Exploring Students' Sense of School Belonging Among Adolescents Across Muslim Countries[1]

Donia Smaali Bouhlila and Imen Hentati

The need for school belonging is crucial for adolescents and affects academic performance (Goodenow, 1993). School belonging refers to the extent to which students feel accepted, valued, and included in their school environment. It encompasses a sense of connectedness to peers, teachers, and the broader school community, contributing to students' emotional and social well-being (Allen et al., 2021). Using selected data from the International Institute of Islamic Thought (2019–2020) and Item Response Theory (IRT), we derived a measure for school sense of belonging across Muslim countries/regions. Three main discriminative items were identified: pride in school, respect from teachers, and community integration. Additionally, the scores of school belonging revealed that students in Tatarstan showed higher levels of belonging, while those in Bangladesh, India, Kenya, Sudan, and Tanzania reported lower levels. We conducted a regression analysis to gain insight into the relationship between school belonging and the country's GDP. The results showed a significant association between school belonging and GDP per capita, indicating that students in wealthier countries tend to have a stronger sense of belonging. These findings have practical implications for educators, researchers, policymakers, and stakeholders in the field of education and social well-being. They underscore the need for schools to focus on pride, teacher respect, and being part of a school community to foster belonging to make a positive impact on students' well-being and academic performance.

Keywords: School sense of belonging, item response theory, education in Muslim societies, GDP

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Bouhlila, D.S., Hentati, I. (2024). Exploring Students' Sense of School Belonging Among Adolescents Across Muslim Countries. *Journal of Education in Muslim Societies, 6*(1), 32–54. DOI 10.2979/jems.00015 •

A sense of belonging is the subjective feeling of profound relatedness and acceptance with social groups, physical places, and both personal and shared experiences. It encompasses the emotional bond one feels toward these various aspects (Sumsion & Wong, 2011). Maslow's (1954) seminal work about *Motivation and Personality* remains useful in understanding that a sense of belonging is an innate psychological need that must be nurtured and fulfilled as it significantly impacts mental, physical, social, economic, and behavioral outcomes. Maslow's theory posits that belongingness is a fundamental human need. He argues that social needs, including belongingness, become paramount once there is a sense that one's physiological and safety needs feel fulfilled. The theory also highlights that social needs are particularly strong during childhood (Maslow, 1954). A sense of belonging also includes a feeling of relatedness, which Deci and Ryan (2012) explain as feeling connected to a societal group, which, in turn, fosters comfort and interest in an individual's surroundings or environment. Therefore, belonging is central to the self-determination theory (Deci & Ryan 2012).

Beyond mere connectedness, belonging entails the presence of social connections and relationships, a feeling of acceptance, and being an integral part of a community (Sumsion & Wong, 2011). Contributions from various disciplinary and theoretical perspectives have enriched the sense of belonging. Sumsion and Wong (2011) derived various interpretations and dimensions of belonging identifying 10 key dimensions: emotional, social, cultural, spatial, temporal, physical, spiritual, moral/ethical, political, and legal. They emphasized the importance of the interplay between these dimensions and noted that the sense of belonging can fluctuate based on context and location. Individuals may experience different aspects of belonging or transition between various forms of connectedness. Given its significance for human health, behavior, and experience, enhancing the sense of belonging is increasingly gaining attention. For example, Allen et al. (2021) propose an integrative framework to foster and cultivate belonging. This framework emphasizes four key areas: competencies for belonging, opportunities to belong, motivations to belong, and perceptions of belonging. By focusing on these areas, the framework can help develop strategies to enhance the sense of belonging at both individual and collective levels. It provides valuable guidance for researchers, practitioners, and individuals aiming to increase a sense of belonging for individuals and within their organizations and groups.

SCHOOL BELONGING

The sense of belonging can manifest in various forms, with school belonging being prominent. Researchers have particularly examined school belonging among adolescents, given the crucial role schools play in adolescents' academic and socio-emotional development (Abdollahi et al., 2020; Arslan et al., 2020; Yeager et al., 2018). Essentially, schools bridge broader societal influences and students' direct experiences within the educational system (Eccles & Roeser, 2011). The focus on adolescents is due to their transitional stage from childhood to young adulthood, during which connections outside the family become increasingly significant (Baumeister & Leary, 1995). Research about students' sense of belonging as they transition from primary to secondary education varies. Some authors suggest that feeling a sense of belonging to a secondary school declines (Anderman, 2002; Ding & Hall, 2007; Cupito et al., 2014; Wilkinson-Lee et al., 2011; Högberg et al., 2021) and others suggest some improvement in belonging progressing through the secondary school years (Hughes et al., 2015; Whitlock, 2006; Meeus & Dekovic, 1995).

SCHOOL BELONGING AND ACADEMIC ACHIEVEMENT

School belonging positively impacts academic achievement, mental health, and risky behaviors. When students feel part of a school community, they tend to perform better academically, exhibit higher motivation to learn and better self-esteem, and are less likely to drop out or engage in risky behaviors (Battistich et al., 1997; Sirin & Rogers-Sirin, 2004; Wang & Holcombe, 2010; Aydiner & Kalender, 2015; Lee & Burkam, 2003; Schulenberg et al., 1994). Additionally, a lack of school belonging is a predictor of depression among adolescents (Shochet et al., 2006). School sense of belonging also mitigates the negative psychological effects of school bullying. It has been shown to partially mediate the effects of bullying victimization and bullying climate on academic performance, buffering against the deleterious effects of school bullying (Huang, 2020). Enhancing students' sense of belonging at school can therefore play a crucial role in improving academic outcomes and mental well-being, while reducing the likelihood of engaging in risky behaviors (Hurem et al., 2021).

PREDICTORS OF SCHOOL BELONGING

Extensive research has explored various factors that influence school belonging. Allen et al. (2016) presented a socio-ecological framework to

explore the factors influencing school belonging within a secondary school system. Based on empirical evidence from past literature (Bronfenbrenner, 1979), this framework can be used to understand the multiple factors contributing to students' sense of belonging in school. The socio-ecological model recognizes that students are influenced by various factors at different levels of their environment, including individual, interpersonal, institutional, and societal levels.

Most research on school belonging predictors has focused on the school environment. Negative conditions such as power abuse, peer rejection, and social exclusion can undermine students' sense of belonging at school (Osterman, 2000; Ryan & Deci, 2000). The significant role of teachers in supporting school belonging is well-documented (Johnson, 2009; Roffey, 2012; Allen et al., 2018; Salten et al., 2015). Additionally, students' socioeconomic backgrounds influence their sense of school belonging, with those from disadvantaged backgrounds experiencing lower levels of belonging (Högberg et al., 2021; Hofer et al., 2024).

Macroeconomic conditions also impact school belonging; greater income inequality is associated with lower levels of school belonging (King et al., 2022). However, students from affluent families and schools tend to be buffered against these negative effects (King et al., 2022). The sense of belonging in school varies across cultures. Differences in this sense of belonging can be observed between collectivist and individualistic cultures. In collectivist cultures, individuals often align with group norms, experiencing a sense of belonging through the internalization of collectivist values. In contrast, conforming to group norms in individualistic cultures may feel like compliance and a threat to personal autonomy rather than an authentic expression of belonging (Deci & Ryan, 2000).

Research on gender differences in the sense of belonging at school has yielded mixed results. Many studies have consistently found that girls report a stronger sense of belonging than their male counterparts. This discrepancy is often attributed to several factors, including girls' greater emphasis on the value of education, generally superior academic performance, and increased involvement in school-related activities (Allen et al., 2016; Gillen-O'Neel & Fuligni, 2013; Goodenow, 1993; Ma, 2003; Witherspoon & Ennett, 2011). However, not all research supports these findings. Some studies suggest boys may experience a more pronounced sense of belonging than girls (Bonny et al., 2000; Galliher et al., 2004), while others have found no significant gender-based differences in the sense of belonging (Cupito et al., 2014; Sirin & Rogers-Sirin, 2005). Additionally,

evidence indicates that gender gaps in the sense of belonging may narrow among older students in lower secondary school (Ma, 2003). In some cases, girls' sense of belonging may decline during their upper secondary school years (Gillen-O'Neel & Fuligni, 2013).

MEASURES OF BELONGING

A sense of belonging has been assessed in various ways. Most measures of belonging are unidimensional, subjective, and static, providing a snapshot of an individual's perception during administration (Allen et al., 2021; Arslan et al., 2020b). Previous research indicates that self-report methods are among the most common for measuring students' sense of belonging in school settings (Allen & Kern, 2017). Student surveys are frequently used to gauge school belonging, typically asking about students' feelings of connectedness to their school community, the supportiveness of their teachers and peers, and their overall sense of school pride and identity. Furthermore, attempts to construct indices for measuring the sense of belonging have been made in TIMSS and PISA reports (Mullis et al., 2020; OECD, 2018). These indices show variation among participating countries, with higher achieving students generally reporting a greater sense of belonging to their school.

PURPOSE OF THE STUDY

Our study's principal goal is to measure the school's sense of belonging using data from the International Institute of Islamic Thought (IIIT). The IIIT has undertaken a significant project under the banner of "*Advancing Education in Muslim Societies*," which seeks to collect and analyze data from Muslim societies globally. This dataset includes information on school and university students, school and university teachers.

The present study has four main objectives. First, it addresses the gap in empirical literature regarding the sense of belonging to schools in Muslim countries. In particular, little is known about regional differences, particularly since most studies on school belonging have been conducted in the United States (Korpershoek et al., 2020). The selection of these countries was driven by the availability of data collected by the IIIT, which focuses primarily on Muslim countries/regions. Second, the study identifies the critical components that contribute to students' sense of school belonging. Third, by assessing the sense of belonging among students in these countries, the study seeks to understand its variability across different

contexts and investigates how the sense of belonging to school is associated with a country's prosperity as measured by GDP per capita. Fourth, it provides insights into how this construct may differ between male and female students.

METHOD

Participants

The survey was conducted during 2019–2020, collecting data from four distinct respondent groups: school students, school teachers, university students, and university instructors across 15 countries/regions. Most country-level samples were limited to specific regions due to factors such as regional variations, budgetary constraints, host-country authorizations, and the locations of IIIT affiliate offices. Despite these constraints, efforts were made to introduce randomness in selecting schools and universities within each region and choosing students from each institution (Nasser et al., 2021). Our research focuses on Muslim students under the age of 18 who are enrolled in either pre-secondary or secondary education, sampled from 14 different countries/regions included in the survey[2]. The focus on this age group is due to the transition during adolescence (ages 10–19), where individuals begin to seek authentic and enduring connections outside their family, often within their school environment (Slaten et al., 2016; WHO, 2015).

Figure 1 shows that in the group of Muslim students below the age of 18, India has the largest sample size, with 1,857 individuals. Kyrgyzstan and Bangladesh follow with 748 and 662 students, respectively. Kenya has the smallest sample size, with 125 students.

Additionally, Figure 2 illustrates that the sample population under the age of 18 comprises more female than male participants, except for Bosnia.

Items of School Belonging

Previous research has indicated that self-report methods are among the most common for measuring students' sense of belonging in school settings (Allen & Kern, 2017). The questionnaire administered to students in this study consists of various items designed to evaluate their sense of belonging within the school community. Students are asked to rate their responses on a four-point Likert scale ranging from "very true (1)" to "not at all true (4)" for all items.

The questions cover multiple aspects, including students' relationships with teachers and peers, the level of respect and acceptance they receive,

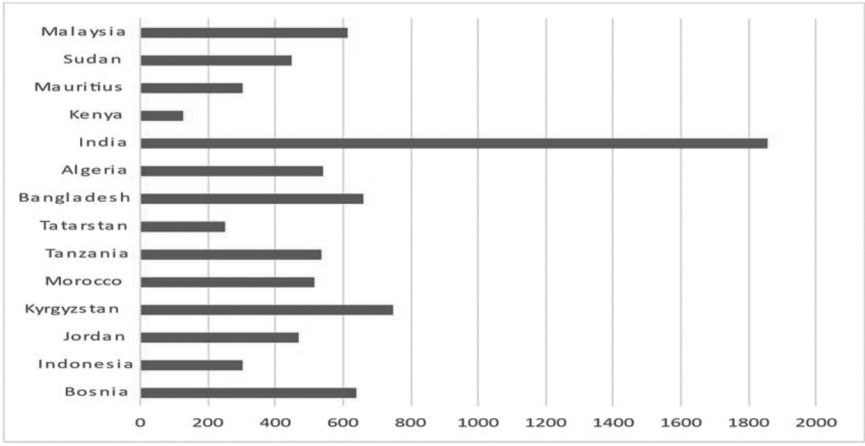

Figure 1. Distribution of Respondents by Country
Note: Data from IIIT (2019–2020)

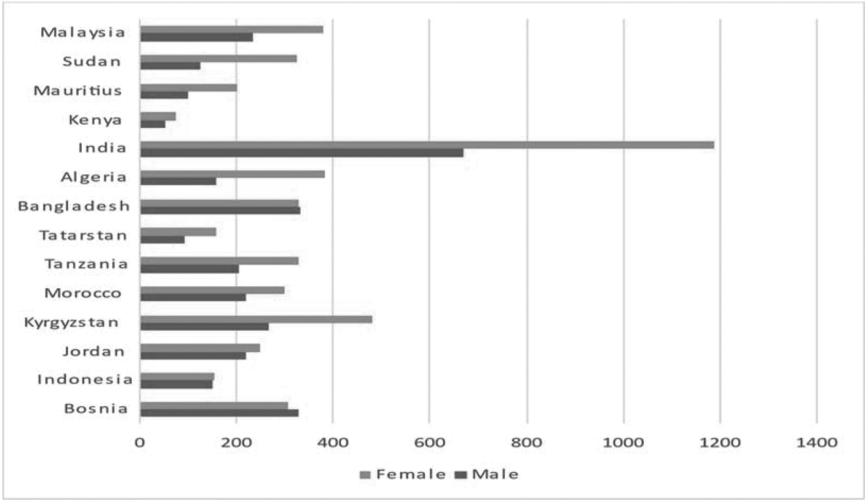

Figure 2. Distribution of Muslim Female and Male Respondents by Country
Note: Data from IIT (2019–2020)

their involvement in school activities, and their overall feelings of pride and belonging. Some questions also address potential barriers to belonging, such as feeling different within the community or not being included in activities.

Based on Sumsion and Wong (2011), our data indicated that all statements or items of belonging cover both the emotional and social aspects of belonging. Emotional belonging was most evident (12 items), followed

by references to social belonging (6 items). Table A-1 in the Appendix contains a list of the 18 items (Q120101–Q120118 as indicated in the data set) used to assess the sense of belonging. Nevertheless, these dimensions collectively assess a singular attribute: the sense of belonging to school (Baumeister & Leary, 1995). To assess the internal consistency of the Likert scale, we calculated Cronbach's alpha, which was found to be 0.7961. A Cronbach's alpha value above 0.7 generally indicates good internal consistency (Ursachi et al., 2015). Table 1 illustrates how respondents are distributed across various items. The data indicate that a significant proportion of surveyed students responded positively to the positive items of school sense of belonging.

Table 1. Distribution of Respondents by Items

Label Items/ Likert scale	Very True	True	Not true	Not at all true	Total
I feel like a real part of my school community.	31%	47%	17%	5%	100%
The teachers have respect for me.	37%	47%	12%	4%	100%
I am treated with as much respect as others at my school.	37%	45%	14%	5%	100%
It is hard for people like me to get accepted here.	10%	19%	37%	34%	100%
Sometimes I feel as if I don't belong here.	11%	21%	33%	35%	100%
People here notice when I'm good at something.	29%	51%	16%	5%	100%
I feel very different from most other students here.	20%	31%	33%	17%	100%
I feel proud of belonging to my school.	44%	39%	12%	5%	100%
Other students like me the way I am.	34%	48%	13%	5%	100%
Other students take my opinions seriously.	20%	49%	24%	8%	100%
Most teachers are interested in me.	21%	47%	25%	8%	100%
There's at least one teacher or adult in school I can talk to.	33%	41%	15%	11%	100%

(*Continued*)

Table 1. Continued

People at this school are friendly to me.	32%	49%	13%	5%	100%
Teachers here are not interested in people like me.	9%	14%	39%	39%	100%
I am included in lots of activities at my school.	24%	42%	25%	9%	100%
I can really be myself at this school.	32%	47%	15%	6%	100%
People here know I can do good work.	31%	52%	13%	4%	100%
People here know I can do good work.	17%	17%	31%	35%	100%

Source: Data from IIT (2019–2020)

THE MODEL

Our research study aims to measure the school's sense of belonging utilizing Item Response Theory (IRT). This approach offers a theoretical and methodological framework for our objective, analyzing individuals' responses to a set of items or questions designed to gauge the targeted construct. Item Response Theory (IRT) is a robust statistical modeling framework increasingly utilized in educational and psychological research. It enables the measurement of latent traits or abilities, such as the sense of belonging to school (Martin et al., 2020). The foundational principles of IRT largely stem from psychometrics and educational measurement, with seminal contributions by Rasch (1960), Birnbaum (1968), Wright and Stone (1979), and Lord (1980). These latent traits cannot be directly measured in individuals. They necessitate quantification through an instrument that comprises items tailored to evaluate an individual's latent trait level.

The IRT framework encompasses a group of models depending on the type of responses. In our study, and using IIIT data, students are asked to rate their responses on a four-point Likert scale ordered from "very true (1)" to "not at all true (4)" for all items. Therefore, we use the Graded Response Model (GRM) proposed by Samejima (1969) based on ordered response categories. In the GRM, each item is modeled with its discrimination and difficulty parameters that identify boundaries between the ordered outcomes. The probability of observing outcome k or higher for item i and person j is given by;

$$\Pr\left(Y_{i,j} \geq \frac{k}{\theta_j}\right) = \frac{exp\{a_i(\theta_j - b_{ik})\}}{1+exp\{a_i(\theta_j - b_{ik})\}} \quad \text{where} \quad \theta_j \sim N(0,1)$$

where a_i represents the discrimination of item i, b_{ik} represents the difficulty of responding with category k or higher for item i, and θ_j is the latent trait of person j.

Evaluating the Assumption of Unidimensionality

The most prevailing assumption of IRT models is unidimensionality (Toland, 2014). This can be assessed using non-IRT methods like exploratory factor analysis (EFA) or confirmatory factor analysis (CFA). CFA is suitable when the dimensional properties of the scale are already known, whereas EFA is more appropriate for scales that are relatively unexplored in terms of their dimensional structure (Toland, 2014). To assess the assumption of unidimensionality, a CFA was employed based on theoretical understanding and prior empirical research indicating a unidimensional construct underlying the school's sense of belonging. Table 2 presents the results of a factor analysis to test the unidimensionality of the latent trait "School sense of belonging."

Table 2. Test of Unidimensionality: Factor Analysis

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	3.558	2.342	0.871	0.871
Factor 2	1.216	0.992	0.298	1.169
Factor 3	0.224	0.060	0.055	1.224
Factor 4	0.164	0.064	0.040	1.264
Factor 5	0.100	0.030	0.025	1.288
Factor 6	0.071	0.046	0.017	1.306
Factor 7	0.025	0.016	0.006	1.312
Factor 8	0.009	0.058	0.002	1.314
Factor 9	-0.049	0.019	-0.012	1.302
Factor 10	-0.068	0.006	-0.017	1.285
Factor 11	-0.073	0.039	-0.018	1.267
Factor 12	-0.112	0.017	-0.027	1.240
Factor 13	-0.129	0.013	-0.032	1.208
Factor 14	-0.142	0.024	-0.035	1.173
Factor 15	-0.166	0.005	-0.041	1.133
Factor 16	-0.171	0.011	-0.042	1.091
Factor 17	-0.182	0.007	-0.044	1.046
Factor 18	-0.189		-0.046	1.000

Factor 1 has an eigenvalue of 3.558, which is significantly higher than the others, indicating it explains the most variance in the data. Subsequent factors have much lower eigenvalues. The largest difference in eigenvalues is between Factor 1 and 2 (2.342), indicating a sharp drop in explained variance after the first factor. Factor 1 accounts for 87.1% of the variance, which is very high, while Factor 2 accounts for 29.8%, with the proportions for subsequent factors dropping sharply. Since Factor 1 explains a dominant portion of the variance (87.1%) and there is a significant drop to Factor 2, this supports the notion that the sense of belonging is primarily unidimensional.

ESTIMATION OF GRM PARAMETERS

The GRM estimates two fundamental parameters: item discrimination and item difficulty (Samejima, 1969). Table 3 presents the estimates for these GRM parameters.

Table 3. Estimation of GRM parameters

	Coef.	Std.Err.	z	P>z	[95%Conf.	Interval]
PartOfCommunity						
Discrim	1.331	0.034	38.780	0.000	1.264	1.398
Diff						
>=2	-0.797	0.028	-28.720	0.000	-0.851	-0.743
>=3	1.224	0.033	37.110	0.000	1.159	1.289
=4	2.678	0.065	41.390	0.000	2.551	2.805
TeachersRespect						
Discrim	1.363	0.036	38.130	0.000	1.293	1.433
Diff						
>=2	-0.512	0.025	-20.800	0.000	-0.560	-0.464
>=3	1.601	0.039	40.780	0.000	1.524	1.678
=4	2.878	0.071	40.670	0.000	2.739	3.017
TreatedRespect						
Discrim	1.241	0.034	37.040	0.000	1.175	1.307
Diff						
>=2	-0.558	0.027	-21.060	0.000	-0.610	-0.506
>=3	1.526	0.040	37.980	0.000	1.447	1.605
=4	2.934	0.075	38.960	0.000	2.786	3.081

(*Continued*)

Table 3. Continued

AcceptanceHard						
Discrim	-0.377	0.024	-15.580	0.000	-0.424	-0.329
Diff						
>=2	5.968	0.381	15.670	0.000	5.221	6.715
>=3	2.454	0.162	15.190	0.000	2.137	2.771
=4	-1.834	0.132	-13.900	0.000	-2.093	-1.576
DontBelong						
Discrim	-0.692	0.026	-26.150	0.000	-0.744	-0.640
Diff						
>=2	3.229	0.121	26.640	0.000	2.992	3.467
>=3	1.254	0.055	22.810	0.000	1.146	1.361
=4	-0.941	0.049	-19.010	0.000	-1.038	-0.844
NoticeGood						
Discrim	0.861	0.028	30.440	0.000	0.806	0.916
Diff						
>=2	-1.219	0.046	-26.350	0.000	-1.309	-1.128
>=3	1.770	0.059	29.760	0.000	1.654	1.887
=4	3.765	0.123	30.720	0.000	3.525	4.005
FeelDifferent						
Discrim	-0.207	0.024	-8.680	0.000	-0.253	-0.160
Diff						
>=2	6.834	0.785	8.710	0.000	5.297	8.372
>=3	-0.119	0.111	-1.070	0.285	-0.337	0.099
=4	-7.811	0.905	-8.630	0.000	-9.585	-6.037
ProudSchool						
Discrim	1.429	0.037	38.330	0.000	1.356	1.502
Diff						
>=2	-0.211	0.022	-9.590	0.000	-0.255	-0.168
>=3	1.506	0.037	41.180	0.000	1.435	1.578
=4	2.708	0.065	41.880	0.000	2.581	2.834
LikeMe						
Discrim	1.307	0.034	38.120	0.000	1.240	1.374
Diff						
>=2	-0.664	0.027	-24.840	0.000	-0.716	-0.611
>=3	1.499	0.038	39.200	0.000	1.424	1.574
=4	2.871	0.072	40.070	0.000	2.731	3.012

(*Continued*)

Table 3. Continued

OpinionsSeriously						
Discrim	1.222	0.032	38.140	0.000	1.160	1.285
Diff						
>=2	-1.465	0.039	-37.260	0.000	-1.543	-1.388
>=3	0.813	0.029	28.390	0.000	0.757	0.869
=4	2.453	0.061	40.160	0.000	2.334	2.573
TeachersInterested						
Discrim	1.295	0.033	39.300	0.000	1.231	1.360
Diff						
>=2	-1.341	0.036	-37.440	0.000	-1.411	-1.270
>=3	0.755	0.027	28.240	0.000	0.703	0.807
=4	2.425	0.058	41.790	0.000	2.311	2.538
CanTalk						
Discrim	0.939	0.029	32.760	0.000	0.883	0.995
Diff						
>=2	-0.873	0.037	-23.780	0.000	-0.945	-0.801
>=3	1.318	0.044	29.790	0.000	1.231	1.405
=4	2.629	0.078	33.650	0.000	2.476	2.782
PeopleFriendly						
Discrim	1.260	0.033	37.830	0.000	1.195	1.326
Diff						
>=2	-0.745	0.028	-26.380	0.000	-0.800	-0.689
>=3	1.520	0.039	38.890	0.000	1.443	1.596
=4	2.827	0.071	40.020	0.000	2.689	2.966
NotInterested						
Discrim	-0.693	0.027	-25.890	0.000	-0.746	-0.641
Diff						
>=2	3.689	0.140	26.390	0.000	3.415	3.963
>=3	1.989	0.077	25.840	0.000	1.838	2.140
=4	-0.694	0.044	-15.650	0.000	-0.781	-0.607

(*Continued*)

Table 3. Continued

Activities						
Discrim	1.101	0.030	36.690	0.000	1.042	1.160
Diff						
>=2	-1.278	0.039	-32.860	0.000	-1.355	-1.202
>=3	0.761	0.030	25.390	0.000	0.702	0.820
=4	2.487	0.065	38.070	0.000	2.359	2.615
BeMyself						
Discrim	1.129	0.031	35.910	0.000	1.067	1.191
Diff						
>=2	-0.821	0.031	-26.120	0.000	-0.883	-0.760
>=3	1.439	0.041	35.190	0.000	1.359	1.519
=4	2.874	0.076	37.590	0.000	2.725	3.024
GoodWork						
Discrim	1.279	0.034	37.530	0.000	1.212	1.346
Diff						
>=2	-0.799	0.029	-28.010	0.000	-0.855	-0.743
>=3	1.568	0.040	38.950	0.000	1.489	1.647
=4	3.029	0.077	39.250	0.000	2.878	3.180
DifferentSchool						
Discrim	-0.636	0.026	-24.640	0.000	-0.687	-0.585
Diff						
>=2	2.721	0.110	24.770	0.000	2.506	2.936
>=3	1.181	0.057	20.680	0.000	1.069	1.293
=4	-1.020	0.055	-18.520	0.000	-1.128	-0.912

The estimated parameters reveal that the item "I feel proud of belonging to my school" possesses the highest discrimination parameter, valued at 1.429, compared with other items. This high discrimination parameter indicates that this item is exceptionally effective at differentiating between students with varying levels of the underlying trait, in this case school sense of belonging. Specifically, students who agree with this statement are significantly more likely to exhibit a higher overall sense of belonging, whereas those who disagree tend to show a lower sense of belonging. Furthermore, the item "teachers have respect for me" has a discrimination parameter of 1.363, ranking it as the second most important item. The third item that differentiates

between students with varying levels of school sense of belonging is "I feel like a real part of my school community," which has a discrimination parameter of 1.33.

Regarding the difficulty parameters, they indicate for the most discriminative item, "I feel proud of belonging to my school", that:

- Students with a below-average sense of belonging will likely transition from not at all true to not true at a trait level of -0.211.
- Students with a moderately high sense of belonging will likely transition from not true to true at a trait level of 1.506.
- Students with a high sense of belonging will likely transition from true to very true at a trait level of 2.708.

Test Information Function

To further evaluate the measurement precision across different levels of the sense of belonging (latent trait), we utilized the Test Information Function (TIF). The TIF provides a graphical representation of the test's precision (information) across the latent trait continuum (Theta). Higher values on the TIF indicate greater test precision and reliability at that latent trait level. The TIF has two prominent peaks. The first peak is around Theta = -1, and the second, higher peak is around Theta = 2. The test provides high information (above 5), roughly in the range of Theta from -1.5 to 2.5. This indicates the test is highly precise in this range of the latent trait (Figure 3).

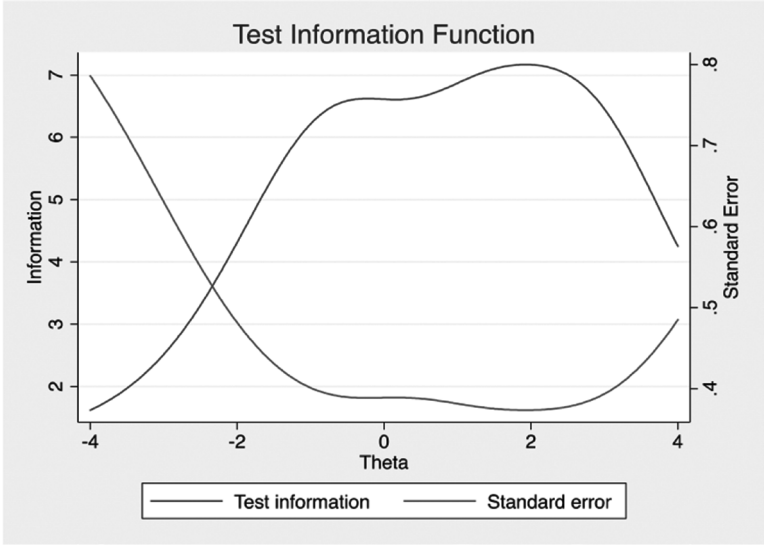

Figure 3. Test Information Function

RESULTS

IRT scores are derived as predictors of the school's sense of belonging. Figure 4 shows significant variations in the school sense of belonging among the countries/regions studied. The region with the highest school sense of belonging is Tatarstan, while the lowest levels are recorded in India, Sudan, Bangladesh, Tanzania and Kenya. In these countries, the the scores of the school's sense of belonging are negative, indicating a considerable deficit in terms of feelings of belonging.

In relation to disparities between females and males, Figure 5 shows that boys exhibit a greater school sense of belonging than girls across all

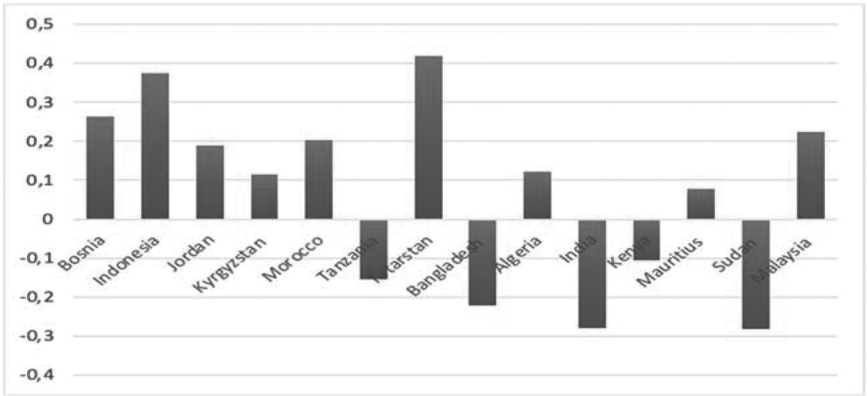

Figure 4. School Sense of Belonging by Country
Source: Authors

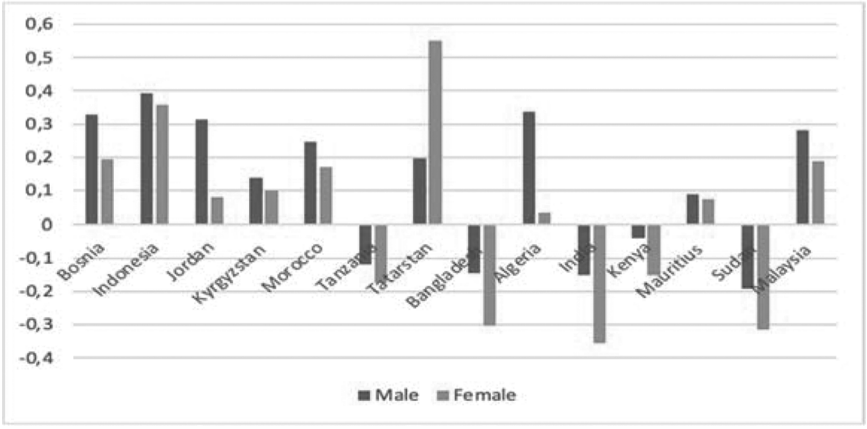

Figure 5. School Sense of Belonging by Gender
Source: Authors

countries under investigation, except for the Tatarstan region, indicating a considerably lower level of belongingness compared with their male counterparts.

Figure 6 indicates that countries with lower GDP per capita tend to have lower levels of school belonging. This raises the question of whether there is a relationship between a country's GDP per capita and students' sense of belonging to their school. To investigate the potential link between the school sense of belonging measure and a country's economic prosperity, measured by GDP per capita (PPP), we conducted a multiple linear regression analysis, incorporating gender as an additional independent variable.

The results indicate a positive and significant relationship for both variables under study: GDP per capita and gender (Table 4). Specifically, the analysis reveals that higher GDP per capita is associated with a greater sense of school belonging among students. This finding suggests that students in wealthier countries may experience a stronger sense of connection and belonging within their school environment. Additionally, the results show that boys exhibit a significantly higher sense of belonging than girls.

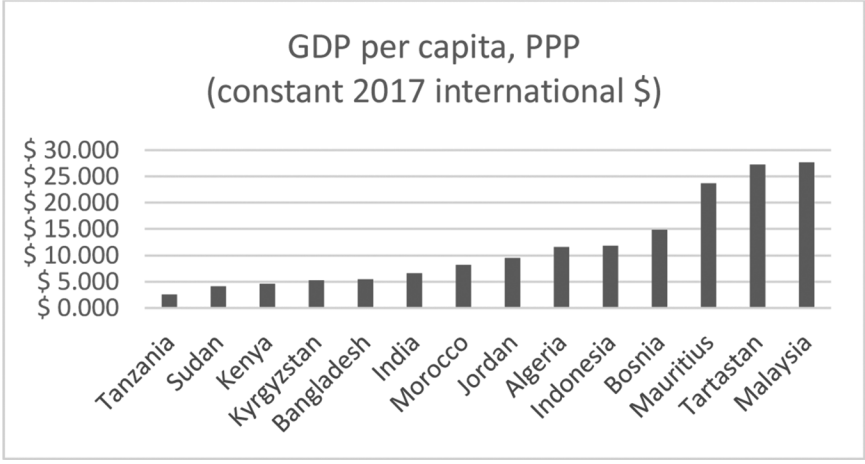

Figure 6. GDP per Capita (PPP) in the Participating Countries/Regions

Notes: The histogram displays the GDP per capita in purchasing power parity (PPP), adjusted to constant 2017 international dollars, for 2020. The GDP per capita for Bosnia corresponds to the GDP per capita for Bosnia and Herzegovina, while the GDP per capita for Tatarstan is represented by the GDP per capita of the Russian Federation.
Source: GDP per capita (current US$) | Data (worldbank.org)

Table 4. Estimation results

Variables	Coefficient
GDP	0.0201***
	(0.00135)
Gender	0.141***
	(0.0206)
Constant	-0.263***
	(0.019)
Observation	8004

Notes: Gender was introduced as a dummy variable taking 1 for boys and zero for girls
Standard errors are in parentheses.
*Significance levels: *** p<.01, ** p<.05, * p<.1*

Discussion and Conclusion

The need to belong, as outlined by Maslow (1954), has proven to be particularly relevant among adolescents. Research indicates that students who feel personally accepted, respected, included, and supported by others within the school's social environment tend to perform better academically. Based on the data collected by IIIT (2019–2020), which reflect students' social connections, involvement in school activities, perceptions of support from peers, teachers and communities, and overall satisfaction with their school experience, this study identified critical components contributing to students' sense of school belonging. The study also examined the relationship between belonging and the economic prosperity of their country, measured by GDP per capita.

We estimated school sense of belonging scores by country/region using IRT methodology. Upon preliminary data inspection, three primary components of the school's sense of belonging emerged: feeling proud of the school, perceiving respect from teachers, and integration within the school community. These three components highlight the pivotal role of pride in membership as a central aspect of students' school sense of belonging. Additionally, the significance of students' perception of respect from teachers aligns with findings from Allen et al. (2021) suggesting its influence on fostering a sense of belonging. Moreover, participation in the school community appears to be a crucial factor in enhancing school belonging. As a consequence, schools must create and maintain an environment where students feel proud of their membership, respected by their teachers, and fully integrated into the school community. This can be achieved through

targeted interventions and policies to foster the following key elements of school belonging. Schools should build a culture of respect, inclusivity, and active participation, ensuring that all students have opportunities to engage meaningfully in school activities and form positive relationships with peers and educators. For instance, schools can cultivate pride by celebrating achievements, promoting school spirit through events and activities, and involving students in decision-making processes. Second, to ensure students feel respected by their teachers, schools should prioritize professional development emphasizing the importance of respectful and supportive teacher-student relationships. This can include training on effective communication, cultural competence, and empathetic teaching practices. Finally, a sense of community can be achieved by encouraging collaborative projects, implementing mentorship programs, and organizing community-building activities that include students and staff.

Following the estimation of school sense of belonging scores, variations in the sense of belonging are apparent across the participating countries/regions. Students in the Tatarstan region demonstrate a heightened sense of belonging. Students in Bangladesh, India, Kenya, Sudan, and Tanzania report markedly lower levels of belonging, with more negative scores relative to other countries in the sample. To gain insights into the relationship between a school's sense of belonging and GDP per capita, we estimated a linear equation using OLS (Ordinary Least Squares) regression. Our main argument was that there is a positive association between GDP per capita and students' sense of school belonging. Indeed, the findings indicate that countries with higher GDP per capita generally show higher scores of school belonging. This relationship is likely due to the increased resources and support wealthier countries can provide their educational systems. These resources lead to better school facilities, various extracurricular activities, and well-trained teachers, all of which foster a supportive and inclusive school environment. making students proud of their school (OECD, 2018; Carbonaro & Maloney, 2019).

Our finding is relatively new in research, as previous studies have primarily focused on individual factors such as mental health, achievement level, and academic motivation (Allen et al., 2018; Korpershoek et al., 2019) and school-level factors such as relationships with teachers, parent support, peer relationships, and school climate (Allen et al., 2016; 2018; García-Moya et al., 2018) affecting school belonging, rather than broader economic indicators. Our study, in line with King et al. (2022), expands the understanding of how macroeconomic conditions

can influence psychological educational outcomes, such as the sense of school belonging, highlighting the importance of economic investment in creating supportive school environments. Lastly, our results also show a gender disparity in school belonging, with females reporting lower levels of belonging (except in the Tatarstan region). While consistent with some studies, this result was not the primary focus of our research and suggests a need for targeted interventions to support female students.

The study's limitations are linked to the sampling which does not represent all 14 locations (Nasser et al., 2021). Despite this limitation, the study's findings can still offer valuable insights and enhance our comprehension of the sense of belonging among students in the countries/regions included in the study.

Future research should explore the causal mechanisms underlying the relationship between GDP per capita and school belonging. Longitudinal studies could provide more insight into how changes in economic conditions impact school belonging over time. Our findings suggest that policymakers should consider the broader economic context when addressing school belonging. Investing in educational resources and support services can create more inclusive and supportive school environments.

Notes

1. This work was funded by a grant from the International Institute of Islamic Thought (IIIT)

2. Data for the United States have been removed because the relative sample is very small.

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APPENDIX

Table A-1. Sense of belonging items

Item's Name	Label	Corresponding dimension
SB_PartOfCommunity	I feel like a real part of my school community	Emotional belonging
SB_TeachersRespect	The teachers have respect for me	Emotional belonging
SB_TreatedRespect	I am treated with as much respect as others at my school	Emotional belonging
SB_AcceptanceHard	It is hard for people like me to get accepted here.	Social belonging
SB_DontBelong	Sometimes I feel as if I don't belong here	Emotional belonging
SB_NoticeGood	People here notice when I'm good at something	Social belonging
SB_FeelDifferent	I feel very different from most other students here.	Emotional belonging
SB_ProudSchool	I feel proud of belonging to my school	Emotional belonging
SB_LikeMe	Other students like me the way I am	Social belonging
SB_OpinionsSeriously	Other students take my opinions seriously	Social belonging
SB_TeachersInterested	Most teachers are interested in me	Emotional belonging
SB_CanTalk	There's at least one teacher or adult in school I can talk to	Emotional belonging
SB_PeopleFriendly	People at this school are friendly to me	Social belonging
SB_NotInterested	Teachers here are not interested in people like me	Emotional belonging
SB_Activities	I am included in lots of activities at my school	Social belonging
SB_BeMyself	I can really be myself at this school	Emotional belonging
SB_GoodWork	People here know I can do good work	Emotional belonging
SB_DifferentSchool	I wish I were in a different school	Emotional belonging

Notes: Social belonging is linked to group membership and attachments beyond close family and friends. It involves feeling part of a community. Emotional belonging is associated with acceptance: feeling liked, recognized, and respected (Sumsion & Wong, 2011).