
- Measurement invariance

Using the same instrument across different populations (e.g., countries) is not enough to assume that researchers can compare scores directly. Researchers need to establish a level of measurement equivalence of the score scales across populations of interest. Different textbooks refer to equivalence using different terms; herein, STS used nomenclature from Brown (2015). There are four levels of equivalence to consider: configural invariance, metric invariance, scalar invariance, and strict invariance. Configural invariance refers to the similarity in data

configurations across populations. For example, if the number of factors and indicators that load onto each of these factors are consistent across the different populations of interest.[109] Metric invariance refers to the equality of factor loadings across populations. In other words, metric invariance means that configural invariance has been established, and the relations between the indicators and factors are equivalent across populations. When reaching metric invariance, means across populations cannot be directly compared, but differences in means can be compared (Kankaras & Moors, Researching measurement equivalence in cross-cultural studies, 2010). Scalar invariance refers to the case in which the indicator intercepts are the same across populations. Such invariance means that score scales have the same origin and, therefore, means across populations can be fully compared (Kankaras & Moors, Researching measurement equivalence in cross-cultural studies, 2010). Last, strict invariance refers to reaching scalar invariance and accounting for indicators with the same level of precision (Brown 2015).

In order to determine the type of measurement equivalence yielded by an instrument across different populations, researchers need to conduct specific analyses. Among the most popular analyses, we find multigroup confirmatory factor analysis (van de Vijver and Leung, 1997). Multigroup confirmatory factor analysis consists of evaluating the goodness of fit of multigroup models that entail different levels of equivalence across populations (Brown 2015; van de Vijver and Leung, 1997). After fitting multigroup models of different equivalence, the researcher compares the differences in goodness of fit vis-a-vis the differences in added parameters and makes a final determination as to which model to retain.

However, multigroup CFA assumes that the latent construct and observed variables (indicators) are continuous (Kankaras & Moors, Researching measurement equivalence in cross-cultural studies, 2010); this is a complicated assumption for any instrument that uses Likert-type scales. That is the case of the global-mindedness scale that STS developed. An alternative and less common approach uses multi-group latent class analysis (MLCA), which assumes ordinal and even nominal constructs and indicators.

STS decided to use MLCA. Due to the large sample sizes, STS decided to choose the best fitting model using the Bayesian Information Criterion (BIC); under this criterion, the lowest BIC indicates the best fitting model. Based on this criterion, the MLCA results indicated that the level of invariance reached was metric, indicating means could not be compared across countries, but differences between means could (Kankaras & Moors, Researching measurement equivalence in cross-cultural studies, 2010). In addition, correlational and regression analyses could be done at aggregated levels, if needed.

[109] Like the items measuring global mindedness.

Appendix Table 27: Fit Indexes for Each Model (Best Fitting Model in Grey)

Type of Invariance	Bayesian Information Criterion - Multi-Group Latent Class Analysis
Equal form (configural)	205,319
Equal factor loadings (metric)	204,368
Equal indicator intercepts (scalar)	205,975
Equal indicator residual variance (strict)	205,530

3. Listwise imputation

The aggregated global-mindedness scores could not be computed for all students due to missing data. To properly deal with the missing data, STS examined the amount of missing data observed for the full global-mindedness tool and the subset of WVS items used in the benchmark analysis. In particular, STS correlated the amount of missing data with other variables in the dataset. Doing so confirmed that data were not missing completely at random and that the level of missingness correlated with a series of background variables (see

Appendix Table 28 Appendix Table 28). In addition, a separate analysis showed that the tendency of data missingness varied by item.[110]

Appendix Table 28: Correlations between Missing Data

Variable	Missingness World Values Survey	Missingness Full Tool
Country of birth (1 = Same as residence)	-0.34	-0.12
Languages at home	0.09	
Mother employed	0.06	
Father employed	-0.03	
Books at home	0.03	
Foreign travel	0.13	0.04
Intention to study abroad for brief period of time	-0.05	
Intention to find a career that involves travel	-0.04	
Higher level courses	0.06	

It is difficult to tell from the data whether the missingness was at random or not at random (i.e., missingness depends on the missing data itself). It is possible that the data were not missing at random. For example, students born in the country of residence could have been more likely to respond to items about immigration and government than immigrants because they felt more

[110] Most items had similar levels of missing data, but STS noted some exceptions. In particular, the item with highest level of missingness was "How proud are you of your nationality?"

comfortable doing so. Similarly, it could be that students who have traveled the world more feel more comfortable reflecting on global mindedness than their peers.

With the risk of non-random data missingness being high, and the recommendations of experts to avoid using multiple imputations when data are not missing at random (Pepinsky, 2018), STS decided to conduct a listwise deletion of the cases. Doing so yielded 18% and 17% of missing data for the full global-mindedness tool and the WVS items, respectively. That left us with more than 2,900 records, providing support for listwise deletion: when the issue is not power, dealing with missingness should mostly focus on minimizing bias (Powell, 2014). Under this condition, listwise deletion may work best (Powell, 2014; Pepinsky, 2018).

Further considerations on relations between background factors and global mindedness

STS ran a series of multilevel models to evaluate the relations between different factors and global mindedness. Due to the risk of endogeneity, these relations may go both ways, and global mindedness, or other shared sources of variance, may affect some variables such as "intention to move abroad for a limited period of time" or "concern about influence of the pandemic on global links." STS considered using an instrumental variable approach to deal with the problem, but STS found the approach not fully convincing given the variables available in the dataset. For example, intention to pursue a graduate degree could have been used as an instrument for intentions to move abroad; yet the variable did not meet all the characteristics for a good instrument. Ultimately, the relations shown below should not be taken as causal nor assumed as unidirectional.

STS produced series of hierarchical linear models (HLM) by country; in each model, students were nested into schools. STS denotes significant coefficients by highlighting them in each table.

Appendix Table 29: Factors in Australia (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Gender	3.93	1.20	3.29	0.00
Age				
Country of birth				
Languages at home				
Mother employed				
Father employed				
Books at home	1.43	0.48	2.95	0.00
Foreign travel				
Intention to study abroad for limited period	0.87	0.80	1.08	0.28
Intention to move abroad for extended period	1.58	0.70	2.26	0.02
Intention to pursue a graduate degree				
Intention to find a career with travel	-0.21	0.60	-0.35	0.72
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				

Item	Coefficient	Standard Error	Z	P > |z|
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				
Pandemic influence on perceptions around country				
Pandemic influence on perceptions around world				
Judgment of governments response				
Concern about influence of pandemic on global links	5.96	0.89	6.73	0.00

Appendix Table 30: Factors in Germany (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	P > |z|
Gender	7.06	3.04	2.32	0.02
Age				
Country of birth				
Languages at home	3.28	2.29	1.43	0.15
Mother employed				
Father employed				
Books at home				
Foreign travel				
Intention to study abroad for limited period	1.41	1.89	0.75	0.45
Intention to move abroad for extended period	2.72	2.11	1.29	0.20
Intention to pursue a graduate degree	2.05	1.96	1.05	0.30
Intention to find a career with travel				
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				
Pandemic influence on perceptions around country				
Pandemic influence on perceptions around world				
Judgment of governments response				
Concern about influence of pandemic on global links	6.73	2.25	2.99	0.00

Appendix Table 31: Factors in Japan (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	P > |z|
Gender	6.33	1.54	4.11	0.00
Age				
Country of birth				
Languages at home	1.96	1.21	1.61	0.11
Mother employed				
Father employed				
Books at home				

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Foreign travel				
Intention to study abroad for limited period				
Intention to move abroad for extended period	2.20	0.83	2.64	0.01
Intention to pursue a graduate degree				
Intention to find a career with travel	0.52	0.78	0.67	0.51
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				
Pandemic influence on perceptions around country	-2.64	1.33	-1.98	0.05
Pandemic influence on perceptions around world				
Judgment of governments response				
Concern about influence of pandemic on global links	4.89	1.39	3.52	0.00

Appendix Table 32: Factors in Mexico (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Gender	3.78	0.53	7.17	0.00
Age	0.62	0.35	1.77	0.08
Country of birth	0.55	1.40	0.39	0.70
Languages at home	0.56	0.42	1.33	0.18
Mother employed				
Father employed	1.57	0.80	1.97	0.05
Books at home	0.71	0.24	2.93	0.00
Foreign travel				
Intention to study abroad for limited period	0.02	0.37	0.07	0.95
Intention to move abroad for extended period	2.30	0.37	6.14	0.00
Intention to pursue a graduate degree	1.03	0.35	2.94	0.00
Intention to find a career with travel	-0.14	0.31	-0.45	0.65
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				
Pandemic influence on perceptions around country				
Pandemic influence on perceptions around world	0.45	0.47	0.96	0.34
Judgment of governments response	0.49	0.45	1.09	0.28
Concern about influence of pandemic on global links	3.30	0.40	8.25	0.00

Appendix Table 33: Factors in Spain (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Gender	4.48	1.40	3.21	0.00
Age				
Country of birth				
Languages at home				
Mother employed	4.93	1.72	2.86	0.00
Father employed				
Books at home	0.84	0.64	1.31	0.19
Foreign travel				
Intention to study abroad for limited period				
Intention to move abroad for extended period	1.72	0.81	2.13	0.03
Intention to pursue a graduate degree	1.56	0.85	1.83	0.07
Intention to find a career with travel	1.10	0.78	1.40	0.16
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				
Pandemic influence on perceptions around country				
Pandemic influence on perceptions around world				
Judgment of governments response				
Concern about influence of pandemic on global links	5.61	1.00	5.61	0.00

Appendix Table 34: Factors in the United States (Hierarchical Linear Models, significance at 5% level)

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Gender	5.71	1.03	5.54	0.00
Age				
Country of birth				
Languages at home				
Mother employed				
Father employed				
Books at home				
Foreign travel	0.56	0.25	2.24	0.03
Intention to study abroad for limited period	1.29	0.68	1.90	0.06
Intention to move abroad for extended period	1.39	0.62	2.23	0.03
Intention to pursue a graduate degree	0.11	0.62	0.18	0.86
Intention to find a career with travel	0.23	0.57	0.40	0.69
Years of International Baccalaureate® education				
Total courses (standard level and higher level)				
Primary Years Programme alumni/ae (1 = yes)				
Middle Years Programme alumni/ae (1 = yes)				

Item	Coefficient	Standard Error	Z	$P > \|z\|$
Pandemic influence on perceptions around country	6.42	0.96	6.68	0.00
Pandemic influence on perceptions around world	-0.62	0.86	-0.73	0.47
Judgment of governments response	0.51	1.19	0.43	0.67

School-to-School International

1005 Terra Nova Boulevard, Suite 1

Pacifica, CA 94044

STS-International.org