Explaining differences in civic knowledge across 38 countries

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Abstract

The IEA International Civic and Citizenship Education Study studied the ways in which young people in lower secondary schools are prepared to undertake their roles as citizens in a wide range of countries in Europe, Latin America, and the Asian-Pacific region. A central aspect of the study was the assessment of student knowledge about a wide range of civic and citizenship-related issues. This paper includes analyses that use a multi-level model to explain differences in civic knowledge on the basis of student characteristics, home background and school contexts. In addition, the analyses in this paper include a consideration of factors characterizing educational systems that may explain differences among countries as well as differences in within-country effects of student- or classroom-level variables. The analyses in this paper are based on data from approximately 140,000 students from 38 countries and comprise measures of student knowledge, attitudes, behaviors, and student background. Additional contextual data were collected using surveys of principals and teachers of the sampled schools and an online national contexts survey.

Keywords: *ICCS, Civic Education, comparative analysis, multi-level modeling*

Introduction

The IEA International Civic and Citizenship Education Study studied the ways in which young people in lower secondary schools are prepared to undertake their roles as citizens in a wide range of countries including Europe, Latin America, and the Asian-Pacific region. ICCS was the third IEA study designed to measure contexts and outcomes of civic and citizenship education and was linked to the 1999 IEA Civic Education Study (CIVED) (Amadeo, Torney-Purta, Lehmann, Husfeldt & Nikolova, 2002; Schulz & Sibberns, 2004; Torney-Purta, Lehmann, Oswald & Schulz, 2001). A central aspect of the study was the assessment of student knowledge about a wide range of civic-related issues.

This paper makes use of the data of the IEA Civic and Citizenship Education Study (ICCS) to analyze which factors explain variation in student knowledge about civic and citizenship-related issues in 38 countries at the lower secondary level. The analyses are based on multi-level analyses of sample survey data and make use of contextual data from students, schools and systems.

Theoretical Framework

Civic knowledge refers to the application of the civic and citizenship cognitive processes to the civic and citizenship content described in the ICCS Assessment Framework (Schulz, Fraillon, Ainley, Losito & Kerr, 2008). It is a key outcome of civic and citizenship education programs and is fundamental to effective civic participation. Civic knowledge as described in this paper is therefore taken to be a broad term that is inclusive of knowing, understanding and reasoning.

ICCS is the third IEA international study that includes the measurement of Civic Knowledge. In 1971 the IEA Civic Education Study included a 47 item test for 14 year olds in nine countries (Torney, Oppenheim & Farnen, 1975). In 1999 the IEA CIVED study included a 38 item test for 14 year old students in 28 countries (Torney-Purta et. al., 2001) and a 42 item test for 17-18 year olds in 16 countries (Amadeo et. al., 2002).

Numerous national and international studies have analyzed the factors that influence students' civic knowledge. The first IEA Civic Education Study in 1971 found (male) gender, socio-economic background and encouragement of independent expression of opinion to be positive predictors of civic knowledge (Torney, Oppenheim & Farnen, 1975).

General literacy plays a crucial role in acquiring knowledge related to civic and citizenship. Chall and Henry (1991) noted that considerably more than a minimal level of literacy is required for understanding documents such as constitutions or for locating information in sources such as newspapers. This was also confirmed for the NAEP in the United States where samples of students at Grades 4, 8 and 12 (ages approximately 9, 13 and 17) are regularly tested in civic-related content areas. Use of English at home had a significant influence on test performance (Niemi & Junn, 1998) which is consistent with the proposition that proficiency in reading is important for understanding political communication.

Using data from the IEA Civic Education Study in 1999 (CIVED) models were estimated for each country to predict civic knowledge by regressing scores on several indicators of home background, school and the individual characteristics (Torney-Purta, Lehmann, Oswald & Schulz, 2001). Gender (female) had a moderate negative effect in 11 countries and the frequency of watching television news was found to have a significant positive effect in about half of the countries. Spending evenings outside the home was negatively related to civic knowledge in all but four countries. Expected further education, perceptions of the encouragement of expression in the classroom as well as student interest in public affairs television were predictors of civic knowledge scores.

Further secondary analyses of CIVED data revealed different patterns of effects depending on characteristics of the national context. Schulz (2002) used multi-level analyses to predict civic knowledge. Those analyses largely confirmed findings from earlier studies but also revealed variations in school- and student-level effects among countries. Torney-Purta, Richardson and Barber (2005) analyzed the link between teacher factors and civic knowledge and found evidence of an influence of teachers' experience and confidence in only some countries. The research also highlighted the differences between countries in the context for teacher preparation and civic education.

This paper assumes that the acquisition of civic knowledge is influenced by contextual factors that relate to different levels (for example community, school/classroom, home environment) which can operate as either antecedents or processes (see Schulz, Fraillon, Ainley, Losito & Kerr, 2008). Whereas antecedents (factors such as socio-economic background or school resources) set the constraints for student learning about civic-related issues and how it takes place, factors directly related to the learning process (classroom instruction, student activities) are also important elements of context.

Data and methods

The paper includes results from analyses of data from the main survey of ICCS which was carried out in 38 participating countries between October 2008 and May 2009. In each country, the sample consisted of over 3000 students from intact classes in the target grade that were selected at random in approximately 150 schools (that were selected on the basis of a probability proportional to size). The target grade was the eighth year of schooling provided that the minimum age of students was 13.5 years. In 36 countries students in grade 8 and in two countries (England and Malta) students in grade 9 were surveyed.

The following international instruments were used in the ICCS data collection:

- The international student test with 80 items in seven different clusters administered in complete rotated design with seven randomly allocated booklets, each consisting of three 15-minutes clusters.

- The international student questionnaire (40 minutes length) was administered after the international test booklets.

- The international teacher questionnaire contained questions regarding school context, teaching and learning and took about 30 minutes to answer.

- The international school questionnaire contained questions about school characteristics, school and community context and took 20-30 minutes to be answered.

- The national contexts survey collected information about the national contexts for civic and citizenship education from national centers including the implementation of this subject area, related policies and practices.

National centers provided information on the national contexts for civic and citizenship education in an on-line survey conducted in two phases in 2007 and 2009. The analysis in this paper will be primarily based on data from the student and school survey instrument with civic knowledge derived from the student test and explanatory variables derived from the student and school questionnaires.

The civic and citizenship knowledge cognitive assessment comprised 80 items. Seventy-four items were multiple-choice questions and six items were constructed response items in which students were required to write responses of between one and four sentences. Student responses to the constructed response items were scored by trained scorers in each country. The ICCS test of Civic Knowledge included a link to

the CIVED survey in 1999 through the use of a set of common items within the larger ICCS item pool.

Using the Rasch model (Rasch, 1960) a cognitive scale of ICCS civic knowledge was derived from those 79 ICCS test items that had satisfactory scaling properties. The resulting scale had a highly satisfactory reliability ($\alpha = 0.84$). To obtain accurate summary statistics a plausible values methodology with full conditioning was used for scaling through which five separate estimates are generated for each student. By using these five "plausible values" it is possible to estimate the uncertainty inherent in the measurement process (see von Davier, Gonzalez & Mislevy, 2009). The final reporting scale was set to having a metric with a mean of 500 (the ICCS average score) and a standard deviation of 100 for equally weighted national samples that satisfied guidelines for sample participation. Details on scaling procedures for test items will be provided in the ICCS Technical Report (Schulz, Ainley & Fraillon, forthcoming).

The first part of the analyses included a description of the variation in ICCS civic knowledge across participating countries. The second part consisted of multi-level analyses (Bryk & Raudenbush, 2002; Snijders & Bosker, 1999) where separate two-level models (students nested within schools) were estimated for each participating countries to explain variation in civic knowledge. Missing values were substituted with means for continuous and modes for categorical variables and missing indicators for each independent variable (1 = missing, 0 = not missing) were added as additional predictors to the model. The coefficients for missing indicators were not included in the tables.

Results

Comparison of Civic Knowledge across countries

The distributions of Civic Knowledge for all countries are shown in Table 1. The average country scores on the Civic Knowledge scale range from 380 to 576 scale points which spans below proficiency Level 1 to proficiency Level 3 on the scale and represents almost two standard deviations.

Table 1   Country averages in civic knowledge, years of schooling, average age and percentile graph

Table 1 shows the distributions of student achievement on the Civic Knowledge test for all participating countries.[1] The average country scores on the Civic Knowledge scale range from 380 to 576 scale points which is equivalent to almost two standard deviations.

Different countries have different distributions of scores. This can be seen graphically in the length of the bars showing the distribution of student scores for each. The spread of student scores within each country appears to be unrelated to the average scale score for that county. In most countries the distance between the lowest five per cent and the highest 95 per cent of Civic Knowledge scores was around 300 scale points.

It can be seen that there was some variation in the average age of students in the target grade (Grade 8) across countries. The average age ranged from 13.7 to 15.5, although relatively few countries were at the extreme ends of this range. The relationship between student age and Civic Knowledge is complex in that it differs within countries and between countries. These relationships will be discussed in detail in the extended ICCS International Report (Schulz, Ainley, Fraillon, Kerr & Losito, forthcoming).

The average scores of four countries were not statistically significantly different from the ICCS average of 500 scale points. There were 14 countries with national averages that were significantly below the ICCS average and the average scores of 18 countries were significantly higher than the international average. The difference between the bottom quartile and the top quartile (i.e. covering the middle half of the averages for countries) was 60 scale points; more than half a standard deviation.

Slight evidence of clustering of countries can be seen at some points on the scale where the difference between adjacent country averages was greater than was typical across the scale. For example, at the top of the scale, 17 scale points covers the spread of average scale scores in four countries (Saturn, Venus, Juno and Titan) followed by a gap of 22 scale points to the next country (Helios).

To obtain estimates of the proportion of variance within schools, between schools within countries and between countries, a three-level model with random intercepts of schools and countries (null model) was estimated using the HLM software package.

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[1]   As this paper was written prior to official project release (29 June 2010) to ensure confidentiality country names were substituted with planet names in this table.

Only the 34 countries that had sufficiently large samples of schools (N >50) for multi-level analysis and that had also met the sample participation requirements were included in this analysis.

Table 2   Estimated proportions of variance in civic knowledge at the levels of students, schools and countries

Table 2 shows that more than half of the overall variance was recorded within schools, somewhat less than a quarter was between schools within countries and slightly less than one quarter of the overall variance was between countries.

Figure 1   Relationship between national averages of civic knowledge and Human Development Index

Figure 1 shows a scatter plot of national averages in civic knowledge and the Human Development Index[2] which is a composite index with a minimum value of 0 and a maximum value of 1 derived from country statistics on life expectancy at birth, adult literacy rate, combined gross enrolment ratio in education and GDP per capita. There is a strong relationship between the two variables at the country level and the variation in HDI explains 54 percent of the between country variation in civic knowledge. This shows that national averages of civic knowledge are related to factors reflecting the general development of a country. This findings is similar to those from other international studies of educational outcomes, however, it does not necessarily mean that there is a causal relationship between the two variables.

Predictors of variation in civic knowledge

Two-level hierarchical models with students nested within schools were estimated for each national sample. Country data where IEA sample participation requirements had not been met or where there were fewer than 50 schools were excluded from the analysis. In most countries one intact classroom per school had been sampled, therefore it is not possible to disentangle classroom and school level variance. In two smaller countries (Cyprus and Malta) two classrooms had been sampled in each school, in a few others some schools had more than one classroom. This needs to be

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taken into account when interpreting these results. The software package MPLUS was used to estimate the models and data were weighted at school and student level.

To explain variation of students' civic knowledge predictors from the following broader categories were used:

- Student background characteristics

- Factors related to individual participation and engagement in the home and school context

- School characteristics

- School learning contexts

The following individual student background characteristics were included in the analysis:

- *Gender* (1 = female, 0 = male)

- *Index of family socioeconomic background* (standardized to having mean of 0 and standard deviation of 1 within countries) consisting of factor scores from a principal component analysis of highest parental occupation (SEI scores derived from the ISCO-88 classification, see Ganzboom, de Graaf and Treiman, 1992), highest parental education (ISCED levels in approximate years of education) and number of books at home. Higher scores reflect higher socioeconomic status.

- *Use of test language at home* (1 = Yes, 0 = No)

The following individual-level variables were used as indicators of the extent that students participated in and engaged with civic learning activities in their homes and schools.:

- *Reported parental interest in political and social issues* (four-point scale: 0 = not interested, 1 = not very interested, 2 = quite interested, 3 = very interested).

- *Frequency of discussion of political and social issues with parents* (four-point scale: 0 = Never or hardly ever, 1 = Monthly, 2 = Weekly, 3 = Daily). This variable reflects the communication with parents with regard to civic-related themes.

- *Frequency of watching television news* (four-point scale: 0 = Never or hardly ever, 1 = Monthly, 2 = Weekly, 3 = Daily). This variable reflects communication-seeking behavior and exposure to information about civic-related issues.

- *Voting for class representative or school parliament* (0 = never, 1 =more than 12 months ago, 2 = within the last 12 months). This variable reflects students' personal experience with democracy at school.

- *Perception of openness in classroom discussions of political and social issues*. The predictor is an IRT scale (with a mean of 50 and standard deviation of 10 for equally weighted countries) based on students reports about the frequency ("never", "rarely", "sometimes", "often") with which they observe things that may happen during regular lesson when discussing political and social issues.[3] The (international) reliability (Cronbach's α) for this scale was 0.76. This variable relates to the individual perceptions of students that they are free to express opinions in class and discuss civic-related issues. It should be noted that this variable may vary within classes.

- *Expected education.* Students were asked about the highest educational level they expect to complete. It is not strictly measuring the same construct as other variables in the block but it reflects an intended engagement with education and is an important potential predictor of civic knowledge. It also reflects parental expectations as well as individual aspirations and provides an indication of home environments. The education levels were classified according to the international ISCED classification and transformed into approximate years of further education.

The following school-level variables reflect school characteristics:

- *School socioeconomic context:* This variable was computed as the average of student scores on the national composite index of socioeconomic background. It reflects the "social intake" of schools and the social context in which students learn.

- *School location:* This variable was derived from the school questionnaire asking about the size of the community (1 = Schools in communities with over 15,000 inhabitants, 0 = Rural schools). In some countries the distinction

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[3] Students were asked to rate the following statements: "Teachers encourage students to make up their own minds", "Teachers encourage students to express their opinions", "Students bring up current political events for discussion in class", "Students express opinions in class even when their opinions are different from most of the other students", "Teachers encourage students to discuss the issues with people having different opinions", "Teachers present several sides of the issues when explaining them in class".

between rural and urban schools is important and has implications for resources, learning opportunities and community context.

The following school-level variables relate to the school learning context:

- *Opportunities for student participation at school*: This variable was based on an IRT scale (with a mean of 50 and a standard deviation of 10 for equally weighted country data) derived from principals' reports on opportunities for target grade students to take part in number of civic-related activities ("All or nearly all", "Most of them", "Some of them", "None or hardly any").[4] The scale had an international reliability (Cronbach's α) of 0.76 at the individual level (and is even more reliable at the school level). The predictor indicates to what extent students are encouraged to engage at school.

- *Students' sense of belonging to school*: This measure was based on an IRT scale (with a mean of 50 and a standard deviation of 10 for equally weighted country data) derived from principals' ratings ("To a large extent", "To a moderate extent", "To a small extent", "Not at all") of statement deriving four possible student behaviors[5]. The scale had an international reliability (Cronbach's α) of 0.79 at the individual level (and is even more reliable at the school level). This measure was seen as an indicator of school climate in general and of the extent to which the school environment supports engagement and learning.

- *School average of open classroom climate*: This measure was derived as the average student score on perceptions of openness in classroom discussions[6] of political and social issues. This indicator provides an indicator about the extent to which classes at school are open for student discussions of civic-related themes.

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[4] This list included: "Activities related to the environment, geared to the local area, Human rights projects, Activities related to underprivileged people or groups, Cultural activities (for example, theatre, music, cinema), Multicultural and intercultural initiatives within the local community, Campaigns to raise people's awareness, such as AIDS World Day, World No Tobacco Day, and Activities related to improving facilities for the local community (for example, public gardens, libraries, health centres, recreation centres, community hall)

[5] The statements were "Students enjoy being in school", "Students work with enthusiasm", "Students take pride in this school" , "Students feel part of the school community".

[6] The scale is described above as one of the student-level predictors related to the school context.

- *School average of student electoral participation*: This measure is based on the percentage of students who reported that they had participated in classroom or school parliament elections during the last 12 months. This is taken as an indicator of general civic engagement of students at school.

Model estimation

Five different models were estimated:

- The basic (null) model had only random school intercepts. This model provides estimates of the variance at each level (within and between schools) and is the reference point to determine how much variance is explained by subsequent models.

- Model 1 included only student background variables as predictors

- Model 2 included in addition to the above family and school context variables

- Model 3 included in addition to the above school characteristics.

- Model 4 included in addition to the above school and community learning context variables.

Table 3   Additional and total variance explanation provided by each model on average across ICCS countries

Table 3 shows, on average across countries, the percentage of additional variance explained by each model and the total percentage of variance explained at each level. The full model explains about one fifth of the within-school variance and a little less than two-thirds of the between-school variance. The additional predictors in models 3 and 4 are school-level factors and only contribute to explaining variance between schools. Those for model 4 (school learning contexts) explain only an additional five percent of the variance.

Table 4   Total variance and explained variance in civic knowledge across ICCS countries

Table 4 shows variance estimates for each country overall at each level as well as how much variance was explained by full model (including all predictors). There is a considerable range in the variance across countries. The percentages of variance between schools (*intra-class correlation*) also varied considerably among countries from six percent to 50 percent (with an inter-quartile range from 18 to 38 percent).

When looking the percentage of variance explained by the model predictors for each country it can be seen that at the student level between nine and 33 percent (with an

average of 21 percent) is attributable to the student-level predictors. The percentages of explained school-level variance range from 29 to 84 percent (with an average of 63 per cent).

Table 5   Summary of significant effects for model predictors

The results for model predictors are summarized in Table 5. This shows the number of countries where predictor variables had significant positive or negative effects. The complete results for all countries included in this analysis are found in the appendix in Table 6, Table 7 and Table 8.

The student background variables female gender, use of test language and socioeconomic background were positive predictors of civic knowledge in most countries. Expected further education was a positive predictor in all countries. This is finding is similar to those from earlier studies (see Torney-Purta et. al. ,2001; Amadeo, et. al., 2002).

Reported parental interest in political and social issues was an inconsistent predictor in only a few countries whereas discussion with parents of political and social issues was a positive predictor in almost two thirds of the countries. Watching television news had significant positive effects in a majority of countries. Both student perceptions of openness in classroom discussions and experience with voting at school were significant positive predictors in most of the countries in this analysis.

Of the school characteristics that were investigated, school average socioeconomic background was clearly the more important. It had significant positive effects in 24 countries. Non-rural school location had a significant positive effect in one country and a negative effect in another country but in most countries had no effect.

As observed previously, the variables related to the schools' learning context generally contributed little to the variance explained. School average openness was a positive predictor in almost half of the countries. Students' sense of belonging had effects in a small number of countries and opportunities for student participation at school and the percentage of students' electoral participation had only inconsistent effects on civic knowledge.

Conclusion

ICCS developed a test of civic knowledge that covered a breadth of the content and cognitive domains. There was considerable variation in Civic Knowledge between and within participating countries.

When comparing variance overall, as well as the variance at student and school levels within countries, there are considerable differences both in the overall variation of civic knowledge scores as well as of the proportion that is attributable to the school level. Predictors related to student background, student variables related to the home and school context, school characteristics and school learning context explained on average about a fifth of the variance within schools and almost two thirds of the variation between schools.

Female gender, use of the test language at home and socioeconomic background are important predictors of civic knowledge. Other predictors of civic knowledge were students' educational aspirations, communication about political and social issues, perceptions of openness in classroom discussions and experience with voting at school.

The socioeconomic context of the school was the most important school-level predictor of civic knowledge. Other school-level variables that predicted civic knowledge were related to the learning context. The average student perception of openness in classroom discussions was a significant predictor of civic knowledge in more than half of the countries. Other school-level predictors such as opportunities for student participation, perceived school climate and electoral participation at the school level had effects on civic knowledge in only few countries.

Between-country variations in civic knowledge were related to the general human development in participating countries. This finding is similar to other international studies of educational achievement.

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Tables

Table 1 Estimated proportions of variance in civic knowledge at the levels of students, schools and countries

Country	Years of schooling	Average Age	Civic Knowledge	Average Scale Score	
Saturn	8	14.7		576 (2.4)	▲
Venus	8	14.9		576 (3.6)	▲
Juno	8	14.7		565 (1.9)	▲
Titan	8	14.2		559 (2.4)	▲
Helios	8	14.8		537 (3.1)	▲
Irene	8	14.9		536 (4.7)	▲
Ceres	8	14.3		534 (4.6)	▲
Selene	8	14.7		531 (3.8)	▲
Astrea	8	14.8		531 (3.3)	▲
Pallas	8	13.8		531 (3.3)	▲
Eris	8	14.4		529 (4.5)	▲
Jupiter	8	15.0		525 (4.5)	▲
Mars	9	14.0		519 (4.4)	▲
Parthenope	9	14.0		517 (5.0)	▲
Makemake	8	13.7		516 (2.7)	▲
Victoria	8	13.7		515 (3.4)	▲
Europa	8	13.9		514 (4.7)	▲
Mercury	8	14.4		510 (2.4)	▲
Eunomia	8	14.7		506 (3.8)	
Hebe	8	14.7		505 (2.8)	
Haumea	8	14.1		505 (4.1)	
Io	8	14.4		503 (4.0)	
Flora	9	13.9		490 (4.5)	▼
Callisto	8	14.2		483 (3.5)	▼
Vesta	8	14.8		482 (4.0)	▼
Uranus	8	13.7		476 (4.4)	▼
Iris	8	14.6		473 (2.2)	▼
Ganymede	8	14.7		466 (5.0)	▼
Iapetus	8	14.4		462 (2.9)	▼
Rhea	8	13.9		453 (2.4)	▼
Metis	8	14.1		452 (2.8)	▼
Copernicus	8	14.4		452 (3.7)	▼
Pluto	8	15.5		435 (3.8)	▼
Dione	8	14.3		433 (3.4)	▼
Egeria	9	14.9		424 (3.4)	▼
Terra	8	14.8		380 (2.4)	▼

Civic Knowledge scale: 200 300 400 500 600 700 800

Countries not meeting sample requirements

Country	Years of schooling	Average Age	Civic Knowledge	Average Scale Score	
Tethys	8	14.3		554 (5.7)	
Hygeia	8	14.3		494 (7.6)	

( ) Standard errors appear in parentheses.

Percentiles of Performance
5th 25th 75th 95th
Mean and Confidence Interval (±2SE)
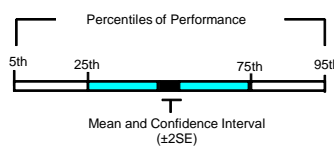
▲ Achievement significantly higher than ICCS average

▼ Achievement significantly lower than ICCS average

† Met guidelines for sampling paticipation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation only after replacement schools were included.

[1] Country surveyed the same cohort of students but at the beginning of the next school year.

[2] National Desired Population does not cover all of International Desired Population

Table 2   Estimated proportions of variance in civic knowledge at the levels of students, schools and countries

Level	Variance*	in percent
Students	4616	54
Schools	1973	23
Countries	2027	24
Total	8616	100

* HLM variance estimates using data from 34 ICCS countries.

Figure 1   Relationship between national averages of civic knowledge and Human Development Index
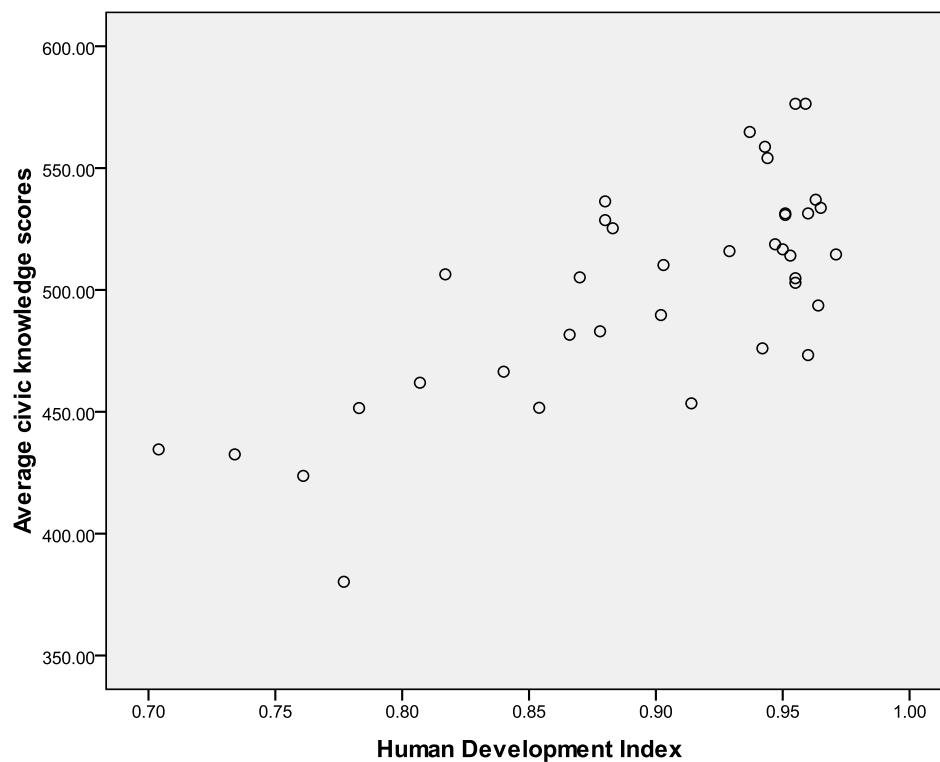
Table 3   Additional and total variance explanation provided by each model on average across ICCS countries

Model	% percent additional variance	
	Within schools	Between schools
Model 1: Student background	8	31
Model 2: Home and School context	13	14
Model 3: School characteristics	0	12
Model 4: School learning context	0	5
Total % explained variance	21	63

Table 4   Total variance and explained variance in civic knowledge across ICCS countries

Country	Total variance	% of variance between schools	Variance without controls		% of variance explained by model		Variance within schools	Variance between schools
			Within schools	*Between schools*	*Within schools*	*Between schools*	10,000 5,000	5,000 10,000
Austria	8943	25	6682	2261	20	67		
Belgium (Flemish) †	7026	45	3871	3154	10	70		
Bulgaria	10485	49	5364	5121	16	77		
Chile	7585	32	5171	2414	13	84		
Chinese Taipei	9684	21	7647	2036	29	79		
Colombia	6365	29	4496	1868	16	58		
Cyprus	8887	6	8344	543	32	64		
Czech Republic †	7990	26	5883	2107	20	80		
Denmark †	9626	17	8004	1622	28	67		
Dominican Republic	4615	23	3564	1051	17	59		
England ‡	10888	37	6905	3983	20	79		
Estonia	8418	25	6329	2089	23	65		
Finland	6915	10	6241	674	23	36		
Greece	9562	17	7900	1662	31	29		
Guatemala¹	5889	41	3479	2410	9	72		
Indonesia	4493	39	2763	1730	11	54		
Ireland	10956	36	6979	3977	24	65		
Italy	7651	16	6438	1213	29	47		
Korea, Republic of¹	6602	7	6124	478	27	71		
Latvia	6790	23	5206	1584	20	45		
Lithuania	6548	19	5322	1226	30	49		
Malta	9084	50	4560	4523	12	82		
Mexico	7582	34	4976	2606	14	72		
New Zealand †	12394	44	6909	5485	18	71		
Norway †	8713	10	7877	836	32	51		
Paraguay¹	8244	39	5055	3190	16	73		
Poland	9893	24	7516	2377	29	68		
Russian Federation	8061	45	4432	3630	20	49		
Slovak Republic²	8178	31	5672	2507	22	60		
Slovenia	7506	9	6862	644	33	33		
Spain	7653	32	5231	2422	23	68		
Sweden	10706	18	8773	1933	23	74		
Switzerland †	6826	42	3926	2900	11	60		
Thailand †	5345	35	3490	1854	22	61		
ICCS average	8121	28	5823	2297	21	63		

Within-school variance explained by model predictors

Within-school variance <u>not</u> explained by model predictors

Between-school variance explained by model predictors

Between-school variance <u>not</u> explained by model predictors

† Met guidelines for sampling paticipation rates only after replacement schools were included.

‡ Nearly satisfied guidelines for sample participation only after replacement schools were included.

¹ Country surveyed the same cohort of students but at the beginning of the next school year.

² National Desired Population does not cover all of International Desired Population

Table 5   Summary of significant effects for model predictors

Predictor	Number of countries where predictor had a significant <u>positive</u> effect	Number of countries where predictor had a significant <u>negative</u> effect
Student background		
Gender (female)	27	1
Use of test language at home	24	2
Index of socioeconomic background	32	0
Family and school context		
Parents' interest in political and social issues	3	5
Expected years of education	34	0
Discussion with parents of political/social issues	20	2
Watching TV news	24	0
Openness in classroom discussions	28	0
Voting for class representative or school parliament	29	0
School characteristics		
School average of index of socioeconomic background	24	0
School location (urban)	1	1
School learning context		
Opportunities for student participation at school	2	1
Students' sense of belonging	6	2
School average of openness in classroom discussions	15	0
School average of student electoral participation	2	3

Appendix

Table 6   Multi-level results for ICCS countries (Austria to Finland)

Predictor	Austria	Belgium (Flemish) †	Bulgaria	Chile	Chinese Taipei	Colombia	Cyprus	Czech Republic †	Denmark †	Dominican Republic	England ‡	Estonia	Finland
Intercept	**481.5** (4.3)	**495.8** (4.0)	**434.3** (5.6)	**457.9** (6.9)	**545.8** (3.1)	**460.9** (4.8)	**447.6** (3.3)	**499.2** (5.5)	**568.0** (4.0)	**385.6** (5.5)	**513.7** (4.8)	**504.6** (7.0)	**560.2** (4.5)
Gender (female)	**7.2** (2.4)	-.4 (1.8)	**5.7** (1.7)	1.3 (1.4)	**6.4** (1.4)	**2.5** (1.2)	**13.9** (1.7)	**4.4** (1.3)	2.7 (1.5)	**10.6** (1.2)	**5.8** (1.9)	**8.6** (1.6)	**12.8** (1.7)
Use of test language at home	**24.2** (2.7)	**16.6** (2.4)	**8.2** (3.9)	**19.8** (6.8)	**5.8** (2.0)	3.4 (4.0)	**9.7** (2.8)	**10.5** (4.8)	**14.6** (3.6)	.0 (4.1)	**10.9** (2.8)	**17.6** (5.7)	**19.3** (4.1)
Index of socioeconomic background	**8.1** (2.2)	**8.9** (1.5)	**8.8** (2.4)	**11.2** (1.8)	**12.1** (1.5)	**8.1** (1.3)	**19.0** (1.6)	**8.4** (1.3)	**19.2** (1.8)	2.9 (1.6)	**20.1** (2.3)	**12.7** (2.0)	**20.4** (1.9)
Parents' interest in political/social issues	4.0 (2.9)	-1.1 (2.0)	-1.1 (3.1)	-1.7 (1.5)	-.3 (1.9)	.2 (1.1)	.5 (2.1)	**6.0** (1.8)	3.7 (2.8)	**2.4** (0.9)	-.4 (2.5)	-.3 (3.0)	**-6.3** (2.7)
Expected years of education	**6.8** (0.8)	**2.9** (0.7)	**3.7** (0.7)	**5.1** (0.6)	**17.2** (0.9)	**4.6** (0.8)	**9.1** (0.5)	**13.8** (0.7)	**11.5** (0.9)	**3.2** (0.5)	**7.8** (1.4)	**11.2** (0.9)	**6.6** (0.9)
Discussions with parents	**4.2** (1.8)	**7.6** (1.7)	-.6 (1.7)	**4.9** (1.1)	**4.2** (1.3)	-2.0 (1.2)	1.5 (1.9)	2.6 (1.3)	**12.1** (1.8)	-2.4 (1.3)	**9.3** (2.0)	**11.5** (2.5)	**17.3** (3.0)
Watching TV news	**8.7** (1.5)	**5.2** (1.3)	**6.1** (1.6)	**8.5** (1.1)	**10.2** (1.3)	**3.8** (1.4)	**6.5** (1.4)	**10.1** (1.3)	**8.3** (1.5)	**3.7** (1.0)	2.1 (1.6)	.7 (2.3)	2.1 (1.6)
Openness in classroom discussions	**.7** (0.2)	.1 (0.2)	**1.4** (0.2)	**.8** (0.1)	**.8** (0.2)	**1.8** (0.1)	**.9** (0.1)	**.7** (0.1)	**1.3** (0.2)	**1.4** (0.1)	**1.4** (0.2)	.0 (0.2)	.0 (0.2)
Voting for in school elections	**12.5** (2.2)	**7.2** (1.7)	2.3 (2.4)	**14.4** (1.7)	**13.0** (1.7)	**18.7** (1.8)	**20.7** (2.0)	**10.9** (1.8)	**12.0** (2.1)	**7.0** (1.6)	**17.9** (2.4)	4.9 (2.6)	**14.2** (2.1)
School average of socioeconomic background	**39.9** (6.4)	**51.8** (7.3)	**36.4** (10.1)	**34.9** (3.9)	**31.6** (4.8)	**24.4** (6.3)	2.7 (8.8)	**46.4** (5.1)	**27.1** (5.9)	**13.1** (6.0)	**22.6** (9.2)	22.1 (12.8)	-1.7 (7.0)
School location (urban)	-1.0 (3.6)	-4.2 (3.4)	3.4 (4.1)	-1.7 (2.7)	3.5 (4.0)	2.5 (3.0)	.0 (2.9)	-3.4 (2.3)	4.2 (2.4)	3.8 (2.5)	-.3 (3.8)	-1.9 (3.8)	-.6 (2.6)
Opportunities for student participation at school	.0 (0.4)	.2 (0.4)	-.7 (0.5)	**1.1** (0.4)	-.5 (0.4)	.0 (0.3)	**-.7** (0.3)	-.2 (0.2)	.1 (0.2)	.1 (0.2)	-.6 (0.6)	-.3 (0.4)	**.5** (0.2)
Students' sense of belonging	.0 (0.3)	.1 (0.3)	**1.3** (0.5)	-.5 (0.3)	.4 (0.2)	-.1 (0.4)	.2 (0.2)	-.2 (0.3)	.0 (0.3)	**.9** (0.4)	.3 (0.5)	.0 (0.4)	-.3 (0.3)
School average for openess in class discussions	.0 (0.9)	**3.1** (0.6)	**3.8** (1.2)	1.5 (0.7)	-1.0 (0.9)	.4 (1.2)	**2.1** (0.9)	1.2 (0.9)	-.1 (0.7)	1.1 (0.9)	**4.6** (1.1)	**3.5** (1.2)	1.9 (0.8)
Percentage of students voting at school	**.8** (0.3)	.2 (0.2)	-.2 (0.2)	.1 (0.2)	.2 (0.2)	.4 (0.3)	.3 (0.2)	**-.2** (0.1)	-.1 (0.1)	-.2 (0.2)	.1 (0.2)	.0 (0.2)	**-.3** (0.1)
Variance at student level	5372 (193)	3487 (118)	4504 (183)	4508 (127)	5417 (169)	3788 (88)	5691 (169)	4717 (122)	5724 (171)	2956 (86)	5529 (268)	4866 (258)	4781 (136)
Variance at school level	752 (172)	945 (187)	1174 (288)	379 (67)	426 (98)	779 (155)	196 (53)	432 (94)	537 (108)	427 (86)	851 (159)	721 (199)	429 (97)
Variance explained at student level	20	10	16	13	29	16	32	20	28	17	20	23	23
Variance explained at school level	67	70	77	84	79	58	64	80	67	59	79	65	36
Additional variance explained at student level	0	0	0	0	0	0	0	0	0	0	0	0	0
Additional variance explained at school level	4	5	9	5	1	2	11	1	0	5	7	5	12

Table 7 Multi-level results for ICCS countries (Greece to New Zealand)

Predictor	Greece	Guatemala[1]	Indonesia	Ireland	Italy	Korea, Republic of[1]	Latvia	Lithuania	Malta	Mexico	New Zealand †
Intercept	**464.8** (5.7)	**420.9** (3.7)	**422.0** (3.3)	**515.7** (4.8)	**516.1** (3.7)	**557.9** (3.4)	**468.8** (5.0)	**493.5** (3.7)	**482.2** (5.6)	**450.0** (5.2)	**515.5** (5.2)
Gender (female)	**10.6** (2.5)	**-2.7** (1.3)	**7.1** (1.1)	.6 (2.1)	**5.3** (1.3)	**6.2** (1.9)	**7.8** (2.0)	**9.8** (1.6)	**11.2** (3.2)	**8.7** (1.5)	**7.7** (1.9)
Use of test language at home	**14.3** (4.6)	5.1 (2.8)	**-3.3** (1.2)	**19.7** (3.0)	**15.3** (3.0)	6.4 (3.5)	**14.0** (4.2)	4.7 (3.3)	**7.8** (3.0)	-4.4 (4.9)	**18.6** (2.6)
Index of socioeconomic background	**13.0** (2.3)	**8.2** (1.8)	**2.5** (0.9)	**18.3** (2.0)	**16.8** (1.7)	**15.3** (1.6)	**12.3** (2.2)	**11.8** (1.5)	**9.2** (1.8)	**7.3** (1.7)	**12.4** (1.7)
Parents' interest in political/social issues	2.7 (3.0)	.4 (1.7)	-.2 (1.5)	-4.0 (2.2)	-3.2 (2.4)	-3.6 (2.2)	**-9.9** (3.0)	-4.4 (2.5)	-.7 (2.1)	**-5.9** (1.4)	.2 (2.3)
Expected years of education	**10.9** (1.4)	**1.5** (0.5)	**3.5** (0.4)	**10.9** (1.2)	**10.4** (0.7)	**14.3** (1.7)	**8.1** (1.0)	**14.6** (0.9)	**6.0** (0.7)	**5.6** (0.5)	**14.5** (1.1)
Discussions with parents	1.4 (2.1)	**-3.1** (1.5)	-1.0 (1.1)	**9.1** (1.7)	**6.9** (1.4)	**11.1** (1.6)	**9.6** (2.4)	1.1 (1.7)	**6.1** (1.7)	1.7 (2.0)	2.4 (1.7)
Watching TV news	1.4 (1.8)	-1.1 (1.3)	**6.2** (1.4)	1.8 (1.5)	**5.7** (1.7)	**4.2** (1.4)	1.1 (2.2)	3.3 (1.8)	**4.3** (1.3)	**5.3** (1.2)	**5.8** (1.5)
Openness in classroom discussions	**1.6** (0.2)	**1.2** (0.1)	**.8** (0.1)	**1.1** (0.1)	**1.5** (0.2)	.1 (0.2)	**.8** (0.3)	.3 (0.2)	**.6** (0.2)	**.7** (0.2)	**.9** (0.1)
Voting for in school elections	**23.7** (2.9)	**12.8** (1.9)	.8 (1.6)	**6.2** (2.4)	.1 (2.6)	**17.7** (1.5)	**8.7** (2.8)	**8.3** (2.1)	**7.4** (2.1)	**7.0** (1.7)	**11.5** (2.1)
School average of socioeconomic background	-8.3 (11.3)	**39.4** (5.4)	**23.3** (6.6)	**48.5** (9.5)	**12.1** (5.5)	6.8 (3.9)	7.4 (11.5)	10.6 (8.5)	**65.1** (11.7)	**30.0** (5.3)	**53.6** (9.0)
School location (urban)	**9.0** (4.2)	2.9 (2.9)	1.7 (3.0)	1.6 (4.4)	-1.3 (2.6)	-1.5 (2.8)	7.0 (5.8)	2.2 (3.8)	-6.4 (4.9)	1.3 (3.7)	**-13.0** (4.9)
Opportunities for student participation at school	.2 (0.5)	.3 (0.3)	-.1 (0.3)	.0 (0.4)	.5 (0.3)	.2 (0.2)	.4 (0.4)	-.4 (0.4)	-.6 (0.4)	.6 (0.4)	-.5 (0.4)
Students' sense of belonging	-.2 (0.4)	-.2 (0.4)	**1.0** (0.4)	.2 (0.5)	-.3 (0.3)	**.4** (0.2)	-.2 (0.6)	.0 (0.6)	**1.5** (0.4)	**-1.0** (0.4)	.4 (0.5)
School average for openess in class discussions	.7 (1.4)	**1.7** (0.8)	**3.1** (0.9)	1.4 (1.2)	-.5 (0.8)	-.3 (0.7)	**2.2** (1.1)	-.7 (1.2)	-.9 (1.5)	**3.6** (1.1)	**3.7** (1.2)
Percentage of students voting at school	-.3 (0.4)	.1 (0.2)	.2 (0.3)	.0 (0.2)	-.1 (0.1)	-.1 (0.2)	.1 (0.2)	.0 (0.2)	.3 (0.2)	.2 (0.2)	.0 (0.1)
Variance at student level	5438 (176)	3173 (109)	2463 (86)	5297 (158)	4550 (160)	4450 (136)	4177 (178)	3739 (137)	4009 (150)	4286 (110)	5668 (167)
Variance at school level	1184 (274)	664 (140)	788 (146)	1398 (285)	648 (108)	138 (44)	876 (330)	622 (165)	816 (197)	718 (111)	1566 (290)
Variance explained at student level	31	9	11	24	29	27	20	30	12	14	18
Variance explained at school level	29	72	54	65	47	71	45	49	82	72	71
Additional variance explained at student level	0	0	0	0	0	0	0	0	0	0	0
Additional variance explained at school level	2	2	16	1	3	3	6	1	6	8	4

Table 8   Multi-level results for ICCS countries (Norway to Thailand)

Predictor	Norway †	Paraguay[1]	Poland	Russian Federation	Slovak Republic[2]	Slovenia	Spain	Sweden	Switzerland †	Thailand †
Intercept	**502.1** (4.4)	**415.7** (4.2)	**524.1** (12.2)	**497.9** (5.0)	**509.9** (6.5)	**512.2** (3.7)	**502.6** (4.0)	**525.7** (4.2)	**512.3** (4.6)	**439.7** (4.2)
Gender (female)	**6.6** (1.7)	**7.9** (2.0)	**10.9** (2.2)	**2.9** (1.4)	2.5 (1.6)	**9.4** (2.0)	**6.9** (1.4)	**6.2** (2.4)	2.3 (1.4)	**12.8** (1.2)
Use of test language at home	**18.3** (3.0)	1.8 (2.2)	7.4 (12.1)	**10.2** (2.9)	**18.1** (4.8)	**11.0** (3.0)	**8.8** (2.9)	**21.5** (3.2)	**15.6** (2.3)	**-5.4** (2.3)
Index of socioeconomic background	**19.0** (2.0)	**9.5** (1.9)	**19.2** (2.1)	**11.1** (1.6)	**7.0** (1.7)	**13.5** (1.7)	**7.8** (1.7)	**25.9** (2.1)	**8.1** (1.8)	1.0 (1.6)
Parents' interest in political/social issues	1.3 (3.3)	-2.6 (2.0)	**-7.1** (2.6)	-3.5 (2.0)	2.3 (2.3)	**5.6** (2.1)	1.0 (2.1)	-2.0 (3.5)	3.9 (2.7)	**-5.4** (1.8)
Expected years of education	**8.8** (0.9)	**6.4** (0.7)	**13.1** (1.1)	**9.4** (0.8)	**12.7** (1.0)	**16.7** (1.0)	**9.3** (0.6)	**10.0** (1.2)	**2.7** (0.7)	**4.9** (0.6)
Discussions with parents	2.7 (2.7)	**4.6** (1.7)	**11.1** (1.9)	1.5 (1.9)	**4.1** (1.8)	**9.2** (3.0)	**8.1** (1.5)	**11.0** (2.1)	**5.0** (1.5)	**-4.8** (1.4)
Watching TV news	**5.6** (2.0)	**3.2** (1.5)	3.9 (2.5)	**4.7** (1.4)	**3.6** (1.7)	**8.7** (1.5)	**3.8** (1.2)	2.7 (2.6)	**4.2** (1.7)	**10.6** (1.6)
Openness in classroom discussions	**1.4** (0.2)	**1.0** (0.2)	**.7** (0.2)	**1.1** (0.2)	**1.1** (0.2)	**1.0** (0.2)	**.3** (0.2)	**1.3** (0.2)	.3 (0.2)	**1.2** (0.1)
Voting for in school elections	**30.2** (3.4)	**7.6** (2.4)	**30.0** (3.0)	3.4 (1.7)	**8.7** (2.3)	**11.4** (2.5)	**14.1** (2.6)	**7.8** (2.8)	**9.4** (2.1)	**8.8** (2.1)
School average of socioeconomic background	2.4 (8.5)	**31.9** (8.9)	**16.0** (7.4)	14.2 (13.7)	**24.9** (8.4)	-6.3 (5.7)	**30.7** (6.6)	**22.8** (5.7)	**53.3** (6.7)	**22.0** (9.2)
School location (urban)	.5 (3.1)	-2.7 (4.5)	-1.0 (3.2)	-1.1 (4.8)	2.3 (3.7)	4.0 (2.8)	2.6 (3.5)	1.1 (2.9)	-2.1 (3.6)	-2.5 (4.2)
Opportunities for student participation at school	-.2 (0.3)	.5 (0.4)	-.2 (0.3)	.1 (0.6)	.5 (0.4)	.1 (0.3)	.2 (0.3)	.2 (0.4)	.2 (0.6)	-.3 (0.4)
Students' sense of belonging	-.2 (0.5)	**-1.1** (0.5)	**1.0** (0.4)	.2 (0.5)	.5 (0.6)	.1 (0.3)	.0 (0.3)	.2 (0.2)	.6 (0.4)	.8 (0.5)
School average for openess in class discussions	-.1 (1.4)	1.9 (1.4)	1.4 (0.9)	**3.7** (0.9)	.6 (1.2)	.0 (0.6)	1.0 (1.1)	1.5 (0.9)	**3.0** (0.8)	**4.5** (1.4)
Percentage of students voting at school	-.1 (0.2)	.0 (0.2)	.5 (0.3)	-.2 (0.3)	-.4 (0.2)	.3 (0.2)	**.4** (0.1)	-.2 (0.2)	**-.4** (0.2)	.3 (0.3)
Variance at student level	5378 (237)	4262 (140)	5353 (234)	3543 (93)	4426 (144)	4625 (165)	4038 (135)	6718 (228)	3484 (137)	2708 (95)
Variance at school level	408 (136)	860 (165)	752 (166)	1861 (358)	1007 (474)	430 (108)	767 (147)	497 (125)	1151 (203)	723 (143)
Variance explained at student level	32	16	29	20	22	33	23	23	11	22
Variance explained at school level	51	73	68	49	60	33	68	74	60	61
Additional variance explained at student level	0	0	0	0	0	0	0	0	0	0
Additional variance explained at school level	1	5	5	11	5	3	3	3	8	12